H. Rostach

1910.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

REPORT

OF THE

EPARTMENT OF PUBLIC WORKS,

FOR THE

YEAR ENDED 30 JUNE, 1910.

Printed under No. 4 Report from Printing Committee, 21 December, 1910.

SYDNEY: WILLIAM APPLEGATE GULLICK, GOVERNMENT PRINTER.

1911.

80783 *289— [5s.]

1910.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

REPORT

OF THE

EPARTMENT OF PUBLIC WORKS,

FOR THE

YEAR ENDED 30 JUNE, 1910.

Printed under No. 4 Report from Printing Committee, 21 December, 1910.

SYDNEY: WILLIAM APPLEGATE GULLICK, GOVERNMENT PRINTER.

1911.

0783 *289— [5s.]

INDEX.

Illustrations.—Bridge over the Hunter River, North Coast Railway; Bridge over the Paterson River, North Coast Railway; The Spout, North Coast Railway Works; Fire Station, Drummoyne; Police Station, Hornsby; Medical School, Sydney University; Hospital for Insane, Morrisset; Technical College, West Maitland; Shop premises, George-street North; Barren Jack Dam—under construction (2 plates); Berembed Weir; Filter Beds, Katoomba; Low-level Sewerage, Pumping Station, Iron Cove Creek; Bridge over the Macquarie River, near Geurie; Bascule Bridge, Swansea; Steam Ferry Punt, Hexham, Hunter River; Cantilever Cranes, Fitzroy Dock; Cast-iron Pipes for Barren Jack Dam; Water-tube Boiler; Corner of Erecting Shop, Fitzroy Dock. Two Maps.

1910.

NEW SOUTH WALES.

THE DEPARTMENT OF PUBLIC WORKS.

(ANNUAL REPORT, 1909-10.)

THE UNDER SECRETARY FOR PUBLIC WORKS TO THE HONORABLE ARTHUR HILL GRIFFITH, M.L.A., SECRETARY FOR PUBLIC WORKS.

Department of Public Works,
Sydney, 8th December, 1910.

Sir,

I have the honor to submit the following report and appended statements from the Heads of Branches, showing the work carried out by the Department during the year ending 30th June, 1910.

The total expenditure, as shown in the statement furnished by the Accountant, amounted to £2,791,868 8s. 11d., an increase of £300,792 3s. 2d. over the total for the preceding year. This total includes £265,238 18s. 11d. expended on behalf of other State Departments and £45,742 0s. 10d. for the Commonwealth Government.

FINANCIAL.

The approximate cost of administration, design and supervision, is shown to be £180,961 9s. 2d., which is equivalent to 6·48 per cent. of the total expenditure. This is ·43 less than the percentage of cost for 1908-9.

Exclusive of the cost of administration, etc., as given above, the expenditure carried out under the several branches was as follows:—

	£	s.	d.
Railways and Tramways	1,047,371	9	7
Public Buildings	485,780	2	10
Harbours and Water Supply	299,584	5	3
Irrigation, Drainage and Sewerage	291,006	6	4
Local Government (incidental to)	279,139	4	5
Roads, Bridges, and Ferries (not under Shire or Municipal control)	127,287	0	9
Fitzroy Dock	53,396	4	8

Of the total expenditure, £2,460,98 19s. 2d. was made directly by the Officers of the Department, while the remainder, £330,886 19s. 9d., was issued to Shire and Municipal Councils.

Payments

Payments in connection with the Darling Harbour and Rocks resumptions amounted to £2,874 3s. 10d., bringing the total expenditure under that head, at 30th June, 1910, to £4,821,504 3s. 10d. Exclusive of the Darling Harbour and Rocks areas, £38,359 15s. 9d. was paid during the year for land and property resumed in connection with public works.

The number of officers employed on the permanent staff of the Department at close of the year was 688, the total annual salary being £150,776. Temporary employees numbered 508, with an aggregate salary of £84,461. Equipment and travelling allowances amounted to £16,657 12s. 9d.

Two thousand two hundred and sixty-eight contracts were let, of a gross value of £1,806,988 18s. 8d., of these 1,892 were for or in connection with public buildings, their value amounting to £976,821 0s. 5d., whilst Railway and Tramway works accounted for contracts to the value of £594,981 3s. 3d.

RAILWAYS AND TRAMWAYS.

As in the preceding year, the heaviest expenditure was incurred in connection with railway and tramway construction, the total payments from the first of July, 1909, to 30th June, 1910, amounting to £1,047,371 9s. 7d.

Further contracts were let on the North Coast Railway to the value of £383,542 3s. 6d., bringing the total value of contracts let on this line at 30th June, 1910, to £1,189,118 5s. 2d., whilst payments were made during the year to the extent of £471,043 4s. 9d. Work is being advanced as rapidly as possible, and a continuous length of 115¾ miles is now under construction, while instructions have been issued for the invitation of tenders on the sections lying between Taree and Kempsey, and South Grafton and Glenreagh, a further length of 106⅛ miles. The permanent marking of the remainder of the line is well in hand. Among the more important of the works so far undertaken on this line, the Chief Engineer refers to the bridge, consisting of four 200-feet steel truss spans at the Manning River, for which a contract has been let at £14,851, and the tunnel passing through the Monkerai Range, which on account of its length, 847 yards, and situation, it is proposed to construct sufficiently large for a double line of rail.

A contract was let in April, 1910, for the first section of the extension from Cooma to Bombala; the construction of which was authorised last year. Amount of contract, £99,879 10s.; length of section concerned, 24 miles 25·935 chains, extending from Cooma, the present terminus, to Nimmitabel.

The extension from Casino to Kyogle (light line), commenced in January, 1909, was completed and handed over to the Railway Commissioners in June. Total length, 17 miles 78 chains. Cost about £87,117.

At close of the year the following lines, commenced the preceding year, were still under construction:—Cowra to Canowindra, 23 miles 18 chains in length; estimated cost, £10,345; Mudgee to Dunedoo, 2nd section, 29 miles 34 chains in length; estimated cost, £97,127; Narromine to Peak Hill, 36 miles 57 chains in length; estimated cost, £119,366; and Lockhart to Clear Hills, 1st section, 21 miles 75·117 chains in length, extending to Lake Cullivel; estimated cost, £149,681. There was thus a total of 251⅜ miles of new lines under construction at 30th June, 1910, estimated to cost £2,248,631.

The permanent marking of the extension from Moree to Mungindi was put in hand, and a length of 25 miles completed during the year. The total length of the proposed extension is 76 miles 12 chains, and the estimated cost £285,889.

A large number of proposals for additional extensions were dealt with, necessitating, together with the permanent surveys of lines previously authorised, 1,457 miles of exploration, 357 miles of inspection, 1,402¼ miles of traversing, staking, etc., and 1,999¼ miles of levelling and section work.

As referred to in last year's report, the proposal to provide railway communication from Coramba to the Dorrigo country was reported upon by the Parliamentary Standing Committee, which, after an exhaustive inquiry, decided in favour of the proposal generally, but adversely to the particular route under consideration. The Committee came to the conclusion that the line should junction at Glenreagh, and this route formed the subject of a second inquiry reported upon in June, 1910. Dealing with the country concerned, the Committee stated that it was exceptionally fertile, well-timbered, and capable of great development, and wherever production has been attempted the results appear to have been exceptional, and in some instances phenomenal.

Tramway Construction.—Of the 17¾ miles of new lines under construction on 1st July, 1909, 14 miles 18½ chains were completed and opened for traffic during the year at a cost of £161,606, estimated. Satisfactory progress had also been made on the Wallsend to West Wallsend line, 7 miles 45 chains; estimated cost, £39,895; as also on the Cronulla-Sutherland line, 7 miles 6 chains; estimated cost, £34,525, whilst the extension of the existing tramway from Baulkham Hills to Castle Hill was practically completed; length 2¼ miles; estimated cost, £11,047. These lines will be under steam traction, and the two latter will be used for the conveyance of passengers and goods as auxiliary to the railway.

Work was commenced upon the Spit-Manly line authorised last year, a contract being let in December, 1909, for £20,520 16s. 3d. Contracts were also let on the Harris-Evans Street extension, and the line from High-street to West Maitland.

The total length of tramway under construction at close of the year was 21 miles 68½ chains; the estimated cost being £176,061.

Authority was given during the year for construction of the following, and preliminary work on same has been put in hand:—

Military-road to Cremorne.
Waverley to Bronte.
Leichhardt to Petersham.
Campbell-street, from Flinders-street.
Erskine-street extension.
Marrickville to Undercliffe.
Watson's Bay and Bellevue Hill Tramways connection at Park-street.
Baptist-street, and other connections to Western Suburbs.

The total length being 6 miles 61 chains.

In connection with the Cremorne Tramway, an undertaking was obtained from the Sydney Ferries Company, before submitting the proposal to Parliament, to provide the requisite wharfage and steamer accommodation and run an independent and frequent ferry service from the Circular Quay to the tram terminus at Cremorne Point. This tramway and ferry service will, in conjunction with the tramway under constructon from the Spit to Manly, shorten the overland route from Manly to Sydney by ten or fifteen minutes.

Public Buildings.

The expenditure on and in connection with State public buildings amounted to £143,137 16s. 7d., in addition to which £42,564 11s. 7d. was expended on behalf of the Federal Government and £77 14s. 8d. for the Norfolk Island Administration.

A glance at the comprehensive statement furnished by the Government Architect will show the variety and importance of the works dealt with. They may be grouped as follows, the figures representing the value of work completed and contracted for during the year :—New Abattoirs, £158,765 ; Public Schools, £140,500 ; Prisons, Court-houses, &c., £112,715 ; Hospitals (including those for Insane), £107,197 ; Government Offices, £86,621 ; University, £41,258 ; Resumed Properties, £37,906 ; Post and Telegraph Offices, £22,737 ; Museums and Art Gallery, £14,083 ; Fire Stations, £12,544 ; State Government House, £9,000 ; State Clothing Factory, £6,493 ; Commonwealth Stores, £5,779 ; Military Buildings, £7,467 ; Benevolent Asylums, £4,566 ; Old Government House, Parramatta, £4,086 ; Yanco Experimental Farm, £1,560 ; Hawkesbury Agricultural College, £910 ; Technical College, £681 ; Admiralty House, £300.

Among the more important of the works entered upon, reference may be made to the completion of the new abattoirs at Homebush, a contract for which was let in April at £158,765. A considerable amount of work had previously been carried out by the Department in preparing the site, forming roadways, and providing connection with the general railway system. The design and general arrangement adopted for dealing with the various classes of animals, the transmission of carcases, collection and disposal of blood, etc., etc., is the result of careful consideration of the most approved methods in vogue elsewhere, and in addition to the administrative buildings, slaughter-houses, stables, refreshment-rooms, etc., provided for in the contract now in hand, the scheme when finally complete will include a power-house, desiccating chamber, and complete accommodation for dealing with by-products and diseased animals.

Mention may also be made of the contract let in December, 1909, for £83,977, for the completion of the new offices for the Registrar-General's Department. Owing to the increasing inconvenience of the present offices in Elizabeth-street, and the urgency for securing additional space, part of the internal portion of the new premises was erected some three or four years ago, and has since been in occupation by several branches of the Department. These rooms will be absorbed with but little alteration in the work now in hand. The new building will be of fire-proof construction, with vaults for the storage of valuable documents, etc. The external walls will be of sandstone with trachyte base, and special methods have been adopted for ventilation, etc.

A further contract in connection with the Penitentiary at Long Bay was let at £76,325, for the completion of that section of the prison which will be set apart for the reception of male prisoners ; 350 inmates will be provided for, together with all necessary accommodation for staff, workshops, etc.

Particulars of several other large contracts, let in connection with the Hospitals for Insane at Parramatta and Kenmore, are given in Mr. Vernon's statement.

For the Commonwealth Government extensive alterations were undertaken to the internal construction of the General Post Office for the purpose of improving and increasing the working accommodation available in the present building. Value of the work done during the year amounted to £9,757, whilst the total cost is estimated at £30,000. The

The old Naval Stores on the western side of Circular Quay, which were constructed by Governor Macquarie in 1814, were also altered and repaired at a cost of £4,700, the work being carried out by day-labour. These stores were formerly vested in and used by the Imperial Government, but were transferred to the State in 1899, and subsequently passed to the Commonwealth Government. They will now be used as offices for the Department of Taxation.

Extensive alterations and additions to the residence of His Excellency the State Governor were also carried out by day-labour, the expenditure for the year amounting to £7,002.

The amount of work carried out in connection with the public schools of the State as shown by the list attached to Mr. Vernon's statement, is evidence of the intention of the Department of Education to bring these important factors in the progress of the State into line with the most advanced ideas in the matters of accommodation, lighting, ventilation and air-space, as rapidly as circumstances will permit.

The necessity for a properly-organised system of inspection of buildings in use as places of public entertainment, as is now provided for under the Theatres and Public Halls Act, is shown in the fact that of 1,350 such buildings examined during the year it is reported that very few were found to comply with the requirements of public safety. Some of the older theatres and halls have had to be entirely remodelled in order to conform fully with the regulations; but in all cases the necessary alterations have been carried out, and the public risk has been reduced to a minimum.

Particulars of inspections, etc., carried out under the Scaffolding and Lifts Act are furnished in an appended statement.

Harbours and Water Supply.

The total expenditure incurred during the year in connection with Harbour works and River entrances is £238,520 17s. 2d., of which £107,005 9s. 8d. was for dredging. The material removed by dredging amounted to 4,603,030 tons, at an average cost of 5·58d. per ton. These figures do not compare favourably with those of preceding years, the difference being attributable chiefly to industrial disturbances.

As has been the case in preceding years, the works designed to effect the permanent improvements of the principal river entrances have for the most part been in abeyance, and channels have been kept open and the formation of sand-bars in check only by constant and carefully-organised movements of the dredging plant.

At the Richmond River, where the permanent works include northern and southern breakwaters, 4,500 feet and 8,555 feet long respectively, together with a middle training-wall, work has been in constant progress since 1899. The total expenditure on these works at 30th June, 1910, amounted to £429,929 16s. 10d., and the quantity of stone used to 1,423,046 tons deposited in blocks ranging from 1 to 20 tons in weight. The work for the year was confined to the southern breakwater, which was extended 101 feet. As the work now stands, the middle training-wall is complete, together with 3,966 feet of the northern and 8,438 of the southern breakwater, leaving 534 feet and 117 feet of the northern and southern walls respectively to complete the scheme as designed.

At Camden Haven, where work has been carried on at intervals since 1897, operations were resumed in July, 1909, after having been in abeyance since February, 1907. Part of the northern wall and the whole of the southern wall and breakwater are complete, and the work now in hand is confined to the completion of the northern wall which was extended a further distance of 970 feet. This addition has carried the wall beyond the line of beach and the effect in checking the flow of sand has been very marked. The average cost of dredging at this entrance in former years has been £1,395.

The question of further extending the northern breakwater at the entrance to the Manning River formed the subject of inquiry by the Parliamentary Standing Committee, which reported in favour of the proposal placed before it, involving an expenditure of £150,000.

For several years the cost of dredging at this entrance has averaged about £2,500 per annum, and it has become very evident that no lasting improvement can be secured until such time as the permanent works may be carried out. The scheme submitted for consideration of the Committee provides for the completion of the improvements on practically the same lines as were originally recommended in 1885 by the late Sir John Coode.

At Newcastle authority was given for the extension of the northern breakwater 420 feet. Work was commenced in February, and at 30th June 17,730 tons of stone had been tipped, extending the wall 82 feet. The total length of the breakwater is now 3,062 feet. The maintenance of the southern breakwater, which sustained damage from heavy seas, involved an expenditure of £1,168.

A new timber wharf 1,088 feet long by 32 feet wide, with cargo-shed, offices, and approaches, together with connection to the Great Northern Railway, was completed at an outlay for the year of £19,625.

The material removed by dredging from the harbour amounted to 1,206,107 tons, in addition to 504,697 tons taken from the bar.

The reclamation and improvements undertaken at Wolli Creek were completed in September, at a total cost of £11,329 9s. 4d. The reclamation covers about 15 acres of low-lying ground which has been raised to about high-water level, and converted into a park and sports ground. The material used amounted to about 100,000 cubic yards.

The northern and eastern breakwaters at Port Kembla were extended 610 and 330 feet respectively, making the total length of the northern wall 1,140 feet and of the eastern wall 2,630 feet. The quantity of stone used in these walls to date is 787,152 tons. The concrete sea-wall along Brighton Beach was extended 250 feet at a cost of £665 11s. 5d.

Work was commenced on the northern breakwater at the entrance to the Crookhaven River, and by 30th June, 600 feet of wall had been completed; 32,920 tons of stone having been used. The cost, nearly 4s. a ton, is comparatively high; but the stone must be shipped 12 miles by sea, and handled at each end by steam cranes, before it can be run out and tipped in position.

The southern training-wall at the entrance to the Moruya River was extended 200 feet, the total length of wall being being now 5,550 feet, and the stone used 53,036 tons. Repairs to the northern breakwater cost £730.

At Eden a platform and cargo-shed were erected at a cost of £1,994 10s. 5d.

Minor

Minor works and improvements were carried out at other places referred to more particularly in the Chief Engineer's statement.

Water Supplies for Country Towns.—The year's expenditure on these works amounted to £58,367 5s. Among the more important of the minor works, additions or extensions to existing works, carried out during the year may be mentioned the 457,000 gallon concrete service reservoir at Lismore, by which the total storage capacity of the town supply was increased to 729,250 gallons; the concrete storage dam at Nowra, which is designed to impound 9,000,000 gallons of water; the reinforced concrete balance tank at Orange, capacity 141,000 gallons; and the raising of the dam at Picton, capacity being increased from 27,000,000 to 57,000,000 gallons.

At Gundagai and Singleton the works undertaken during the preceding year were completed, the supply in each case being obtained by means of wells from water-bearing drift and pumped thence into service reservoirs, from which it flows to the consumer by gravitation.

The works in hand at 30th June included driving into the drift under the Macquarie River for purpose of increasing the Bathurst supply. A considerable increase has resulted from the 1,010 feet of drive already completed, and it is anticipated that the work in hand will still further augment the supply.

An auxiliary well at Dubbo, with requisite machinery, &c., was practically completed at end of the year. The wells are about 50 feet apart, and neither is affected by the pumping operations carried on at the other. The combined supply is about 20,000 gallons an hour.

Additional storage for supply of towns north of Wollongong is being provided on the Cordeaux River by the construction of a curved concrete wall about 2 miles below the existing dam. The crest of the new dam will be 60 feet above the bed of the river, with a length of 816 feet. The storage capacity of the supply will be increased by 260,284,400 gallons, making a total of 433,250,000 gallons. Further details of this scheme are furnished in the appended statement by the Chief Engineer. The work is being carried out by day-labour.

Tenders were invited for the construction of a steel service reservoir with a capacity of 753,000 gallons, for the Forbes water supply.

A large number of proposed works were inquired into, surveys made and estimates prepared. The most important of these, viz., the schemes for the supply of Broken Hill and Grafton and South Grafton, were investigated by the Parliamentary Standing Committee and reported upon favourably. The first named proposes the construction of a dam of cyclopean rubble across Umberumberka Creek, at a point about 18 miles from the town. The wall will be 134 feet high, 50 feet being below ground, and will be 680 feet long on crest. It will be capable of impounding 2,903 million gallons, and when full the water will cover about 380 acres. The loss per annum, from evaporation, it is estimated, will be about 644 million gallons. Duplicate pumping machinery will be provided, each plant being capable of delivering 1,800,000 gallons per diem. The water will be pumped through a rising main about 2 miles long into a covered concrete reservoir 200 feet in diameter and 10 feet deep, from which it will gravitate through 16·8 miles of pipe-line to Broken Hill. Cost is estimated at £359,000, but is subject to revision.

The supply for the Grafton municipalities will be taken from the Nymboida River, at a point about 24 miles distant. The water will be diverted through a tunnel

tunnel and cast-iron pipe to an excavated concrete-lined 600,000 gallon service tank commanding both towns, whence it will be distributed by gravitation. Cost is estimated at £68,390.

Irrigation, Drainage, and Sewerage.

Work on the contract for the construction of the Barren Jack dam, which was commenced in March, 1909, was considerably interfered with by the exceptionally wet winter experienced. The river was in flood from June till September, inclusive, and concreting could not be commenced until towards the end of October. The foundation for the dam, when laid bare, was found to consist of solid granite. The wall, which is curved in plan, will measure 241 feet from the lowest point of foundation to the top, and will have a width at base of 160⅓ feet. Length along the crest will be 765 feet, and width on top 18 feet. The impounded water will have a surface area of about 20 square miles, representing about 208,630 million gallons, and the depth of water at face of the dam will be about 200 feet. The wall is being constructed of cyclopean concrete, and at 30th June 27,145 cubic yards had been placed in position, the plums ranging up to 15 tons in weight. Height of wall at that date was 50 feet above the foundations. Expenditure during the year, £18,397. Contract price for construction of the dam, £217,760. It should, perhaps, be mentioned that the contract does not include the preliminary work of stripping the river bed of the mass of huge boulders which covered it, or diverting the ordinary flow of the river, &c., &c., these matters having already been carried out by the Department in order to reduce the speculative element to a minimum.

As has been explained in previous Reports, the conserved water will not be used for irrigation in the neighbourhood of the dam, but will be fed into the river, and after travelling about 220 miles will be intercepted by the diversion weir being constructed at Berembed, and so much of it as is required turned into the main canal. The whole of the river portion of this weir is complete, and the river is flowing through and over the finished work. The weir is 165 feet between abutments, and consists of 55 shutters, which, when closed, hold up 13 feet of water. The lock gates are also in position, but the fixing of the large iron lift gates, which will control the sluiceway and lock, has had to be deferred until danger of high flood is over. The head gates of the main canal were practically complete at the end of June, also the canal excavation for a length of 76 miles. 1,600,000 cubic yards of material were taken out during the year, bringing the total excavation to 3,100,000 cubic yards, while contracts are in hand for a further 800,000 cubic yards.

A contract has been let for about 10 miles of branch canal, and further contracts are being advertised.

On the completed length of the main canal there are 6 combined regulators and bridges and 30 highway bridges, 25 of the latter being complete or in hand, and 5 are being prepared for contract.

Extensive contour surveys were carried out, and plans for the subdivision of the irrigable lands prepared.

The expenditure on the canal and works in connection therewith during the year amounted to £105,000, bringing the total at 30th June, 1910, to £269,000.

The Condobolin West weir was completed at a cost of £692, and handed over to a "Trust" constituted under the Water and Drainage Act, and preliminary action was taken towards the formation of a similar "Trust" to benefit an area of about

about 50,000 acres of agricultural land lying between the Murray River and Berrigan, which town would also be supplied. Cost is estimated at £11,000.

Further investigations were made in connection with the proposed storage reservoirs on the Lachlan and Macquarie Rivers, and the systematic measurement of the volume and velocity of the various rivers was continued, and tables showing the monthly discharge of the more important streams have been prepared for publication.

Surveys and preliminary estimates were prepared in connection with a proposal to supplement the Sydney water supply from the Warragamba Basin, and details of the scheme were placed before the Parliamentary Standing Committee when inquiring into the necessity for increasing the existing sources of supply.

The scheme provides for the storage of 102,965 million gallons of water, of which 60,492 million gallons would be available for supply to the Potts' Hill reservoir by gravitation. The maximum capacity of the present storages at Prospect and Cataract is 26,861 million gallons. The estimated cost, which, however, is subject to revision when more detailed information is available, is £2,957,300.

Artesian Wells.—The total number of artesian wells in the State is now 365, of which 108 have been provided by the Department, 48 by the holders of improvement leases, and 209 by private individuals. The total yield is approximately 116 million gallons per diem. In addition, there are 72 bores in which the water does not rise to the surface, but from which a supply can be obtained by pumping. Of the State-owned bores, 48 are included in Trusts, formed under the authority of the Water and Drainage Act or the Artesian Wells Act, which provide for the repayment of cost to the State. The total flow from the wells under Trust is 36,053,248 gallons per diem, which is utilised in providing water for domestic and stock purposes to an aggregate area of 2,724,818 acres, the total length of drains being about 1,450 miles. Action is proceeding in connection with 18 additional trust proposals, designed for the supply of a further total area of 1,351,120 acres.

Further investigation has been made into the probable cause of the rapid deterioration of bore-casing which has occurred within a restricted area about Coonamble, and arrangements are being made for the trial of a specially prepared iron, which, it is claimed, has strong rust-resisting properties.

Swamp Drainage.—A considerable amount of work has been done in connection with the drainage of the coastal swamp lands, and at 30th of June seven swamps, comprising 37,826 acres, had been successfully drained at a cost of £18,834; six more, having a total area of 39,156 acres, and estimated to cost £50,520, were in hand; twelve proposals having an aggregate area of 119,935 acres, and estimated cost £141,870, were in more or less advanced stages; and ten others were projected. As explained in previous Reports, these areas, which consist principally of alienated lands, are dealt with under the provisions of the Water and Drainage Act, which authorises the formation of Trust districts, the cost to the State being recouped by easy annual payments.

Public Watering Places.—The excavation of a number of large tanks for the conservation of additional water supplies on the dry stages of the Western roads has been authorised for some considerable time. Lack of feed and water has, however, seriously interfered with the works, and the progress made has not been as satisfactory as could be desired. Five new tanks were completed and one enlarged, at a total cost of £4,129. Nine others, estimated to cost £8,330, were commenced, and the construction of thirteen more were authorised, at an estimated cost of £15,772.

Sewerage

Sewerage Construction.—Expenditure on sewerage construction amounted to £60,464 12s. 11d., distributed as follows:—Metropolitan area, £978 13s. 5d.; Newcastle and district, £41,158 8s. 1d.; and Country Towns, £18,327 11s. 5d.

The construction of the Long Bay extension of the Western, Southern, and Illawarra Suburbs sewerage system, briefly referred to in last year's Report, was entered upon towards the close of the year—a contract for about £110,000 being let in June. The system at present terminates at Arncliffe, where the sewage is discharged on to filter-beds. The extension will deliver the material directly into the ocean at a point on the northern headland of Long Bay, the outlets being 25 feet below H.W.S.T. It will be approximately 6 miles 18 chains in length, and the work will be divided into three sections. The section now in hand (2 miles 12 chains 54 feet in length) is principally tunnelling in rock at the ocean end; the middle section (1 mile 62 chains 48 feet) will be open cut in wet sand; the remaining section (2 miles 22 chains 26 feet) crosses Cook's River by means of a double concrete syphon 31 feet below low-water mark. This depth will allow of the river channel being deepened for future navigation. Total cost is estimated at £452,400.

The low-level pumping station at Iron Cove, completed about the end of last year at a cost of £5,672 14s. 3d., was handed over to the Metropolitan Board of Water Supply and Sewerage. The station is equipped with motor-driven centrifugal pumps, power being obtained by arrangement with the Railway Commissioners.

Tenders were called for the extension of the Canterbury main sewer, a length of 58 chains 16 feet.

Schemes were prepared for the sewerage of Vaucluse at an estimated ultimate cost of £97,000, and for Botany and North Botany at £270,000, the proposals in each case being submitted for the consideration of the Parliamentary Standing Committee.

Plans were prepared, at request of the Shire Council, for the sewerage of the Hornsby-Wahroonga district.

The Ashfield Storm-water Channel was extended a distance of 32 chains 35 feet, at a cost of £2,256; and drawings were prepared for storm-water drainage at Auburn at an estimated cost of £6,100. Plans were also being prepared, at request of the Council, for a storm-water channel at Chatswood.

The Parramatta sewerage was finally completed and handed over to the Council, the gazetted cost being £66,010 9s. 4d.

Work was continued on the sewerage of Katoomba, but, in common with most other public works, was considerably delayed by the coal strike, and is still incomplete. The sewerage of this popular mountain town presented some difficulties, inasmuch as it was necessary to avoid interference with the natural attractions of the place as a tourist resort. The work has, however, been carried out in such manner that there is little, if any, trace of sewerage construction.

Extensions of the existing systems at Narrandera and Lismore were put in hand, the estimated cost being £3,361 and £6,568 respectively, and preliminary work was undertaken in connection with the sewerage of Lithgow and Goulburn.

Schemes for four other country towns were also prepared and submitted for the consideration of the Parliamentary Standing Committee, the aggregate cost being estimated at £156,975; and preliminary work was undertaken in connection with proposals for the sewerage of six more.

Valuation Branch.

The work dealt with by this branch included resumptions and valuations in connection with two tramways and five railway extensions, in addition to three sections of the North Coast Railway, and a number of miscellaneous works in various parts of the State connected with the operations of the different branches. 146 claims for compensation were finally adjusted, and 460 additional claims were in more or less advanced stages. Negotiations were also carried out on behalf of the Commonwealth Postal Department, and the Government Land Valuer's services were utilised by the Department of Lands as a member of the Closer Settlement Appeal Court in those cases where the compensation was disputed.

Local Government.

The report of the officer in charge shows that the Councils as a whole are disposed to make full use of their privileges under the new Acts, and frequent applications come to hand for additional powers and authority to undertake the necessary financing of new works, &c. The triennial classification prescribed by the Local Government Act for purpose of determining the amount of endowment to be paid annually to each shire was gazetted in December, 1909, the result being a large increase in the number of shires granted subsidies, and in the aggregate annual endowment.

It is instructive to note that the endowment has increased from £179,135 in 1907 to £262,146 in 1909, whilst the annual payment estimated for the current term of three years is £290,030.

The number of shires to which endowment or subsidy has been allotted is 107, an increase of 20 over the original classification. The remaining 27 are regarded as self-supporting and receive no subsidy; 21 shires receive annually, as endowment from the State, sums below £1,000; 73 receive between £1,000 and £5,000; 11 receive between £5,000 and £10,000; and 2 receive sums above £10,000.

Roads, Bridges, and Ferries (including National Works).

Under the above heading are included all roads, bridges, and ferries in the Western Division, and similar works in the incorporated section of the State which have been proclaimed "National" under the provisions of the Local Government Acts, together with roads providing access to or within Crown lands made, or proposed to be made, available for Closer Settlement.

The total expenditure amounted to £127,287; of which £61,162 9s. 8d. applied to bridges, £50,724 5s. 3d. to roads, and £14,417 17s. 10d. to ferries, whilst the caretaking of public watering places in the Western Division accounted for £982 8s.

Sixteen bridges which were under construction during the preceding year were completed and made available to traffic, five being handed over for future maintenance to the Councils of the respective shires.

The small bridge over the Bogan at Marra Crossing, referred to in last year's Report as being constructed by day labour, owing to the impossibility of securing a tender at a reasonable price, was completed well within the estimate, and £163 below the lowest tender received.

Contracts were let for ten new bridges, the total contract price being £25,239 11s. 11d.

Improvements to the approaches to Pyrmont Bridge were effected at a cost of £3,939 16s. 9d ; and a contract was let for the repair and extension of the bridge over the Peel River, at Moore, damaged by flood in January last. Repairs to other bridges damaged by flood were carried out by day labour.

Authority was also given during the year for the erection of fifteen new bridges, at a total estimated cost of £34,635, four of them being renewals of bridges carried away or wrecked by the January floods.

The total amount expended on bridge maintenance was £19,749.

An unusually large amount of work was carried out on the construction of Closer Settlement roads, and in addition to the actual expenditure—£32,036—a further liability had been incurred of £12,790.

One hundred and six miles of road were opened and made available to settlers, and about 48 miles were still in hand on 30th June.

On the construction and maintenance of roads within the Western Division an expenditure of £12,132 4s. 6d. was incurred. In this, the unincorporated section of the State, there are 6,190 miles of road ; 124 bridges, of a total overall length of 21,815 feet; 120 culverts, having a total length of 1,955 feet; 378 causeways, aggregating 20,809 feet; and 197 proclaimed public watering-places, under control of the District Officers. From the Public Watering-places a revenue of £2,587 was obtained from those under lease, whilst the subsidy paid for those worked under agreement amounted to £1,018 14s.

A contract was let at £2,745 for a new punt for the Hexham Ferry; and the construction of a new punt for use on the Spit Ferry, Middle Harbour, was put in hand at the Government Dockyard. Estimated cost, £3,500.

The question of providing increased accommodation for the traffic using the Dover (Tom Ugly's) Point Ferry was placed under consideration, but decision has been held over pending result of the construction of the Sutherland-Cronulla tramway, which it is thought may have the effect of considerably relieving traffic on this ferry.

The Government Dockyard.

The managing committee report an expenditure of £86,847 for the year. Of that amount, £6,725 17s. 11d. was absorbed in working expenses, maintenance, &c.; £11,494 3s. 7d. was in connection with alterations and additions to the working plant and buildings; and £64,622 12s. 7d. for services in connection with other public departments.

The improvements effected at the Dock include two slips large enough to admit of the construction of vessels 450 and 350 feet in length respectively, each of 50 feet beam and 30 feet moulded depth. Two cantilever cranes, each having a clear span of 75 feet, were specially designed to serve these slips, and have been successfully constructed. The constructing machinery, including bending rolls, shearing and punching, countersinking and radial drilling machines, were also constructed entirely at the Dock at a cost considerably below that for which similar tools could have been imported.

The water-tube boiler for the Commonwealth torpedo boat "Countess of Hopetoun," referred to in last year's Report, was completed and tested with satisfactory results.

Contracts were entered into with the Commonwealth Government for the manufacture and erection of the generating plant for the Small Arms factory at Lithgow, and for alterations to and supply of new boilers for H.M.A.S. "Protector."

The construction of a shallow draught ocean-going dredge for use of this Department was commenced and good progress made. This vessel, its engines and boilers, will be designed for a draught of 4 ft. 9 in. when carrying a load of 200 tons.

The large punt for use at the Spit Ferry, referred to elsewhere in this Report, is also being constructed at the Dock.

The total number of vessels docked or slipped during the year was 95, the tonnage amounting to 76,561, but the vessels being mainly the property of the Imperial, Commonwealth, or State Governments, dues were not chargeable and but little revenue was received.

Engineering Drawing Office and Ironwork Inspection.

Exclusive of preliminary sketches, the total estimated cost of work for which designs were prepared and sent on for tender or put in hand by day labour amounted to £1,043,930 14s. 5d.

Exclusive of the Assistant Engineer-in-charge, the permanent staff comprised 1 assistant engineer, 24 draftsmen, and 4 cadets, in addition to whom 27 temporary draftsmen were employed. The total amount paid in salaries was £12,770, representing an office cost of 1·22 per cent. on value of the work designed, &c.

The quantity of material supplied by the Lithgow Ironworks under the Steel and Iron contract was 22,319 tons 9 cwt. 1 qr. 7 lb., the total value being £151,630 2s. 7d. Cost of inspection, 1·08 per cent.

The Chemical Laboratory recently added to the Testing Branch has proved of considerable service, and during the preceding six months 360 analyses have been made. A drop test machine for fish plates, an impact testing machine and a high speed milling machine have also been added to the plant.

The total number of machine and forge tests made during the year was 4,949.

Survey and Survey Drafting.

The work of these branches covers a very wide field, and it has been found at times impossible to cope with the quantity of work requiring immediate attention. In such cases it has been necessary to engage the assistance of surveyors in private practice and contract draftsmen.

The field-work dealt with included resumption surveys for all classes of public works, contouring and levelling in connection with irrigation, drainage and water supply schemes, survey and levelling of drains for the distribution of water from artesian wells, determination of catchment areas, and continuation of the National Detail Survey, &c. Railway surveys are carried out by a specially-trained staff working under the direction of the Chief Engineer.

The work of the drawing-office included the preparation of plans and sections in connection with the whole of the above, including railway and tramway works, together with all necessary descriptions, searches into title, computations of areas, quantities, discharges, &c., and the tabulation of information relating to the supply of water from artesian wells, &c. The mounting of plans and preparation of all heliographic copies is also carried out under control of the Chief Draftsman. The staff employed numbered 57, of whom 30 were temporary.

Stores and Plant.

This branch deals with all requisitions for the purchase or supply of material required by the various branches in carrying on the work of the Department. It carries out the inspection of practically all timber used on public work, and deals with the testing of sand, stone, cement, bricks, pipes, &c. It has charge also of a general depôt at which working plant and tools of all kinds, including railway or tramway material, are stored ready for immediate issue if required. 16,387 requisitions of all kinds were dealt with during the year, and these involved the issue of 20,212 orders on various contractors or stores, each order having an average value of £15 4s. 4d.

2,190,208 sup. feet of sawn or hewn timber, 27,731 lineal feet of round timber, 161,236 sleepers, and 101,000 wood blocks were passed and branded.

525 tests of cement and sand were made, the total quantity of cement tested being 360,450 bags of locally made and 455 bags and 16,100 casks of imported brands. 68,044 feet of earthenware pipes were tested, each pipe being subjected to internal hydraulic pressure. In addition, a large number of inspections and tests of miscellaneous materials, including bricks of various sorts, tiles, bends, gullies, traps, &c., were also made. Tabulated statements are attached to the Acting-Superintendent's report, showing analyses of imported cements and locally-made sand-bricks.

A complete report upon the work of the State Labour Bureau has already been furnished, and beyond stating that 3,883 of the unemployed were assisted and sent to work, it is perhaps unnecessary to refer to it here.

The business of the Department necessitated the writing of 29,515 official letters, exclusive of formal acknowledgments, and the issue of 10,230 circulars.

In conclusion, I must again acknowledge the hearty co-operation of officers throughout the Department, and the generally efficient manner in which their duties have been carried out.

W. J. HANNA,
Under Secretary for Public Works.

Accounts Branch, 1909-1910.

I HAVE the honour to submit the Annual Report of the Accounts Branch for the year ending the 30th June, 1910 :—

Omitting the disbursements of the Metropolitan Board of Water Supply and Sewerage and of the Hunter District Water Supply and Sewerage Board, on account of their outgoings being under the direct control of the respective Boards, the expenditure of the Department has been :—

	£	s.	d.
Loan Votes	1,378,097	3	11
Consolidated Revenue Votes	638,711	6	6
Public Works Fund	431,819	7	2
Miscellaneous	19,460	7	3
Special Deposits	12,082	18	5
Other Departments and Commonwealth Funds	312,703	8	10
Total	2,792,874	12	1
Less Credits	1,006	3	2
	£2,791,868	8	11

Further details as to the distribution of this total amongst the various classes of works are given in Appendix " A."

A comparative statement of the volume of business is given in Appendix " B." It will be observed that the expenditure for 1908–9 was £2,491,076 5s. 9d., while that of 1909–10 was £2,791,868 8s. 11d., or an increase of £300,792 3s. 2d.

The 1909–10 expenditure has been further divided, as follows (Appendix "C"):—

	£	s.	d.
Under Departmental Officers	2,460,981	9	2
„ Municipalities	24,661	12	8
„ Shires	306,225	7	1
	£2,791,868	8	11

Out of the total for the year the sum of £38,359 15s. 9d. was expended for land resumptions and costs (Appendix "D"), exclusive of the Darling Harbour and Rocks Resumptions.

CONTRACTS.

The contracts let and in progress during the year were as follows :—

Branch.	No. Let.	Contracts Let from 1 July, 1909.			No. Unfinished.	Outstanding Balances on 30 June, 1910.		
		£	s.	d.		£	s.	d.
Bridges	48	45,791	5	3	17	23,772	1	8
Railways and Tramways	22	594,981	3	3	32	518,244	1	9
Artesian Bores	34	26,125	7	7	18	21,558	19	0
Water Conservation and Water Supply	30	30,853	16	1	24	246,126	18	3
Sewerage Construction	10	44,956	6	7	14	170,861	19	6
Harbours and Rivers	25	24,354	10	6	8	13,337	13	6
Public Buildings	711	665,309	13	8	236	465,825	18	11
School Buildings	808	231,799	4	0	278	92,102	13	0
Commonwealth Buildings	373	89,712	2	9	82	56,528	5	9
Roads	207	53,105	9	0	51	16,892	7	8
	2,268	1,806,988	18	8	760	1,625,250	19	0

COMPARATIVE STATEMENT OF CONTRACTS FOR WORKS.

Year.	Number of Contracts let during the year.	Amount of Contracts let during the year.			Number of Contracts unfinished on 30th June.	Outstanding Balances on Contracts on 30th June, due on completion.		
		£	s.	d.		£	s.	d.
1903-4	2,356	350,794	5	7	370	119,870	4	9
1904-5	3,604	586,660	13	3	550	329,013	3	5
1905-6	3,878	578,655	10	5	697	399,627	12	6
1906-7	3,259	627,489	4	5	332	324,561	1	8
1907-8	1,542	1,112,875	7	8	432	667,308	11	4
1908-9	1,516	2,015,784	18	11	442	1,471,578	18	1
1909-10	2,268	1,806,988	18	8	760	1,625,250	19	0

WAGES.

Exclusive of the salaries of Officers and of Dredge Service employees, the number of vouch and the amount paid for wages of daily rate men is detailed in the comparative statement below :—

Year.	Number of Vouchers.	Amount.
		£ s. d.
1905-6	7,821	442,568 11 11
1906-7	7,915	306,213 10 7
1907-8	10,420	317,657 12 9
1908-9	9,911	303,761 14 9
1909-10	9,909	291,889 3 10

OPERATIONS OF PAYMASTER.

The amounts dealt with by the Paymaster make up the following grand total :—

Account.	Receipts.	Disbursements.	Dr. Balance.	Cr. Balance.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Expenditure Accounts	745,316 4 4	747,837 13 2	2,521 8 10	.....
Collection Accounts.—Revenue, Suspense, and other moneys	77,596 6 5	77,463 2 11	.....	133 3 6
Trust Accounts Deposits	34,550 12 6	33,017 2 3	.....	1,533 10 3
Fixed bank deposits securities on contracts	132,065 8 0	29,489 5 0	.....	102,576 3 0
	989,528 11 3	887,807 3 4	2,521 8 10	104,242 16 9

With respect to the Expenditure Accounts, the Paymaster disbursed £747,837 13s. 2d. as above, while the balance of £2,044,030 15s. 9d., making up the year's total of £2,791,868 8s. 11d. was paid by the Treasury and other Departments.

The preliminary and security cash deposits on tenders and contracts numbered 1,673 ; while the fixed bank deposits received as securities during the year numbered 92.

The number of bank accounts for head and local offices at the 30th June, 1910, was 109.

The floating advances granted to enable wages and other urgent claims to be promptly paid were :—

Account.	Amount of Advance.	Amount unadjusted on 30th June, 1910.
		£ s. d.
Revenue	34,777	8,933 19 4
Loans	28,400	10,840 7 5
Public Account	1,500	343 19 0
Commonwealth	4,000	719 19 9
£	68,677	20,838 5 6
Overdraft Accounts.		
Expenditure Suspense	7,000	2,515 8 10
Salaries Suspense	8,000	6 0 0
£	15,000	2,521 8 10

COUNTRY TOWNS WATER SUPPLY AND SEWERAGE.

During the year applications were made by the local Municipal Councils for works to be carried out in connection with water supply or sewerage, and the financial aspect of the schemes was investigated and reports furnished on the following :—

Water Supply—
Canbelego.
Illawong.
Wrightville.
Dungog.
Dapto and Brownsville.
Peak Hill.
Helensburgh.
Blackheath and Medlow.
Sewerage—Wollongong.

Additional Works.

Water Supply—
Narrandera.
Gunnedah.
Picton.
Forbes.
Parkes.

At the request of the Treasury an examination was made of the undermentioned accounts and reports furnished :—

Water Supply—
Wentworth.
Balranald.
Moama.
Deniliquin.
Sewerage—Hay.

Annexures are attached (E F G.) relating to Country Towns Water Supplies, Country Towns Sewerage and Drainage, and Water and Drainage Trusts, giving costs as gazetted, repayments, &c., &c.

OFFICERS.

In the Statements referring to the cost of supervision, only those of the Dredge Service, designated "Chief Engineers and Masters," are included, as the others are not deemed to be "Officers" in the ordinary acceptance of the term; also, for the same reason, the following have been omitted:—Mechanics, maintenance men, labourers, Labour Farm hands, and others employed without the specific authority of the Public Service Board.

The Staff of the Department at the close of the financial years 1908–9 and 1909–10 is shown in the following comparative statement:—

Designation.	No. of Officers.		Annual Salary Charges.	
	30th June, 1909.	30th June, 1910.	30th June, 1909.	30th June, 1910.
			£	£
Permanent	402	424	106,313	111,794
Temporary	385	406	65,654	73,193
Dredge Service employees, not engaged in supervision — Permanent	270	264	39,192	38,982
Dredge Service employees, not engaged in supervision — Temporary	112	102	13,752	11,268
Total	382	366	52,944	50,250

The total increase for the year was:—

	No.	Amount.
Permanent	22	£5,481
Temporary	21	7,539
Total	43	13,020
Dredge Service, Decrease	16	2,694
Net Increase	27	£10,326

The actual disbursements for salaries and wages of Officers, from Loans and Revenue Votes, or other headings of appropriations, during the financial year 1909–10, were as follows:—

Permanent Staff.

	£ s. d.	£ s. d.
General	103,376 1 4	
Dock	2,840 6 2	
Labour Bureau	865 0 0	
Dredge Service	41,336 3 4	
		148,417 10 10

Temporary Staff.

	£ s. d.	£ s. d.
General	72,390 14 8	
Dock	537 4 0	
Labour Bureau	1,165 15 0	
Dredge Service	11,434 18 1	
		85,528 11 9
Total		£233,946 2 7

The disbursements in connection with design, administration, and supervision may be stated as:—

	£ s. d.	£ s. d.
Salaries		233,946 2 7
Allowances, &c.—		
Equipment	7,953 7 1	
Other allowances, travelling expenses, hire of vehicles, and sundries	18,051 5 11	
Rents	182 19 1	
Cleaning, fuel and light, country offices	431 2 8	
Fuel and light, Head office	234 16 5	
Postage and telegrams	1,967 3 8	
Telephones	269 9 7	
		29,090 4 5
Total		£263,036 7 0

Of the above, the charges for those who would be employed by Contractors, such as foremen, gangers, overseers, leading hands, time and store keepers, &c., are estimated at £82,074 17s. 10d.

	£ s. d.	£ s. d.
Total disbursements		263,036 7 0
Less—Salaries	77,373 3 11	82,074 17 10
Allowances, &c., as above	4,701 13 11	
Approximate cost of administration, design, and supervision		£180,961 9 2

This

This amount represents, say, 6·48 per cent. of the total expenditure for 1909–10, which was £2,791,868 8s. 11d.

Statements are attached showing number of Officers, with annual salary and allowance charges, also total disbursements, as above, for the past ten years. (H. and J.)

It is with pleasure that I again bear testimony to the efficiency of the Accounts Branch Staff, and to the satisfactory manner with which their duties have been discharged.

THOMAS R. STEEL,
Accountant.

1st September, 1910.

Appendix A.

SUMMARY of Expenditure for Year ended 30th June, 1910.

Head of Service.	Loans.	Revenue.	Public Works Fund.	Miscellaneous.	Special Deposits.	Other Departments.	Total.	Credits Loan Votes.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Establishment—Salaries	.....	87,878 8 3	.....	893 0 7	.....	.....	88,771 8 10	.....
Railway Construction	842,320 2 11	.....	6,264 6 11	.....	13 2 6	.....	848,597 12 4	.....
Tramway Construction	192,755 15 3	.....	.....	.....	.....	.....	192,755 15 3	177 19 7
State Public Buildings	11,354 3 8	33,977 1 8	197,341 1 3	75 0 0	930 5 3	.....	243,677 11 10	.....
Roads	.....	16,979 11 11	12,271 16 10	8,808 11 2	466 8 2	.....	38,526 8 1	.....
Bridges	.....	19,341 19 10	41,023 6 4	.....	797 3 6	.....	61,162 9 8	9 7 0
Punts, Ferries, and Launches	.....	19,645 0 1	4,629 8 6	.....	688 19 4	.....	24,963 7 11	.....
Public Watering Places, Artesian Bores, Water Conservation, and Water Supply and Drainage	.....	7,341 19 1	20,252 16 3	.....	26 6 3	.....	27,621 1 7	53 14 0
Harbours and Rivers and Dredge Service	13,628 16 10	9,868 16 5	113,029 13 7	.....	4,459 1 1	.....	238,520 17 2	.....
	.....	97,534 9 3	.....	.....	.....	.....		
Dock Establishment	.....	8,149 12 4	12,014 18 0	.....	.....	.....	20,164 10 4	.....
Government Dockyard—Fire	.....	1,000 0 0	.....	.....	.....	.....	1,000 0 0	.....
Water and Drainage Act	48,998 15 10	.....	.....	.....	.....	.....	48,998 15 10	.....
Water Conservation	.....	.....	.....	.....	.....	.....	.....	647 16 9
Barren Jack Reservoir and Northern Murrumbidgee Irrigation Scheme	156,205 14 9	.....	.....	.....	.....	.....	156,205 14 9	.....
Sewerage Construction, Country Towns	11,798 5 3	152 14 2	6,358 2 4	.....	18 9 8	.....	18,327 11 5	.....
Water Supplies, Country Towns	54,933 4 3	.....	.....	2,777 14 8	656 6 1	.....	58,367 5 0	117 5 10
Metropolitan—								
Sewerage Construction	978 13 5	.....	.....	.....	.....	.....	2,923 2 6	.....
Water Supplies	1,944 9 1	.....	.....	.....	.....	.....		
Hunter District—								
Sewerage Construction	41,158 8 1	.....	.....	.....	.....	.....	42,027 7 11	.....
Water Supplies	868 19 10	.....	.....	.....	.....	.....		
Labour Bureau	.....	4,725 6 11	.....	.....	3,727 12 8	.....	8,452 19 7	.....
Miscellaneous Schedule	.....	13,107 1 1	.....	.....	.....	.....	13,107 1 1	.....
Compensations and Gratuities	.....	3,469 0 10	.....	15 0 0	.....	.....	3,484 0 10	.....
Equipment, Travelling Allowances, &c.	.....	36,186 16 8	.....	.....	.....	.....	36,186 16 8	.....
Rents, Cleaning, Departmental Contingencies, &c.	.....	7,221 15 4	.....	.....	.....	.....	7,221 15 4	.....
Local Government	.....	271,948 19 8	.....	6,891 0 10	299 3 11	.....	279,139 4 5	.....
Grants to Shires and Municipalities	.....	.....	18,633 17 2	.....	.....	.....	18,633 17 2	.....
Public Pounds	.....	50 2 6	.....	.....	.....	.....	50 2 6	.....
Royal Commission—Sydney Improvement	.....	132 10 6	.....	.....	.....	.....	132 10 6	.....
Darling Harbour and "Rocks" Resumption	1,151 14 9	.....	.....	.....	.....	1,722 9 1	2,874 3 10	.....
Claims against and work done for other Departments	.....	.....	.....	.....	.....	265,238 18 11	265,238 18 11	.....
Claims against and work done for Commonwealth Government	.....	.....	.....	.....	.....	45,742 0 10	45,742 0 10	.....
Total £	1,378,097 3 11	638,711 6 6	431,819 7 2	19,460 7 3	12,082 18 5	312,703 8 10	2,792,874 12 1	1,006 3 2

	£ s. d.	£ s. d.
Expenditure		2,792,874 12 1
Less Credits—		
Loan	710 17 9	
Public Works Fund	295 5 5	
		1,006 3 2
Net Expenditure		£2,791,868 8 11

Appendix B.

STATEMENT of volume of expenditure, &c., for 6 years :—

Year.	Number of Persons or Firms dealing with Department, exclusive of Officers or Wages Men.	Number of Pay Vouchers of all Descriptions.	Expenditure.						
			Loans.	Revenue.	Public Works Fund.	Miscellaneous.	Special Deposits.	Other Departments.	Total.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1904-5	5,297	40,840	812,680 4 7	709,205 16 2	.....	35,750 11 5	.....	169,894 2 8	1,727,530 14 10
1905-6	5,244	43,831	743,943 7 10	789,449 7 11	.....	11,540 13 11	38,936 7 0	117,121 15 2	1,701,041 11 10
1906-7	5,661	44,280	659,705 4 4	814,546 5 4	240,847 8 7	28,068 9 8	23,428 13 5	153,884 4 10	1,920,480 6 2
1907-8	6,585	45,009	823,049 3 7	560,002 18 8	685,091 17 7	18,588 12 9	16,400 0 6	211,189 2 2	2,314,321 15 3
1908-9	4,312	46,264	1,027,730 9 0	572,673 7 11	527,987 8 4	4,349 0 11	26,001 9 7	332,334 10 0	2,491,076 5 9
1909-10	4,105	49,041	1,377,388 6 2	638,711 6 6	431,524 1 9	19,460 7 3	12,082 18 5	312,703 8 10	2,791,868 8 11

Appendix C.

DISTRIBUTION of 1909-10 Expenditure between Departmental Officers and Local Bodies :—

	£	s.	d.	£	s.	d.
Departmental Officers				2,460,981	9	2
Municipalities—						
Local Government—Endowment ...	3,663	0	0			
Roads	1,335	0	0			
Punts, Ferries, Launches	540	5	0			
Repair of Flood Damages	3,987	10	0			
Harbours and Rivers...	943	13	0			
Water Supplies	1,849	8	6			
Special Grants...	10,292	16	2			
Relief Works	2,000	0	0			
Pounds	50	0	0			
				24,661	12	8
Shires—						
Endowment	274,052	0	10			
Roads	10,728	19	6			
Punts, Ferries, and Launches... ...	9,316	5	9			
Public Watering Places	100	0	0			
Repair of Flood Damages	3,652	0	0			
Harbours and Rivers...	25	0	0			
Special Grants	8,331	1	0			
Pounds...	20	0	0			
				306,225	7	1
TOTAL				£2,791,868	8	11

Appendix D.

LAND RESUMPTIONS AND COSTS.

DISBURSEMENTS for the year 1909–10, exclusive of the Darling Harbour and Rocks Resumptions :—

Head of Service.	Loan Votes.			Revenue Votes.			Public Works Fund Votes.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Railways	10,336	9	3	.....			.....			10,336	9	3
Tramways	21,131	16	8	.....			.....			21,131	16	8
Public Buildings	31	9	5	.....			4,242	2	0	4,273	11	5
Water Supplies	630	7	5	.....			.....			630	7	5
Sewerage	495	4	7	.....			315	0	0	810	4	7
Harbours and Rivers	.....			9	11	0	203	6	11	212	17	11
Public Watering Places	.....			7	7	0	132	15	5	140	2	5
Barren Jack Reservoir	789	3	5	.....			.....			789	3	5
Bridges	.....			.....			35	2	8	35	2	8
Totals	33,414	10	9	16	18	0	4,928	7	0	38,359	15	9

Appendix E.

Appendix E.

COUNTRY TOWNS WATER SUPPLY.

STATEMENT of Gazetted Works.

Municipality.	Debt as Gazetted.		Period of Repayment of Debt.	Annual Repayment Instalment.
	Amount.	Date.		
	£ s. d.			£ s. d.
Albury	41,000 0 0	31 Dec., 1894 ...	100 years ...	1,482 11 0
Armidale	40,417 13 2	1 July, 1898 ...	100 ,, ...	1,461 10 3
,, Additional	300 0 0	7 Apl., 1909 ...	50 ,, ...	12 15 10
Ballina	13,605 0 0	30 Dec., 1904 ...	100 ,, ...	491 19 1
Balranald	6,000 0 0	31 Dec., 1894 ...	100 ,, ...	216 19 0
Bathurst	55,000 0 0	31 Dec., 1894 ...	100 ,, ...	1,988 16 0
,, Additional	733 15 1	2 Feb., 1906 ...	100 ,, ...	29 18 10
Berry	4,323 0 0	13 May, 1902 ..	100 ,, ...	156 6 4
,, Additional	56 10 8	25 Apl., 1906 ...	100 ,, ...	2 6 2
Blayney	10,519 15 9	19 Oct., 1904 ...	100 ,, ...	380 7 11
,, Additional	251 0 11	7 Nov., 1906 ...	100 ,, ...	9 1 6
Bourke	13,436 0 0	31 Dec., 1894 ...	100 ,, ...	485 17 0
Bowral	872 8 10	29 Sept., 1909 ...	20 ,, ...	61 7 9
Casino	10,285 4 5	12 Sept., 1906 ...	100 ,, ...	371 18 3
,, Additional	1,141 16 0	30 Sept., 1908 ...	50 ,, ...	48 13 7
Cobar	26,067 11 0	29 Sept., 1903 ..	100 ,, ...	942 12 0
,, Additional	92 9 0	28 Mar., 1906 ...	100 ,, ...	3 15 5
Condobolin	7,039 5 8	16 Apl., 1901 ...	100 ,, ...	254 10 9
,, Additional	685 16 11	2 Feb., 1906 ...	100 ,, ...	27 19 9
Coonamble	6,742 8 1	1 July, 1898 ...	100 ,, ...	243 15 10
,, Additional	2,606 17 6	4 Apl., 1906 ...	100 ,, ...	106 7 7
,, ,,	865 3 3	9 Mar., 1910 ...	50 ,, ...	36 17 8
Cootamundra	10,896 0 0	31 Dec., 1894 ..	100 ,, ..	394 0 0
,, Additional	10,073 8 0	7 Nov., 1906 ...	100 ,, ...	364 5 1
Corowa	9,317 17 4	5 Feb., 1908 ...	50 ,, ...	397 5 2
,, Additional	610 4 0	14 Apl., 1909 ...	50 ,, ...	26 0 4
,, ,,	469 17 8	18 Aug., 1909 ...	50 ,, ...	20 0 8
Cowra	15,520 17 6	5 Jan., 1910 ...	50 ,, ...	661 14 0
Deniliquin	18,468 7 2	31 Dec., 1894 ...	100 ,, ...	667 16 0
Dubbo	15,238 3 4	30 June, 1896 ...	100 ,, ...	551 0 3
Forbes	7,958 7 2	31 Dec., 1893 ...	100 ,, ...	287 15 3
,, Additional	12,968 11 5	23 Feb., 1906 ...	100 ,, ...	529 4 5
Goulburn	55,000 0 0	31 Dec., 1894 ...	100 ,, ..	1,988 16 0
Gunnedah	14,881 0 0	22 July, 1909 ...	50 ,, ...	634 8 8
Hay	7,691 4 10	31 Dec., 1893 ..	100 ,, ...	278 2 2
,, Additional	8,337 7 3	25 July, 1906 ...	100 ,, ...	301 9 7
,, ,,	1,046 9 6	11 Dec., 1907 .	50 ,, ...	44 12 4
Hillgrove	4,000 0 0	7 Nov., 1906 ...	50 ,, ...	170 10 9
Jerilderie	5,428 14 5	31 Dec., 1894 ...	100 ,, ...	196 6 3
,, Additional	873 16 6	7 Mar., 1906 ...	100 ,, ...	35 13 2
,, ,,	215 7 8	23 Dec., 1903 ...	25 ,, ...	13 1 4
Junee	42,000 0 0	14 July, 1903 ...	100 ,, ...	1,518 14 5
Katoomba	19,548 13 2	10 Nov., 1909 ...	50 ,, ...	833 8 9
Kiama	7,073 9 8	19 Mar., 1901 ...	100 ,, ...	255 15 3
Lismore	10,016 4 8	31 Dec., 1894 ...	100 ,, ...	362 3 6
,, Additional	4,806 7 0	28 Mar., 1906 ...	100 ,, ...	196 2 9
Lithgow	12,749 5 11	30 June, 1896 ...	100 ,, ...	461 0 0
,, Additional	8,026 13 10	6 Nov., 1907 ...	50 ,, ...	342 4 2
,, ,,	12,734 6 6	18 Mar., 1908 ...	50 ,, ...	542 18 3
Moama	7,600 11 0	25 Feb., 1898 ...	100 ,, ...	274 16 4
Moss Vale	13,000 0 0	1 July, 1898 ...	100 ,, ...	470 0 0
Moree	10,940 10 0	2 Dec., 1904 ..	100 ,, ..	395 12 2
Mudgee	17,029 13 11	3 Feb., 1903 ...	100 ,, ...	615 15 10
Nowra	12,592 15 10	30 June, 1896 ...	100 ,, ...	455 7 3
,, Additional	636 4 0	2 Feb., 1906 ...	100 ,, ...	27 3 8
Nyngan	9,000 0 0	31 Dec., 1906 ...	100 ,, ..	325 8 9
,, Additional	1,218 19 0	12 Sept., 1906 ...	100 ,, ...	44 1 6
Orange	32,688 0 0	31 Dec., 1894 ..	100 ,, ..	1,182 0 0
Parkes	13,660 8 0	27 Apl., 1894 ...	100 ,, ...	493 19 2
,, Additional	8,339 12 0	30 June, 1906 ...	100 ,, ...	301 11 2
Picton	15,951 1 10	15 Feb., 1901 ...	100 ,, ..	576 15 10
,, Additional	35 19 8	11 Apl., 1906 ...	100 ,, ...	1 9 4
,, ,,	1,207 3 5	11 Apl., 1910 ...	50 ,, ...	51 9 4
Tumut	10,238 0 10	26 Aug., 1903 ...	100 ,, ...	370 4 2
Wagga Wagga	38,500 0 0	31 Dec., 1894 ...	100 ,, ...	1,392 3 0
,, Additional	3,087 13 0	2 Feb., 1906 ...	100 ,, ...	126 0 0
Warren	3,969 3 4	21 Aug., 1900 ...	100 ,, ...	143 10 5
,, Additional	1,850 6 8	10 June, 1908 ...	25 ,, ..	112 5 4
Wellington	12,061 10 10	26 Apl., 1902 ...	100 ,, ...	436 2 10
,, Additional	371 4 7	2 Feb., 1906 ...	100 ,, ...	15 3 0
Wentworth	4,000 0 0	31 Dec., 1894 ...	100 ,, ...	144 13 0
Wilcannia	8,380 12 4	31 Dec., 1894 ...	100 ,, ...	303 1 2
£	784,382 1 0		£	29,149 9 3

Appendix F.

Appendix F.

COUNTRY TOWNS SEWERAGE AND DRAINAGE.

STATEMENT of Gazetted Works.

Municipality.	Debt as Gazetted. Amount.	Debt as Gazetted. Date.	Period of Repayment of Debt.	Annual Repayment Instalment.
	£ s. d.			£ s. d.
Ballina	326 18 9	3 Jan., 1906...	25 years	19 16 9
Blayney	429 5 3	1 May, 1905...	25 ,,	26 0 11
Casino	3,023 4 7	17 July, 1904...	50 ,,	128 17 10
Coraki	1,214 6 2	15 Dec., 1909...	28 ,,	68 14 8
Forbes	1,623 8 8	16 July, 1904...	100 ,,	58 14 1
Hay	22,040 6 5	26 Sept., 1905...	100 ,,	796 19 6
,, Additional	327 18 8	6 Oct., 1909...	100 ,,	11 17 2
Lismore	17,588 19 9	24 ,, 1906...	100 ,,	636 0 4
Narrandera	5,196 15 2	9 Feb., 1906...	100 ,,	187 18 3
,, Additional	881 4 0	21 July, 1909..	28 ,,	49 17 7
Parkes	250 0 0	1 Jan., 1907...	28 ,,	15 0 0
Tamworth	1,216 13 3	19 Sept., 1906...	50 ,,	56 12 9
	£54,119 0 8			£2,056 9 10

Appendix G.

WATER AND DRAINAGE.

IE undermentioned Trusts have been constituted in connection with the Bores, &c., constructed under the Water and Drainage Act, and the debts have been fixed and gazetted.

Name of Bore, &c.	Debt as Gazetted. Amount.	Debt as Gazetted. Date.	Total Annual Payment.	Amount of first Payment.	Due date.	Subsequent Payments.	How Payable.
	£ s. d.		£ s. d.	£ s. d.		£ s. d.	
g Swamp Drainage	7,797 12 8	24 Oct., 1903	469 9 2	87 19 3	1 Jan., 1907	234 14 7	Half-yearly.
ack Swamp Drainage	836 19 0	29 July, 1908	49 16 7	37 7 5	29 ,, 1909	12 9 2	Quarterly.
omuckledi	2,704 2 2	2 Sept., 1908	160 19 9	120 14 10	2 Mar., 1909	40 4 11	,,
omi	1,120 3 2	2 Oct., 1907	339 13 8	254 15 4	2 April, 1908	84 18 5	,,
,, Additional	331 9 7	6 ,, 1909	19 14 8	14 16 0	6 ,, 1910	4 18 8	,,
urbah	1,194 7 6	23 ,, 1907	183 1 9	137 6 2	23 ,, 1908	45 15 7	,,
undee Swamp Drainage	980 11 4	30 Dec., 1905	43 8 10	12 2 9	30 June, 1906	21 14 5	Half-yearly.
gilbone	3,736 18 11	28 July, 1909	222 9 8	166 17 3	28 Jan., 1910	55 12 5	Quarterly.
lyeroi	1,004 1 10	15 ,, 1908	202 15 7	152 1 8	15 ,, 1909	50 13 11	,,
reunga	6,180 0 0	5 Feb., 1908	367 18 8	275 19 0	5 Aug., 1908	91 19 8	,,
,, Additional	55 14 0	1 Dec., 1909	3 6 4	2 9 9	1 June, 1910	0 16 7	,,
me-by-Chance	4,049 16 10	18 Feb., 1903	231 18 6	86 8 4	18 Aug., 1906	115 19 3	Half-yearly.
ndobolin West Weir	691 14 7	22 Mar., 1910	41 3 10	30 17 11	24 Sept., 1910	10 5 11	Quarterly.
roobongatti Swamp Drainage	4,888 14 3	2 Nov., 1909	291 1 0	218 5 9	3 May, 1910	72 15 3	,,
dgell Creek Cutting	6,865 3 9	29 June, 1905	274 12 2	137 6 1	5 June, 1910	137 6 1	Half-yearly.
lgelly	579 11 2	28 April, 1909	328 10 1	246 7 7	28 Oct., 1909	82 2 6	Quarterly.
raba	863 5 9	9 Oct., 1906	324 14 0	243 10 6	9 April, 1907	81 3 6	,,
rie Eurie	5,110 16 8	7 Feb., 1907	293 7 8	166 11 4	7 Aug., 1907	146 13 10	Half-yearly.
,, Additional	203 15 8	6 Nov., 1907	12 2 8	9 2 0	6 May, 1908	3 0 8	Quarterly.
orida	2,984 3 9	30 ,, 1905	179 1 0	70 5 0	31 ,, 1906	89 10 6	Half-yearly.
l Gil	69 5 6	23 Jan., 1909	4 2 8	3 1 10	29 July, 1909	1 0 8	Quarterly.
llywood	2,827 10 7	2 Sept., 1908	168 6 8	126 5 0	2 Mar., 1909	42 1 8	,,
ga	5,638 3 1	26 ,, 1906	336 17 4	252 12 11	26 ,, 1907	84 4 4	,,
,, Additional	195 5 11	8 June, 1910	11 12 7	8 14 5	15 Dec., 1910	2 18 2	,,
ndhurst	233 19 11	30 Oct., 1906	13 18 8	10 9 0	30 April, 1907	3 9 8	,,
ercadool	2,453 1 8	12 Sept., 1906	146 1 0	109 10 8	12 Mar., 1907	36 10 3	,,
illie	1,122 0 0	9 ,, 1903	192 16 0	144 12 0	9 ,, 1909	48 4 0	,,
oomin	823 6 4	12 Feb., 1903	198 0 4	148 10 3	12 Aug., 1908	49 10 1	,,
,, Additional	26 5 0	5 May, 1908	1 11 6	1 3 8	5 Nov., 1908	0 7 10	,,
ungyer	3,858 16 2	24 Mar., 1909	229 14 8	172 6 0	24 Sept., 1909	57 8 8	,,
argo	3,812 0 0	23 May., 1907	226 19 0	170 4 3	23 Nov., 1907	56 14 9	,,
lson's Plains Drainage	150 0 5	5 Dec., 1906	18 6 7	13 14 11	5 June, 1907	4 11 8	,,
d Gnomery	4,132 10 0	8 Jan., 1906	246 0 8	184 10 6	8 July, 1906	61 10 2	,,
reel No. 1	4,556 7 7	3 June, 1903	271 5 4	203 9 0	3 Dec., 1908	67 16 4	,,
,, Additional	300 6 0	1 Dec., 1909	17 17 8	13 8 2	1 June, 1910	4 9 5	,,
reel No. 2	5,657 17 5	27 Nov., 1907	336 16 11	252 12 8	27 May, 1908	84 4 3	,,
lmoi	4,837 11 4	2 Feb., 1910	288 0 1	216 0 1	2 Aug., 1910	72 0 0	,,
lleraga	3,966 1 9	12 Jan., 1909	236 2 6	177 1 10	12 July, 1909	59 0 8	,,
rranora Swamp Drainage	153 17 10	29 Mar., 1907	10 6 0	8 0 2	29 Nov., 1907	2 5 10	,,
rrigammy, Muggabah, and Merrimagell Creeks	343 19 10	21 April, 1909	20 9 7	15 7 2	21 Oct., 1909	5 2 5	,,
ree Corners	1,530 4 4	30 Dec., 1905	91 16 4	43 15 4	30 June, 1906	45 18 2	Half-yearly.
lloona	1,283 9 0	16 Jan., 1908	296 8 2	222 6 1	16 July, 1908	74 2 1	Quarterly.
ppal Creek	5,800 0 0	30 July, 1908	345 6 1	258 19 7	29 Jan., 1909	86 6 6	,,
cannah	3,142 12 5	5 Aug., 1908	187 2 0	140 6 6	5 Feb., 1909	46 15 6	,,
reel	4,444 0 0	2 Feb., 1910	264 11 7	198 8 8	2 Aug., 1910	66 2 11	,,
lumbie	3,140 7 6	17 Oct., 1906	186 19 4	140 4 6	17 April, 1907	46 14 10	,,
,, Additional	207 12 8	10 Feb., 1909	12 9 2	9 6 10	6 Aug., 1909	3 2 4	,,
ranbah	928 19 10	16 Jan., 1907	205 6 2	153 19 7	16 July, 1907	51 6 7	,,
algett	2,409 0 9	20 Mar., 1907	219 8 6	164 11 9	20 Sept., 1907	54 17 1	,,
,, Additional	121 0 0	2 April, 1908	7 5 1	5 8 10	8 Oct., 1908	1 16 3	,,
eetalibah	3,386 9 10	22 June, 1909	201 12 4	151 4 3	30 Dec., 1909	50 8 1	,,
elbondonga	4,834 10 2	19 July, 1909	287 16 4	215 17 4	21 Jan., 1910	71 19 1	,,
uendah	759 9 5	16 Oct., 1907	189 4 4	141 18 3	16 April, 1908	47 6 1	,,
£	129,325 4 10	£	9,509 16 9				

Appendix H.

STATEMENT of Officers, Annual Salaries, and Allowances charged as at 30th June of each financial year as under :—

Financial Year.	Permanent.			Temporary.			Totals.		
	No.	Annua Charge.		No.	Annual Charge.		No.	Annual Charge.	
		Salary.	Allowance.		Salary.	Allowance.		Salary.	Allowance.
		£	£		£	£		£	£
1899–1900	972	193,635	10,900	272	48,126	167	1,244	241,761	11,067
1900–1901	976	200,145	12,655	412	70,959	1,722	1,388	271,104	14,377
1901–1902	1,010	204,536	12,858	497	84,597	2,083	1,507	289,133	14,941
1902–1903	1,015	206,986	13,011	347	61,731	1,541	1,372	268,717	14,552
1903–1904	853	176,796	11,827	107	17,316	551	960	194,112	12,378
1904–1905	784	161,569	12,690	109	16,936	21	893	178,505	12,711
1905–1906	782	161,292	11,641	156	22,801	100	938	184,003	11,742
1906–1907	738	155,880	6,822	282	45,086	1,153	1,020	200,966	7,975
1907–1908	682	143,825	7,043	417	68,308	1,546	1,099	212,133	8,589
1908–1909	672	145,505	7,590	497	79,406	2,208	1,169	224,911	9,798
1909–1910	688	150,776	6,791	508	84,461	3,030	1,196	235,237	9,821

Appendix J.

STATEMENT showing number of Officers, Permanent and Temporary, actually engaged on the 30th June of Finan Years 1899–1900 to 1909–10, with amount of Disbursements for Salary, Equipment, and Travelling Allowar during those years (Officers on leave prior to retirement, or lent to other Departments, not included).

Year.	Permanent.				Temporary.				Total.			
	No.	Salaries.	Equipment.	Travelling.	No.	Salaries.	Equipment.	Travelling.	No.	Salaries.	Equipment.	Travelli
		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s
1899–1900 ..	972	192,943 7 2	14,315 17 6	9,746 4 4	272	47,863 8 4	166 19 11	1,702 6 5	1,244	240,806 15 6	14,482 17 5	11,448 1
1900–1901 ..	976	205,738 12 9	15,510 3 0	10,584 2 5	412	61,992 8 5	1,722 1 5	2,013 0 10	1,388	267,731 1 2	17,232 4 5	12,597
1901–1902 ..	1,010	203,271 2 2	16,534 3 0	11,123 1 7	497	83,078 10 1	2,083 16 5	1,642 7 8	1,507	286,349 12 3	18,617 19 5	12,765
1902–1903 ..	1,025	207,395 3 6	16,923 19 6	11,020 3 6	347	82,076 14 7	1,541 17 5	1,717 6 5	1,372	289,471 18 1	18,465 16 11	12,746
1903–1904 ..	739	179,813 13 11	14,722 3 2	9,324 9 7	107	42,997 10 7	551 5 5	271 15 6	846	222,811 4 6	15,273 8 7	9,596
1904–1905 ..	741	158,504 19 5	12,601 12 4	7,256 7 4	109	16,685 17 11	21 3 4	242 3 2	850	175,190 17 4	12,622 15 8	7,498 1
1905–1906 ..	757	154,752 19 8	13,147 19 7	7,920 17 10	171	21,793 0 5	28 11 4	607 7 10	928	176,546 0 1	13,176 10 11	8,528
1906–1907 ..	694	146,359 8 3	6,388 5 2	6,350 10 2	282	34,485 11 0	320 14 9	604 17 5	976	180,844 19 3	6,708 19 11	6,955
1907–1908 ..	682	146,847 4 11	7,524 3 10	6,665 9 6	417	57,815 16 0	1,077 1 0	1,158 2 8	1,099	204,663 0 11	8,601 4 10	7,823 1
1908–1909 ..	672	145,867 11 3	7,656 11 10	6,702 9 10	497	72,339 1 10	1,081 12 2	1,879 19 9	1,169	218,206 13 1	8,738 4 0	8,582
1909–1910 ..	688	148,417 10 10	7,352 3 0	7,493 11 11	508	85,528 11 9	601 4 1	1,210 13 9	1,196	233,946 2 7	7,953 7 1	8,704

Appendix K.

STATEMENT showing repayments during year ended 30th June, 1910, on account of previous years Revenue Votes.

Vote of Work.	Amount. £ s. d.
Labour Commissioners	226 19 6
Harbours and Rivers	175 19 3
Dredge Service	300 7 0
Treasurer's Advance Account	4 9 6
Dock Contingencies	81 17 2
Roads	0 1 0
Bridges	234 4 3
Public Watering Places	49 11 6
Miscellaneous Schedule	479 2 8
Establishment Salaries	47 14 8
Public Buildings	782 9 8
Punts, &c.	14 3 0
Equipment	21 11 5
Rents, Cleaning	2 15 6
	£2,421 6 1

Railway and Tramway Construction Branch.

Report of the Chief Engineer for Railway and Tramway Construction.

Sir,—

I have the honour to report as follows on the works carried out in the Railway and Tramway Construction Branch during the year ending 30th June, 1910 :—

Light Lines of Railway

are railways laid with 60 lb. steel rails on round-backed sleepers with earth ballast, bridge-ends and station-yards being ballasted with broken stone or gravel.

During the year in review the construction of no new works has been undertaken. The following lines, begun in the preceding financial year, have been proceeded with, and several are now nearing completion, viz. :—

Casino to Kyogle, the building of which has been carried out by day-labour, was commenced in January, 1909, was handed over to the Railway Department on the 23rd of June, 1910.

This work differs from the usual type of light line, in that it is ballasted with sand instead of earth ballast. It commences at Casino station-yard, 67 miles 17 chains from Grafton, and terminates at the township of Kyogle at 85 miles 15·9 chains, and has a length of 17 miles 78 chains. The ruling grade is 1 in 60 in both directions ; the minimum curvature is 12 chains radius, with the exception of one short curve 10 chains radius. Five stations have been provided, viz., at Mammoona, Fairy Hill, Baraimal, Cedar Point, and Kyogle.

The estimated cost of construction is £87,117, and the expenditure to the end of the year is £81,244 9s. 5d. This includes station buildings, water supplies, &c. There are still some unfinished works that will add to the above expenditure.

Cowra to Canowindra, commencing at 223 miles 20 chains from Sydney, and ending at 246 miles 38 chains, giving a length of 23 miles 18 chains.

This line has also been constructed by day-labour, and was commenced in January, 1909. It has a ruling grade of 1 in 100 both ways, and the sharpest curvature is 15 chains. Five stations have been provided, viz., at Cowra West, Glenlogan, Billimare, Bangaroo, and Canowindra. The construction is sufficiently advanced to permit of public traffic being carried on from the 1st of July next; this will, however, be under the control of the Railway Construction Branch.

The estimated cost of this work is £103,451, and the expenditure to the 30th June, £102,172 5s.

Mudgee–Dunedoo, second section *Gulgong to Dunedoo*, beginning at 209 miles 52 chains from Sydney, and ending at 239 miles 6 chains, or a length of 29 miles 34 chains. The ruling grades are 1 in 60 with, and 1 in 75 against the load, and the sharpest curve 14 chains radius.

Station accommodation is provided at Puggoon, Tallewang, Wyaldra, Craboon, and Dunedoo, and also a loop at 220 miles, for the loading of iron ore to be used at Lithgow.

This work is being carried out under contract, a tender having been accepted on the 19th January, 1909, for the main works, amounting to £64,956 3s., and another on the 31st July, 1909, for the station buildings, amount £7,423 10s.

On the 10th January, 1910, a tender for the excavation of a tank to supply water for locomotives at Dunedoo was accepted, the amount being £2,987 12s. 10d.

The estimated cost of the line is £97,127 1s. 8d., and the expenditure to the end of the year £84,823 9s. 5d.

Narromine to Peak Hill.—This extension, 36 miles 57 chains in length, commences at the west end of Narromine station-yard, at 304 miles 78 chains from Sydney, and ends at 341 miles 55 chains at Peak Hill. The ruling grade in both directions is 1 in 100, and the sharpest curve 20 chains radius. Stations are provided at Narwonah, Fairview, Washington, Tomingley West, and Peak Hill.

On the 5th May, 1909, a tender for the main contract was accepted, the amount being £44,187 ; on the 28th October, 1909, a tender for station buildings, amounting to £7,898 19s. was accepted. Sleepers were provided by the Department under another contract. On the 13th June, 1910, a tender for excavating a tank for locomotive water supply, amount £2,717 1s., was accepted.

The estimated cost of the line is £119,366, and the expenditure to the end of year £88,115 2s. 1d.

Lockhart to Clear Hills.—The first section of this extension is under construction, viz., from Lockhart, 351 miles 47·883 chains from Sydney, to Lake Cullivel, at 373 miles 43 chains, the length being 21 miles 75·117 chains. The ruling grade is 1 in 100 both ways, and the sharpest curve 20 chains radius. Stations are provided at Long Park, Boree Creek, and Mucra. On the 30th June, 1909, a tender for the main contract was accepted, amount £42,308 12s., and on the 24th January, 1910, a tender for station buildings was accepted, the amount being £2,730.

The estimated cost of the line from Lockhart to Clear Hills is £149,681, and the expenditure to end of year £49,508 19s. 9d.

The aggregate length of the above five extensions is 129 miles 22⅓ chains, and the estimated total cost £556,742.

Ballasted Railways.

This type of railway comprises lines fully ballasted with stone ballast and laid with 60 lb. or 80 lb. to the yard steel rails on square hewn or sawn sleepers.

Cooma to Bombala.—This line will be laid with 60 lb. steel rails; the first section, Cooma to Nimmitabel, has a length of 24 miles 25·935 chains. It commences at 264 miles 47·5 chains from Sydney

and

and terminates at 288 miles 73·435 chains at Nimmitabel. The second section, to Bombala, is at present being permanently staked. On the 20th of April, 1910, a tender was accepted for the construction of the main contract, the amount being £99,879 10s.

The estimated cost of the first section of extension is £151,666, and the expenditure to end of June, 1910, £2,097 18s. 6d.

The estimated cost, Cooma to Bombala, is £496,100.

The ruling grade is 1 in 50 in both directions, and the radius of the sharpest curve is 12 chains.

Station accommodation is provided at Rock Flat, Coonerang, and Nimmitabel.

North Coast Railway.

This railway is being laid with 80 lb. to the yard silicon rails.

First Section.—West Maitland to Dungog—length, 32 miles 65·60 chains. The ruling grade is 1 in 80 on this railway, and the minimum radius of curves 15 chains, excepting in a few instances where 14-chain curves have been introduced to avoid obstacles and reduce expenditure.

On the 28th April, 1908, a tender for the construction of the main line, amounting to £298,235 15s., was accepted, and at various times tenders for the construction of steel bridges over the Hunter River, Paterson River, West Maitland station-yard, Oakhampton Swamp, Wallarobba and Tabbil Creeks, at a cost of £17,279, have been accepted. All these bridges have now been erected.

Station accommodation is being provided at Oakhampton, Dunmore, Paterson, Marton's Creek, Hilldale, Wallarobba, Wiragulla, and Dungog, and a tender for the buildings at these stations was accepted on the 21st October, 1909, the amount being £5,848 11s. 10d.

The excavation of tunnel at Wallarobba has been completed ready for concrete lining, and the rails are being laid from West Maitland.

The estimated cost of this section is £443,374, and the expenditure to end of financial year £320,793 2s. 6d.

Second Section.—This commences at Dungog at 53 miles 8·60 chains from Newcastle, and terminates at Gloucester at 91 miles 77 chains, with a length of 38 miles 68·4 chains.

On this section 8 feet by 10-inch by 5-inch sleepers will be used instead of 9 feet by 10-inch by 5-inch on Nos. 1 and 3 sections, but the number to the 40-ft. rail is increased to 18 as against 16 on the other sections, giving the same area of support to the rails.

On the 28th of August, 1909, a tender amounting to £377,693 11s. 8d. was accepted for the construction of the line; and on the 26th May, 1909, a tender was accepted for manufacture, supply, and delivery of steel bridges over the Williams, Karuah, and Avon Rivers, and Myall and Ramstation Creeks, the amount of which is £6,399 10s.

Station accommodation will be provided at Nooroo, Stroud Road, Ward's River, name not decided, and Stratford.

On this section will be built the longest tunnel found necessary so far on this extension—this is through the Monkerai range; the proposed length is 847 lineal yards. Taking into account the situation of this tunnel and its length, it has been decided to construct it for a double line of rails.

The estimated cost of this section is £514,565 2s. 3d., and the expenditure to the 30th June, 1910, is £88,792 0s. 11d.

Third Section.—Gloucester to Taree.—This commences at 91 miles 77 chains, and ends at 136 miles 3 chains from Newcastle, and has a length of 44 miles 6 chains. This section is of similar construction to the rest of the line, with the exception of the introduction of several 12-chain curves, found necessary to avoid excessive cost.

The following tenders have been accepted:—For main line, £455,365 16s. 8d.; and for steel bridges over Avon and Manning Rivers, Charity, Rocky Falls, Dingo, Bakers, Cedar Party, and Carpunghat Creeks, various tenders have been accepted to the amount of £28,276.

It was intended to have two single-line tunnels on this section—one 88 yards long, the other 234 lineal yards; it has been found possible to eliminate the shorter tunnel without extra cost.

Station accommodation will be provided at Gloucester, Bulliac, Bundook, Somerset, Blackflat, Charity Creek, Killawarra, Wingham, Woolla Woolla, and Taree.

Taree will be a small depôt for locomotives, an eight-stall shed being provided; it is also intended to make a connection at this place with the Manning River for the handling of river traffic.

The estimated cost of this section is £669,401, and the expenditure for the financial year £283,448 5s. 6d.

The total estimate for the three sections is £1,627,340.

Instructions have been received to call for tenders for three more sections, viz., Taree to Wauchope, Wauchope to Kempsey, known as 4 and 5, and Glenreagh to South Grafton, No. 9. The length of these sections is 106 miles 10 chains.

When completed this line will be very picturesque, and will well repay a visit, both on account of the magnitude of the works and the grandeur of the scenery passed through.

The permanent survey of the North Coast Railway was advanced during the year by the completion of the lengths from Taree to Wauchope, Wauchope to Kempsey, and Glenreagh to South Grafton, and by the commencement of the permanent staking of the extensions from Kempsey to Macksville, Macksville to Coff's Harbour, and Coff's Harbour to Glenreagh.

A length of about 39 miles of the permanent survey of the Cooma to Bombala railway was completed during the year.

The permanent survey of the Moree to Mungindi line was commenced on the 1st March last, 25 miles of which were completed.

The following trial surveys were completed, viz.:—Bowning to Burrowa, Booyong to Ballina, Wyalong to Lake Cargellico (*viâ* Ungarie), Yalgogrin to Youngara, Collarendabri to Angledool, Muswellbrook to Merriwa deviation (*viâ* Denman), Mount Horeb to Batlow and Tumbarumba, Mount Horeb to Tumbarumba (*viâ* Mud Holes Gap), Reka to Tumbarumba, and Perthville to Rockley and Burraga.

Railway surveys were in progress from Kyogle to Acacia Creek, and from Germanton to Bringenbrong, 49 and 35 miles of each respectively were completed. The

The following explorations of proposed railway routes were made, and reports accompanied by illustrative diagram plans prepared, viz. :—Morisset to Singleton, Woy Woy to Singleton, Bonville Creek to Coff's Harbour, Warren to Quambone, Gulargambone to Quambone, Coonamble to Quambone, Coombaning to Mimosa, Coolamon to Mimosa, Coolamon to Currawarna, Tarago to Jervis Bay, Molong to Cumnock, Bowral to Robertson, and Moss Vale to Robertson.

Inspections of the following permanent and trial surveys were made, viz. :—Taree to Wauchope, Wauchope to Kempsey, Glenreagh to Dorrigo, Moree to Garah, Mount Horeb to Tumbarumba, Muswellbrook to Denman and Merriwa, and Barellan towards Hillston.

The aggregate mileage of the field operations carried out during the year are shown in the following tables :—

STATEMENT of Trial and Permanent Surveys—Field Work.

Trial Surveys.

Explorations.	Preliminary traverse.	Preliminary levels.	Cross levels.	Staking.	Levels.	Check levels.	Details.	Inspections.
miles	miles chains	miles chains	miles chains	miles chains	miles chains	miles chains	miles chains	miles
1,457	648 17	739 62	488 10	114 40	109 10	194 23	120 4	247

Permanent Surveys.

Staking.	Levels.	Check levels.	Cross levels.	Details.	Inspections.
miles chains	miles chains	miles chains	miles chains	miles chains	miles
163 74	159 4	163 00	146 20	349 53	110

TRAMWAYS.

Castlereagh-street to Newtown-road viâ Cleveland-street is a double track electric tramway 63½ chains in length, estimated to cost £17,592.

A contract was let on the 22nd December, 1908, for the construction of the permanent way, amounting to £6,875 4s. 2d. The ruling grade is 1 in 12 and the sharpest curve 66 feet radius.

On the 17th February, 1909, a contract was let for the erection of poles and overhead wiring amounting to £693 17s. 6d.

The whole of the works were completed and the tramway opened for traffic on the 16th of August, 1909.

Argent-street to Blende-street, Broken Hill.—This is an extension of the existing steam tramway traversing Argent and Silver streets to the end of Blende-street, a distance of 75 chains single track, estimated to cost £8,751. The ruling grade is 1 in 29 and the sharpest curve 132 feet radius. A contract was let on the 5th January, 1909, amounting to £2,008 12s. 6d. for the construction of the permanent way, and on the 19th of August, 1909, the works were completed and the tramway handed over for traffic.

Beryl-street to the Oval, Broken Hill, is an extension of the existing tramway traversing Bismuth, Mica, and Gypsum streets, and connecting with the existing loop at the Oval, a length of 1 mile 30 chains single track, estimated to cost £12,059.

The ruling grade is 1 in 21·50, and the sharpest curve 106 feet radius. A contract amounting to £5,321 18s. 2d. was let on the 27th January, 1909, for the construction of the permanent way, and on the 19th of August, 1909, the works were completed and the tramway handed over for traffic.

Miller-street to Crow's Nest, North Sydney.—This is a connection traversing the Lane Cove road and joins the existing tramway at Miller-street and at Falcon-street, Crow's Nest. The length of the line is 70 chains double track, and the estimated cost £20,381. The ruling grade is 1 in 12·9, and the sharpest curve is 89 feet radius. A contract amounting to £7,076 1s. was let on the 19th October, 1908, for the construction of the permanent way.

The erection of the poles and overhead wiring was carried out by day-labour.

The whole of the works were completed and the tramway handed over for traffic on the 21st of September, 1909.

Junction-street viâ Walker and Mount streets to Miller-street, North Sydney.—This is an extension 23 chains in length double track, estimated to cost £9,095. The ruling grade is 1 in 13·02, and the sharpest curve 80 feet radius. A contract for the construction of the permanent way amounting to £2,224 4s. 8d. was let on 19th October, 1908. The erection of the poles and overhead wiring was carried out by day-labour. The whole of the work was completed and the tramway handed over for traffic on the 21st September, 1909.

Miller-street to M'Mahon's Point, North Sydney.—This is a connection from M'Mahon's Point, thence along Blue's Point road joining the existing tramway at Miller and Blue streets, a distance of 60 chains double track, estimated to cost £12,985. The ruling grade is 1 in 12, and the sharpest curve 55 feet radius. A contract amounting to £8,286 9s. for the construction of the permanent way was let on the 19th October, 1908. The erection of the poles and overhead wiring was carried out by day-labour. The whole of the work was completed and handed over for traffic on the 23rd September, 1909.

Arncliffe to Bexley.—This is a steam tramway from Arncliffe Railway Station, traversing Done-street, Wollongong Forest and Stoney Creek roads, a distance of 2 miles 42 chains single track, estimated cost £19,224.

The ruling grade is 1 in 20, and the sharpest curve 90 feet radius. The rail joints have been Thermit welded in view of conversion to electric power at a later date.

A contract was let on the 30th June, 1908, for the construction of the permanent way, amounting to £8,803 1s. 6d., and on the 24th February, 1909, a contract amounting to £3,654 16s. 8d. was let for the motor and car shed, coal stage, water supply, &c. On the 13th July, 1909, a contract was let for the erection of a waiting-room at the Bexley terminus, the amount of the contract being £29 17s.

Owing to the failure of the contractor to complete his contract for the motor and car sheds, &c., the work was taken out of his hands and completed by day-labour. The whole of the works were completed and the tramway handed over for traffic on the 12th October, 1909.

Botany-road along Gardener's-road to Rosebery Park Racecourse.—This extension, 72 chains in length, single track, with double track junction at Botany-road, is an electric tramway, estimated to cost £7,858.

The ruling grade is 1 in 39·40, and the sharpest curve 80 feet radius.

The whole of the works in connection with this extension were carried out by day-labour; the work was commenced on the 11th October, 1909, and the tramway was completed and handed over for traffic on the 12th January, 1910.

Manly to Brookvale—Part 2 (Curl Curl to Brookvale).—This is a single track steam tramway 2 miles 12 chains in length, estimated to cost £13,192.

The ruling grade is 1 in 31, and the sharpest curve 90 feet radius.

A contract for the construction of the permanent way amounting to £5,644 7s. 6d. was let on the 31st August, 1909. The rail joints have been Thermit welded in view of conversion to electric power at a later date.

The ballast, white metal from French's Forest quarry, was supplied under contract by the bondholders, the quantity used representing a value of £2,344 6s. The whole of the works were satisfactorily completed and the tramway opened for traffic on the 15th of April, 1910.

Drummoyne to Hatton's Flat.—This tramway will reach the Field of Mars, the length is 3 miles 51 chains single track electric tramway, and the estimated cost £40,469.

A contract was let on the 2nd December, 1908, for the construction of the permanent way, amounting to £12,601 2s. 8d.; the erection of the poles and overhead wiring was carried out by day-labour.

The ruling grade is 1 in 15, and the sharpest curve 99 feet radius.

In connection with this tramway, the bridge across the Parramatta River at Gladesville has been strengthened, and motors for working the swing span electrically have been installed. The whole of the works in connection with the construction of the tramway were satisfactorily completed, and the tramway handed over for traffic on the 8th June, 1910.

In addition to the above works, the following tramways are now under construction.

Baulkham Hills to Castle Hill, is an extension of the Parramatta-Baulkham Hills steam tramway to Castle Hill, a distance of 2 miles 20 chains single track, estimated to cost £11,047.

The ruling grade is 1 in 20·42, and the sharpest curve, 5 chains radius.

A contract amounting to £3,147 16s. 1d. for the construction of the permanent way was let on the 22nd October, 1909.

It is intended that this tramway, besides carrying passengers, shall be used for the carriage of fruit and goods to the railway. At the close of the year it was practically completed.

Wallsend to West Wallsend.—This is an extension of the existing Plattsburg or Wallsend tramway to the coal-fields and the town of West Wallsend, having a length of 7 miles 45 chains single track.

The estimated cost is £39,895, and a contract for the construction of the permanent way was let on the 14th April, 1909, amounting to £24,715 6s. 4d.

The ruling grade is 1 in 30, and the sharpest curve is 90 feet radius.

On the 7th October, 1909, a contract was let for the erection of motor and car shed, coal stage, water supply, &c., amounting to £2,335 17s.; up to the end of the year satisfactory progress has been made with the work.

Sutherland to Cronulla Beach, is a steam tramway for the conveyance of passengers and goods, 7 miles 6 chains in length, single track. The tramway follows the coach route, *viâ* Malvern-road from Sutherland Railway Station to Cronulla; since work commenced a further extension along Ewos parade has been authorised.

The estimated cost is £34,525; the ruling grade is 1 in 20, and the sharpest curve 100 feet radius. On the 24th December, 1909, a contract amounting to £17,349 5s. 5d. was let for the construction of the permanent way, and on the 9th June, 1910, a contract for the erection of the motor and car shed, coal stage, water supply, &c, amounting to £2,799 6s. 10d. At the close of the year satisfactory progress had been made with these contracts.

Spit to Manly, is an electric tramway from the Spit, Middle Harbour, to Manly, a distance of 3 miles 1½ chains, single track. The route from the ferry landing at the Spit is off the roadway for a distance of 70 chains, and winds up through private property and Crown lands, skirting Middle Harbour, from which magnificent views of the same are obtained. This portion of the work is of a heavy character, the grade being almost continuously 1 in 15, with some heavy rock cuttings and embankments. The tramway then traverses Sydney-road until Ivanhoe Park is reached; the tramway passes along the western and northern boundaries of the park; thence along Raglan-street, joining the Manly-Brookvale tramway at the "Clarendon Hotel."

A special punt is being designed to hold 250 people, in addition to vehicular traffic, and this will run in conjunction with the tramways.

A punt is also being designed to transfer empty rolling-stock from one side of the Spit to the other to enable cars to be easily moved at rush times so as to avoid keeping a number of idle cars on the tramway which can otherwise be utilised in the general tramway system.

The estimated cost of the tramway is £36,354; the ruling grade is 1 in 15, and the sharpest curve 55 feet radius.

On the 8th December, 1909, a contract was let for the construction of the permanent-way amounting to £20,520 16s. 3d., and at the close of the year the work was well advanced.

The construction of an extension from Raglan-street, *viâ* Belgrave-street, joining the existing tramway at the intersection of the Corso with Gilbert-street, has been approved. The length, single track, is 2½0 chains, and the estimated cost £2,370.

By

By this means a continuous loop is formed by the existing Manly-Brookvale tramway, which joins the Spit line at the "Clarendon Hotel."

Harris-street to Evans-street, Balmain, is an electric tramway 1 mile 35 chains double track, starting at the intersection of Harris-street and Miller-street, thence along Miller-street, Banks-street, Glebe Island Bridge, Abattoir-road, and Weston-road, joining the Balmain tramway at Evan's-street. The estimated cost is £51,240; the ruling grade is 1 in 15, and the sharpest curve 70 feet radius.

On the 3rd of December, 1909, a contract for the construction of the permanent way was let, amounting to £12,873 6s. 3d.

The erection of the poles and overhead wiring is being carried out by day-labour.

The alterations to the Glebe Island Bridge in connection with the laying of the tramway across the bridge are being carried out by the Fitzroy Dock. At the close of the year satisfactory progress had been made, the work being well advanced.

High-street to West Maitland Railway Station, is a steam tramway traversing Church-street, a distance of 41 chains single track, estimated to cost £3,000. The ruling grade is 1 in 27·12, and the sharpest curve 90 feet radius.

A contract was let on the 9th March, 1910, for the construction of the permanent way, the amount of the tender being £1,939 11s. 2d., and at the close of the year the work was well advanced.

The total length of tramway, electrical and steam, opened for traffic during the year ended June, 1910, is 16 miles 77 chains, and there are under construction 21 miles 63 chains.

The amount expended on tramway construction during the year amounted to £192,755.

The construction of the following tramways have been authorised, for which surveys are in hand and plans in course of preparation:—

Military-road to Cremorne	1 mile 47 chains,	double	track.
Waverley to Bronte	50 „	„	„
Leichhardt to Petersham	70 „	„	„
Campbell-street from Flinders-street	48 „	single	„
Erskine-street extension	8 „	double	„
Marrickville to Undercliffe	1 mile 20 chains,	single	„
Watson's Bay and Bellevue Hill Tramways connection at Park-street	3 „	double	„
Baptist-street and other connections to Western Suburbs Tramways to relieve Racecourse and Show Ground traffic	1 mile 55 chains,	single	„

The total expenditure on railway construction during the year under review is £842,320.

The total expenditure on tramway construction is £192,755, making a grand total expenditure for the branch of £1,035,075.

The staff employed on railway and tramway construction work consists of 1 principal assistant, 13 assistant engineers in charge of works, assisted by 9 assistants, 12 surveyors, 23 engineering draftsmen, 25 survey draftsmen, and 45 inspectors, and I desire to express my appreciation of the way in which these officers have carried out their work.

WM. HUTCHINSON,
Chief Engineer,
Railway and Tramway Construction.

Government Architect's Branch.
Annual Report, 1909-10.

I HAVE the honor of submitting an Annual Report of the work of the Branch for the year ending 30th June, 1910.

As will be gathered from the Accountant's statement of expenditure, the year has been an exceedingly busy one, and the temporarily increased office staff kept fully engaged. These circumstances are a reflex of the general prosperity of the State of New South Wales, and also of the fact that the public requirements having quite outgrown the accommodation, the means of meeting them are being actively met, and an era of remodelling the older buildings, and of erecting new ones, largely entered upon.

The certified expenditure is as follows, and for the sake of comparison, that for the preceding three years is also added :—

	1906-7.	1907-8.	1908-9.	1909-10.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Loans	32,743 8 5	94,024 4 0	33,520 2 1	11,354 3 8
Consolidated Revenue ...	33,322 7 3	34,644 0 11	39,796 6 1	33,977 1 8
Special Deposits	15,252 14 6	7,633 9 6	2,924 6 1	9,930 5 3
Treasury Advance ...	.....	279 1 11	432 15 7	75 0 0
Federal Works	23,450 8 9	29,596 3 4	43,306 2 0	42,564 11 7
Other Departments ...	57,022 5 2	48,238 16 6	107,872 7 4	48,894 15 3
School Buildings ...	61,289 11 1	80,257 11 6		140,500 14 2
Imperial Naval Authorities	12,237 11 5	836 8 8	.....	.....
Norfolk Island Administration	43 6 3	43 2 11	101 10 7	77 14 8
Resumed Properties ...	7,539 13 1	14,012 15 3	6,897 19 5	15,790 16 5
Public Works Fund ...	76,826 11 8	199,507 6 6	226,621 5 1	182,615 0 2
Challis House	31,000 0 0	.....	.....	.....
Totals	£350,727 17 1	£509,073 1 0	£461,472 11 11	£485,780 2 10

The following are some of the more important buildings either completed during the year or upon which expenditure has been entered into, the contract amount also being stated :—

	£
Fire Stations—	
George-street, North—additions ...	1,541
Neutral Bay—erection	1,511
Drummoyne—erection	3,043
Bexley—erection	1,679
Granville—additions	481
Rozelle—erection	1,776
Arncliffe—erection	1,596
Hospitals for the Insane—	
Callan Park—flooring, No. 4 male ward	185
Callan Park—alterations to roofs ...	359
Gladesville—administrative block—kitchen additions...	870
Kenmore—Offices for Inspector-General of Insane...	269
Parramatta—staff dining-room and kitchen	2,363
Parramatta—sewerage	529
Do nurses' quarters and administrative block	2,814
Morisset—farm attendants' cottage	473
Do De Laitte gas machine	330
Gladesville—additions to Hill branch kitchen	1,623
Morisset—recreation block... ...	4,810
Parramatta—new admission block, &c....	8,384
Rydalmere—dormitory additions ...	2,211
Coast Hospital, Little Bay—	
Erection of lodge and entrance gateway	786
New operating room	365
Erection two pairs of artisans' cottages	2,248
New linen stores, &c.	209
Additions to medical staff quarters...	259

	£
Penitentiary and Females Prison, Long Bay—	
Erection of four warders' cottages...	2,348
Fencing work	558
Painting work	538
Fencing four cottages	237
Erection of hospital, warders' quarters, &c.	16,960
Rabbit Island Inebriate Institute—	
New buildings	3,888
Hospitals for the Insane—	
Kenmore—convalescent blocks ...	11,400
Do administration and admission blocks	10,995
Parramatta—erection visiting and office block	4,288
Parramatta—laundry and boiler-house	785
Parramatta—new coal-shed ...	535
Do new male admission block	5,989
Parramatta—additions to Isolation Block	208
Rydalmere—additions to residences	840
Penitentiary, Long Bay—	
Completion of Penitentiary... ...	56,325
Cottage for Electrician	498
Registrar General's Department—Erection of new offices	83,977
New Abattoirs, Homebush Bay—erection	158,765
Australian Museum—fittings	722
Auburn Police Station	1,394
Redfern Telephone Exchange	2,158
Commonwealth Stores—foundations ...	5,779
Police and Prisons Department—alterations	3,559
Hornsby Police Station	1,523

Art

	£
Art Gallery—dwarf wall	455
Kogarah Telephone Exchange	1,004
Canterbury Police Station	1,284
Alterations and additions, Police Station, Waverley	310
Hurstville Police Station	1,356
Australian Museum—treatment of fretted and decayed wall surfaces	135
Chatswood Telephone Exchange ...	1,100
Manly Telephone Exchange	1,359
Burwood Telephone Exchange—increased accommodation...	887
Paddington Telephone Exchange ...	1,367
Australian Museum—internal renovations	227
Camden Police Buildings—alterations ...	327
Glebe Post and Telegraph Office—additions and alterations...	879
Works in connection with Military buildings, &c.	597
University of Sydney—general works ...	485
Waterfall Hospital—general works ...	25,726
Newington Asylum	2,047
Rookwood Asylum	329
Liverpool Asylum—alterations	527
Lands Department—remodelling lavatories	330
Board of Health—additions	425
Stores Supply Department—additions ...	1,678
University of Sydney—	
First contract—Medical School ...	19,460
Second contract—Medical School ...	18,887
Increased office accommodation ...	369
Liverpool Asylum—alterations and repairs	489
Spectacle Island—repairs	4,350
Waterfall Hospital—Administrative block	9,973
New Mining Museum	11,718
State Clothing Factory	6,493
Warehouse, Gloucester and Essex streets	2,988
Old Government House, Parramatta—renovations	4,086
New Mining Museum—fittings, chemical laboratory	826
Fort-street Site—excavation	1,080
Ten Shops, George-street North contract	15,063
Two do do do ...	4,492
Workmen's Dwellings, Lower Fort street	9,753
Do do Gloucester-street..	7,518
Works carried out at Vice-regal residences	9,000
Do do Admiralty House ...	300
Schools—	
Newtown North—additions ...	9,065
Cleveland-street—additions ...	5,895
Granville Technical College — new building	5,237
Sydney Technical College — wool department	4,390
Dulwich Hill—additions	3,736
St. Leonards—alterations	2,530
Haberfield—new school	2,272
Picton—new school...	2,217
Newtown—additions and alterations	2,216
Rozelle—additions	2,171
Leichhardt West—new infants' school	1,923
Camden—new school	1,757
Randwick—additions	1,606
Cleveland-street—sanitary conveniences	1,343
Hurstville West—additions ...	1,015
Long Bay—new school	852
Willoughby—additions	825
Parramatta Girls' Industrial—improvements	815
Cronulla—new school	640
Fort-street—painting, &c.	634

	£
Schools—	
Wollongong—physical science and class-room...	624
Waverley—alterations to school ...	613
Waterloo—repairs	494
Marrickville West—conversion of residence into manual training ...	380
Kogarah—weather shed, &c....	367
Pyrmont—improvements	331
Erskineville—conversion of residence into cookery	314
Burwood—conversion of residence into science room...	285
Girls' High School—alterations ...	277
Banksmeadow—repairs	230
Surry Hills South—conversion part play shed into cookery	223
Rockdale—additions to residence ...	221
Neutral Bay—improvements to residence	217
Berry—improvements	214
Chatswood—new sanitary conveniences	211
Glenmore-road—improvements ...	201
Leichhardt West — new infants' school	1,846
St. Leonards—alterations	2,240
Banksmeadow—repairs	230
Camdenville—science rooms ...	349
Hurstville West—additions ...	1,012
Chatswood—new closets	215
Cronulla—new wood building ...	637
Haberfield—new building	2,177
Picton	2,207
Fort-street—painting	634
Marrickville—manual training ...	380
Marsfield—new school	332
Cleveland-street—new sanitary conveniences	1,343
Moorfields — additions and alterations	313
Waterloo—general repairs	494
Surry Hills South—cookery school...	223
Camdenville—improvements ...	392
Erskineville—cookery school ...	314
Neutral Bay—improvements to residence	217
Paddington—alterations	1,481
Kogarah—weathersheds, &c. ...	367
Auburn—additions	1,899
Waverley—alterations	613
Regentville—new building, &c. ...	557
Pyrmont—improvements	331
Surry Hills South—additions ...	2,527
Wollongong—science and class room	624
Mortlake—alterations	888
Woonona—improvements	479
Concord—additions...	1,137
Artarmon—new building	1,100
Woollahra—alterations	889
Glebe—alterations	436
Wollongong—repairs	267
Naremburn—manual training room	389
William-street, additions	1,576
Sydney Technical College—additions	6,670
Bexley—repairs	229
Double Bay—alterations	665
Annandale North—new weather sheds, &c.	243
Balgownie—additions	435
Rockdale—remodelling	987
St. Peters—additions	1,675
Forest Lodge—additions	873
Gordon—improvements	356
Albion-street—additions	2,847
Marrickville West—additions ...	2,552

Schools—

Schools—	£
La Perouse—class room, &c. ...	411
Bulli—weathersheds	234
Wyong—class rooms	260
Randwick—improvements	469
Goulburn Gaol—new steam cooking plant	597
Hawkesbury Agricultural College—erecting pump-house	235
Hawkesbury Agricultural College—refrigerating plant	460
Coast Hospital, Little Bay—laundry machinery	456
Parramatta Hospital for Insane—supplying and fixing two Lancashire boilers	1,159
General Post Office—iron chimney stack	243
Hawkesbury Agricultural College—supply and delivery steam boiler ...	215
Newcastle Hospital for Insane—steam cooking plant	905
Gladesville Hospital for Insane—steam cooking plant	851
Electrical Works—	
Technical College—installation of electric lighting	502
Female Prison, Long Bay—wiring for electric bells and lights ...	1,376
Female Prison, Long Bay—temporary plant	505
Female Prison, Long Bay—batteries, &c....	210
Fisher Library—electric goods lift...	400
Do do book lift	220
Mining Museum—wiring for electric light	240
Mining Museum—lift	630
Technological Museum — electric lighting	813
General Post Office—Removal of goods lift	275
Rookwood Asylum for Infirm—electric storage batteries... ...	812
Newington Asylum—electric storage batteries	362
Kurri Kurri Hospital—electric lighting...	112
Newcastle Post Office—electric lighting...	169
Technical College—wool department electric lighting	179
University of Sydney—installation of fire alarms	200
General Post Office—electric goods lift...	685
Fisher Library	1,437
Old Naval Stores	211
Darlinghurst Gaol and Courthouse...	195
Penitentiary, Long Bay—maintenance of plant	423
Minor Repairs	1,260
Country Works—	
Orange Public School—new infants' school	2,698
Young Public School—science rooms	670
Bangalow Court-house—erection ...	297
Cessnock Post Office—erection ...	975
Molong Public School—additions ...	834
Borambil Public School—new residence	490
Tamworth Public School—science rooms	489
Inverell Court-house—additions ...	950
Orange Court-house—additions ...	489
Cathcart Public School—additions...	493
Dalgety Public School—new building	324
Dorrigo Public School—new residence	428
Dorrigo Public School—additions ...	441

Country Works—	£
Nimbin Public School—new school and residence	862
Richmond Hill Public School—new residence	487
Fernleigh Public School—erection...	236
Moama Public School—repairs ...	345
Mathoura Public School—repairs ...	368
Singleton Public School—additions	1,288
Wentworth Post Office—erection ...	533
Gallymont Public School—erection	157
Barraba Public School—additions...	315
Broken Hill North — new infant school	2,400
Singleton Public School—repairs ...	389
Peak Hill Public School—erection...	849
Angledool Public School—new residence	620
Bredbo Public School—erection ...	219
Lacmalac Public School—additions	407
Gulargambone Public School—erection	310
Moss Vale Post Office—additions ...	230
Inverell Public School—additions to residence	325
Woodstock School — additions to school, new residence	1,187
Lambton Public School—repairs ...	647
Canbelego Post Office—erection ...	1,075
Katoomba Post Office—erection ...	1,073
Woodstock Police Buildings—erection	1,462
Hanbury Public School—repairs ...	527
Bellata Public School—new residence	478
Barraba Post Office—additions ...	237
Uralla Lockup—additions	240
Inverell Public School—new infants' school	996
Orange Public School—improvements	487
New Vale Public School—additions	390
Lobbs' Hole Public School—erection	235
Spring Vale—new school and residence	844
Eden Court-house—additions ...	377
Ariah Park Public School—residence	498
Temora Public School—additions ...	646
Junee Post Office—additions ...	665
Dubbo Public School—science rooms	485
Wellington Post Office—additions...	358
Coff's Harbour Post Office—erection	998
Cundletown Public School—repairs	315
Grafton Post Office—additions ...	292
Lismore Fire Station—erection ...	917
Cumeroogunga Mission School—erection	652
West Maitland Post Office—alterations	327
Dungog Police Station—additions...	230
Dungog Post Office—additions ...	649
Goulburn Police Buildings—erection	6,640
Coff's Harbour Public School—additions	457
Taree Public School—new residence	1,045
Cobar Public School—science rooms	480
Milbrulong Public School—new residence	495
Monteagle new school and residence	1,095
Coramba Public School—erection ...	363
West Kempsey—science rooms ...	428
Taree Post Office—additions ...	530
Murwillumbah Post Office—erection	1,641
Hay Public School—alterations ...	1,750
Deniliquin Public School—additions	726
Glenrock Police Station—erection...	1,080
Scone Police Buildings—additions...	579
Glen Innes School—science rooms...	398

Country Works—	£
Uralla Post Office—additions ...	425
Mudgee Public School—additions ...	1,840
Bega Public School—science rooms	414
Pambula Public School—new residence	544
Walbundrie Police Station—erection	1,088
Guerie Public School—additions ...	575
Mogo—new school and residence ...	660
Cowper Public School and Residence—erection	700
Lismore Post Office—additions ...	495
South Grafton Post Office—additions	440
Newcastle Naval Boat Shed—erection	1,100
Forbes Post Office—additions ...	357
Kyamba Post Office—removal ...	336
Burringbar Public School—new residence	470
Wollombi Police Quarters—erection	534
Cumnock Public School—erection ...	440
Newnes South Public School—erection	822
Spring Hill Public School—additions	498
Portland Court house and Police Station—erection...	868
Corowa Public School—improvements	350
Wingham Public School—improvements	449
Lismore Public School—additions ...	8,429
Dungog Public School—erection ...	1,600

Country Works—	£
Guyra Court-house—additions ...	365
Numbla Public School—erection ...	245
Wellington Lockup—additions ...	309
Yanco Experimental Farm—erection of quarters	1,560
Newcastle Drill Hall—erection ...	2,520
Adamstown Public School—additions	1,009
Kurri Kurri Court-house—erection	939
Wellington Vale Public School—erection	210
Gyran's Gap Public School—erection	274
Inverell Public School—science rooms	595
Uralla Public School—erection ...	2,550
Breakfast Creek Public School—erection	397
Adaminaby Public School—additions	390
Cunningbar Public School—erection	674
Coonabarabran Public School—additions	687
Frogmore Police Buildings—erection	1,469
South Lismore Police Station—erection	1,052
Coraki Public School—additions ...	373
Cessnock Public School—new infants' school	2,875
Werris Creek Post Office—erection	1,350
Narrabri Court-house—additions ...	780
Bulga Police Station—erection ...	909
Narrabri Public School—science rooms	600
Attunga Public School—additions...	398

In addition to the large number of smaller contracts throughout the State, and also the smaller day work items referred to below, day labour has been suitably employed in the restoration and adoption for occupation by the Taxation Department of the old Naval Stores in George-street North at a cost of £4,700. The original tablet over the main entrance states these were erected by Governor Macquarie in 1812, so that in their renewed condition they are entering upon their second century of usefulness. Extensive additions to (also by day labour) and remodelling of "Cranbrook," the residence of His Excellency the State Governor, have been carried out, and a third large work in the reorganisation of the internal accommodation at the General Post Office for the Commonwealth Government is in full operation. £9,757 out of an estimated cost of £30,000 has been to date so expended, and no less than 369 minor requisitions on the part of the Department of Home Affairs, and relative to this building, have been attended to.

Detailed particulars regarding a few of the more important of the contract works in hand are as follow:—

New Offices for the Registrar-General.—Contractors, Messrs. Loveridge and Hudson. Amount, £83,977.

These new offices will, when completed, present an imposing appearance, worthy of the important site which they occupy.

The architectural style adopted is Perpendicular Gothic; the external walls of sandstone upon a base of trachyte. The building throughout is of fire-resisting construction, the basement is occupied as vaults for the storage of valuable documents, records, and registers which are deposited in the building. On the ground floor, the eastern wing will be devoted to the Lands Titles Office, the central portion to public offices, and the western wing to the Births, Deaths, and Marriages Branch. The Deeds Branch, Deeds Registers, and the Drafting Room will be accommodated on the first floor.

The second floor is set apart for the Registrar-General's room, the Examining Branch, and storage for Deeds Registers. Caretaker's quarters and other accommodation have been provided on the upper floor.

A special feature which has been introduced in the construction of this building is the method of warming and ventilating. Fresh air will be supplied to the various rooms and offices, warmed in the cold weather, and the vitiated air will be extracted by means of specially constructed fans and ducts. The fresh air, before being admitted to the rooms, will be filtered and purified.

New Abattoirs.—Messrs. McLeod Brothers, Contractors; amount, £158,765.

The branch line of railway connecting the Abattoirs to the main trunk line has been constructed. The whole of the site which will be occupied by the Abattoir buildings has been levelled and excavated, and the various roadways formed and platform walls erected.

The buildings included in the above contract comprise:—

7 beef houses, with a daily capacity for slaughtering 72 cattle each; total, 504.
23 mutton houses, having a capacity for slaughtering 490 each; total, 11,270.
3 veal houses, with a capacity for slaughtering 160 calves daily; total, 480.
5 pork houses, with a capacity for slaughtering 250 pigs each daily; total, 1,250.

Provision has been made for future extension, which will double the above output.

These buildings will be erected in two ranges with the slaughter-houses facing the yards and the hanging or cooling chambers fronting the central line of railway. The beef houses will have a total frontage to the railway platforms of 211 feet, the mutton houses 693 feet, the veal houses 91 feet, and the pork houses 151 feet. In addition to the slaughter-houses, it is proposed to include in the same contract, the

the erection of the Administrative Block, the Gatekeeper's Office, the Entrance Gates, Refreshment-rooms for Butchers, Slaughtermen and the Cleansing Staff, Locker Rooms for the Staff and Slaughtermen, Stables and Buggy-shed for the Butchers, and Staff Stables.

The completed scheme will also provide for Power House, Desiccator House, House for treating tripe, gut cleaning and drawing, isolated Slaughter-houses for diseased animals, latrine accommodations, settling tank.

The importance of separating the carcases and all parts used for food from offal, hides, and other by-products, as quickly as possible, has received careful consideration.

The carcases, immediately upon being dressed in the slaughtering pens, will be conveyed to a chamber entirely separated from the slaughter-houses—well ventilated and situated so as to facilitate loading to either train or cart, without coming into close proximity with similar loading for offal, hides, and other by-products of slaughtering.

Penitentiary, Long Bay, £56,325.—Howie Bros., Contractors.

The completion of the Penitentiary for Males comprises the erection of five cell ranges, power house for generating electric light, laundry, hospital, kitchen block, with bathrooms, offices for staff, stores, &c.; completion of workshop block, latrines, forming and grading yards, &c.; entrance block with the enclosing walls and portions of workshop with one cell range, was erected previous to the acceptance of the above contract. Accommodation is provided for 350 prisoners.

Hospital for the Insane, Parramatta.—Erection of Visiting and Office Block. Contractor, Mr. J. Barnes; amount, £4,288.

This building is placed near the main entrance to this institution, and comprises two rooms for visitors interviewing patients, offices for the Medical Superintendent, Medical Officer, Chief Attendant, Assistant Superintendent, and clerks, also a library for storage of books for the use of inmates.

Admission Block.—Contractor, Mr. J. L. Thompson; amount, £5,988.

The erection of this building will complete the new mental hospital, which consists of two pavilions, one for males and one for females, and Administration Block with accommodation for the nursing staff and matron on the upper floor. The Admission Block consists of three dormitories and three dayrooms with single rooms, bathroom and lavatories so arranged as to admit of the patients being classified.

Hospital for the Insane, Kenmore.—Convalescent Blocks for Males and Females.

These buildings were included as part of the original plan for this institution.

Each block consists of four dormitories, dayroom, sitting-room, four single rooms, attendants' rooms, bathrooms, and dressing-rooms, also store, kitchen, lavatories, &c., and provides accommodation in each for about thirty patients.

Administration and New Admission Block.—J. Lusted, Contractor. Amount, £10,995.

These buildings, with the Admission Block already erected, form the new mental hospital for the special treatment of recent cases. The Administration Block is two storeys in height, placed centrally between the two hospital blocks, and provides, in addition to the necessary offices and medical rooms, accommodation for the Matron and Nursing Staff on the upper floor. The Admission Block is a one storey building with three dormitories, three dayrooms, bathrooms, single rooms, pantries, &c., arranged for separate classification.

Schools.—With regard to the heavy expenditure on the Public Schools of the State, I venture to quote from the Report of the Department of Public Instruction bearing upon the work of this branch:—

> "The Chief Inspector of Schools, in his annual report, states that last year witnessed great activity in the remodelling of schools and class-rooms to make them accord with modern hygienic ideas of light and ventilation, and the transformation worked has made the rooms bright, airy, cheerful, pleasant, healthy places for both teachers and pupils. The new rooms are so attractive in appearance and so desirable from all points of view that the possession of one of them by any locality makes surrounding communities desirous of the like. The new furniture is now being supplied at a more rapid rate, and the change from the long forms and desks to the dual desks and seats suited to the physique of the pupils is welcomed. Of course, says the report, there is here the inevitable "much remains to be done." Many years must elapse before anything like completeness as regards furniture and remodelling is reached."

As a general review of the architectural and technical work of the branch in its relation to modern design and construction was enlarged upon so late as in the report of the immediately preceding year, it is not necessary to again refer to this subject.

Office Returns.—The registration of plans and papers shows the total returns for the year in both Head and Country Offices to be as follows:—

Drawings and duplicates	7,877
Specifications	6,996
Contracts entered into	1,978
Vouchers passed	17,204
General papers registered at Head Office	19,433
Do in country offices...	14,338
Minor works not contracted for	5,238

The Officer administering the work in the country offices reports:—

The following are particulars of expenditure in the several Districts in the Eastern and Central Divisions showing the amounts expended during the year on account of Architectural Works.

District.	£	s.	d.	District.	£	s.	d.
Armidale	6,921	1	8	Kempsey	14,340	18	11
Bathurst	28,481	0	0	Lismore	17,267	5	2
Cooma	8,434	13	0	Narrandera	8,771	0	0
Cootamundra	12,431	5	0	Newcastle	33,447	12	11
Dubbo	8,122	9	5	Tamworth	14,706	7	11
Goulburn	15,619	0	0				

The

The following is a statement showing the amount of travelling done by each of the District Works Officers :—

District.	Officer.	Miles travelled by Road.	Miles travelled by Rail.
Armidale	D.W.O.	6,149	1,098
	Asst.	3,994	2,224
Bathurst	D.W.O.	15,381	1,623
	Asst.	10,424	2,151
Cootamundra	D.W.O.	.....	.....
	Asst.	10,795	2,759
Dubbo	D.W.O.	7,235	6,799
	Asst.	9,049	2,031
Goulburn	D.W.O.	3,584	2,118
	Asst.	2,810	2,458
Kempsey	D.W.O.	104	6,059
	Asst.	.....	4,694
Lismore	D.W.O.	6,280	3,284
	Asst.	2,433	2,191
Narrandera	D.W.O.	9,689	4,566
	Asst.	6,053	2,589
Newcastle	D.W.O.	797	187
	Asst. 1	4,368	2,163
	do. 2	6,950	4,226
	do. 3	1,241	2,037
	do. 4	1,661	1,986
Tamworth	D.W.O.	.....	.....
	Asst.	14,893	4,920
Bourke	D.W.O.	636	815
Broken Hill	D.W.O.	.....	359
	Asst.	.....	179
Cobar	D.W.O.	211	181
Walgett	D.W.O.	.....	2,000
Wentworth	D.W.O.	.....	1,365
Wilcannia	D.W.O.	.....	960

The following are the details of the papers registered, inspections made, estimates prepared, plans, specifications, and copies in connection with the work of the several districts :—

District.	Papers.	Inspections.	Estimates.	Plans.	Specifications.	Tenders.	Contracts.
Armidale	764	104	65	158	194	80	82
Bathurst	1,574	621	69	220	269	100	101
Cooma	808	275	52	93	207	43	46
Cootamundra	1,251	298	86	161	274	127	127
Dubbo	530	253	47	58	142	57	78
Goulburn	1,239	424	60	55	233	80	110
Kempsey	1,178	582	134	130	115	54	117
Lismore	1,008	576	139	337	381	117	117
Narrandera	586	245	42	9	30	47	47
Newcastle	3,217	1,123	400	408	560	510	226
Tamworth	1,065	306	78	95	119	83	87
Bourke	144	22	21	3	10	9	9
Broken Hill	171	77	41	9	16	16	19
Cobar	100	118	2	3	7	9	9
Cudgellico	53	9	2	.....	2	2	2
Walgett	77	57	15	.....	13	11	11
Wentworth	562	21	14	.....	9	9	9
Wilcannia	71	9	5	3	10	3	3
Total	14,338	5,120	1,172	1,742	2,531	1,357	1,200

Referring to the Acts of Parliament recently brought into operation, the administration of which having brought a great deal of work to this Branch, the Principal Assistant Architect dealing with the Theatres and Public Halls Act, and the Chief Inspector dealing with the Scaffolding and Lifts Act, report severally as follows :—

Theatres and Public Halls Act.—The work of dealing with all licensed places of public entertainment in the State of New South Wales under the Theatres and Public Halls Act of 1908, which came into

operation

operation within the past twelve months, has necessitated a careful examination of all such buildings and their appointments, so as to bring them to accord with the Regulations under this Act.

In all, some 1,350 theatres, halls and temporary structures have been dealt with and reported upon in detail, the majority of which within the metropolitan area have been inspected by officers of this Department.

In very few instances were any of these buildings found to comply with requirements from a public safety standpoint, under the new Act; but from recommendations made to the Chief Secretary, considerable alterations have been effected and licenses issued for the remodelled buildings, which now comply in all respects with the Regulations.

During the last year, an unprecedented number of new places of entertainment have been erected, for which, in every instance, plans and specifications were submitted and examined with a view to bringing them up to date, and frequently structural and other alterations were recommended and effected with beneficial results.

A striking feature in connection with this work has been the erection of about 150 temporary structures for open-air cinematograph exhibitions, a form of entertainment which has rapidly come into popular favour during the summer months.

The class of structure used for this purpose was scarcely anticipated when the Act was framed, but every endeavour has been made to consider the public safety and comfort, with the result that these premises are, in all cases, safe, and in the majority particularly attractive to the public.

In the city itself many of the older theatres and halls, which were dangerous in the extreme, have been completely remodelled, often at considerable expense, so as to bring them fully up to the Regulations, and are now places of entertainment providing a maximum of safety for the public, while the risk from fire has been reduced to a minimum."

Scaffolding and Lifts Acts.—The number of notices received stating intention to erect scaffolding in the Metropolitan area totalled 1,154, and the two officers deputed to inspect scaffolding have effectively secured conformity with the Regulations, with a daily average of twenty inspections each.

Close attention has also been given to the numerous buildings erected which have had scaffolding and gear in use, but not of such a character as to require statutory notification being given to the Inspectors.

Nine fatalities occurred in connection with building operations, none of which were due to defective scaffolding, but mainly falls from roofs or ladders; one only occurred in connection with steam cranes.

Twenty-five casualties occurred, mostly in a similar manner.

Two hundred and seventeen hand-cranes used on building contracts have been inspected, and, where necessary, altered to conform to the Regulations.

Steam and other Power Cranes and Hoists.—The following is the number of cranes and hoisting-engines erected and inspected in connection with building operations, and used also for the purpose of handling stone and timber and other materials in quarries and timber yards in the Metropolitan districts during the period between 21st February, 1910, and 30th June, 1910. :—

Hand-cranes...	317
Steam cranes	82
Electric cranes	24
Hydraulic cranes	7
Oil-engine hoists	3
	433

The Inspector engaged on the duty of crane inspections is undoubtedly effecting good work, in my opinion, which will have the result of minimising the possibility of crane and hoist accidents.

Forty steam crane drivers' certificates were granted by the Government Architect during the year.

Lifts.—The following table shows the number and types of the lifts in commission in the Metropolitan districts :—

Type of ift.	Hydraulic.	Electric.	Belt-driven.
Passenger lifts..	178	160	1
Goods	468	110	60
Service	23	31	.....
Whips, &c.	66	11	1
Total	735	312	62

Passenger lifts	339
Goods	638
Service	54
Whips, &c.	78
Number of lifts in Metropolitan area...	1,109

The approximate value of 1,109 lifts in round figures is £440,000, and it is safe to assume, neglecting the goods and service lifts and whips, that 339 passenger lifts carry considerably over 50,000,000 passengers per annum.

In connection with passenger lifts, there have been no fatalities or casualities to record for the year, which can, no doubt, be attributed to the provisions of the Amending Act and the Regulations thereunder.

The directions issued, numbering 370, by the Inspectors with repect to lifts have been carried out to their satisfaction, except in a few instances, when the responsible persons were successfully prosecuted. Approximately 2,700 inspections were made on the existing lifts.

In

In Sydney and suburbs 89 new lifts were erected of the following types:—

Electric passenger	24
Hydraulic goods	9
Hydraulic passenger	1
Electric goods	38
Electric service	7
Belt-driven goods	3
Hydraulic service	2
Hydraulic whips	3
Electric whips	1
Belt-driven hoists	1
Total	89

Of the total 89 new lifts erected, 22 represent reconstructions or conversions to electric power.

Two electric passenger lifts were erected in the Newcastle district during the year, and the local Inspector, notwithstanding the extreme disadvantages he is working under—having practically the whole of his working time fully occupied in other duties—has been successful in ensuring conformity with the requirements of the Regulations, so far as the construction of lifts in his district is concerned.

Authorised lift attendants.—A provision embodied in the Amending Act which, to some extent, is responsible for the minimising of passenger lift accidents, is the certification, supervision, and control of lift attendants; 865 "authorised lift attendants' certificates" were issued.

Prosecutions.—One prosecution for failure to empower an employee to operate a goods lift, and not posting name in car; 1 for operating a lift in a manner which constituted a breach of Regulations governing the working of lifts; 2 for leaving lift enclosure gates open and unfastened; 4 prosecutions for failure to post copies of Regulations governing the working of lifts in lift cars; 1 prosecution for failure to carry out directions served by an inspector

Day-Labour Works.—The workshops generally known as the Government Architect's Yard have been during the year considerably curtailed in extent by the operations in connection with the new buildings for the Registrar-General. Only a short period will elapse before this establishment must be moved into some equally advantageous position for its special work and into more modern and better equipped buildings.

The Superintendent reports on the work for the year as follows:—

State works completed, 2,344	£19,802
Do incomplete, 80	15,198
Schools and colleges, &c., works completed, 558	2,930
Works incomplete, 22	68
Number vouchers passed	4,712
Do requisitions issued	2,600
Do dockets issued (store)	9,427
Average issue per docket	26
Total issues on dockets	25,000
Total expenditure—	
Repairs to public buildings—State	35,001
Do do Schools	2,998
Government Architect's Yards, charges and miscellaneous services, foreman, &c.	2,740
	£40,740

Generally.—It has been found a matter of some difficulty during the year to keep pace in estimating the cost of projected works with the rise in the price of all manufactured articles, timber, and bricks; and also with the rise and readjustment of rates of wages as determined from time to time by the awards of the several Wages Boards.

Approximately it may be said that the rise in the cost of building operations during the year has been equal to 20 per cent. in excess of the cost four or five years since.

The long and disastrous brick famine following the coal strike and lasting—with its after effects—upwards of six months, caused very serious stoppages in, and dislocation of, the operations of this branch.

The great activity of the branch has necessitated the temporary employment of a number of additional draftsmen and clerks of works. It has not been an easy matter to secure men with attainments of the standard I have always endeavoured to maintain; but in view of the general demand outside the Service for assistants of this character, the Public Service Board has, however, engaged a very useful set of temporary officers. Another difficult situation has been induced thereby, for in paying the prevailing outside market rates, the salaries of deserving permanent officers of many years standing have suffered by comparison. There are, however, indications that this anomaly will not be permitted to continue.

The services of the Government Architect have been freely made use of, by permission of the Premier, as a member of the Special Board sitting in Melbourne and advising the Commonwealth Government as to the selection of a site within the Yass-Canberra district for the new capital city, and after exhaustive and somewhat anxious deliberation, a site at Canberra itself was recommended, and which it is believed is wholly acceptable to the State Government of New South Wales, besides being eventually adopted by the Commonwealth Government.

I have to again report the continued loyal support and general zeal of the officers placed under my directions, and who now number 152.

W. L. VERNON,

October, 1910. Government Architect.

Harbours

Harbours and Water Supply Branch.

HAVE the honor to submit a report of the operations of the Harbours and Water Supply Branch for the year ending 30th June 1910.

The division of the Rivers, Water Supply, and Drainage Branch of the Department into two branches, viz., Irrigation and Drainage, under Mr. Wade, and the Harbours and Water Supply Branch, under myself, has enabled me during the past year to devote more detailed attention to that portion of the work which has been placed under my charge than was hitherto possible, and strenuous efforts have been made to take the fullest advantage of this fact in the reorganisation of the Branch. In this connection, special attention has been directed towards bringing the dredging fleet to a state of efficiency, which has necessitated the laying up for repair, and in some cases rebuilding, of many of the dredges, and orders have also been placed for a quantity of new plant with the object of bringing the fleet up to the necessary working strength.

With regard to the dredging itself, arrangements have been made for a more complete survey before and after dredging of the waters dealt with, and a systematic programme for future execution has been laid down on the more important rivers. I have strongly urged upon the Hon. the Minister the necessity for forming, and adhering to, a definite programme for the improvement of the river entrances on the coast, and the necessity for dealing with these rivers one by one, in order of importance, so that the rapid completion of each work authorised may enable the improvements effected to be availed of to the fullest extent, and the experience gained thereby to be taken advantage of in the next work put in hand.

In pursuance of the foregoing policy, the Hon. the Minister submitted the completion of the entrance works at the Manning River to the Public Works Committee, and the scheme has been passed by them. It is hoped that the subsequent submissions with regard to other rivers, together with the report of the Royal Commission on Decentralisation now sitting, may enable us to concentrate our plant and efforts on certain approved ports, rather than incur small and ineffectual expenditure at a large number of points simultaneously.

No less than six inquiries by the Public Works Committee into proposed works for harbours and water supplies were in progress during the year, involving a very large mass of work in this Office, as under:—

	£
Broken Hill Water Supply	359,000
Grafton Water Supply	68,000
Junee Water Supply	60,714
Manning River Improvements	150,000
Newcastle Harbour Works, North Breakwater	34,750
Carrington Wharfage Scheme	646,500

Of these schemes the five former have been passed without modification, while in the case of the sixth (Carrington Wharfage) a modified scheme has been passed.

A great quantity of information has been prepared in connection with the inquiry being held by the Royal Commission on Decentralisation into the problem of carrying the trade of the State to the coast.

The important question of the augmentation of the Sydney and Newcastle water supplies has been under inquiry.

The growing demand for water for manufacturing purposes in the South Coast District has necessitated very heavy expenditure with a view to making provision for the increased consumption during the coming summer. This work is now well forward.

In regard to Water Supplies for Country Towns generally the year has been one of great activity; and efforts, which I am pleased to report have been so far successful, are being made to improve the supplies to the municipalities concerned, and to place the whole of the work under this important branch of the Public Service on a sound business footing.

E. M. DE BURGH,
Chief Engineer.

The Under Secretary.
19th September, 1910.

HARBOURS AND RIVERS.

Tweed River.

Harbour Works.—No work on the breakwaters has been carried out since August, 1904, the lengths remaining to complete the scheme of improvements being 282 feet of the Northern and 852 feet of the Southern wall.

Dredging.—The combined grab and suction dredge, "Sigma," after completing necessary work in Belambil Creek, was laid up for docking and thorough overhaul, and on her return to duty the deepening of Cobaki Creek was put in hand.

The suction dredge "Actor" was engaged at Heads to Chindera, Tumbulgum to Murwillumbah, and along the Western Training-wall.

From 15th to 20th October, 24th November to 16th December, and 27th to 30th June, the bar dredge "Antleon" worked on the bar and crossing.

State of Entrance.—A considerable area of shoal water exists outside the mouth of the river, through which the channel finds its way to the ocean by a route which frequently varies its position. The average depth on the bar at low-water spring tides for the year was 4 feet 11 inches, and on the inner crossing 5 feet 10 inches.

Terranora

Terranora Dock.—Transactions :—

Number of Government vessels docked			5
Tonnage „ „ „			905
Number of private vessels docked			5
Tonnage „ „ „			255
Revenue received	£38	18	0
Expenditure on docking private vessels	£9	12	0
Cost of maintenance, &c.	£16	8	7

Miscellaneous.—A few old piles at the Chinderah Wharf were removed at a cost of £28 17s. 11d., and a 200-ton stone punt, to be used in connection with the Crookhaven Harbour Works, was repaired at a cost of £393 3s.

Byron Bay.

Jetty.—Tenders were accepted for repairs and additions to the existing jetty to cost about £6,000, and for the supply of the necessary turpentine piles to cost about £687.

The expenditure under the above headings was £303 3s. 4d.

Richmond River.

Harbour Works.—The scheme of improvements in course of construction since 1889 is that proposed by the late Sir John Coode (with some additions), and authorised in 1890 by Act Vic. No. 9. The work done during the year consisted in the extension of the Southern breakwater.

Riley's Hill Quarry.—The output from the quarry for the year and its distribution were as follows :—

Southern Breakwater		50,352	tons.
Ballast used by Shire Councils		4,982	„
Quarry Refuse :			
Shire Councils	1,349		
Private Sale	898		
		2,247	„
Total		57,581	„

The following table gives the stone quarried at Riley's Hill, Pilot Point, Ballina, and other places for the Entrance Works, &c., and the distribution to date :—

Name of Work.	Quarry.			Total.
	Riley's Hill.	Pilot Point.	Other Sources.	
	tons.	tons.	tons.	tons.
Northern Breakwater	349,844	160,071	.....	509,915
Southern „	752,223	.....	.....	752,223
Middle Training-wall	78,388	.....	.....	78,388
North Guide Wall	52,422	.....	5,040	57,462
North Creek Canal Training-wall	2,233	.....	.....	2,233
Ballina Foreshores	2,741	.....	.....	2,741
Wharves, &c.	4,831	.....	.....	4,831
North Creek Guide Wall, No. 1	.....	.....	18,192	18,192
„ „ „ „ No. 2	.....	.....	4,633	4,633
Totals	1,242,682	160,071	27,865	1,430,618

The cost of quarrying and loading into punts 50,352 tons was £6,989 5s. 11d., or 33·31d. per ton. The total stone taken from this quarry in connection with the harbour works to date has been 1,242,682 tons, costing £161,218 6s. 5d., or 31·13d. per ton. The average number of men employed during the year was sixty, and of horses three.

Towing.—The stone punts were towed between Riley's Hill and Ballina by the tug "Phœnix," the quantity towed during the year being 50,352 tons, at a cost of £2,007 4s. 10d., or 9·57d. per ton. The total stone towed to date is 1,242,682 tons, at a cost of £54,018 17s. 2d., or 10·42d. per ton.

Southern Breakwater.—The quantity of stone lifted and deposited in position was 50,352 tons, extending the breakwater 101 feet, or to a distance of 8,438 feet from the original high-water mark, or 1,883 feet past the first section, leaving 117 feet to complete the wall as designed by Sir John Coode.

The cost of hauling and tipping for the year was £3,068 14s. 1d., or 14·62d. per ton, and the total cost to date £41,493 6s. 5d., or 14·87d. per ton. The cost of the stone in place, including quarrying, towing, hauling and tipping, was £12,065 4s. 10d., or 57·50d. per ton. The total quantity of stone in this breakwater is now 752,223 tons, costing £179,402 7s. 10d., or 57·23d. per ton. The weight of stones used during the year was from 1 to 20 tons, and the depth of water at the tip-head from 35 to 55 feet at low water.

The allowance for depreciation of plant in the cost of the year's work on the Southern breakwater amounts to £1,748 8s. 8d., or 8·34d. per ton.

The average number of men employed during the year was eighty-five, and of horses three.

Heavy seas caused subsidences in the tiphead on six occasions during the year, when the rails at the end were lifted, as follows :—

	Feet.		Feet.
August 25th and 26th, 1909	38	January, 1910	36
September 20th to 28th, 1909 ...	53	March 4th, 1910	45
October 20th to 23rd, 1909	30	May 7th to 9th, 1910	50

Good progress was nevertheless maintained, varying from 5 ft. to 12 ft. per month.

Wharves.—

Wharves.—Repairs were carried out to Crane Wharf at Ballina.

Dredging.—With a view to a general deepening of the navigable water from the entrance to Coraki to meet the increasing demands of the larger class of steamers trading there, the suction and cutter dredge "Dictys" was employed during the year in dredging the Wardell Flats.

The grab dredge "Mu" has been employed in the North Arm, near Lismore, Snow's Flat to Farmer's Bend, and on the South Arm.

No. "52" has worked at Emigrant Creek, Teven Creek, Duck Creek, Little Pimlico Island, Bungawalbyn Creek, North Creek Canal, and Burns' Point Ferry.

The bar dredge "Antleon" worked on the bar from 21st October to 24th November, and 16th December to 8th January, while the "Tethys" continued deepening crossing till 6th September, and from 17th September to 26th October, and the bar from 18th February to 18th March.

State of Entrance.—From July to December the depth of water on the bar at low-water spring tides was from 11 to 12 ft., with a reduction to 8 ft. for a few days in September, caused by heavy, south-easterly weather. For the same period the depth on the inner crossing was from 9½ to 10 ft. From January to June the bar carried from 12 to 13 ft., except for a few days in January, when the depth was reduced to 8 ft., and the crossing had 10 to 11 ft. of water. The inner crossing remained practically in the same position throughout the year. The bar is still inside the breakwaters, a little to the south of the north wall. The average depth at low-water spring tides for the year on the bar was 9 ft. 3 in., and on the inner crossing 10 ft. 7 in.

Snagging, &c.—The overhanging willows likely to cause obstruction to navigation between Lismore and Tuckurimba on the North Arm, and in Oaky Creek and Tatham on the South Arm, were lopped, and all snags removed between these places. A few snags were also removed from Bungawalbyn Creek.

Riley's Hill Dock.—Transactions :—

Number of Government vessels docked	6
Tonnage " " "	1,085
Number of private vessels docked	1
Tonnage " " "	246
Revenue received	£52 1 1
Expenditure in docking private vessels	£15 13 1
Cost of Maintenance, &c.	£80 4 10

Miscellaneous.—Minor works were carried out in connection with the Wollongbar Experimenta Farm, river bank protection, &c.

Clarence River.

Harbour Works.—No extension of the walls has been made in connection with the permanent improvement works since August, 1903.

An opening in the Iluka training-wall for allowing the bar dredges to deposit silt behind the wall, commenced last year, was completed, about 1,200 tons of stone having been removed. About 800 tons of this stone was used in effecting repairs to the Freeburn Island wall.

A gap in the top of the Yamba training-wall, which had washed out about 100 ft. long just above the public wharf, was repaired.

Dredging.—The ladder dredge "Minos" has continued opening the new channel for river steamers behind Freeburn Island to Yamba.

Frequent shoaling having taken place on the Iluka Crossing, the suction dredge "Juno" was removed from Newcastle in August to work thereon, and has since maintained deep water. Prior to the "Juno" making a cutting, the "Tethys" relieved the crossing from 6th to 16th September, and on no occasion since has a bar dredge worked there. A considerable period—18th March to 5th May and 18th May to 4th June—was, however, occupied in deepening the bar.

State of Entrance, &c.—The average depth of water for the year on the bar at low-water spring tides was 11 ft. 3 in., and on the Iluka Crossing 12 ft. 3 in.

Above the crossing, the river and tributaries are in very fair condition.

Ashby Dock.—Transactions :—

Number of Government vessels docked	8
Tonnage " " "	640
Number of private vessels docked	2
Tonnage " " "	165
Revenue received	£56 10 1
Expenditure in docking private vessels	£29 1 1
Cost of maintenance, &c.	£108 9 9

Miscellaneous.—The ballast heap in front of the Freeburn Island stone-loading wharf, the removal of which was commenced last year, was completed.

Six dolphins, with stringers joining them, were erected at the lower end of Freeburn Island between the old stone and coal wharves, giving berthing accommodation 250 ft. long for vessels waiting to cross out during bad weather, &c.

An opening was made 60 ft. wide in the Freeburn Island viaduct, to enable steamers to get through the new channel to Yamba, at the back of Freeburn Island.

Woolgoolga.

Jetty.—The 5-ton steam derrick crane, removed from the outer end of the jetty, was re-erected at the shore end. Other improvements effected comprise a waiting shed, landing stage, wharfinger's office, awning to cargo shed, and the laying of a loop in tramline.

Several trucks have also been repaired. The traffic at the jetty has considerably increased during the year.

Coff's Harbour.

Jetty.—The 5-ton steam derrick crane, for which a 7½-ton crane was substituted in 1907, was re-erected at the shore end of the jetty, and duplicate tramline laid. The outer end of the jetty has been widened, and the existing ramp extended. The

The 7½-ton steam crane was lifted, and fitted with a new cast-iron socket and pin. Minor works, consisting of addition to pig-pen, erection of brush fences to stop movement of sand, repairs to tramline and trucks, building culvert near cargo shed, &c., were also carried out.

Bellinger River.

Harbour Works.—The breakwaters and training-walls remain as described in Annual Report of 1905-6, page 53, no extensions having since been made.

Dredging.—After returning from docking and overhaul at Kempsey Dock, the combined grab and suction dredge "Rho" worked on the crossings at Mann's Point and Government wharf at Urunga, and also in Back Creek.

State of Entrance.—The entrance channel has generally been northerly, but since March it has been almost straight out. The average depth for the year has been 5 ft. 1 in. on the bar, and 5 ft. on the inner crossing.

The depth of water in the upper parts of the river has not varied materially, and above Raleigh the traffic is limited to droghers and log punts.

Nambucca River.

Harbour Works.—The permanent improvement works still remain suspended, no work having been done at this entrance since October, 1903.

Dredging.—The combined grab and suction dredge "Tau" has deepened the channels at the entrance to Warrell Creek, in Warrell Creek, from Schoolhouse Point to Davis' mill, and at the training-wall.

The grab dredge "Iota" worked at Welsh's Crossing, entrance to Broadwater, Broggy's Crossing, near Congarini Ferry, and from Government wharf to old Bowra Wharf.

State of Entrance.—The direction of the navigable channel has generally been straight out, in line with the northern breakwater, but at times the channel has been very narrow. The average depth of water on the bar for the year was 5 ft., and on the inner crossing 5 ft. 2 in. at low-water spring tides.

Macleay River.

Harbour Works.—No wall-work has been constructed at the entrance since December, 1906, and the work still stands as described in Annual Report of 1907, page 53.

A quantity of bushes was placed behind the north wall, to prevent scour, with satisfactory results.

The northern and southern breakwaters are in very fair order, but the training-wall on the south side, along Rudder's frontage, has broken away, and slipped considerably in places; steps are being taken to make this good.

Dredging.—After working at Cox's Crossing, Shark Island, above Frederickton Wharf, and at Curnoe's, the suction dredge "Groper" was dismantled, and towed to Sydney, for the purpose of fitting her machinery into a new hull.

It has been necessary on four occasions to send the bar dredges to improve the entrance, the "Antleon" having worked there from 28th August to 3rd September, and from 24th March to 10th May, and the "Tethys" from 2nd December to 7th January, and 5th to 29th June.

State of Entrance.—The general direction of the entrance channel has been north-easterly.

The average depth on the bar for the year was 7 ft. 4 in., against 8 ft. 3 in. for the preceding twelve months.

From the entrance to Kempsey the river is in good condition, and vessels drawing 9 ft. can navigate the shallowest places at low water.

Kempsey Dock—Transactions:—

Number of Government vessels docked	5		
„ private „ „	1		
Tonnage of vessels docked	368		
Revenue received	£56	10s.	0d.
Expenditure in docking private vessels	£5	0s.	0d.
Cost of maintenance, &c.	£148	0s.	0d.

Hastings River.

Harbour Works.—The harbour works were stopped in October, 1901, and a descriptive outline of the work done up to that time is given in the Annual Report of 1904, page 30.

Dredging.—Deepening operations were continued by the ladder dredge "Pluto" at Andrews Island to Wauchope, Muscio and Ennis' Crossings, when it was found necessary, in November, to remove the dredge to perform urgent work on the Manning River.

The "Antleon" worked at the Hastings from 13th to 27th August, and 9th January to 24th March, and the "Tethys" from 6th to 17th May, deepening at the bar, crossing, and near Government wharf.

State of Entrance.—The direction of the entrance channel was E. N. by E. from the outer end of the training-wall. The average depths for the year at low-water spring tides were 6 ft. 3 in. and 5 ft. 4 in. on the bar and inner crossing respectively. The general condition of the upper part of the river remained about the same as last year.

Camden Haven.

Harbour Works.—Work on the northern wall was commenced on 7th July, and at the end of the financial year had been extended 970 feet, with 44,184 tons of stone of from ½ cwt. to 6 tons in weight, at a cost of £7,268 8s. 11d., or 3s. 3½d. per ton. Particulars of the work previously carried out will be found at page 55 of Annual Report for 1906–7.

The output of stone from the quarry for the year was 44,184 tons, costing £4,768 16s. 4d., or 2s. 2d. per ton. The average number of men employed in the quarry was thirty-five, and one horse.

The towing of the stone punts from the Laurieton Wharf to the Crane Wharf, on the northern wall, was done by the "Shamrock," for the charter of which £39 10s. per month was paid. The total cost of towing was £749 10s. 10d., or 4¼d. per ton.

The

The cost of hauling and tipping stone into the wall was £1,639 18s., or 9d. per ton, the number of men employed being ten, and three horses. The depth of water at the tip-head during the year varied from nothing to 25 feet.

Dredging.—At Klondyke, channel opposite Gogley's Island, and Coal Wharf to Dumbogan Wharf, deepening has been effected by the suction dredge "Alesus."

Only once during the year have the services of the "Antleon" been required to improve the bar and crossing, the time so occupied being from 2nd to 28th July.

During the year a coal-bunker, with a capacity of 100 tons, was built for the dredge "Alesus."

State of Entrance.—The entrance has improved considerably during the year, the inner crossing, which previously proved very troublesome, carrying only at times 3 feet of water at low-water spring tides, has now 6¾ feet. The channel over the bar has been in line of the southern wall almost throughout the year. The average depth on the bar at low-water spring tides for the year was 3 feet 5 inches, and on the inner crossing 4 feet 1 inch.

Manning River.

Harbour Works.—No work has been done on the training-walls or breakwaters since operations were suspended in February, 1904. The improvements effected at this entrance stand as outlined in Annual Report of 1904, pages 30 and 31.

On 14th December, Parliament referred to the Public Works Committee a scheme for further improvements, consisting of an extension of the northern breakwater 210 feet, and the construction of 11,150 feet of training-wall and breakwater on the southern side of the entrance, the estimated cost being £150,000. The expediency of carrying out the work was affirmed by the Committee on 28th June, 1910.

In April the s.s. "Minimbah" was wrecked on the northern breakwater. The owners have salved everything of value, the hull only remaining on the wall. Arrangements have been made by the company to remove the hull.

Dredging.—The services of the suction dredge "Dorus" have been utilised throughout the year in order to maintain navigable water at the Harrington Crossing.

In view of the increased amount of shipping consequent on carriage of material for the North-Coast Railway, the ladder dredge "Pluto" returned from Port Macquarie to deepen and improve the channel from Taree to Wingham. The works carried out were at Contractor's Wharf, Cedar Party Creek, Bird's Flat to Wingham, Neil's and Bird's Flats, near Dawson's Barn, Tinonee Reach, Midgy Gharett in South Arm and Wolla Wolla Bend.

The bar dredge "Tethys" worked on the bar and crossing from 8th to 20th January, and from 8th to 16th February.

State of Entrance.—From the month of July to the end of January, the channel was straight out with good water on the bar, from 8 to 10 feet; in February the bar suddenly shoaled to 7 feet, with a very crooked channel; in March the channel shifted back to straight out, but carried only 6 feet of water on the bar; the channel then remained straight out for the rest of the year, carrying ample water, from 9 to 10 feet.

The average depth on the bar has been 8 feet at low water, and on the inner crossing 7 feet 1 inch—a decided improvement on the preceding year, which was 7 feet 5 inches and 6 feet 1 inch on the bar and crossing respectively.

Cundle Dock—Transactions:—

Number of Government vessels docked	1
„ „ Private „ „	2
Tonnage of vessels docked	138
Revenue received	£16 3s. 3d.
Expenditure incurred docking private vessels	£6 3s. 3d.
Cost of maintenance, &c.	£25 18s. 6d.

Cape Hawke.

Harbour Works.—No extension and repairs to the walls have been carried out since December, 1901.

Dredging.—During the year the combined grab and suction dredge "Theta" has operated at Porter's Mill, Mile's Mill to Forster Wharf, Devil's Rock, Wallis Lake, Tourist's Channel, Forster to Wallis Lake, Godwin Island to Wallamba River, and Wallamba River to Tuncurry.

The bar dredge "Antleon" worked on the bar from 28th July to 12th August, and the "Tethys" from 20th January to 8th February.

State of Entrance.—The bar channel has been generally straight out, but with slight variations to north and occasionally to the south.

The average depth at low-water spring tides for the year on the bar was 3 feet 7 inches, and on the crossing at Tuncurry 6 feet 2 inches.

Port Stephens.

Wharves.—A new wharf and approach at Nelson's Bay was started in January, 1910, and is now nearly completed. The wharf, which is strongly built, extends into 18 feet of water at low-water spring tides, and has a T head 60 feet long by 20 feet wide.

Repairs were also effected to the wharves at Booral and Sawyer's Point.

Dredging.—The combined grab and suction dredge "Delta" excavated channels 60 feet wide, 10 feet to 12 feet in depth, and of a total length of 5,630 feet at the following places:—Myall Lakes to Tamboy entrance, Tamboy, Black Oaks, Black's Crossing, Zeinager's, Monkey Jacket, Mouth of Creek, Myall River, between mouth of Creek and Tea Gardens, Corrie Creek, and Corrie Creek entrance.

The grab dredge "Beta" cut channels 40 to 70 feet wide by 9 feet deep, totalling 2,290 feet in length at the following places:—At and near Booral Wharf and Back Channel, Port Stephens.

The small suction dredge "Portable" had just commenced work at Swansea, when she was destroyed by boiler explosion.

Newcastle Harbour.

Harbour Works—Northern Breakwater.—The extension of 420 feet, authorised by the Newcastle Northern Breakwater Extension Act, No. 11, 1909, was commenced in February, and 17,730 tons of stone have been tipped, extending the length 82 feet at a cost of £5,196 5s. 7d., or 5s. 10d. per ton; included in this cost is the expenditure incurred in renewing a large portion of the railway from the gantry to the breakwater, and the installation of electric lighting plant, as well as the necessary stripping at the quarry. The total length of the northern breakwater is now 3,062 feet.

Southern Breakwater.—During the year 3,289 tons of large stone was tipped to repair the tiphead and the adjacent wall, which were damaged by heavy seas, but the gale of the 4th June displaced about 5,000 tons of stone on the seaward face. The effective length of 4,570 feet was maintained. The cost of the repairs carried out amounted to £1,167 12s. 10d., or 7s. 1d. per ton.

Waratah Quarry.—A large amount of stripping, necessitated by the requirements of the northern breakwater extension, has been carried out during the year.

The output of the quarry amounted to 27,306 tons, distributed as follows:—

Northern Breakwater	17,730 tons.
Southern	3,289 ,,
Reclamation-walls	1,176 ,,
Stockton Breakwater Training-wall	677 ,,
Lee Wharf, Backing, Reclamation, and Roadway	4,183 ,,
Newcastle and Hunter River S.S. Co.'s Wharf	183 ,,
Hospital for Insane...	68 ,,
Total...	27,306 tons.

During the late coal miners' strike, the coal seam at the quarry was worked sufficiently to keep the cranes, loco., and gantry in coal.

Reclamation-walls.—During the year, 1,176 tons of stone were used on the North Stockton training-walls, and 677 tons on the new training-wall off the site of the old northern breakwater.

Dredging.—The following table shows the work done by the various dredges in Newcastle Harbour:—

Shoal.	Dredge employed.	Dimensions of Cutting.		
		Length.	Breadth.	Depth.
		ft.	ft.	to – ft.
Basin Entrance	"Hunter"	223	150	25
Sales Flat	"Neptune"	2,200	100	14
Dyke Wharf	"Samson"	530	250	25
,, ,,	,,	800	250	31
North Harbour	"Newcastle"	338	250	27
Ajax Buoy	,,	350	400	22–25
Stockton Channel	,,	760	250	28
,, ,,	,,	700	150	28
Bar	"Upsilon"	100	50	28
Basin Entrance	,,	150	50	20
,, ,,	,,	100	30	10
Lee Wharf	"Upsilon" and "Nu"	170	30	30
McMyler Hoist	,, ,,	140	30	23½
Pembroke-street	,, ,,	150	50	17–18
Merewether-street	,, ,,	50	30	10
Bar	,, ,,	225	100	30
,,	"Jupiter"	3,300	300	25
Basin	"Glaucus"	900	250	30
Stockton, between green beacons	,,	350	350	20
North Harbour	,,	1,000	400	25–30
,, ,,	,,	600	200	25–30
North Carrington, reclaiming land with sand from dredges	"Castor"	about 120,000 tons.		
Reynold's Bend, Paterson River	"Omega"	170	30	9
Opposite Cant's	,,	210	40	9
Duggan's Lane	,,	270	40	9
Queen's Wharf	,,	875	40	9
Paterson Reach	,,	1,100	40	9

The "Juno" also worked for a short time on the Stockton channel, but was withdrawn for work on the Clarence River.

Wharves.—The new timber wharf on the south side of the basin, known as the Lee Wharf, to be used for inward cargoes, was completed. This wharf is 32 feet wide and has a length of 1,088 feet. Two cargo sheds, 150 feet by 50 feet, were erected thereon. An approach 90 feet in width from Merewether-street has been constructed, and a roadway at the back for the full length of the wharf has been completed, with the necessary kerbs, pathways, and drainage system for storm-water.

Railway connection has been provided from the shed platforms to the Main Northern Line, with the necessary sidings.

Offices have been erected for the Customs and Navigation Departments.

The wharf, sheds, and roadway are lighted by electricity supplied by the Newcastle Municipality. The total expenditure on this work for the year amounted to £19,624 19s. 7d.

A new shed, 274 feet long by 45 feet wide, was constructed over the Newcastle and Hunter River S.S. Co.'s Wharf, with raised portion to allow for the swing of the crane used for handling cargo, and the existing shed of 144 feet by 45 feet was re-roofed and repaired. Repairs to the wharf, and alterations necessitated by the construction of the new shed, were also carried out.

Repairs were effected to the following structures:—King's Wharf, Newcastle and Hunter River S.S. Co.'s Wharf, Market Wharf and Ferry Pontoons, Boat Harbour Bridge, Timber Berth, Stockton Coal

 Wharf,

Wharf, Mitchell-street Ferry Wharf, Stockton Ballast Jetties, Stockton Gantry, Hereford-street Wharf, Basin Ballast Jetties, Basin Crane Wharf, Harbours and Rivers Wharf, Dyke Wharf, Carrington Ballast Jetties, and 30-ton Crane Wharf.

State of Entrance.—The following table shows the depth on bar and least width and depth of navigable channel during the year, and the quantity of material dredged in maintaining the channel :—

Month.	Depth on Bar.	Width and Depth of Navigable Channel.	Dredging.	
			Sand.	Boulders.
			tons.	tons.
July, 1909	22¼ feet	450 ft. x 22¼ ft.	82,500	650
August, ,,	22¼ ,,	450 ,, x 22¼ ,,	73,500	761
September, ,,	22¼ ,,	450 ,, x 22¼ ,,	51,750	809
October, ,,	22 ,,	450 ,, x 22 ,,	63,000	977
November, ,,	22¼ ,,	400 ,, x 22¼ ,,	42,000	406
December, ,,	22¼ ,,	400 ,, x 22¼ ,,	...	645
January, 1910	22¼ ,,	350 ,, x 22¼ ,,	...	170
February, ,,	22 ,,	350 ,, x 22 ,,	29,250	293
March, ,,	22¼ ,,	350 ,, x 22¼ ,,	46,010	405
April, ,,	22¼ ,,	350 ,, x 22¼ ,,	58,460	465
May, ,,	22½ ,,	350 ,, x 22½ ,,	12,560	595
June, ,,	23 ,,	350 ,, x 23 ,,	42,000	818
Total tons			501,030	6,994

Owing to the shortage of coal during the late strike very little dredging was done at the entrance from December to February, and a corresponding decrease in the depth is noticeable. The dredge "Jupiter" has removed the sand very close to the boulder formation on the north side of the fairway, as far out as the end of the north breakwater, with the exception of the sand-spit, which continually makes inside the end of the breakwater. She is now working outside this point at ebb tides to arrest the inflow of sand from the Stockton Bight, and inside the breakwater during flood-tides. The grab dredges "Nu" and "Upsilon" have worked on the boulder formation between the line of Fairway Towers and the Green Beacons, lifting 6,994 tons. The material now being dredged is much smaller in size than formerly, enabling greater tonnage to be raised.

Miscellaneous.—The following works were also carried out during the financial year, viz.:—New Light Beacon on Southern Breakwater for Wigham Light; repairs to Police Launch for Navigation Department; additions to Lee Wharf; erection of new store to Dyke Workshop; construction of five pontoons for dredge "Portable"; alterations to No. 16 punt; repairs to various punts; repairs to beacons, Hunter River Channel; repairs to High-street embankment, West Maitland.

Lake Macquarie.

Snagging.—A portion of Dora Creek was snagged during the year by contract.

Dredging.—The small suction dredge "Portable" dredged channels on Dora Creek, totalling 1,633 feet in length by 50 feet in width, and 6 to 6½ feet in depth.

Tuggerah Lakes.

Dredging.—The suction dredge "Portable" cut 955 feet of channel, 35 feet wide by 5½ feet deep.

Hawkesbury River.

Reclamation at Brooklyn.—The facing of the rough ballast dyke with hand-dressed stone, laid dry, has been completed during the year, and the grass on the reclaimed area is growing fairly well.

Milson's Island Wharf.—The extension of this wharf, including steps for boat-landing, was completed.

Dredging.—A considerable area was reclaimed with dredgings at Rabbit Island, in connection with the institution erected there, and subsequently the dredge "Zeta" removed to excavate a channel to the western side of the Hawkesbury River Railway-station.

Sydney Harbour.

Deepening Prospect Creek.—The deepening of the channel, which was commenced last year, was completed.

Parramatta River Improvements.—The left bank of the river above Marsden-street dam, for a length of about 23 chains, has been laid out to definite lines, formed, and turfed. The bed of the river has been cleaned out, to give 4 feet of water below overflow level of dam, the material raised having been utilised in the formation of banks and for filling purposes. The extension of work on the left bank, and further improvements on the right bank, having been approved, the work is now proceeding.

In July, a flood passed through the newly-formed banks, to a depth of several feet, without causing any serious damage.

Repairs were effected to portions of the work carried out previously, for the protection of the foreshore near Newington Asylum.

Botany Bay.

Cook's River and Shea's Creek.—The bank protection work on the lower river has been extended about 420 yards on the right bank, and a quantity of stone has been raised at Bald Face Quarry for future requirements.

Improvements

Improvements at Confluence of Wolli Creek and Cook's River.—These works were completed about the end of September. The expenditure for the current year has been £1,102 17s 11d. The works carried out comprise the reclamation of about 15 acres of low-lying land to about original high-water level, including oval for sports ground, with concrete gutter and banked slope around the same; also fencing; culverts, and embankments, The earthwork in the reclamation and banks represents about 100,000 cubic yards of material, of which about four-fifths was sent ashore from dredge by means of trucks or fluming, the remainder having been taken out by hand. The average cost per yard has been 1s. 6d., and the total expenditure amounted to £11,329 9s. 4d.

Reclamation near Gladstone Hotel, Arncliffe.—This work was started towards the end of 1908 by the suction dredge "Gamma" pumping material from the bed of Cook's River on to the low-lying area. The work was practically completed about the end of the year, only a little levelling remaining to be done.

Wharves.—The wharves on Botany Bay, Shea's Creek, and Cook's River have been maintained; also at Kurnell and La Perouse.

Port Hacking.

At the latter end of June, a small grab machine, known as "Midget," commenced the deepening of the fresh-water portion of the Port Hacking River, which is extensively frequented by pleasure parties visiting the National Park.

Wollongong.

Miscellaneous.—New fenders have been fixed at the Illawarra and South Coast S.N. Co.'s wharf, Belmore Basin, at a cost of £138 9s. 10d.

The sand drift fences on the beach south of Wollongong were repaired at a cost of £34 9s. 5d.

The entrance of the Tom Thumb Lagoon having closed, a cut was made, at an expenditure of £38 12s. 10d, to let the flood-waters out.

Dredging.—The suction dredge "Neptune" was engaged in Belmore Basin for a time removing obstructions,—principally at the coal-shoots—the material raised being coal-dust and silt.

Port Kembla.

Harbour Works.—A complete description of these works is given in the Annual Report of 1907, page 58.

The output of stone at Reid's Hill Quarry, and its distribution, were as follows:—

Eastern breakwater	123,749 tons.
Northern ,, ...	95,373 ,,
Total...	219,122

The face of the quarry is now over 90 feet in height, and very good stone is being obtained.

The eastern breakwater was extended 330 feet during the year with 123,749 tons of stone, costing 23·75d. per ton. The total length of this wall is now 2,630 feet, and in which have been tipped 667,019 tons of stone, at a cost of 39·31d. per ton. The depth at the tip head is 53 feet at low-water spring tides.

The northern breakwater, which is being constructed of the smaller stone, has been continued throughout the year, absorbing 95,373 tons in the construction of 610 lineal feet of breakwater, at a cost of 23·52d. per ton. The total length of breakwater built to date is 1,140 lineal feet, the quantity of stone used being 120,133 tons, and the cost 23·56d. per ton. The depth of water at the tip head is 22 feet at low-water spring tides.

Miscellaneous.—Two concrete breast moorings have been laid at the root of the eastern breakwater for the convenience of steamers lying at the low-level jetty.

The sand-pump dredge "Neptune" did a little dredging at the site of the proposed new coaling jetty, to ascertain the nature of the bottom, which proved to be clay overlying rock.

A number of borings to rock were also put down round the harbour, extending from the shore to a distance of about a quarter of a mile.

Kiama Harbour.

The concrete sea-wall along portion of Brighton Beach was extended inshore by contract, 250 feet, at a cost of £665 11s. 5d.

Repairs to one of the fenders in Robertson Basin were also effected.

Crookhaven River.

Harbour Works.—The construction of the northern breakwater was commenced early in the year, and to date 600 feet have been built, the work proving effective in preventing the sand from entering the river.

The stone is quarried at Nowra, and lifted by means of a 10-ton steam travelling crane on to the punts, and towed by the tug "Unara" to Comarong Island Wharf, a distance of about 12 miles; it is then lifted off by a 10-ton steam derrick crane on to trucks, run out, and tipped in position. The stone deposited in the breakwater was 32,920 tons, the cost being 47·56d. per ton.

State of Entrance.—The bar carried good water throughout the year; the inner crossing, however, and the tortuous and narrow channel, gave some trouble to shipping. The average depth on the bar at low-water spring tides for the year was 11 feet, and on the crossing 4 ft. 3 in.

Bomaderry Creek.—A channel 100 feet by 25 feet by 5 feet deep at low-water springs, was cut through a bar of rocks opposite the Bacchus Marsh factory, at a cost of £114 9s. 5d.

Jervis Bay.

Currumbene Creek.—The remains of an old stone wall at the mouth of the creek have been built up to the original section for the purpose of keeping the sand out of the creek, at a cost of £27 19s. 9d.

1910

Bateman's Bay.

No permanent work for the improvement of the entrance has been carried out at this place. The bar carried an average depth during the year of 6 feet.

Moruya River.

Harbour Works.—The south training-wall was extended 200 feet with 8,916 tons of stone, at a cost of 44d. per ton. The total stone deposited in this wall, which is now 5,550 feet long, is 53,036 tons, costing 36·43d. per ton.

The northern breakwater has been thoroughly repaired, at a cost of £730 1s. 9d. The stone for this purpose was lifted by hand-winch from the old northern training-wall, and conveyed in trucks to the breakwater.

Dredging.—The combined grab and suction dredge "Eta" has been fully employed working along south training-wall, and opposite the town wharves.

State of Entrance.—The average depth on the bar at low-water spring tides was 7 ft. 9 in., and on the crossing 5 ft. 5 in.

Wagonga River.

Two slate hills at the northern side of the entrance were opened up to ascertain if suitable stone could be obtained for the construction of training-walls; the trial, however, has so far not proved satisfactory, but it is thought that suitable stone can be obtained within a mile from the inlet.

State of Entrance.—The average depth on the bar at low-water spring tides has been 8 ft. 10 in., and on the inner crossing 6 ft. 9 in.

Merimbula.

Wharf.—In May a contract was let for the extension of the existing wharf, and for the provision of additional storage accommodation by putting an upper storey on to part of the existing shed; this work is still in hand.

Tathra.

Wharf.—The floor of the stock-yard has been concreted, and some minor repairs to wharf effected, at a cost of £70.

Eden.

Jetty.—A platform 280 feet long, 4 ft. 6 in. from the edge of the jetty, with vertical piles to act as fenders, has been erected, at a cost of £786 11s. 7d.

A new cargo-shed, with tram-lines to site of depôt for sleepers, and a 5-ton hand-power derrick crane, have been erected at a cost of £1,207 18s. 10d.

The supervision of harbour and river works has been under the direction of Mr. W. Rossbach, Assistant Engineer.

DREDGE SERVICE.

The attached statements show the year's work amounts to 4,603,030 tons, costing £107,005 9s. 8d., or 5·58d. per ton.

In consequence of the strike of coal-miners, the operations of the dredges were seriously interfered with, and in many cases it was found necessary to suspend work entirely. The reduced output and increased cost of work during the year is attributable primarily to these conditions.

Three new hopper barges, each of 550 tons capacity, have been completed at the Government Dockyard, but owing to necessity for lighters for disposal of imported coal, for which these barges were temporarily equipped, no use has yet been made of them for silt-carrying purposes.

An order has been placed with the Government Dockyard for the construction of a twin-screw hopper suction trailing dredge, to be known as the "Latona." The new vessel will be of the "Antleon" type, but so constructed that a small load can be carried on a lighter draught than is practicable with the vessels already in the service. When the depth of water available will admit, a load as great as "Antleon's" can be taken to sea.

The demands for extending navigation for droghers, cane punts, &c., up the narrow and shoal creeks and tributaries of the northern rivers, points to necessity for increasing the number of small dredges considerably. In this connection the hulls of two grab dredges are being prepared, and will be equipped with cranes removed from combined grab and suction dredges.

Several more cranes can thus be made available, and it is desirable that the plant at the disposal of this Branch be increased by the construction of hulls to carry the grab machines, which are now almost wholly idle.

The tug "Lilian" has undergone extensive alterations at the Dyke Shop, Newcastle, and is now in commission at Newcastle.

After seventeen years' useful service, the wooden hull of "Groper" has been condemned, and a new one of iron is being constructed at the doekyard.

On 13th May, at Swansea, the small dredge "Portable" was destroyed by the explosion of boiler.

While in tow from Newcastle to Richmond River, the ladder dredge "Ulysses" and hopper punt No. 67 broke adrift from their tugs during a south-east gale, and went ashore near Evans' Head on 11th March; fortunately, no lives were lost. Salvage operations were placed in the hands of Mr. A. Brooks, and it is with pleasure his success in floating and delivering both vessels at the Richmond River is recorded.

Ladder Dredge.	Where working.	Material lifted.	Tons lifted.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage of working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Waiting for punts.	Repairs.	Other causes.	
						£ s. d.	d.	£ s. d.	£ s. d.								
"Samson"	Newcastle	Mud and sand	184,870	890	1,906	4,113 15 8	5·34	4 12 6	2 3 2	47	2	2	3	9	36	1	
"Newcastle"	do	Mud, sand, stone	283,980	1,356	1,820	4,356 5 9	3·68	3 4 3	2 7 10	76	3	3	5	3	8	2	
"Hunter"	do	Rock	29,469	1,586	2,265	3,164 4 7	25·77	1 19 11	1 7 11	70	3	1	...	...	15	11	
"Minos"	Clarence River	Mud and sand	145,180	1,292	2,460	2,805 1 9	4·64	2 3 5	1 2 10	53	5	8	...	10	24	...	
"Pluto"	Port Macquarie and Manning River.	Shingle, sand, mud, &c.	178,700	1,204	2,916	2,100 3 9	2·82	1 14 11	0 14 5	41	5	16	3	6	27	2	
		Totals	822,199	6,328	11,367	16,539 11 6											
		Averages					4·83	2 12 3	1 9 1	58	3	6	2	6	22	3	

STATEMENT of Sand-pump Dredge Expenditure for twelve months ending 30 June, 1910.

Sand-pump Dredge.	Where working.	Material lifted.	Tons lifted.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage of working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Silt to sea.	Repairs.	Other causes.	
						£ s. d.	d.	£ s. d.	£ s. d.								
"Neptune"	Hunter River, Port Kembla, Wollongong	Mud, clay, stone, &c.	63,494	1,052	2,297	3,965 2 3	14·99	3 15 4	1 14 6	46	2	5	1	2	38	6	
"Juno"	Clarence River	Sand, mud	465,135	835	2,518	4,650 17 2	2·40	5 11 5	1 16 11	33	8	18	1	10	22	8	
"Jupiter"	Newcastle	Shingle, stone, &c.	499,650	656	1,969	4,858 3 7	2·33	7 8 1	2 9 4	33	5	6	5	35	15	1	
"Castor"	do	Sand, mud	207,903	861	2,468	4,757 1 11	5·49	5 10 6	1 18 7	35	3	5	...	...	55	2	
"Actor"	Tweed River	Sand and stone	112,876	911	2,495	3,531 17 1	7·51	3 17 6	1 8 4	37	2	14	4	...	42	1	
"Alesus"	Camden Haven	Sand, shell	176,485	1,380	2,496	2,280 16 0	3·10	1 13 1	0 18 3	55	6	18	1	...	19	1	
"Dorus"	Manning River	Sand, shingle	134,591	883	1,942	2,731 14 6	4·86	3 1 10	1 8 2	45	3	24	1	...	23	4	
"Dictys"	Richmond River	Hard sand and mud	61,160	1,638	2,447	3,614 9 4	14·18	2 4 2	1 9 6	67	6	5	1	...	20	1	
"Groper"	Macleay River	Sand, mud, shingle	54,299	441	1,486	3,819 0 3	16·88	8 13 2	2 11 5	30	2	13	...	...	54	1	
"Glaucus"	Newcastle	Sand, mud, &c.	490,600	899	1,724	3,728 4 9	1·82	4 2 11	2 3 3	52	4	6	5	18	10	5	
"Antleon"	Camden Haven, Cape Hawke, Port Macquarie, Macleay River, Tweed River, Richmond River.	Sand	213,750	529	2,830	6,116 6 11	6·87	11 11 3	2 3 3	19	8	5	8	27	24	9	
"Tethys"	Richmond River, Clarence River, Macleay River, Manning River, Cape Hawke, Port Macquarie.	Sand	372,350	726	2,742	5,565 11 11	3·59	7 13 4	2 0 7	26	5	4	13	32	15	5	
		Totals	2,852,293	10,811	27,414	49,619 5 8											
		Averages					4·18	4 11 10	1 16 2	40	5	10	3	10	28	4	

Statement of Combined Grab and Sand-pump Expenditure for twelve months ending 30 June, 1910.

Combined Grab and Sand Pump Dredge.	Where working.	Material lifted.	Tons lifted.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Waiting for punts.	Repairs.	Other causes.	
						£ s. d.	d.	£ s. d.	£ s. d.								
"Gamma"	Cook's River	Sand, shell, clay, mud	128,765	1,764	2,768	2,648 8 1	4·94	1 10 0	0 19 2	64	1	9	...	...	23	3	
"Delta"	Myall River	Sand, mud, shell	107,810	1,250	2,484	2,088 16 11	4·65	1 13 5	0 16 10	50	3	17	1	...	27	2	
"Eta"	Moruya	Sand	65,272	799	2,592	2,434 10 9	8·95	3 0 11	0 18 9	31	...	13	3	...	48	5	
"Theta"	Cape Hawke	Sand, shingle	178,816	1,521	2,495	1,703 15 3	2·28	1 2 5	0 13 8	61	2	28	...	...	7	2	
"Sigma"	Tweed River	Mud, sand, &c.	19,529	932	4,841	3,037 18 11	37·33	3 5 2	0 12 7	19	1	3	...	...	76	1	
"Rho"	Bellinger River	Stiff mud and sand	130,197	1,391	2,428	2,187 6 7	4·03	1 11 6	0 18 0	57	3	17	3	...	17	3	
"Tau"	Nambucca River	Gravel and sand	80,335	1,767	2,876	2,118 4 5	6·33	1 4 0	0 14 9	62	1	8	1	...	22	6	
"Portable"	Lake Macquarie	Sand, mud	7,585	820	2,305	1,133 18 0	35·88	1 7 8	0 9 10	36	3	25	1	...	19	16	
"Zeta"	Hawkesbury River	Sand, mud, shell, &c.	87,602	1,399	2,509	1,876 13 2	5·14	1 6 10	0 14 11	56	5	7	...	...	30	2	
		Totals	805,911	11,643	25,298	19,229 12 1											
	Averages						5·73	1 13 0	0 15 2	48	2	14	1	...	30	5	

Statement of Grab Dredge Expenditure for twelve months ending 30 June, 1910.

Grab Dredge.	Where working.	Material lifted.	Tons lifted.	Hours dredging.	Hours working.	Expenditure.	Pence per ton.	Cost per hour dredging.	Cost per hour working.	Percentage working hours.							Remarks.
										Dredging.	Coaling.	Removals.	Bad weather.	Waiting for punts.	Repairs.	Other causes.	
						£ s. d.	d.	£ s. d.	£ s. d.								
"Beta"	Myall River	Shingle, mud, shell	33,980	1,448	3,299	1,096 5 0	7·75	0 15 2	0 6 8	44	3	13	2	3	23	12	
"Iota"	Nambucca River	Gravel	19,300	1,715	2,454	827 10 9	10·29	0 9 8	0 6 9	70	3	5	3	...	15	4	
"Mu"	Richmond River	Sand, mud, clay	13,968	1,048	2,434	1,313 1 4	22·56	1 5 1	0 10 9	43	3	20	4	...	20	10	
"Nu"	Newcastle	Boulders, mud, ballast, &c.	4,594	1,120	2,524	1,125 7 8	58·79	1 0 1	0 8 11	44	1	26	14	1	7	7	
"Omega"	Paterson River	Stones, shingle	25,340	950	2,188	959 15 1	9·09	1 0 2	0 8 9	43	1	4	1	12	36	3	
"No. 52"	Richmond River	Rock, sand, gravel	15,557	1,478	2,477	881 3 1	13·59	0 11 11	0 7 1	60	4	14	2	...	16	4	
"Upsilon"	Newcastle	Rock, clay, stones, &c.	9,738	1,494	2,512	1,144 14 5	28·21	0 15 4	0 9 1	59	1	25	8	1	6	...	
"Midget"	Port Hacking River	Sand and weeds	150	26	489	30 2 0	48·16	1 3 2	0 1 3	5	...	...	...	...	...	95	
		Totals	122,627	9,279	18,377	7,377 19 4											
	Averages						14·44	0 15 11	0 8 0	47	2	13	4	2	15	17	

Statement of Tug Expenditure for twelve months ending 30 June, 1910.

Name of Tug.	Where employed.	Tons towed.	Miles run towing.	Miles run special service.	Total working hours.	Hours attending.	Cost of towing.	Cost of special service.	Cost per ton.	Cost per mile towing.	Cost per mile special service.	Cost per hour working	Cost per hour attending.	Percentage of working hours.					Remarks
														Steaming.	Coaling.	Repairs.	Bad weather.	Other causes.	
							£ s. d.	£ s. d.	d.	s. d.	s. d.	s. d.	s. d.						
"Ceres"	Newcastle	229,070	5,535	591	1,828	1,706	1,106 18 0	190 19 2	1·16	4 0	6 6	14 2	15 2	63	5	7	4	21	
"Orestes"	do	249,923	5,344	913	1,900	1,542	1,393 2 3	258 6 11	1·34	5 3	5 8	17 5	21 5	60	4	19	4	13	
"Rhea"	do and Coast	30,625	1,124	8,570	3,280	3,017	297 2 10	1,778 8 3	2·33	5 3	4 2	12 8	13 9	57	4	8	11	20	
"Galatea"	do	240,843	6,882	347	2,306	1,923	1,387 17 11	182 19 9	1·38	4 0	10 6	13 7	16 4	64	4	16	1	15	
"Dooribang"	do	57,215	2,756	3,346	1,868	1,783	423 11 8	537 6 2	1·78	3 1	3 3	10 3	10 9	82	2	5	2	9	
"Dione"	Richmond River	51,540	3,205	88	2,350	2,044	643 6 8	6 7 2	2·99	4 0	1 5	5 6	6 4	36	4	13	...	47	
"Athena"	Clarence River	145,180	10,479	.....	3,007	2,769	770 9 5	.....	1·27	1 5	...	5 1	5 7	76	6	8	...	10	
"Ganymede"	Newcastle	611	40	3,458	2,119	2,096	13 6 8	1,022 5 7	5·24	6 8	5 11	9 9	9 11	42	...	1	...	57	
"Callisto"	Hastings River ... / Manning River ...	178,500	5,000	95	3,009	2,530	405 5 10	12 3 7	·54	1 7	2 7	2 9	3 4	61	4	16	...	19	
"Yimmang"	Newcastle	30	6	5,873	2,283	2,227	0 10 8	395 14 2	4·27	1 9	1 4	3 6	3 7	79	...	2	...	19	
"Burunda"	do and Coast.	36,786	953	5,963	3,196	2,900	244 0 2	1,741 5 7	1·59	5 1	5 10	12 5	13 8	42	2	9	7	40	
"Wollombi"	do	102,288	3,260	1,488	1,826	1,634	936 8 7	382 12 11	2·20	5 9	5 2	14 5	16 2	70	4	10	2	14	
"Minerva"	do	2,255	435	5,679	2,381	2,021	100 18 0	1,091 9 8	10·47	4 8	3 10	10 0	11 9	57	3	15	1	24	
"Powerful"	do and Coast.	.....	.....	2,051	2,430	2,160	.....	1,248 9 9	10·74	...	12 2	10 3	11 7	16	...	11	3	70	
	Totals	1,324,866	45,019	38,462	33,783	30,352	7,722 18 8	8,848 8 8											
	Averages								1·40	3 5	4 7	9 10	10 11	57	3	10	3	27	

Comparative Statement of Quantity and Cost of Work done by Ladder Dredges (with towing), for periods as stated.

Ladder Dredge.	Where working.	1 July, 1908—30 June, 1909. Dredging, Towing, and Repairing.			1 July, 1909—30 June, 1910. Dredging, Towing, and Repairing.			Remarks.
		Tons.	Expenditure.	Pence per ton.	Tons.	Expenditure.	Pence per ton.	
			£ s. d.	d.		£ s. d.	d.	
"Samson"	Newcastle	474,080	8,313 3 9	4·21	184,870	5,761 9 10	7·48	
"Newcastle"	do	369,700	5,260 1 5	3·41	283,980	6,665 13 6	5·63	
"Hunter"	do	73,400	3,819 6 5	12·49	29,469	3,854 9 11	31·39	
"Ulysses"	Cape Hawke	96,372	3,092 13 8	7·70	.....	.....	.....	1909–10. Under Overhaul, Towing to Richmond, Wrecked, Salved. Total Expenditure, £7,723 11s. 10d.
"Minos"	Clarence River	174,860	3,391 13 10	4·66	145,180	3,611 19 1	5·97	
"Pluto"	Port Macquarie / Manning River	147,630	3,086 19 9	5·02	178,700	2,649 7 8	3·56	1909–10. Tons. Cost. Pence per ton. Port Macquarie ... 67,130 ... £1,003 19 5 ... 3·59; Manning River ... 111,570 ... £1,645 8 3 ... 3·54

Comparative Statement of Quantity and Cost of Work done by Sand-pump Dredges (with towing), for periods as stated.

Sand-pump Dredge	Where working.	1 July, 1908, to 30 June, 1909. Dredging, Towing, and Repairing. Tons.	Expenditure. £ s. d.	Pence per ton. d.	1 July, 1909, to 30 June, 1910. Dredging, Towing, and Repairing. Tons.	Expenditure. £ s. d.	Pence per ton. d.	Remarks.
"Neptune"	Newcastle, Hunter River, Port Kemb'a, Wollongong	126,503	3,621 7 4	6·87	63,494	4,029 10 10	15·23	1909-10. Tons. Cost. £ s. d. Pence per ton. d. Hunter River 40,634 2,682 5 4 15·84 Port Kembla 20,550 536 16 1 6·27 Wollongong 2,310 810 9 5 84·20
"Juno"	Newcastle and Clarence River	307,200	4,147 15 8	3·24	465,135	4,717 17 2	2·43	At Clarence River all 1909-10.
"Jupiter"	do do	624,050	6,768 7 4	2·60	499,650	5,140 14 3	2·47	At Newcastle all 1909-10.
"Castor"	Newcastle	732,490	6,163 18 1	2·02	207,903	5,195 11 4	6·00	
"Actor"	Tweed River	211,122	2,764 9 0	3·14	112,876	3,542 17 1	7·53	
"Alesus"	Camden Haven	171,258	3,910 5 6	5·48	176,485	2,280 16 0	3·10	
"Dorus"	Manning River	101,942	3,136 15 3	7·38	134,591	2,740 19 4	4·89	
"Dictys"	Richmond River	52,600	5,024 7 3	22·92	61,160	4,338 12 3	17·03	
"Groper"	Macleay River	235,195	3,604 17 6	3·68	54,299	4,259 8 6	18·83	
"Glaucus"	Newcastle	749,850	8,640 0 10	2·77	490,600	7,415 8 5	3·63	
"Antleon"	Bellinger River, Cape Hawke, Camden Haven, Port Macquarie, Macleay River, Tweed River, Richmond River, Crookhaven River, Clarence River, Moruya River, Manning River	242,000	7,281 14 2	7·22	213,750	6,158 16 11	6·92	1909-10. Tons. Cost. £ s. d. Pence per ton. d. Camden Haven 33,000 683 1 10 4·97 Cape Hawke 14,500 432 8 10 7·16 Port Macquarie 75,000 2,035 10 1 6·51 Macleay River 40,000 1,338 12 10 8·03 Tweed River 17,250 911 14 2 12·68 Richmond River 34,000 757 9 2 5·35
"Tethys"	Richmond River, Clarence River, Macleay River, Manning River, Cape Hawke, Port Macquarie, Tweed River	367,690	5,678 14 0	3·71	372,350	5,711 4 5	3·68	1909-10. Richmond River 142,110 2,518 6 8 4·25 Clarence River 95,050 1,274 18 1 3·22 Macleay River 70,230 1,050 1 1 3·59 Manning River 24,000 330 10 7 3·35 Cape Hawke 26,880 321 10 9 2·87 Port Macquarie 14,080 215 17 3 3·68

Comparative Statement of Quantity and Cost of Work done by Combined Grab and Sand-pump Dredges (with towing), for periods as stated.

Combined Grab and Sand-pump Dredge.	Where working.	1 July, 1908, to 30 June, 1909. Dredging, Towing, and Repairing. Tons.	Expenditure. £ s. d.	Pence per ton. d.	1 July, 1909, to 30 June, 1910. Dredging, Towing, and Repairing. Tons.	Expenditure. £ s. d.	Pence per ton. d.	Remarks.
"Gamma"	Cook's River	134,173	2,091 2 4	3·74	128,765	2,648 8 1	4·94	
"Delta"	Myall River	115,070	1,421 10 1	2·96	107,810	2,157 19 1	4·80	
"Kta"	Moruya River	105,689	2,401 0 7	5·45	65,272	2,480 12 6	9·11	
"Theta"	Lake Macquarie, Cape Hawke	80,320	1,847 10 10	5·52	178,816	1,707 15 3	2·29	At Cape Hawke all 1909-10.
"Sigma"	Tweed River	80,759	1,763 9 7	5·24	19,529	3,149 3 11	38·70	
"Rho"	Bellinger River	60,610	2,071 16 2	8·20	130,197	2,371 18 4	4·37	
"Tau"	Nambucca River	90,994	1,930 14 3	5·09	80,335	2,118 4 5	6·33	
"Zeta"	Hawkesbury River	72,137	2,240 3 10	7·45	87,602	1,924 17 3	5·27	1909-10. Tons. Cost. Price per ton.

Comparative Statement of Quantity and Cost of Work done by Grab Dredges (with towing), for periods as stated.

Grab Dredge.	Where working.	1 July, 1908, to 30 June, 1909. Dredging, Towing, and Repairing. Tons.	Expenditure. £ s. d.	Pence per ton. d.	1 July, 1909, to 30 June, 1910. Dredging, Towing, and Repairing. Tons.	Expenditure. £ s. d.	Pence per ton. d.	Remarks.
"Beta"	Myall River	29,309	1,514 11 3	12·40	33,980	1,440 4 4	10·17	
"Iota"	Nambucca River	24,010	796 11 8	7·96	19,300	831 10 9	10·34	
"Mu"	Richmond River	11,957	1,275 3 3	25·59	13,968	1,320 12 4	22·69	
"Nu"	Newcastle	38,863	2,275 18 1	14·05	4,594	1,769 5 11	92·43	
"Omega"	Paterson River	30,425	719 11 8	5·91	25,340	1,047 16 3	9·92	
"Upsilon"	Newcastle	59,010	2,828 0 5	11·50	9,738	1,837 3 9	45·38	
"No. 52"	Richmond River	16,770	768 3 6	10·99	15,557	905 13 1	13·97	
"Midget"	Port Hacking River	.....	.....	.....	150	30 2 0	48·16	

Average Cost of Dredging and Towing, for periods as stated.

Class of Dredge.	1 July, 1908, to 30 June, 1909. Tons dredged.	Hours dredging.	Dredging only. Expenditure. £ s. d.	Average cost per ton. d.	Average cost per hour. £ s. d.	Dredging and Towing. Expenditure. £ s. d.	Average cost per ton. d.	1 July, 1909, to 30 June, 1910. Tons dredged.	Hours dredging.	Dredging only. Expenditure. £ s. d.	Average cost per hour. £ s. d.	Average cost per ton. d.	Dredging and Towing. Expenditure. £ s. d.	Average cost per ton. d.
Ladder	1,336,042	11,791	18,933 18 8	3·40	1 12 1	26,963 18 10	4·84	822,199	6,328	16,539 11 6	2 12 3	4·83	22,513 0 0	6·58
Sand-pump	3,921,900	14,096	55,136 18 11	3·37	3 18 3	60,742 11 11	3·72	2,852,293	10,811	49,619 5 8	4 11 10	4·18	55,531 16 6	4·67
Combined Grab and Sand-pump	755,018	13,831	15,761 18 7	5·01	1 2 10	16,510 14 1	5·25	805,911	11,643	19,229 12 1	1 13 0	5·73	19,748 4 9	5·88
Grab	210,344	13,980	8,448 11 5	9·64	0 12 1	10,207 19 10	11·65	122,627	9,279	7,377 19 4	0 15 11	14·44	9,182 8 5	17·97
	6,223,304	53,698	98,281 7 7	3·79	1 16 7	114,425 4 8	4·41	4,603,030	38,061	92,766 8 7	2 8 9	4·84	107,005 9 8	5·58

Country Towns Water Supply.

Works Completed.

Ballina.—An additional line of pipes crossing Fishery Creek Canal have been laid ; ball and socket jointed pipes have been used for this work, as the straight ones have not given satisfaction. The pipes are now buried in a trench, dredged for the purpose, to avoid contact with vessels using the canal.

Cootamundra.—The levée across one side of the flat adjoining the submerged dam near the pumping station, to prevent the escape of water on the rise of the creek, has been completed.

Casino.—Additional reticulation work has been carried out, as well as the construction of a cottage for the engine-driver in charge of the pumping machinery.

Gundagai.—This scheme provides for the supply being obtained from the drift underlying the flat on the right bank of the Murrumbidgee River. A pump well, 15 feet in diameter below, and 10 feet at top, and 60 feet deep, lined with brickwork, was sunk, and then a gallery 150 feet long x 6 feet x 5 feet, with a branch 48 feet x 5 feet x 5 feet, was constructed in the water-bearing strata. A flow of 12,000 gallons per hour was obtained. The water is pumped through 68 chains of 6-inch rising main to the service reservoir on Mt. Parnassus. The service reservoir is constructed of concrete partially below ground surface, and is 51 feet in diameter, and 17 feet deep, with a capacity of 200,000 gallons. The reticulation comprises about 4 miles of 3-inch and 4-inch cast-iron pipes.

The engine-house is built of timber and galvanized iron, on piles. The machinery includes a colonial-type boiler of 40 h.p., burning wood fuel, and duplicate marine-type engines, which can be worked singly or coupled together. The pumps are of the deep-well type, capable of lifting 12,500 gallons per hour to the service reservoir through 68 chains of 6-inch rising main, the static head over suction level being 321 feet.

Gunnedah.—Additional works, comprising some 150 chains of reticulation pipes 3 inches in diameter, have been completed during the year.

Lismore.—An additional service reservoir, having a capacity of 457,000 gallons, has been constructed of reinforced concrete. It is 75 feet in diameter and 17 feet deep. This is the third service reservoir now in use, and the total storage capacity is now 729,250 gallons.

The Municipal Council has installed an additional pumping plant, capable of lifting from Wilson's Creek into the reservoir, a height of 240 feet, 50,000 gallons per hour. The machinery is of the producer-gas type with a centrifugal pump, and the fuel used is coke from the municipal gas-works. The saving in fuel by the use of this plant is reported by the Council's officers to be 50 per cent.

The new reservoir has been supplied with lightning protection.

Lithgow.—Additional reticulation extensions have been carried out here during the year, amounting to 4·56 miles of 3-inch, 4-inch, and 6 inch pipes. Mort's and the Extension Estates are the additional areas now served. The new small arms factory, adjoining the Extension Estate, is now being constructed. The necessary water-supply pipes and other material were supplied by the Government, and the Council has carried out the laying and jointing of this additional work.

Mittagong.—A new reinforced concrete reservoir has been constructed here of 314,000 gallons capacity. It is 50 feet in diameter, and 26½ feet in height, and is protected from lightning.

Electric communication has also been made between the pumping station and the service reservoir to indicate waterlevel.

Mudgee.—An auxiliary pumping scheme has been completed here during the year, and consists of a brick well 10 feet in diameter sunk 17 feet below the ground surface into the drift near the right bank of the Cudgegong River. A timber and galvanised iron engine-shed contains the 8-h.p. colonial-type boiler, and 10 in. x 5 in. x 10 in. Gardner pump. The water is pumped into a small catch-dam below the main storage dam through a 6 in. rising main, half a mile of which is new piping.

Opportunity was taken when the main storage dam was empty, of repairing with puddled clay the fissures found in the foundations, since which time the dam has overflowed, showing the work to be entirely successful.

Nowra.—A storage dam holding about 9,000,000 gallons has been constructed on Bangaloe Creek near the village of Cambewarra. The dam is of concrete 29 feet in height above the creek bed, and has a freeboard of 70 feet. The by-wash is excavated out of the hard shale on the right bank, and is 40 feet wide and 2 feet below crest. On the left bank an earth embankment has been constructed above top-water level, having a puddled clay core.

A service main 8 inches in diameter, and 34¼ chains in length from the storage to the existing gravitation main, has also been constructed. The storage area has been fenced in.

Orange.—A balance tank of reinforced concrete has been constructed between the storage dam and the town in order that the water pressure might be increased. The capacity of the tank is 141,000 gallons, and the dimensions are 30 feet in diameter, with a height of water of 32 feet. An additional 10-inch service main 2·89 miles in length has also been laid between the tank and the town.

The minimum pressure in the mains of the town has been practically doubled by these additional works.

Singleton.—This supply was carried out during the current year, the water being drawn from a well sunk in the drift on the right bank of the Hunter River to a depth of 62 feet. From here the water is pumped through 88½ chains of rising main 8 inches in diameter to the service reservoir on McDougall's Hill, a height of 242 feet above the suction.

The service reservoir is constructed of concrete, and has been partly excavated in the hill. It is of 400,000 gallons capacity, and is 75 feet in diameter by 16 feet height of walls, with a depth of water of 15 feet.

From here the water is distributed by means of a service main 6 inches in diameter, and through 11¾ miles of 6-inch, 4-inch, and 3-inch reticulation pipes.

The

The pumping machinery comprises a 35-h.p. "Dryback" type boiler internally fired, and deep-well pumps operated by duplicate horizontal engines, capable of being worked either together or separately, and equal to 15,000 gallons per hour each, or a total of 30,000 gallons per hour.

The estimated present consumption of water is 194,000 gallons per day, including the supply to the railways.

Tumut.—The rising main, which had been giving considerable trouble through the joints leaking, was opened out, and the joints re-caulked with "lead wool" with satisfactory results.

Hawkesbury College.—This work has been completed and handed over to the Department of Agriculture. The works comprise a reinforced concrete well situated on the right bank of the Hawkesbury River 10 feet in diameter and 79 feet deep. It projects above the surface of the ground 24 feet, so as to allow of the machinery being above flood-level. The suction pipe is laid partly in tunnel, and partly carried by a timber stage to the river, where the water is taken by a trunnion pipe. The pumps are situated at the bottom of the well, and are electrically driven by means of power generated at the College some 3½ miles distant. The water is delivered at the College through 291 chains of 6-inch rising main into a reinforced concrete reservoir 26 feet in diameter and 50 feet high, the capacity being 163,000 gallons.

The water is also used for irrigation purposes, and is pumped into two reinforced concrete tanks 10 feet in diameter and 5 feet in height, the capacity being 2,450 gallons. An additional 5 chains of 4-inch pipes have been laid in the College grounds.

The pumping machinery comprises two sets of pumps, one for the domestic supply and general use at the College and the other for irrigation purposes. The capacity of the former is 8,000 gallons per hour against a head of 142 feet, and of the latter 18,820 gallons per hour against a head of 60 feet.

Cowra.—The drive or gallery constructed from the bottom of the well has been satisfactorily completed, resulting in the volume of water being found more than sufficient for requirements. The whole of the works have been handed over to the Council.

Picton.—The raising of the existing dam by 8 feet has been completed; by so doing the capacity has been increased from 27,000,000 to 57,000,000 gallons.

Coonamble.—The new reticulation has been completed by the Council. The pipes were supplied by the Department.

Works under Construction.

Bathurst.—The construction of a gallery in the drift under the right bank of the Macquarie River for a distance of 1,010 feet has been carried out, and this is being further extended a distance of 250 feet, making a total length of 1,260 feet. The flow has been considerably increased by this addition to the works, and will be further added to when the work now in hand is completed.

Cobar.—The construction of an inner dam in the present storage reservoir, to reduce the quantity lost by evaporation, has been commenced, but owing to rains falling as the work was started further work had to stand over. Surface drains to increase the effectiveness of the catchment area have been carried out, and further work of this nature will be constructed when the levels for same have been taken.

Corowa.—Repairs of damage caused by flood-waters to the embankment round the well sunk in the drift have been carried out; also some small extensions to the reticulation pipes.

Borings have also been put down between the existing well and the river, with a view to the construction of a gallery in the drift for the improvement of the flow to the well.

Dubbo.—An additional pump-well, 20 feet in diameter and 70 feet deep, with a new set of pumping machinery and an additional length of rising main, have been installed here, which will more than double the effectiveness of the works. The engine-house has been extended to cover the new well and machinery. The rate of inflow to the new well has been tested, with the result that 17,000 gallons per hour has been obtained.

The machinery comprises duplicate horizontal engines, connected to crankshaft driving three throw deep-well pumps, capable of lifting 25,000 gallons per hour together. The engines are also capable of being worked separately, each having a pumping capacity of 12,500 gallons per hour against a static head of 180 feet, including suction lift. The delivery pipe is 3,400 feet in length, and has a diameter of 8 inches. Additional 3-inch diameter reticulation pipes to the length of 3,618 lineal yards have also been provided and laid.

These works are now practically completed, only minor details remaining to be carried out.

Forbes.—A new steel service reservoir is being constructed for the town, the capacity of which will be 735,000 gallons. Tenders have been called for this work.

Additional reticulation pipes of 7,250 feet in length, and of 6 inches and 4 inches diameter, have also been supplied to the Council to replace the smaller existing pipes, which will be removed and relaid in other positions.

Goulburn.—About 110 chains of 6-inch service main are being laid from the service reservoir along Clinton-street, in order that additional pressure may be obtained in the centre of the town. This work will shortly be completed.

Katoomba.—Additional reticulation pipes have been laid in various streets of the town, and comprise a total length of about 115 chains of 4-inch and 3-inch diameters. The Council has also cleaned-out and cement-washed the interior of the service reservoir with satisfactory results.

Mittagong.—An additional pump has been ordered for this work, owing to the rapid increase in the consumption, due largely to the water required for railway purposes. It is expected that the plant will be received shortly; it is a compound "Gardener" pump, having a capacity of 11,000 gallons per hour. Sufficient boiler-power was installed in the first place to work this extra plant, but it was not anticipated that the consumption would increase so rapidly in so short a period.

The new service reservoir will be cleaned out and cement-washed internally after the new pump is installed.

Moree—The rate of inflow into the existing well sunk into the water-bearing strata, together with the flow obtained from the insertion of five Cook's strainers, not being found sufficient for summer consumption, the Council were advised that the best means of increasing the flow would be the construction of a gallery in the water-bearing strata. This work has now been commenced, a shaft being sunk some

120 feet distant from the well, and it is proposed to drive from this shaft towards the well. A considerable flow of water has been struck in the temporary shaft, and this will materially add to the supply for the town, and will, it is anticipated, be largely augmented from the gallery when completed.

Orange.—Minor additions to the service main, comprising a by-pass at the new balance tank, &c., are in hand and nearly completed.

Singleton.—Additional reticulation pipes, comprising 204½ chains of 3-inch and 4-inch diameter, are to be laid, and tenders for this work will shortly be received.

Advice has been received that the water-softening plant ordered in Europe will arrive early in July, and as the foundations, which are of concrete, are completed, the erection of the plant will be immediately proceeded with. A store for the materials used in the softening process is also to be erected.

Wellington.—The gallery in the drift has been extended, and an additional flow of considerable volume—more than sufficient to meet the town's requirements—has now been struck. Three hundred and eighty-six lineal feet of gallery, 6 feet wide and 6 feet high, have been constructed and timbered during the year, in addition to 108 feet of shaft sunk and 55 lineal feet of open cutting made.

Minor additions to the reticulation mains have also been carried out.

Dungog.—Tenders have been invited for the whole of the works required to supply water to the town from a well proposed to be sunk in the drift near the Williams River. The water is to be pumped thence to a service reservoir on a commanding site above the town, from where it will supply all the residents by gravitation.

The estimate, as ascertained from the tenderers' prices, will be put before the Dungog Municipal Council for their consideration.

Murwillumbah.—Additional reticulation pipes for use in case of fire are being laid in the town and across the bridge over the Tweed River to South Murwillumbah. The design and estimate for a pumping scheme from Boat Harbour is being prepared.

Towns north of Wollongong.—The supply for the towns north of Wollongong is being drawn from the Cordeaux River. The existing storage dam now supplying Wollongong, Port Kembla, and Unanderra is being supplemented by the construction of a second storage dam, which is situated some 2 miles below the existing dam. This storage will have a total catchment of 7¼ square miles, and includes that of existing dam. Its capacity will be 260,284,400 gallons, which with that of the existing dam (of 173,000,000 of gallons) will make a total storage of 433,250,000 gallons.

The foundations at the new site have been bared, and a good close basaltic rock formation obtained for the entire length. The design is for a curved dam to a radius of 300 feet, with a height of 60 feet above the river bed, length of crest being 816 feet.

A large quantity of material for concrete has been prepared, a steam crusher having been erected for the supply of metal to the required size. This machine is also used for crushing sandstone for the sand required. A concrete mixer has also been erected for use here.

The water will gravitate from the existing dam as at present as far as Mount Nebo, where a steel balance tank holding 60,000 gallons has been constructed. At this point a turbine electric generating plant will be erected, and the power so generated from the head of about 600 feet—which it will have at this place—will be transmitted to a pumping station close to the new dam, and the water stored behind this structure will be pumped up to the existing dam as required. The pumps are designed to work automatically, and will cost a very small sum for supervision and maintenance, compared with the usual steam plant.

The existing pipe-line from the upper dam to O'Brien's Gap, a distance of nearly 4 miles, is now insufficient to carry all the water required, and is being supplemented by a line of woodstave pipes 14 inches in diameter, which is being laid alongside the existing 10-inch steel main. From O'Brien's Gap towards Clifton the gravitation main will be constructed of Mannesmann weldless steel pipes, protected externally from corrosion by means of special coatings of bitumen and jute. These pipes will form a compound main of 14-inch, 11-inch, 9-inch and 6-inch diameters, with a 9-inch branch to Mount Nebo tank. The length of the main will be some 19 miles, and in addition there will be connections to the service reservoirs along the route. Service reservoirs are being provided for at Mount Keira, Balgownie, Corrimal, Bulli, Woonona, Thirroul, Coledale, Clifton and Scarborough, and provision has been made in the scheme for an extension to Stanwell Park when the circumstances warrant it.

Quirindi.—Tenders are about to be called for the works in connection with this supply. The scheme provides for sinking a well 20 feet in diameter into the water-bearing strata near the Quirindi Creek, and the water will be pumped up to a softening tank, and thence flow to the service reservoir from whence it will gravitate to the town.

Supervision.—The cost for supervision on the expenditure for the year (£55,330) was £1,159, or at the rate of 2 per cent. If design and supervision were included, the cost would be 2·6 per cent.

Projected Works.

Berry.—An addition to the present water supply for this town is contemplated, and the scheme suggested is a diversion of the water from Steer's Creek by means of a pipe-head dam and galvanized-iron pipes into the present pipe head dam on Leary's Creek. Survey for this work has been completed, and an estimate will shortly be prepared and put before the Council for consideration.

Blackheath.—An estimate has been made of the cost of supplying the villages of Blackheath and Medlow with water from the storage dam constructed on Wall's Creek holding 67,000,000 gallons. It was found that unless the Railway Commissioners guaranteed to take water at 8d. per 1,000 gallons the high water-rate required would make the cost of the scheme prohibitive.

Broken Hill.—A scheme for the supply of water to this town has been prepared, and has been the subject of inquiry by the Parliamentary Standing Committee on Public Works. The report of the Committee, which was favourable to the construction of the works, has been submitted to Parliament.

The scheme provides for the construction of a storage dam on Umberumberka Creek to hold 2,903,000,000 gallons. This dam will be 84 feet above the creek bed, or 134 feet above the foundations. The water will be pumped through 155 chains of 18-inch rising main to a service reservoir having a T.W.L. of 585 feet above suction valve in pump well. The water will then gravitate to the town through 17 miles of 18-inch pipes and be reticulated to the mines and streets by about 50 miles of pipes of various sizes.

Corowa.—To improve the rate of inflow from the drift in which the well for the supply of this town has been sunk, it is proposed to sink a perforated iron cylinder 6 feet deep and 12 feet in diameter. This improvement also includes the lowering of the existing pumps so that the suction pipe may draw from the greater depth.

Cowra.—In this supply the pumping main is used as the service main, and causes some slight inconvenience by the noise of the pumping engines being communicated to the dwellings by means of the house service pipes. In order that this may be obviated it is suggested that separate service main be laid. An estimate has been prepared for this work, which the Council has agreed to, and the work will shortly be put in hand.

Deniliquin.—Small additions to the reticulation mains at this place are contemplated, and the work will shortly be commenced.

Goulburn.—The Goulburn Council had a survey made of a proposed scheme to supply water from the Pejar Creek by gravitation. This scheme has been investigated, and an estimate forwarded for the Council's consideration. The improvement of the existing scheme has also been reported upon, and an estimate furnished to the Council. This provides for the construction of a second storage dam on the Wollondilly River to hold 48,250,000 gallons, a new 10-inch rising main, a filtration plant, and the addition of another settling tank.

Grafton and South Grafton.—A joint scheme of water supply for these towns has been submitted to and reported favourably upon by the Parliamentary Standing Committee on Public Works. The supply is to be drawn from the Nymboida River, near the village of Nymboida, some 24 miles from Grafton. The off-take will be by a tunnel some 30 chains in length between the Nymboida River and Blaxland's Creek valleys. The water will then be conveyed through a cast-iron pipe a distance of 19 miles to a service reservoir having a capacity of 600,000 gallons, commanding both towns and be distributed by means of service and reticulation mains. Provision has been made for carrying the pipes across the Clarence River slightly below the bed of the stream in a trench dredged to receive them.

Helensburgh.—An estimate has been prepared for a supply to be drawn from the Waratah Rivulet. A small storage dam, holding about 20,000,000 gallons, is proposed, and the water would then be pumped to a service reservoir situated on the top of the range, from whence it would gravitate to the town.

Junee.—The existing scheme of water supply, which is a gravitation one, the water being stored at a dam on Ulandrie Creek, having failed, a new scheme has been devised in which it is proposed to draw the water from the Murrumbidgee River near Mount Tenandra and pump it into reservoirs on Mount Tenandra, from whence it will gravitate a distace of 18¾ miles to the existing service reservoir near Junee. The existing service and reticulation mains are to be used under the new scheme.

Kiama.—A survey for a storage dam on Fountaindale Creek, above the site recently selected, is being made with the idea of satisfying the riparian owners on the lower portion of the creek named, who were afraid if the dam were constructed as at first proposed they would not get sufficient water in the creek for their stock.

Richmond.—An estimate for the installation of a filtering plant for this town has been made, the Hawkesbury River water, from which the supply is drawn, being occasionally discoloured and silt-laden when the river is in flood.

Tamworth.—An auxilliary pumping scheme has been estimated for in connection with this town. The existing supply is drawn from a storage dam on Moor Creek, some 12 miles distance from Tamworth. Owing to the occasional complaints of the quality of the water caused by the growth of *algæ* and the deposit of fine black silt in the storage reservoir, it is proposed to sink a well in the drift near the junction of the Cockburn and Peel Rivers, and draw an alternative supply from there. A small dam to hold the water back in the drift in dry seasons is to be constructed on the Cockburn River. A separate service reservoir, constructed of concrete, is to be erected, and an additional service main is also to be put in.

The pumps are designed to be electrically driven from power generated at the Council's existing electric lighting station. This scheme is now before the Council for consideration.

Investigations.

Albion Park.—A trial shaft and pumping test is nearing completion with a view of supplying Albion Park, and possibly Shellharbour, with filtered water to be pumped from the drift near the right bank of the Macquarie Rivulet near the village. Previous borings proved the existence of a deep drift, which, should the analysis of the water prove satisfactory, will be a valuable source of supply.

Blue Mountain Villages.—Investigations have been made for the supply of the villages from Wentworth Falls to Springwood with water to be pumped from the Wentworth and Linden Creeks; the necessary levels are about to be taken to enable an estimate to be prepared.

Bowral.—Estimates for three alternative schemes of water supply have been placed before the Council for consideration. The scheme most favoured by the residents is a gravitation one, in which the water would be drawn from a storage dam proposed to be erected on one of the branches of Mittagong Creek, with an auxilliary pipe-head dam on the adjacent creek, the water from which would be conveyed into the storage dam. This scheme was not recommended by the Department as the catchment area was considered too small to provide sufficient water in dry years.

A second scheme providing for a storage dam on the Nattai Creek above that used by Mittagong, with machinery for pumping to a service reservoir on the "Gib," was also estimated for, but the low flow of this creek in dry years does not appear to be much more than sufficient for the requirements of Mittagong without much larger storage provision being made.

A third scheme, and one which is considered the most suitable for Bowral, is to provide for a storage dam on the Wingecarribee River, the water to be pumped to a service reservoir commanding the town. A preliminary estimate for this scheme has also been prepared, and further information as to the foundation of the site proposed has been obtained by survey and is now being developed.

Cooma.—A survey has lately been made, and an estimate is being prepared, for a scheme of water supply proposed to be pumped from the Murrumbidgee River.

Cootamundra.—Investigations and surveys have been made with a view to increasing the water supply to this town. A storage dam to hold about 229,000,000 gallons on Salt Clay Creek is proposed, the catchment

catchment area of the site selected being about 11 square miles. An additional scheme for a supply from Brawlin Creek, some 9 miles distant, has also been investigated, and the estimates for these proposals are now being prepared.

Glen Innes.—The estimate for a scheme to supply water for this town from Beardy Waters has been forwarded to the Council for consideration. The estimate includes a filtering plant and pumping station near a natural storage in the river. The water will be pumped up to a service reservoir on Martin's Hill, and gravitate thence to the town. The scheme is one which will need to be referred to the Public Works Committee for inquiry.

Gosford.—A further investigation of a partially explored scheme for supplying this township with water by gravitation has been made.

Grenfell.—A survey has been made for a water supply here, and plans are now being prepared with a view to an estimate of cost being furnished to the Council.

Inverell.—Further survey and investigation have been made here with a view to closer estimates of both the gravitation and the pumping schemes being prepared.

Kyogle.—An investigation of a water supply here has recently been made.

Mullumbimby.—An investigation of a water supply has been made; it is proposed to obtain water by gravitation from the head of the Brunswick River and a reservation of land for a catchment area has been made with that object.

Muswellbrook.—An investigation of a scheme for pumping filtered water from the drift underlying the left bank of the Hunter River near the town has recently been made; a trial shaft has been sunk and flow tested. A survey and estimate are now being prepared.

Newcastle.—With a view of increasing the supply of soft water to this city, investigations are now being made, in conjunction with the Irrigation and Drainage Branch, of the country north of Newcastle, in the vicinity of Chichester and other creeks. It is anticipated that should a supply of soft water be obtained, the consumption will increase some 50 per cent., the existing supply, which is obtained from the Hunter River, being so hard that its use for domestic purposes is considerably restricted.

Parkes.—An additional storage dam is projected for this town, and a survey for same is now in hand, after which an estimate will be prepared.

Peak Hill.—An estimate is being prepared for supplying this town with water to be pumped from the Bogan River. A scheme by gravitation from Clagga Creek, about 8 miles from the town, has been found to be beyond the financial means of the Council.

Sydney.—An exhaustive investigation is now being made for increasing the supply of water for the city of Sydney and neighbourhood from the possible sources of the Cordeaux, Woronora, and Upper Nepean Rivers, as well as the Avon and Bourke Creeks, on the lines laid down by the Royal Commission in 1903.

Taree.—Three schemes for the supply of water to Taree are being investigated. In two of these it is suggested that the water might be obtained from the underlying drift at either the Taree Estate or the Woolla Woolla Estate.

The third scheme provides for drawing the water from the Manning River, at Abbot's Falls, and also includes the supply of the town of Wingham.

Preliminary estimates are being prepared of the cost of these schemes for the consideration of the Councils.

Temora.—An investigation has been made with a view to supplying this town with water in conjunction with the proposed new water supply for Junee.

Yass.—An estimate is being prepared for a supply to this town. It is proposed to construct a storage dam on the Yass River, and pass the water downstream to a pumping station, from which it will be elevated to the service reservoir, and thence gravitate to the streets of the town.

Young.—This proposed supply (now being investigated) will be drawn from the drift beds near the junction of Burrangong, Stoney, and McHenry's Creeks, and will be pumped thence to the service reservoir on a commanding site above the town.

The supervision of Country Towns Water Supply Works has been under the direction of Mr. T. E Barrows, Assistant-Engineer.

Irrigation and Drainage Branch.

Report of the Chief Engineer for Irrigation and Drainage.

Sir, 1 July, 1910.

I have the honour to submit, herewith, Report covering the operations of the above Branch of the Public Works Department for the year ending 30th June, 1910.

The work of this Branch during the past year has been effectively supervised by the Assistant Engineers in charge of the several sub-branches, which are as follows:—Sewerage Construction, Mr. A. Peake; Artesian Boring, Swamp Drainage, and Water Conservation, Mr. S. H. Weedon; Irrigation, Mr. W. Claude Wilson; and River Discharge Observation and Records, Mr. H. Shute.

The volume of work dealt with during the year has shown an increase over that of the previous year. In addition to the preparation of sewerage schemes for country towns, and the many minor works about the Metropolitan Area that the Branch is called upon to carry out, the preparation of preliminary information in respect of the large Long Bay Ocean Outfall Sewer Project has been advanced a stage, and tenders received for the first section of that work.

Works in connection with the Murrumbidgee Northern Irrigation Scheme have been gradually carried on both at the Barren Jack Storage site, and in the vicinity of the areas to be irrigated, so that the first areas can be put under occupation when the first water is stored in July, 1911.

The matter of an agreement between the interested States of New South Wales, Victoria, and South Australia, regarding the distribution of the waters of the Murray River has not been advanced during the year. The Parliamentary Royal Commission, appointed by the Victorian Government, for the purpose of reporting upon the draft agreement arrived at between the Premiers in 1908, have submitted a report, but up to the present no action has been taken to convene any further meeting of Premiers.

I have, &c.,

L. A. B. WADE,

The Under Secretary for Public Works. Chief Engineer for Irrigation and Drainage.

BARREN JACK STORAGE AND MURRUMBIDGEE NORTHERN CANAL PROJECT.

Barren Jack Storage.

During the period ending the 30th June, 1910, satisfactory progress has been made in the construction of the Barren Jack Dam. Owing to an exceptionally wet winter, the river was in flood during the months of June, July, August, and September, and it was not until towards the end of October that the contractors were able to pump out and clean up the foundations and commence concreting.

From the beginning of November, 1909, until the 30th June, 1910, 27,145 cubic yards of cyclopean concrete have been placed in position, in which the aggregate percentage of plums, the maximum weighing up to 15 tons, amounts to 31·89 per cent.

The foundations obtained in the bed of the river for this work are exceptional. When the gravel and boulders comprising the present river bed were removed, the foundations were found to consist of solid red granite, smooth and waterworn on the surface, but cut up in contour by pot-holes, so that an ideal key was afforded for connecting the dam wall to the rock foundations. There was practically no loose or defective rock over the whole area, and in taking out the gullet, a trench 10 feet wide x 6 feet deep, the rock was found to be without defect. The greatest depth to which the foundations were taken was to R.L. 948, which is 232 feet below top water level, or 244 feet below crest level.

In building the cyclopean concrete, a system of units, cruciform in shape, having an area of 1,080 square feet, has been adopted. These units are built to heights of 9, 12, and 15 feet, and are so arranged that adjoining units break joint both horizontally and vertically.

With the exception of an area on the up-stream face, in which the gullet is being excavated, the wall has been taken up to a height of about 50 feet above the foundations.

Natural sand of good quality is being obtained from the junction of the Murrumbidgee and Goodradigbee Rivers, about 3 miles above the site of the works. This is brought on to the ground by means of a narrow-gauge railway constructed by the Contractors.

Payments on account of work done for the year amounted to £18,397.

Silt Observations.

During the year observations have been commenced as to the percentage of silt carried by the Murrumbidgee River, but the investigations are not yet sufficiently advanced to enable me to submit any detail report on this question.

Goondah-Barren Jack Railway.

The narrow-gauge railway constructed from the Main Southern Line at Goondah to the site of the Barren Jack Dam, a distance of 26 miles, has, during the year, proved itself to be an efficient and economical means of conveying material to the site of the works.

During this period a total of 29,556 train miles were run, and the freight carried amounted to 220,835 ton miles. The number of passengers carried during the twelve months was 1,658. Everything has worked most satisfactorily, and there was only one slight accident, causing the derailment of a locomotive through the springing of a set of points at a wood siding.

Murrumbidgee Northern Canal.

The work of the Murrumbidgee Northern Canal has, during the year, been pushed on without intermission, and the canal, with the exception of a few short lengths on which work is now progressing, is completed as far as the Mirrool Creek. The whole of that portion of the work at the Berembed Diversion Weir, which is in the bed of the river, has been satisfactorily completed, and the river is at present flowing through the finished work and over the movable weir, the wickets of which have been lowered to the position in the river bed which they will always occupy during high river periods.

The weir, which is 165 feet between abutments, holds up 13 feet of water over its sill, and consists of fifty-five shutters, each 2 ft. 11½ in. wide, made of six tallow-wood planks 3 inches thick at the top and 6 inches at the bottom, bolted together and strongly braced, supported at the back by a trestle and a wrought iron spurbrace working in a cast-iron "hurter" or support. They are non-automatic and will be manipulated from a punt moored upstream of the weir. The whole of the iron and timber work for these wickets was constructed at the Fitzroy Dock in a most satisfactory manner, as can be seen from the finished work, and at a cost considerably below that given as an estimate before their construction was commenced.

The lock gates are also in position, and the fixing of the "stoney" lift gates on the up-stream side of the sluiceway and lock will complete this work, but this has had to be deferred till all danger of high flood due to the melting of the snows on the highlands is over.

The construction of the canal head-gates is practically completed, while the 5½ miles of canal immediately below the head-gates to where the Bundidgerry Creek is entered, is in a very forward state, and should be finished by the end of the year 1910. This section of canal comprises some of the deepest cutting met with in the work, and this is being taken out by 4-yard scoops worked by machinery.

Contracts for two large regulators are now in hand—one at Roach's Escape, about 12 miles below Narrandera, where an escape channel to Yarangery Creek has been provided; and the other where the Hay branch canal leaves the main canal, and their completion will give six regulators and three escapes in the first 46½ miles of the canal, thus ensuring absolute control of the water in the canal at all times. A contract has been let for some 10 miles of the Hay branch canal, and further contracts for the extension of the main canal and the Hay and Mirrool Creek Branches are now being advertised.

The main canal now practically completed as far as the Mirrool Creek, a length of 76 miles, has in that distance the six combined regulators and bridges beforementioned, eighteen completed highway bridges, three minor bridges completed, four highway bridges under construction, and five highway bridges being prepared for contract. At the end of the year ending 30th June, 1910, there were 3,100,000 cubic yards of canal excavation completed, or a total for the year of 1,600,000 cubic yards, and contracts are now in hand for a further 800,000 cubic yards.

Further extensive contour surveys of the irrigable land commanded have also been carried out during the year, and plans for the subdivision of these lands to give an efficient distribution system are practically completed.

If the necessary administrative powers are provided by Parliament, it should be possible to make this land available for settlement during 1911.

The various minor works—such as fencing, telephone lines, &c.—are being completed as the canal excavation progresses, and during the year four cottages for the permanent maintenance men have been erected at various points along the canal.

The whole of the canal staff, both office and field, have been kept exceptionally busy during the year, the Narrandera office being now in charge of Mr. D. F. Campbell, Assistant Engineer, Mr. G. W. Mitchell, who was previously in charge, having left the Public Service. The expenditure on the Canal Works during the current year has been £105,000, the total expenditure to the 30th June, 1910, being £269,000.

WARRAGAMBA STORAGE AND COUNTY CUMBERLAND IRRIGATION.

Extensive surveys in connection with this scheme have been continued throughout the present year, and the information derived therefrom has enabled an estimate to be placed before the Public Works Committee as to the cost of supplementing the Sydney Water Supply from this source. Investigations into the question of run-off on the Warragamba Catchment, and incidentally the adjoining Nepean Catchment, reveals the alarming fact that over a series of dry years such as those recently experienced, the limit of supply from the Nepean Catchment for the city of Sydney is within measurable distance, and that a source of additional supply must now be looked for. This is available on the Warragamba River, which has a catchment ten times the size of the Nepean, and at least double the quantity of the purest filtered water above that at present available can be provided at a cost not exceeding what the present scheme has so far cost. In addition, sufficient water to irrigate 40,000 acres in the County of Cumberland can be supplied at a very reasonable cost. A continuation of the survey for further details of this work is now in hand.

MACQUARIE RIVER IRRIGATION.

During the year the investigations on the storage sites and irrigable areas have been carried on, extensive borings having been made at the White Rock dam site, the Burrendong dam site, and the Narromine weir site, from the results of which designs for these structures are being prepared. The irrigable land below Narromine has been classified, and contour maps are being prepared, so that a comprehensive scheme can be laid down.

During the year investigations and borings for a series of low weirs to conserve water in the river channel through the Bathurst Plains have been in hand, and estimates for cost of same are being got out.

LACHLAN RIVER.

Wyangala Reservoir.

This work is now waiting reference to the Public Works Committee, the details of cost having been prepared for the purpose. The principal investigations during the year have been devoted to the amount of water available for storage, for supply down the river channel, losses *en route* to be provided for, and an investigation of the quality and position of the irrigable areas which could be dealt with below Forbes.

RIVER WORKS.

Lake Cudgellico.

This storage was filled to its top level by the end of August, 1909, and the water released on 1st January, 1910. A careful record was kept of the amount of water passing the gauging-stations as far down as Booligal, and very valuable information as to the amount of water actually lost in transit thus secured. Local information as to the most desirable periods for supplying water to the down-river settlers was also obtained by circularising these settlers, and the regulations governing the release of the stored water have been somewhat amended, so as to secure the best results to all benefited by this storage.

Willandra Weir and Regulator—Booligal Weir and Booberoi Weir.

These works have been maintained in good order, and are fulfilling the duty of regulating the flow of the Lachlan River to give the greatest benefit along its frontage.

Condobolin West Weir Trust.

This Trust, under the Water and Drainage Act, has during the year been put on a working basis, the weir having been finished and handed over to the Trustees, who have already had the benefit of the finished work during the past summer.

Condobolin and Hillston Trusts.

Investigations have been made, and designs are being prepared for the construction of weirs in the Lachlan River, and formation of Trusts under the Water and Drainage Act for the carrying out of these works.

Barooga Water Trust.

During the year investigations and surveys for a scheme to supply water to the district lying between the Murray River and the town of Berrigan have been put in hand. A Trust proposal under the Water and Drainage Act has been gazetted, investigated by the Water and Drainage Board, and will shortly be constituted, and the works, at an estimated cost of about £11,000, be put in hand. The scheme includes the lifting of a supply of water from the Murray River to a height of 70 feet, by means of a pump, and its distribution for stock and domestic supply by means of channels over 50,000 acres of agricultural holdings, as well as giving a supply for distribution in the town of Berrigan.

SEWERAGE DESIGN AND CONSTRUCTION.

1 July, 1909, to 30 June, 1910.

Metropolitan District.

First Section, Contract No. —Western, Southern, and Illawarra Suburbs Ocean Outfall Sewer.—The surveys and designs for this sewer, which will connect the present Western Suburbs Outfall Sewer with the ocean, have been proceeded with. Its length of about 6 miles is divided into three sections, the first section, which consists chiefly of rock excavation in tunnel, being at the outlet end.

A contract was prepared for Section No. 1, which is 11,406 feet in length; and a tender was accepted on the 21st June last, and shaft sinking is now in progress. The estimated cost of the Contract, which is at Schedule rate prices, is £110,000.

The sewer on this section will, with the exception of the short portion from the submerged outlet to the first shaft near the ocean cliff, be constructed as one barrel, the sewer being designed to keep the maximum flow line as low as possible, whilst at the same time ensuring a self-cleansing velocity when the flow is small in quantity.

The dimensions of the sewer will be 12 ft. 3 in. by 7 ft. 6 in. The sides of the sewer are vertical; the bottom slopes to the centre with batters of 4 horizontal to 1 vertical, the meeting of the side and bottom slopes being effected by curves of 3 ft. 3 in. radius. The arched covering will have 1 ft. 6 in. or 3 feet rise, according to the nature of the ground.

The outlet of the sewer will be constructed as two circular sewers of 5 feet diameter. These sewers will be laid on a rapid grade from the shaft chamber at the end of the main sewer, and will discharge through the submerged face of an almost vertical cliff, with an invert level 25 feet below spring high-water.

The depths of shafts range from 40 feet to 170 feet in depth, and all working shafts will be excavated 12 feet x 6 feet in the clear. The shafts will be centrally situated over the sewer, and the longer dimension will be on the axis of the sewer, so as to provide a sufficient base for transferring the lines from the surface into the drives.

The shafts have been set out with the prospect of the Contractor using machine-driven drills in tunnelling. The maximum distance from shaft to shaft is 2,800 feet.

At the outlet end the shafts are placed about 1,200 feet apart, and there is a short length of open trench, the work being so designed that the Contractor can proceed with and complete the lining of about half the work by the time the long drives are holed through. Construction

Construction will be in brickwork or bluestone concrete, the latter being reinforced where used in arches. Double-pressed bricks will be used in the invert of sewer, and picked single-pressed shale brick elsewhere.

Ventilating stacks, to serve as inducts or exhausts as required, will be built of reinforced concrete or brickwork. These are designed 5 feet in diameter, and will be carried up to a maximum height of 80 feet.

Second Section.—The designs for the second section have been completed, and tenders will shortly be called. This length, which measures 9,420 feet, is entirely through water-charged sand, the invert of sewer being 60 feet below the surface as a maximum, and 20 feet as a minimum.

This length will be constructed throughout in open cutting, the proposal being to cut down the sandhills with side-batters of 1 vertical to 2 horizontal to a depth of 30 feet above the invert of sewer, and to then excavate a vertical trench, using interlocking steel sheet-piling for holding the ground.

Extensive areas will be required for spreading the spoil, and the difficulty of the work is somewhat increased by having, for a portion of the length, to restore the filling to about 40 feet above invert, in order to avoid diverting storm-waters from their natural course and discharging them along the line of sewer. The estimated quantity of excavation upon Section No. 2 is 407,500 cubic yards.

The sewer will be constructed throughout this section of reinforced concrete, the internal dimensions being 12 feet by 7 ft. 6 in. The design of internal profile of sewer will be as described for section 1, excepting that the covering arch will have a rise of 4 ft. The thickness of concrete is 15 inches at the crown and 14 inches at the invert.

The foundation for the reinforced concrete will be either prepared by forming the bottom into steps with short hardwood sheet piles, or by putting in a bed of poor concrete.

Some trouble may be expected with the banks on this section from the blowing of the sand, and precautions are being taken to secure all available soil suitable for top-dressing, and for planting grasses and other plants, the roots of which will bind the sand together.

Third Section.—The third, and final, section of the Outfall Sewer, 12,038 feet in length, connects with the carrier which discharges the sewage from the Western and Illawarra Suburbs upon the area known as the Botany Sewage Farm. This farm is on the opposite side of Cook's River to Botany, and the river will have to be crossed by the Ocean Outfall Sewer. In view of the waterway having to carry boats of deeper draught than those at present plying on the river, the means of crossing proposed is by a syphon consisting of two concrete barrels, 4 ft. 3 in. in diameter, the soffit of each pipe being 31 feet below low-water mark. The syphon will be connected to a vertical shaft at each side of the river. To the shaft on the southern side a sewer will be constructed connecting up the present carrier. The distance is about 6,599 feet, and the sewer will be built partly in shallow trench and partly as an aqueduct, the internal dimensions of the sewer being 11 ft. 4½ in. by 5 ft. 3 in.

The above description also applies to the portion of sewer connecting the syphon shaft to the north of the river, with the termination of section 2, a distance of 4,842 ft. The dimensions of the sewer will be increased to 11 ft. 2 in. by 6 ft. to accommodate the flow from the southern outfall sewer, bringing in the sewage of Waterloo, portions of Redfern, Alexandria, and North Botany. This sewer at present discharges upon the Sewage Farm, through a syphon-pipe passing under Cook's River, the pipe being laid so close under the bed of the river as to be an obstacle to providing a channel of greater depth if required in the future for the river traffic. It is proposed to cut out this syphon and to carry the southern sewer round the foreshore of the river to join the Ocean Outfall Sewer near the syphon shaft on the northern side.

Near this point it is also proposed to construct a pumping station to lift into the Outfall Sewer the waste water from the wool-scouring mills and tanneries situated upon the chain of ponds which formerly served as the source of the Sydney water supply.

At Barker-street, between Botany-road and the bay, the discharge of one of the low-level areas will enter the sewer, and two other low-level areas to the eastward will eventually be connected on the second section. The population on the two areas last referred to is so sparse that no sewerage for them is proposed at present.

The drawings for Section 3 are not yet completed, but will be ready in a few months. Although a longer length of sewer, its construction is not anticipated to occupy so long a period as either of the other two lengths, and it is estimated that the three contracts will be completed about the same date.

The construction of this Ocean Outfall Sewer will do away with the necessity for the Botany Sewage Farm, around which the land is becoming so thickly settled that the process of sewage purification can be no longer carried on without nuisance to the inhabitants of adjoining portions of the Municipalities of Kogarah, Rockdale, and Arncliffe. Upon the completion of the Outfall Sewer, the area now dedicated as a sewage farm will be available for conversion into a park, or the higher areas can be sold for building land.

Bankstown, Belmore, and Campsie Sewerage District.—In addition to the sewerage districts at present drained by the Western Suburbs Outfall Sewer, the Illawarra Suburbs Sewer, the Southern Suburbs Outfall Sewer, and their proposed extensions, having a total area of 26,000 acres, an additional area of about 8,000 acres, lying between Wolli Creek and Cook's River and extending as far westward as Bankstown, is provided for in the capacity of the Outfall Sewer.

The construction of the Belmore Railway, and its extension to Bankstown, has opened up this district for settlement, and it is obvious that in a few years sewerage will have to be provided. Surveys have, therefore, been put in hand and completed, which provide sufficient data for preparation of a scheme of sewerage for this Canterbury–Bankstown area.

Canterbury Sewerage.—An extension of the Canterbury main sewer has been designed to serve the settlement known as Fern Hill, where the population round the railway station renders sewerage a necessity in the interests of public health. A contract for this work is ready and tenders have been called for.

The size of the sewer is 4 ft. 6 in. by 3 ft. 6 in., and the shafts range from 26 feet to 57 feet in depth. The length of the proposed extension is 3,844 feet, and the sewer will be constructed in brick and concrete. The estimated cost of the work is £10,300.

Rookwood,

Rookwood, Auburn, and Granville Sewerage.—A scheme of sewerage for the Municipalities of Rookwood, Auburn, and Granville was partly prepared last year, but, owing to pressure of work, it has not yet been completed, and considerable investigation is necessary before the matter can be submitted to Parliament.

Ryde and Hunter's Hill Sewerage.—The scheme of sewerage for these suburbs is awaiting further investigation when an officer is available to proceed with the surveys.

Hornsby and Wahroonga Sewerage.—The insanitary conditions in the neighbourhood of Hornsby Station resulted in an application from the Shire Council for a report and estimate upon a sewerage scheme to deal with the settlement round Hornsby and Wahroonga.

The necessary investigation and survey have been made and a scheme prepared, which provides for treatment in septic tanks and filters upon a creek emptying into Cowan Creek. A report and plan have been prepared, and will shortly be submitted to the Shire Council. Owing to the rock excavation, the cost of the works per head will be heavy.

Vaucluse Sewerage.—A scheme of sewerage for the Municipality of Vaucluse has been submitted to the Parliamentary Standing Committee, which provides for an ocean outfall sewer discharging a little southward of the Hornby Lighthouse, and all the main and reticulation sewers necessary to drain the municipality, excepting the Diamond Bay area, which will require a separate ocean outlet. The scheme submitted includes a low-level pumping station at Camp Cove, to pick up the sewage from the low-level area of Watson's Bay settlement.

The estimated cost of the scheme is :—

For present population	£35,500
Extensions to serve ultimate population	£97,000

Botany and North Botany Low-level Sewerage.—The pressing requirements for sewerage at North Botany led to an examination of all the low-level area along the north shore of Botany Bay, Cook's River, and the flat intersected by Shea's Creek. A scheme has been submitted to the Parliamentary Committee, which shows the area divided into six (6) sewerage districts, each with a centrally situated pumping station, to which the sewage will be led by gravitation sewers, and from which it will be forced through rising mains into the ocean outfall sewer now being constructed to Long Bay headland.

The estimated cost of the sewerage of Botany and North Botany Districts, Nos. 3 and 4, is £72,800' and the total cost of the sewerage of all six (6) districts when they are fully settled will be £270,000.

Iron Cove Creek Pumping Station.—During the year the Iron Cove Creek Pumping Station was completed and handed over to the Metropolitan Board of Water Supply and Sewerage. The construction was almost finished at the end of last year; but no steps could be taken to transfer the station, as the Railway Commissioners were unable to supply electrical current from the tramway cable of sufficient voltage for running the motors. It was not until May, 1910, that the supply was increased to an adequate amount for running the machinery during the times of heavy load on the tramways.

This is the first pumping station constructed by the Department where direct vertically motor-driven centrifugal pumps have been installed. The plant, of which an illustration is attached, was provided by Zollner, Limited. The motors develop 35 b.h.p. at 550 revolutions with 500 volts. They are controlled by Igranic automatic starter, and were made by Messrs. Scott, Mountain, & Co.

The pumps were locally designed, and constructed by the firm of Zollner, Limited, and, with the exception of being vertically driven, are of the same type as installed by the Metropolitan Board of Water Supply and Sewerage upon the low-level sewerage of Sydney, and by this Department at Newcastle and Parramatta. In every case this type of pump has proved itself well suited for dealing with sewage.

Storm-water Sewer, Ashfield.—An extension of the Alt-street Storm-water Channel, Ashfield, has been constructed, and the channel has been extended from Alt-street to Iron Cove Creek, a distance of 2,147 feet. The channel was constructed with concrete bottom and brick sides, coped with concrete blocks, its dimensions being 6 ft. 6 in. deep and 3 ft. 6 in. wide. Owing to delays in the supply of material, due to the coal strike and the dislocation of trade caused thereby, this channel is not yet quite completed. Its approximate cost is £2,256.

Auburn Storm-water Drainage.—Contract Drawings are being prepared for a storm-water channel along the creek crossing the western suburbs railway at Auburn Station and discharging into Haslam's Creek.

The channel is designed to give temporary drainage relief to this suburb until the sewerage is carried out. It will be constructed of reinforced pipes for the greater portion of its length, the outlet end being built of concrete bottom and brick sides of the usual type adopted by the Department. The estimated cost is £6,100.

Chatswood Stormwater Drainage.—The growth of settlement at Chatswood, and the numerous obstructions formed in the natural bed of the creek which drains the northern portion of the suburb, has incited the Council to ask for the construction of a channel along it. So much storm-water finds its way into the sewer, that a channel is also required to receive in storm-time the overflow from the main sewer. The plans of the work are well advanced.

Country Sewerage

Being carried out, or proposed to be carried out, under the powers of the Country Towns Water Supply and Sewerage Act and Amending Acts, including the Local Government Act.

Narrandera Sewerage Extensions.—Extensions of the sewerage of Narrandera were commenced in October, 1909. The work includes an additional 9,550 feet of reticulation sewers and additional septic tank and filter.

The estimated cost of the works is £3,361.

Lismore Sewerage Extensions.—A contract was let in October, 1909, for an extension of the Lismore sewerage, to serve the area known as Girard's Hill. The additional length of reticulation sewers is 32,900 feet, and the estimated cost of the work is £6,568.

Katoomba Sewerage.—The sewerage of the Central and Eastern Districts of Katoomba was commenced in April, 1909. The disposal of the sewage involves some novelties in construction. The septic tanks

tanks are above the Falls, and the tank effluent is conveyed in cast-iron pipes to filters below the Falls, the sites being remote from tourist resorts. The laying of the pipes through these gorges was a matter, not only of difficulty, but of considerable danger. The work has, however, been carried out without any serious accident to the workmen, and without damaging the natural beauties of the surroundings. All traces of sewer construction have now been covered up.

The filters at Katoomba are the first of any magnitude where a form of overfed sprinkler, which had its origin in America, and which has been adapted to local conditions, has been used. The nozzle, which is inserted in the bottom of the supply pipe, and not in the top of the pipe, as is usually the case in spray nozzles, consists, first of a half-inch drop pipe, threaded outside, with attachments, and, second, of a dash-plate of a form arrived at by experiment set at right angles and centrally to the drop-pipe. The dash-plate is suspended by hangers attached to a ring passing round the pipe, and held between lock-nuts. The plate being set at the correct distance from the outlet of the drop-pipe, and held in position by the lock-nuts, the jet impinges on its surface in such a manner that it is broken into spray and projected a distance, depending upon the head in the supply pipe. The distributors are supplied from a dosing chamber fed by the overflow from the septic tank. A bell syphon in the dosing chamber supplies the distributors with an intermittent feed. Owing to the drop-pipes being half an inch in diameter, there is less likelihood of these overfed sprinklers choking than in the case of upward sprinklers, which discharge either through small apertures or narrow annular spaces. In practice, such nozzles have run for a fortnight without any attention.

With regard to the works at Narrandera, Lismore, and Katoomba, it might be here noted that they have all been delayed so much owing to the coal strike that they are not yet completed, and the contract time has had to be repeatedly extended. The effect of the strike was not confined to the four months it lasted. Manufacturers of bricks and pipes have not yet wiped off outstanding orders.

Parramatta Sewerage.—The ventilation contracts were completed during the year, and the works were finally handed over to the Council for maintenance, the capital cost being gazetted at £66,010 9s. 4d. The house connections to the sewers are well advanced. Both pumping plant and treatment works have given every satisfaction since they were started in February, 1909.

Lithgow Sewerage.—An Enabling Act for the construction of the Lithgow Sewerage was passed last session, and a sum of money to commence construction was placed on the 1909–10 Estimates. The detail survey has been completed and plotted during the year, and the sewer lines have been set out and levelled. Sections of the sewers have been drawn and are ready for the preparation of Contract Drawings. Details of the design of pumping station and treatment works are well advanced, and it is expected that tenders can be called in about four months' time.

The estimated cost of this work is £26,500.

Goulburn Sewerage.—The Public Works Committee recommended the construction of the sewerage of Goulburn, subject to the Council augmenting the water supply, the present supply being considered inadequate to bear the extra strain of sewerage requirements. An Enabling Bill was not, therefore, submitted, and there are at present no powers to proceed with this sewerage. Preliminary work has been gone on with, and the detail survey is approaching completion.

The scheme provides for treatment works upon the north side of the Wollondilly River, opposite the gaol, the sewage being conveyed across the river by an aqueduct constructed above flood-level. From this initial level, the main sewer has been designed on as flat a grade as would give a self-cleansing velocity to intercept and bring by gravitation to the treatment works the higher area of the city. The business centre and more thickly settled blocks will be outside the gravitation area, and their sewage will gravitate to a pumping station near Mulwarree Ponds whence it will be lifted through a short rising main to the main sewer in Grafton-street. Septic tanks, stone filters, and irrigation beds will be provided for the treatment of the sewage, and 21½ miles of main and reticulation sewers will be required.

The estimated cost is £45,700.

Albury, Bathurst, Orange, and Wagga Wagga Sewerage.—Schemes of sewerage have been submitted to the Public Works Committee for Albury, Bathurst, Orange, and Wagga Wagga. All of these schemes provide for the treatment of the sewage in septic tanks and stone filters, with a subsequent land filtration.

In the cases of Albury and Wagga Wagga, the crude sewage will be pumped into the septic tanks. At Orange there is sufficient fall for the carriage of the sewage by gravitation into septic tanks, and the subsequent discharge of the filters upon the land.

At Bathurst most of the sewage will be discharged into the septic tanks by gravitation, leaving only a small area the sewage of which will be pumped. To allow of the necessary grade, the septic tanks will be constructed in an excavation, which will be protected from flooding by a surrounding embankment. The effluent will be pumped up and used for irrigating fodder crops.

The estimated cost of these completed schemes is as follows :—

	£		£
Albury	39,675	Orange	27,500
Bathurst	43,200	Wagga Wagga	46,600

Tamworth and Wollongong Sewerage.—Schemes for the sewerage of Tamworth and Wollongong have been prepared, but owing to amendments made with a view of cheapening or rendering them more efficient, the plans and reports have not yet been submitted to the Municipal Councils. Tamworth, as in the case of other inland country towns, will be provided with septic tanks, stone filters, and an irrigation area. The portion of the town on the hill can be drained by gravitation. The flat portion, which includes the chief business street, will require a pumping plant.

Wollongong, although on the shore of the Pacific, has not a suitable point of discharge where the crude sewage could be turned into the ocean without fear of some of it being washed up on the beaches. The beaches being extensively used for surf bathing, it is proposed, in order to protect them, to treat the sewage in septic tanks at a point little frequented on the foreshore between Wollongong and Port Kembla. The sewage of Wollongong cannot be gravitated to the septic tanks, and it will be collected at a pumping station, and forced through a rising main to the tanks.

The estimates for these schemes are not yet ready.

Grafton, Tumut, Dubbo, and Coonamble Sewerage.—In response to applications by the Municipal Councils, inspections have been made of the towns of Grafton, Tumut, Dubbo, and Coonamble, to ascertain their

their sanitary requirements, and the possible means of dealing with them. In the case of Grafton an approximate estimate of £19,000 was supplied to the Council for providing treatment works and a system of sewers. This could not, however, be carried into effect until a satisfactory water supply is installed.

An engineer will be sent to Tumut to take levels and obtain sufficient data for designing the sewerage. The site of the town does not permit of satisfactory sewage disposal without considerable expenditure.

A scheme for the sewerage of Dubbo is well advanced, but has been put aside from press of work. It will be completed as soon as an engineer is available.

The report and plan of the Coonable sewerage proposals is being checked, and will then be forwarded to the Municipal Council.

Murwillumbah Sewerage.—A contract has been prepared for sewers to remove the slop water from the business portions of the town of Murwillumbah. These sewers will temporarily discharge into the river, but are constructed so as to form, eventually, a portion of a sewerage system with treatment works.

The estimated cost is £911.

Casino Storm-water Drainage.—The Municipal Council of Casino have applied for storm-water drainage works, and in response to their application a plan and report have been forwarded to them, stating that the estimated cost will be £8,150. The Council has the matter under consideration.

Lismore Storm-water Drainage.—A contract has been let for the lining of a portion of Brown's Creek, Lismore, from its outlet to the termination of the effluent pipe from the treatment works.

The channel will be constructed in concrete, and is estimated to cost £1,072.

Throughout the year there has been a growing tendency evinced by Municipal Councils to avail themselves of the financial advantages offered by the Country Towns Water Supply and Sewerage Act for the improvement of their sanitation, and schemes have now been considered for the sewerage of all the large towns in the State. The progress of sanitation would, however, appear likely to be checked by the scarcity of suitable labour, and the high prices of material. The shortage of good earthenware pipes has been the chief source of delay and monetary losses to the contractors. This has been only partly due to the coal strike. The shortage was largely due to the heavy demand for bricks, which has caused several owners of brick and pottery works to neglect pipe-making. The experience of the past year must have the effect of greatly increased prices for sewerage works, and the question of the Department supplying contractors with cement pipes in lieu of earthenware pipes for the sewerage of country towns is now being considered.

SEWERAGE OF GOVERNMENT INSTITUTIONS, HOSPITALS, &c.

During the year a number of septic tanks and filters have been installed at Government Institutions and Hospitals.

Jenolan Caves House Sewerage.—The treatment works for the Caves House were completed and the main sewer extended to it. A good irrigable area round the tanks was fenced in, so that the effluent can be used in growing fodder plants, shrubs, &c. The cost of the treatment works and sewer extension was £918.

Newington Asylum.—A contract for the sewerage of the Newington Asylum was let in November 1909. The contracts include not only the usual sewers, septic tanks, and filters, but also a pumping station to raise the water to existing elevated tanks, whence it can be drawn off for irrigating the cultivation paddocks of the Asylum. Owing to the delays caused by the coal strike the works are not yet quite completed. The estimated cost is £2,052.

Rookwood Asylum.—The increase of inmates at Rookwood Asylum necessitated additions to the sewage filters. In order to obtain extra filtering capacity without destroying the existing arrangement of paths and plantations, the shallow contact filters have been replaced by continuous filters 6 feet deep. The distribution is effected by a spraying apparatus similar to that described as installed at Katoomba.

The cost of the alterations has been £800.

Wagga Wagga Hospital.—The site of the Wagga Wagga Hospital was singularly unsuitable for the carrying out of sewerage and treatment works. The fall of the ground is from back to front, and the hospital is built towards the frontage. The treatment works having to be as near the back boundary line as possible, the septic tank had to be constructed in a deep excavation to provide the necessary fall in the sewers. The septic tank effluent has to be lifted by pumping, and discharge upon filters built above the surface of the ground a sufficient height to allow a fall in the irrigation channels leading away from it.

Provision was made in this installation for separating from the sewage the water containing antiseptics, by laying from the operating room and sinks receiving antiseptics, separate sewers leading to a pit adjoining the septic tank, whence it will be lifted by a hand-pump upon a specially prepared plot of land. The cost of the installation was £700.

Penitentiary Sewerage.—Septic tanks and a continuous filter are being constructed to deal with the sewage of the male prison at the Penitentiary. The filter distribution will be effected by a "Fiddian" distributor, which has been imported from Ham, Baker, & Co., sanitary engineers, London. To get over the trouble experienced from wind interfering with the rotation of the distributor, the filter has been covered with a conical roof of slates, with a lantern and louvres at the top.

The cost of the installation is estimated at £1,012.

Bathurst Hospital.—Designs for treatment works and sewerage for Bathurst Hospital are ready, and the work will be shortly put in hand. The estimated cost is £450.

Newcastle Sewerage.

Surveys.—During the year surveys have been made and plans prepared for the reticulation of additional areas in Hamilton and Wickham, and for the extension of the Waratah main sewer; also preliminary surveys have been made for the reticulation of Waratah.

Since the completion of the detail survey in 1897 fresh areas have been subdivided and built on, and it was found necessary to bring the detail sheets up to date before the reticulation surveys could be started.

City

City Low level Second Division and part of Wickham First Division Reticulation, Contract No. 802.—This work was started on the 5th January, 1909, and completed on the 30th March, 1910, and consists of 6,500 lineal feet of 6-inch E.W. pipes, 13,750 lineal feet of 6-inch C.I. pipes, 3,300 lineal feet of 9-inch C.I. pipes, 2,000 lineal feet of 12-inch C.I. pipes, and 179 concrete manholes. The completed cost of this work will, it is estimated, be £10,682.

Supply and Erection of Pumping Machinery for No. 2 Pumping Station, Contract No. 797.—This work was started on the 10th February, 1909, and completed on the 14th December, 1909, and consists of two vertical drive, 3-phase, 440 volt induction motors, capable of developing 20 b.h.p., and two centrifugal pumps, vertically driven, and direct coupled to motors.

The cost of this work was £1,150. This work has been transferred to the Hunter District Water Supply and Sewerage Board.

Waratah Main Sewer, First Division—Contract No. 801.—This work was started on the 9th February, 1909, and it consists of 1¾ miles of brick and concrete sewer, 4 ft. 9 in. x 3 ft. 9 in. and 3 ft. 9 in. x 2 ft. 6 in., and of Monier sewer 3 ft. 6 in. x 2 ft. 4 in. This work is to be completed in August, 1910, and it is estimated to cost £28,000.

No. 1 Pumping Station and Rising Main.—Contract No. 819.—This work was started on the 12th June, 1909, and consists of four concrete storage wells 39 ft. 3 in. internal diameter, an inlet well, a pump well, and a red tiled brick building over the pump well; 2·12 chains brick and concrete sewer 4 ft. 9 in. x 3 ft. 9 in.; 18·37 chains concrete sewer 4 ft. x 2 ft. 8 in.; and 10·92 chains of 24 inch diameter cast-iron pipes for rising main. This work is to be completed on the 9th December, 1910, and it is estimated to cost £32,129.

Pumping Machinery for No. 1 Pumping Station—Contract No. 835.—A tender was accepted for this contract on the 26th May, 1910. The work consists of two vertical drive, 3-phase, 415 volt induction motors, capable of developing 50 b.h.p. each, and two centrifugal pumps, vertically driven, and direct-coupled to motors. This work is estimated to cost £1,692.

VITICULTURAL STATION, RAYMOND TERRACE, WATER SUPPLY.

This work, which is nearly completed, has been delayed through the tank supplied not being built to specification. This matter is now being attended to, and the whole plant should be in working order within a fortnight.

ARTESIAN BORES.

Good progress has been made in watering further areas of country by means of the water flowing from artesian bores. It is, however, noted that there has been an all-round increase in the cost of works, both as regards the sinking of bores and the construction of distributary drains.

The operation of the provision of the Water and Drainage Act, requiring the licensing of all new bores, has allowed of the Department imposing conditions that will ensure the efficient casing and control of all works in the future. It has been found on investigation that, in every case where it has been reported that water is escaping to the surface outside of the bore casing, either the string of 10-inch or 8-inch casing has been withdrawn and has made a lead for the water. There is also no doubt that where the flow of bores has decreased, owing to an escape of water into dry drifts above the artesian water-bearing beds, this has been almost wholly due to either the inefficient casing of the bore in the first instance, or the withdrawal of 10-inch or 8-inch casing after the bore has been completed. Licenses now provide that all bores are to be sunk and cased under the conditions set out in the Departmental specifications; that is, that the 10-inch and 8-inch casing is to be carried to such a depth as to cut off all danger of escape of water into dry drifts, and then to be efficiently and solidly bedded, so that there is no risk of water rising to the surface outside of the casing, and that all casing is then to be left in the bore.

In future, all new bores are to be provided with closing gear. This will enable their flow to be controlled and waste of water prevented. The necessity of the proper control of bores and the stoppage of waste has been very much impressed upon the Department of late; and steps are being taken, in every case where waste is known to exist, to reduce the flow, by means of the closing gear, to a volume that will suffice to meet requirements only.

The investigations into the phenomena surrounding the artesian flow have proceeded both in the field and the office during the year, and a large volume of information, which has accumulated over past years, is now being analysed and collated for the purpose of making deductions as to the sources and permanency of supplies. The survey of the outcrops of the artesian beds, which has been carried out by the Geological Branch of the Department of Mines, from funds furnished by the Public Works Department, has been completed and plotted. An officer of this Department has been engaged in taking measurements of the springs and the flow of the streams which cross these artesian beds, in order to arrive at an estimate of the volumes of water, if any, which are absorbed into these beds and supplement the supplies stored in the water-bearing beds under the great plains of the interior. In addition to the usual measurements which have been made in the past of the flows, pressures, and temperatures of the bores, arrangements have been made for the separate measurement of the volumes and pressures, and the identification of any gases which are contained in the artesian waters.

It is hoped that, with the information now available in the Department, it may be possible at an early date to say with some definiteness to what extent it will be safe to exploit our artesian sources of water supply in the future, and what restrictions it will be necessary to place upon the construction of new bores.

Reports have been received by the Department during the year of serious deterioration to the casing of the bores within a zone extending in a north-easterly direction from the town of Coonamble. In two instances the deterioration has been very rapid, and the Department has been urged to advise as to a material for use that will offer greater resistance to corrosion than the mild steel which has been utilised for bore-casing for many years past. It might be mentioned that this question of the corrosion of artesian bore-casing was first investigated by the Department in 1903, on the occasion of the re-casing of the No. 1 bore at Coonamble. Since that date an endeavour has been made to keep in touch with manufacturers, both in Great Britain, Europe, and America, so that a casing at commercial prices might be found that would

would offer a resistance to corrosion in the zones where such action was experienced. It has been the aim and object of iron and steel manufacturers for many years past to produce a material that will resist corrosion, and that can be used under the adverse conditions encountered in boilers under high steam pressures, and also in structural work exposed to the atmosphere, such as bridge building. No material has been produced up to the present time at commercial prices that can be relied upon to resist the corrosive action of such waters and gases as come to the surface through some of the bores in the Coonamble District. The Department is assisting the Coonamble Council to re-case the Coonamble No. 2 Bore, where the mild steel casing had corroded within a period of nine months, the material now being used being wrought-iron. In addition, an order has been placed in the United States for the supply of some sheets of ingot iron, to be also used at this bore for the purposes of comparison. Inquiries are also being made regarding the supply of an ingot steel manufactured by Krupp, and which has been successfully used for many years past, both in this State and the neighbouring States, for tube plates in locomotive boilers.

In addition to the above, inquiries are being instituted as to a suitable coating for tubing which could be used in connection with bores where casing has deteriorated, and that are to be re-cased. It is recognised that a coated casing cannot be used while sinking a bore, as the abrading action of the steel cables would remove any coating that could be placed in the interior of the tube. It may be, however, that in extreme cases a bore may be sunk by means of the ordinary steel casing, and after it has been bottomed a specially coated 6-inch casing may be inserted.

It must be recognised by the general public that the solution of this question can only be arrived at by means of experiment, and that these experiments must be spread over a considerable space of time. The Department is doing all that it can in the matter, both in its own interests as the owners of a large number of artesian bores, and in the interests of the public, to whom they regard themselves as advisers. It is satisfactory, however, to note that this deterioration of casing has occurred only in a comparatively small zone, and that it has affected not more than a dozen bores out of the 480 odd which have been sunk in this State.

During the past year nine (9) Trust proposals have been gazetted, two (2) Trusts have been constituted, and six (6) Trust works have been completed and handed over to the Trustees.

SWAMP DRAINAGE.

Fair progress has been made in the preparation of Swamp Drainage Trusts under the Water and Drainage Act, but unfortunately many proposals have not matured, owing to opposition raised by some owners. The main obstacle appears to be in cases where large holdings occur, the owners of which, having acquired same when land was cheap, and holding at the same time areas of dry pasture, are able to obtain a fair return from the land by simply breeding and fattening stock. Consequently, the owners of smaller holdings, who chiefly make their living from dairying, are unable to reap the advantages to be derived from drainage, however much they may desire to participate in a drainage scheme carried out under the provisions of the Act before mentioned.

In other cases, the cost of the work and consequent rates that would accrue under the Act immediately after completion are greater than the immediate enhanced value, particularly where swamps are thickly timbered, these areas taking some years to become properly grassed and revenue-producing, in these cases the owners, besides paying drainage rates, have to expend money in clearing and sowing the land. This drawback, it is hoped, will be removed in the amending Bill now being prepared, providing that the liability to pay interest and sinking fund will not commence until a period of years has elapsed after completion.

One remarkable feature that has been disclosed in carrying out the field work in connection with swamp drainage is, that the land at the head of some of the swamps is from 20 to 25 feet higher than the lower parts ; the latter being above high water, one can walk through water from high tide to the top of the swamp area, this retention of water on the land being due to the dense growth of reeds and aquatic plants. So great is the fall in many cases that the gradients have to be flattened by means of drops. Without this provision the velocity of the water would erode the drains at bottom and sides, and it would be impossible to maintain them unless they were lined throughout.

Difficulty has been experienced in dealing with swamp areas on the coast, where an outlet to a permanently open channel to the sea is not available. Even if it were possible to construct an outlet through the sand beach that would not be closed by the sand, the cost of such an undertaking would be prohibitory. Such cases have been met with ; one occurs at Byron Bay, and although there is a possible alternative, the cost would be too great, consequently only the higher swamp area has been dealt with. In the Curl Curl drainage at Manly a rock formation has enabled the swamp waters to be discharged into the sea by means of large pipes embedded in mass concrete.

Attention might be drawn to the subject of flood-gates in connection with swamp drainage, particularly on the large rivers in which freshets and floods occur. Swamps near the coast are often little above high water spring tide level, or even below it, and they could not be successfully drained at the present time, were it not for the rise and fall of the tides ; also by means of flood-gates, and utilising the period of low tide to discharge the accumulated water, very satisfactory results are obtained. In time to come it may pay to drain many areas by intercepting all water that can be discharged by gravitation, and removing the balance by pumping.

Reverting to the swamp areas on large rivers, great annoyance and loss is sustained from medium freshets that fill the swamps, inundate and destroy crops grown on low-lying lands ; floods, although having the same result, are looked upon as unavoidable and not objected to in the same degree, as they leave in their train fertilising deposit over large areas. Now, all owners would like to keep out the freshets, but allow the floods on to these low areas, and, although the danger of such a course is explained, they are still dissatisfied that their wishes cannot be fulfilled. The danger would arise when a freshet became a flood. Here you would have a large area, of, say, 10,000 to 20,000 acres empty of water, and a rising river pouring into it, and where that river first overflowed its banks a large channel would be cut into the swamp. This, of course, could be avoided by the construction of levee banks high enough to keep out any flood, as has been done in the Maitland district. By this means the fertilising matter brought down by the river is

passed

passed on to form a bar at the river mouth, the fertility of the land becomes exhausted, and already at Maitland many say they want the flood over the land again. Therefore, it is better not to go too far in disturbing nature's methods.

The following tabular statement shews the swamp areas dealt with during the year.

PUBLIC WATERING PLACES IN THE WESTERN DIVISION.

During the past year weather conditions have been most unfavourable to the progress of works authorised to water several of the roads in the Western Division lying between the Darling and the Lachlan Rivers. In several instances the silt tanks, and sufficient drains to fill them with water, have been constructed in the first instance, so that water may be available for the use of the contractors when tenders are invited for the construction of the main supply tanks.

The existing general system of storing water in tanks is not altogether reliable on account of the poor rainfall in this district, also owing to the fact that available sites, with adequate catchment areas do not abound, making it impossible to supply water at regular intervals for travelling stock; evaporation is high, and travelling sand fills the drains, silt, and main tanks to a greater or less extent. Surface storages have also the disadvantages that, when the water falls to a low level, it becomes polluted by algae and organic growths, and dogs, rabbits, and other vermin have access to open tanks. It has been demonstrated in many instances that suitable water is available underground at a shallow depth, and it is hoped that the possibilities of watering stock routes by means of shallow bores will shortly be thoroughly tested by departmental plants. It may then be advisable, where efficient catchments do not exist, to utilize this form of supply. On some of the stock routes at the present time there are occasional dry tanks, which make the stages from water to water too long, and those particular routes cannot be utilised.

The usual upkeep and maintenance of all Public Watering Places in the above Division has been carried out during the year.

The following list shows the Watering Places approved and position of works at the end of the year :—

Road.	Tanks.	Remarks.
Cobar-Wilcannia	Donald's Plains	Under construction.
Via Lakes	Coonavittra	,,
	Yoree	Silt tank and drains constructed. Main tank to be constructed.
	Caltigeena	,, ,,
	Gunyulka	Completed.
		Construction authorised. Preparing to invite tenders.
Via Darling River	Keilor	Under construction
Cobar-Balaraboon	Bulgoo	Completed.
Mossgiel-Barnato	Waverley	Construction authorised. Preparing to invite tenders.
	Ninty	,, ,,
	Gidgeroo	,, ,,
	Winini	Construction authorised. Site not yet determined.
	Balarabon	Construction authorised. Preparing to invite tenders.
	Tiltagara	Construction authorised. Site not yet determined.
	Carolina	Construction authorised. Preparing to invite tenders.
Clare-Menindie	Manfred	Construction authorised. Tenders invited.
	Linbee	,, ,,
	Sayers Lake	,, ,,
	Huco	,, ,,
	Toorincaca	,, ,,
Clare-Oxley	Younga	Tenders have been invited. Conditions unfavourable for construction.
	Bomarthong	,, ,,
	Kitcho	,, ,,
	Nandum	,, ,,
Euston-Pooncarie	Prungle	Under construction.
	Mundonah	,,
	Arumpo	Completed.
Euston-Balranald	Waldaira	,,
Broken Hill-Milparinka	Fowler's Gap	,,
Broken Hill-White Cliffs	Rowena	Under construction.
	Mount Wright	Completed.
Broken Hill-Wompah	Gairdner's Creek	Under construction.
	Milparinka	,,
Wilcannia-Wanaaring	Copago	Cleaning out tank, &c., completed.
	Coopooka	,, ,, ,,
Clare-Ivanhoe	Kilfera	Tenders invited. No offers. Weather unfavourable.
Clare-Ivanhoe	Erin Siding	Completed. Constructed for the Lands Department.

The map attached shows the various Public Watering Places and their nature within the Western Division of the State.

RIVER DISCHARGE RECORDS.

Yass-Canberra (Federal Capital) Water Supply.

Further gaugings of the Cotter River and of the Lee and Condor Creeks were made during the year. The results were confirmatory of previously published returns, and give further assurance of the adequacy of the Cotter River as a supply for the domestic and civic requirements of the proposed Federal City for many years to come. Early

Early in the year a measuring weir and recording appliances were installed at the Cotter River by the Federal Government Advisory Board, and the work of gauging was continued by their officers.

It is gratifying to learn, from the reports of the Federal officers on the subject, that the estimates of discharge made by this Branch were rather under than over stated. On the alteration of the boundaries of the proposed Federal Territory, a report was supplied showing the estimated run-off of the catchment areas of the Gudgenby, Naas, and Paddy Rivers; also of the Queanbeyan and Molonglo Rivers, based on recorded rainfall data extending over a number of years.

Discharges at stages higher than any previous ones were obtained of the Snowy River at Jindabyne during a fresh caused by melting snow. Gaugings at 13 feet higher levels are still required to complete the curve.

Upper Murray Discharges.

Advantage was taken of a good rise in the Upper Murray during the spring to obtain high discharge measurements at Albury, Greg Greg, Swampy Plains, and Bringenbrong. Some 200 observations were made in all. The results were plotted and combined with daily readings to obtain monthly volume of discharge. Besides being very valuable in the investigation of a storage and irrigation scheme for the lower Riverina country, they afford a reliable basis upon which to base the respective diversion rights of New South Wales and Victoria to the Murray waters above Albury.

Power Supply Data.

Towards the end of the year, gauges were erected on the Yarrangobilly and Buddong Creeks and the Tumut River, near the junction of the Buddong, and readers appointed to take daily readings. Observations at low stages were carried out on the Colo River at the crossing of the Main Northern Road, or about 12 miles below the proposed storage site.

About forty additional velocity measurements, from low to fairly high stages, were made on the Shoalhaven River at Welcome Reefs. With the exception of high flood readings, the operations at this station are now fairly complete. When all the data now being obtained at the above points is complete, the possibilities of storage and generation of electrical power can be intelligently discussed.

Lachlan River.

Additional diagrams showing the effect of storage at Wyangala and supply to lower river have been submitted. The question of volumes lost in transit has also been carefully studied, in order to arrive at a method of releasing the stored waters to the best advantage to probable users on the lower river.

Murrumbidgee River.

With the exception of a number of discharge measurements at Berembed, which were required in the designing of the weir and shutters at that site, no gauging work was done on the Murrumbidgee.

Macquarie River.

At Narromine and Dubbo Stations further observations from low to medium stages were made and added to the curve of discharges. The difficulty of gauging flood volumes at the former station has now been minimised by the provision of a suitable boat.

Hunter River.

Extensive preparations to successfully gauge the Hunter River in high flood have been made. Complete waterway sections were measured at the North Coast Railway Crossing, and movable platforms, equipped with winches for handling heavily-weighted meters, are in readiness, so that the whole field staff may simultaneously measure the flood volumes from the bridge deck. Another section has been measured at Morpeth, extending from the left bank across the road bridge and through Phœnix Park for a distance of about 7,000 feet for flood-measurement purposes.

Steps have also been taken to determine maximum flood levels by the erection of extra gauges at Green Rocks, where the flood waters will be confined between comparatively narrow banks.

Lower Murray Diversions.

Gaugings were made at Tuppal Creek, Bullatale Creek, Tocumwal, Edward River, and Barham, to determine the extent of the New South Wales diversions from the Murray River below Albury. Copies of the information were supplied to the South Australian Government.

Castlereagh River.

Gauges were erected at Coonabarabran, Mundooran, and Gilgandra, and observations at low stages taken to determine the proportion of surface volumes which are lost in the intake beds of the Artesian Basin. In connection with the same investigation the Warrambungle Ranges were explored, topographical features outlined, and numerous weir measurements of surface springs made at the sources of the Castlereagh.

Summary.

Altogether 351 separate observations of discharge have been taken at thirty-four stations, divided over twenty main rivers and tributaries.

Complete monthly discharges of all the more important rivers have been computed to date, and copies supplied to the Commonwealth Statistician for publication in the Year Book, also to the State Rivers and Water Supply Commission, Melbourne.

ADMINISTRATION OF WATER RIGHTS ACT.

Applications for 126 new licenses and two applications for amended licenses have been received for works under the Water Rights Act. These, with forty applications received for renewals of existing licenses, make a total of 168 that have been dealt with. Out of these applications ninety-three licenses have been issued.

GOVERNMENT BORES.—(Completed to date).

Public Watering Place (Flowing) Bores.

Bore.	Road where situated.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		Feet.	Gallons.	Degs. Fah.	lbs. per sq. inch.	£
Barringun	Bourke to Barringun	1,711	38,431	115	27	3,786
Barrona	Louth to Wanaaring	1,011	*200,000	100	...	1,482
Belalie	Bourke to Barringun	1,565	107,348	120	76	2,882
Brigalow	Brewarrina to Enngonia	2,292	52,672	103	46	3,233
Brindingabba	Bourke to Hungerford	1,211	46,430	99	20	1,439
Carinda	At Carinda	1,702	254,442	98	47½	2,531
Clifton	Wanaaring to Milparinka	1,638	*1,500,000	139	...	3,477
Coolabah	Near Coolabah	781	18,038	79	15	1,209
Cuttaburra	Bourke to Wanaaring	1,707	13,130	87	Nil.	2,303
Dargle	,, ,,	1,182	1,348	85	Nil.	1,618
Dungle Ridge	Collarendabri to Angledool	2,566	152,676	117	54	7,316
Enngonia	Bourke to Barringun	1,666	163,497	120	85	3,079
Finger Post	Angledool to Goodooga	3,155	128,678	121	138	5,814
Ford's Bridge	Bourke to Hungerford	1,616	16,753	94	Nil.	1,990
Gidgea Camp	,, Barringun	2,002	2,735	90	18	2,599
Goodooga	At Goodooga	2,812	523,555	118	150	5,608
Goonery	Bourke to Wanaaring	89	*1,000	.....	...	240
Gularg ambone	At Gularg ambone	1,748	50,929	86	7	2,462
Kelly's Camp	Bourke to Hungerford	1,577	206,684	99	50	2,188
Kenmare	,, ,,	1,539	924,999	113	80	1,672
Kerribree Creek	,, ,,	1,193	358,761	108	40	1,603
Mackenzie's Point	Brewarrina to Goodooga	2,224	134,582	96	88	2,074
Moongulla	Collarendabri to Angledool	2,570	235,885	120	38	6,839
Moramina	Walgett to Wilby Wilby	2,272	345,495	108	123	3,540
Moree	At Moree	2,793	761,141	118	46	6,496
Mumblebone	Warren to Brewarrina	1,276	97,003	91	5	1,558
Native Dog	Bourke to Barringun	476	46,430	93	13	1,009
Nedgera	Warren to Coonamble	1,911	457,980	102	32	2,039
Parragundy	At Parragundy, Queensland Border	1,078	15,454	94	Nil.	1,275
Pera No. 1	Bourke to Wanaaring	1,154	118,007	104	17	1,488
Pera No. 2	,, ,,	1,569	107,348	100	18	1,582
Pilliga	At Pilliga	1,852	943,490	102	82	1,816
Sibraas	Bourke to Wanaaring	1,059	344,049	100	24	1,555
Tenandra	Warren to Coonamble	1,036	266,123	88	4	1,348
Tineroo	Wanaaring to Milparinka	1,858	*800,000	139	...	3,835
Tinchelooka	Bourke to Wanaaring	1,236	15,454	92	Nil.	1,690
Tooloora	Coonamble to Walgett	1,543	345,495	104	14	2,429
Wallon	Moree to Boggabilla	3,747	667,440	125	100	7,993
Walkden's	Bourke to Hungerford	1,605	59,062	98	18	2,060
Wanaaring	At Wanaaring	1,645	118,007	110	Nil.	2,702
Waroo	Bourke to Hungerford	385	9,163	78	Nil.	705
Wilby Wilby	Walgett to Goodooga	2,163	312,731	114	30	2,913
Woolabra	Narrabri to Moree	1,988	149,100	90	11	3,544
Yantabulla No. 1	Bourke to Hungerford	209	*4,000	90	...	754
,, No. 2	,, ,,	587	20,789	90	18	691
Youngerina	,, ,,	165	.....	86	...	763

* Approximate.

Public Watering Place (Pumping) Bores.

Bore.	Road where situated.	Depth.	Pumping Supply—Per diem.	Temperature.	Cost.
		Feet.	Gallons.	Degs. Fah.	£
Bidura	Balranald District	1,387	.....	.....	2,437
Currabulla	Milparinka to Wanaaring	1,973	.....	96	2,711
Dolmoreve	Balranald to Ivanhoe	1,237	.....	.....	2,817
Finley	At Finley	930	.....	.....	1,510
Gaffney's	Bourke to Wanaaring	600	.....	.....	.....
Gilgandra	At Gilgandra	3,035	.....	.....	6,272
Grafton	At Grafton	3,700	.....	.....	8,762
Green Camp	Nyngan to Warren	1,509	*60,000	.....	2,156
Hay	At Hay	1,962	* 2,000	.....	4,011
Hungerford No. 2	On Queensland border, near Hungerford	768	29,000	.....	†701
Momba	Wilcannia to Wanaaring	482	.....	.....	1,699
Mulgany	Milparinka to Wanaaring	1,700	*30,000	105	1,446
Mullaley	At Mullaley	1,953	.....	.....	3,659
Narrowin	Nyngan to Brewarrina	1,179	6,000	.....	1,639
Nevertire	At Nevertire	2,525	.....	.....	5,301
Ninety-one Mile	Milparinka to Wanaaring	2,002	50,000	.....	4,013
Nyngan	At Nyngan	710	*11,000	.....	1,733
Ooarnoo	Wilcannia to Yalpunga	1,359	.....	.....	1,970
Opera	Louth to Wanaaring	804	50,000	.....	1,358
Packsaddle	Cobham to Broken Hill	1,942	15,000	.....	3,982
Paldrumata	,, Wilcannia	780	43,000	.....	1,282
Sandy Creek	,, Broken Hill	730	50,000	.....	1,872
Tibooburra	Broken Hill to Yalpunga	*1,200	.....	.....	.....
Tolarno	Ivanhoe to Menindie	1,602	*50,000	.....	3,036
Trangie	At Trangie	1,021	.....	.....	1,239
Warratta	Milparinka to Wanaaring	2,393	6,000	.....	4,992
Warri Warri	Cobham to Queensland border	3,925	57,600	.....	9,085
Yellow Waterholes	Deniliquin to Moama	800	.....	.....	1,075

* Approximate. † Half cost of bore, balance pa d by Queensland Government.

Bores which failed.—P.W.P.

Bore.	Road where situated.	Depth.	Causes of Failure.	Cost.
		Feet.		£
Arumpo	Euston to Pooncarrie	2,000	Salt water struck.	3,913
Banncannia	Cobham to Broken Hill	3,615	.....	8,535
Bendemere	Brewarrina to Gongolgon	1,726	Salt water struck.	2,391
Berawinnia	Near Hungerford	855	,, ,,	1,720
Bourke	At Bourke	1,467	No water struck.	2,270
Collie	At Collie	2,123	,, ,,	7,234
Holey Box	Ivanhoe to Mossgiel	1,230	.....	1,919
Hungerford No. 1	Near Hungerford	318	Salt water struck.	224*
Kulkyne	Bourke to Wanaaring	1,781	Flow 5,000 gallons per day of salt water.	2,565
Limestone	Silverton to Broken Hill	.....	.....	...
Manfred	Mossgiel to Menindie	2,027	.....	3,964
Narrabri	At Narrabri	2,040	.....	1,772
Osaca	Wanaaring to Milparinka	1,646	Bore choked; flow ceased.	3,276
Poison Point	Bourke to Wanaaring	1,399	Brackish supply; trickles over surface.	1,651
Quarry	Bourke to Cobar	1,391	Salt water struck.	1,531
Toorincaca	Menindie to Ivanhoe	1,488	.....	2,556
Whitewood	Brewarrina to Goodooga	1,240	No water struck.	1,358

Artesian Wells Act (Flowing) Bores.

Bore.	District.	Depth.	Flow per diem.	Temperature.	Pressure.	Cost.
		Feet.	Gallons.	Deg. Fah.	lb. per sq. inch.	£
Artesia	Bourke	1,201	18,052	90	17	1,407
Curragh	,,	786	4,239	.....	.....	731
Ginghett	Coonamble	1,319	358,743	94½	18	1,743
Glenalbyn	Bourke	2,081	548,803	119	75	2,112
Goangra	Walgett	3,063	217,971	121	30	2,933
Haddon Rigg	Coonamble	1,251	322,262	88½	9	1,192
Kensington	Walgett	2,666	777,117	114	51	2,434
Killowen	Bourke	1,486	563,366	104	35	1,500
Milchomi	Coonamble	2,029	989,495	103	107	1,950
Rowena	Walgett	2,669	787,500	126	94	2,489
Tubba	Coonamble	741	1,261	82	21	1,288
Tuon	Bourke	1,790	397,881	116	58	2,300
Willie	Coonamble	1,009	8,342	84	Nil.	1,250
		Failure.				
Tuncoona	Bourke	1,691	.....	.....	.....	1,858
Willara	,,	331	.....	.....	.....	432

P.W.P. Bores and W. and D. Act (Flowing Bores).

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		Feet.	Gallons.	Deg. Fah.	lb. per sq. inch.	£
Boomi	Moree	4,008	1,133,300	135	150	9,647
Bourbah	Coonamble	1,797	232,594	94	24	4,049
Bulyeroi	Moree	2,405	449,565	111	80	3,773
Dolgelly	,,	4,086	637,124	128	120	11,125
Euraba	,,	4,002	967,323	131	116	9,599
Gil Gil	,,	3,093	563,366	115	74	7,756
Millie	,,	2,228	622,185	101	44	2,062
Moomin	,,	2,690	334,011	111	63	4,263
Tulloona	,,	3,537	637,124	118	82	9,461
Uranbah	,,	2,522	698,080	122	80	2,166
Walgett	Walgett	2,036	1,168,710	108	75	2,469
Youendah	,,	1,954	371,977	103	52	2,384

* Hal cost o bore; balance paid by Queensland Government.

Water and Drainage Act (Flowing Bores).

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		Feet.	Gallons.	Deg. Fah.	lbs. per sq. inch.	£
Bogewong	Walgett	1,459	42,672	90	42	1,287
Bomuckledi	Moree	2,186	359,044	99	29	1,923
Boobora	,,	3,225	...	.....	.....	3,287
Boronga	,,	4,338	1,062,133	128	124	.....*
Bugilbone	Walgett	2,494	1,012,670	111	93	2,237
Bunyah	Moree	2,226	.....	.....	.....	.....*
Careunga	,,	4,013	637,124	125	101	8,640
Come-by-Chance	Walgett	2,504	652,782	111	.....	2,875
Coubal	Moree	3,991	1,259,975	140	152	.....*
Currumbah	,,	2,816	1,010,154	97½	44	.....*
Drildool	Walgett	2,163	1,083,735	101	93	.....*
Eurie Eurie	,,	2,722	1,079,776	120	124	3,881
Florida	Moree	2,374	745,403	118	65	2,159
Hollywood	Coonamble	2,065	809,500	104	55	1,846
Kiga	Moree	3,048	637,124	112	45	4,704
Mercadool	Walgett	1,872	250,819	112	.....	2,291
Merrigal	Coonamble	1,605	2,330	77½	Nil	1,752
Mungyer	Moree	2,716	924,990	113	83	6,049
Neargo	,,	3,005	1,044,749	124	110	6,123
Nowley	,,	2,156	.....	.....	.....	.....*
Old Gnomery	Bourke	2,576	557,930	124	80	3,612
Oreel No. 1	Walgett	2,728	875,840	124	122	3,327
Oreel No. 2	,,	3,117	966,320	126	150	3,937
Sherwood	,,	2,945	1,012,670	122	116	.....*
Talmoi	Moree	3,573	1,133,300	122	116	3,638
Telleraga	,,	2,853	548,803	120	61	2,706
3B	Walgett	2,729	1,229,915	116	117	2,211
Three Corners	Coonamble	968	67,994	86	7	1,246
Tunda	,,	2,376	875,840	108	91	.....†
Tycannah	Moree	2,547	186,607	106	12	2,256
Tyreel	,,	3,046	793,093	115	55	3,038
Ulumbie	Walgett	2,660	478,170	112	61	2,772
Weetaliba	Coonamble	2,073	641,420	100	42	1,962
Welbondonga	Moree	3,734	1,259,975	136	150	3,926

* Cost not yet complete.
† Cancelled Improvement Lease Bore; no compensation paid.

Country Towns Water Supply (Flowing) Bores.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.	Cost.
		Feet.	Gallons.	Deg. Fah.	lbs. per sq. inch.	£
Coonamble No. 1	Coonamble	1,303	286,859	96	43	3,060
,, No. 2	,,	2,180	473,754	101½	...	1,895
Warren	,,	869	126,489	70	12	1,151

Improvement Lease (Flowing) Bores.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		Feet.	Gallons.	Deg. Fah.	lb. per sq. inch.
Beanbah No. 2	Coonamble	2,372	989,495	106	.....
Benah	,,	1,235	27,080	87	2
Bouka	,,	1,003	200,316	86½	21
Box Camp	,,	1,542	437,318	102	24
Brewon No. 1	Walgett	1,740	193,497	96	28
,, No. 2	,,	1,525	809,500	97	35
,, No. 3	,,	1,689	621,260	95	.....
,, No. 4	,,	2,384	396,334	100	35
Brigalow	,,	1,500	941,887	98	54
Bungle Gully	,,	2,365	1,107,870	108	72
Combogolong	,,	1,572	265,753	100	.....
,,	Coonamble	1,953	491,950	110	68
Colly Mongle	Moree	3,203	908,090	134	.....
Gilgoin No. 1	Walgett	1,077	221,547	91	31
,, No. 2	,,	972	11,232	87	19
Ginghett	,,	1,674	281,243	98	36
Kialgara	Coonamble	2,199	546,241	100	32
Kiameron	,,	1,014	7,522	92	12
Lower Quambone	,,	1,567	682,185	102	59
Mercadool	Walgett	2,753	682,185	116	112
Middle Paddock	Coonamble	1,113	81,682	87	7
Midkin No. 3	Moree	3,642	1,115,360	137	101
Mole No. 2	Coonamble	1,330	497,664	98	10
Muckerawa	Walgett	2,290	630,870	119	74

† Cost not yet complete.
* Cancelled Improvement Lease bore no compensation paid.

IMPROVEMENT Lease (Flowing) Bores—*continued.*

ore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		Feet.	Gallons.	Deg. Fah.	lb. per sq. inch.
Mungrabambone	Coonamble	1,815	371,977	96	12
Munna Munna	,,	2,197	825,410	103	117
Narraway	,,	1,976	336,732	100	40
Noonbah	,,	1,617	581,770	96	17
Ottendorf	,,	1,500	181,667	94	10
Pillicawarrina	,,	1,403	520,010	104	22
Polly Brewon No. 1	Walgett	1,492	523,555	98	23
,, No. 2	,,	1,792	207,210	103	17
Quabothoo	Coonamble	1,723	702,790	97	28
Quambone No. 4	,,	1,600	102,136	99	35
,, No. 5	,,	1,516	577,930	98½	21
Quondong	,,	1,342	60,665	92	.....
Sandy Camp	,,	1,260	128,522	100½	10
Trialgara	,,	1,472	688,878	100	34
Urawilkie No. 1	,,	1,313	293,833	87	.....
,, No. 2	,,	1,470	315,090	92	40
Wallangambone	Coonamble	1,702	229,060	102	18
Wangrewally	Walgett	2,166	265,753	108	35
Willie	Coonamble	1,139	239,178	88	13
Willow Camp	,,	1,322	245,865	96	18
Wingadee No. 3	,,	1,644	277,301	98	12
Womboin No. 1	,,	1,439	163,497	98	33
,, No. 2	,,	1,440	366,157	96	13
,, No. 3	,,	1,614	579,174	99	17
	Pumping.				
Gilgoin No. 4	Walgett	822			
Ogle's Camp	Dubbo	778			
	Failures.				
Buckinguy	Coonamble	440			
Burrawong No. 1	Forbes	322			
,, No. 2	,,	280			
Gilgoin No. 3	Walgett	661			

PRIVATE BORES (Completed to date).

FLOWING.

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		Feet.	Gallons.	Deg. Fah.	lb. per sq. inch.
Angledool	Walgett	2,664	43,562	115	48
Bangate No. 1	,,	2,473	265,753	119	.....
,, No. 2	,,	2,640	766,165	111	73
Beanbah No. 1	Coonamble	2,346	1,083,735	108	.....
Belalie No. 1	Bourke	1,693	140,203	110	.....
,, No. 2	,,	1,720	334,011	124	.....
,, No. 3	,,	1,720	563,366	118	95
Biblah	Coonamble	1,464	497,664	99	27
Bimble	,,	1,350	293,833	93	45
Bogamildi	Moree	2,518	359,044	112	38
Boolooroo	,,	2,408	410,853	112	56
Bootra No. 2	Wilcannia	.....	.....	.....	.....
Brindingabba No. 1	Bourke	760	52,458	93	10
,, No. 2	,,	820	30,595	94	7
,, No. 3	,,	1,276	70,511	108	.....
,, No. 4	,,	1,221	18,052	103	Nil
Buckinguy No. 1	Coonamble	1,195	118,007	90	.....
,, No. 2	,,	1,069	3,692	86	Nil
Bulgah	,,	1,453	245,865	98	37½
Bullagreen	,,	1,823	181,667	88	12
Bunaba	Moree	3,514	1,010,154	138½	141
Bundy	Coonamble	2,289	592,588	104	.....
Bunna Bunna No. 1	Moree	2,311	577,930	109	75
,, No. 2	,,	2,347	622,185	123	74
Buttabone No. 1	,,	1,039	36,448	88	Nil
,, No. 2	,,	1,341	42,441	92	7
,, No. 3	,,	1,458	46,430	88½	Nil
,, No. 4	,,	1,260	63,528	89	2
,, No. 5	,,	1,237	77,308	92	7
,, No. 6	,,	1,221	16,753	80	8
Calga No. 3	,,	1,013	157,575	86	.....
,, No. 4	,,	1,175	226,010	86	20½
Carney's Tree	Coonamble	1,265	71,392	96	10½
Carwell	,,	1,414	300,900	95	10
Clifton Downs	Bourke	1,074	18,052	92	.....
Combadelo	Moree	2,749	858,134	123	60

PRIVATE Bores (Flowing)—*continued.*

Bore.	District.	Depth.	Flow per Diem.	Temperature.	Pressure.
		Feet.	Gallons.	Deg. Fah.	lb. per sq. inch
Come-by-Chance	Walgett	1,862	505,980	109	52½
Coonimbia	Coonamble	1,504	254,442	98½	10
Corella No. 1	Bourke	943	175,529	100	57
,, No. 2	,,	1,112	36,448	94½	.....
,, No. 3	,,	1,327	67,994	106	.....
,, No. 4	,,	.....	.....	.....	.....
Cuttabunda	Walgett	2,168	281,243	115	.....
Darnley Chase	Coonamble	1,740	307,968	93	21
Dobikin	Moree	1,980	309,577	96	21
Dunlop No. 1	Bourke	740	.....	.....	.....
,, No. 2	,,	940	.....	.....	.....
,, No. 3	,,	860	.....	.....	.....
,, No. 4	,,	740	.....	.....	.....
,, No. 5	,,	1,445	.....	.....	.....
,, No. 8	,,	833	.....	.....	.....
,, No. 9	,,	800	.....	.....	.....
,, No. 10	,,	1,030	77,308	102	Nil
,, No. 11	,,	816	.....	.....	.....
,, No. 12	,,	948	.....	.....	.....
,, No. 13	,,	823	.....	.....	.....
,, No. 14	,,	703	.....	.....	.....
,, No. 16	,,	1,087	.....	.....	.....
,, No. 17	,,	1,200	.....	.....	.....
Ellerslie	Coonamble	2,005	766,165	101	57
Elsinora No. 2	Broken Hill	1,757	.....	.....	.....
Emby	Coonamble	1,300	97,003	94	6
Erlside	,,	1,300	59,062	88	Nil.
Eulalie	Walgett	2,605	413,932	125	.....
Eulawah	Coonamble	840	6,770	81	Nil.
Euroka	Walgett	1,584	101,465	110	.....
Federal Park	Coonamble	567	75,662	80	15
Fort Bourke No. 1	Bourke	1,284	102,175	105	17
,, No. 2	,,	1,403	62,776	104	17
,, No. 3	,,	1,807	259,337	113	47
,, No. 4	,,	974	2,735	94	Nil.
,, No. 5	,,	1,104	46,430	94	7
Gingie	Walgett	2,089	621,260	110	54
Glengeera	Bourke	1,369	118,007	105	76
Glenroy	Moree	2,540	729,665	105	36
Gnomery	Bourke	2,415	268,735	116	40
Goolring	,,	1,776	315,115	122	52
Goonal	Moree	2,980	874,662	126	88
Goondablui No. 1	Walgett	2,802	312,731	126	.....
,, No. 2	,,	3,333	101,304	130	51
,, No. 3	,,	2,560	328,730	124	67
Goorianawa No. 6	Coonamble	611	3,692	89	Nil.
Gurley No. 2	Moree	2,729	217,971	94	.....
Haddon Rigg No. 1	Coonamble	1,078	145,927	90	9
,, No. 2	,,	2,002	245,865	99	22
Jews Lagoon	Moree	2,711	478,170	107	50
Kallara No. 1	Bourke	140	.....	.....	.....
,, No. 2	,,	46	.....	.....	.....
,, No. 7	Wilcannia	540	.....	.....	.....
,, No 10	,,	700	.....	.....	.....
,, No. 12	Bourke	463	.....	.....	.....
Kerribree No. 1	,,	1,073	36,448	100	.....
,, No. 2	,,	1,340	163,497	102	.....
,, No. 3	,,	940	.....	.....	.....
Krui	Moree	2,300	207,410	115	57
Kurrawa	Coonamble	774	52,724	82	28
Landers	,,	960	22,307	82½	5
Larkins	,,	2,084	1,010,154	104½	.....
Lila Springs, No. 1	Bourke	1,357	4,787	92	11
,, No. 2	,,	2,001	30,595	108	18
,, No. 3	,,	1,729	698,080	123	125
Lissington No. 1	,,	1,400	20,789	113	45
,, No. 2	,,	1,130	19,420	104	45
,, No 3	,,	1,207	346,527	104	42
,, No. 4	,,	1,070	426,817	107	60
Llanillo	Walgett	2,397	486,085	111	61
Llano	Moree	1,384	217,971	86	20
Loma	Coonamble	503	42,441	79	7
Maranoa No. 1	Bourke	1,340	858,134	116	37
,, No. 2	,,	1,510	97,003	111	.....
Marra No. 3	Wilcannia	.....	.....	.....	.....
Marra	Coonamble	932	226,010	89	13
Martindale	Walgett	1,970	250,819	98	.....
Mascotte	Moree	1,508	437,318	97	37
Merimba	Coonamble	1,135	140,203	94	7
Midkin No. 1	Moree	3,420	548,803	124	74
,, No. 2	,,	3,478	1,027,366	134	91
Mole No. 1	Coonamble	800	6,770	86	Nil.
,, No. 3	,,	901	32,530	88	13
Momba No. 4	Wilcannia	223	.....	.....	.....
Moorlands	Coonamble	1,515	272,980	91	40
Morendah	,,	2,151	542,540	114	52
Morton's Plains No. 1	Bourke	1,855	309,577	114	57

PRIVATE Bores (Flowing)—*continued.*

Bore.	District.	Depth.	Flow per Diem.	Temperature	Pressure.
		Feet.	Gallons.	Deg. Fah.	lb. per sq. inch.
Mount Tenandra No. 1	Coonamble	894	97,003	80	18
Muckerawa No. 2	Walgett	2,264	362,200	115	55
Multagoona No. 1	Bourke	1,030	52,295	90	32
,, No. 2	,,	1,118	42,144	98	32
Mumblebone No 1	Coonamble	1,150	72,651	90	Nil.
Mundadoo	,,	730	3,190	80	24
Mungerie	,,	600	5,402	80½	.....
Mungie Bundie	Moree	1,997	268,735	103	21
Nardoo	Coonamble	2,032	875,840	104	72
Nebea	,,	1,507	505,674	94	.....
Nelgowrie	,,	1,807	554,421	102	60
Nocoleche No. 1	Bourke	916	73,400	94	.....
,, No. 3	,,	1,227	.....	.....	.....
,, No. 4	,,	1,051	14,292	98	.....
,, No. 5	,,	1,289	40,551	101	.....
Noonbah	Coonamble	595	62,776	81	19
Nullawah	Walgett	3,020	523,555	129	133
Nulty No. 1	Bourke	1,001	334,011	96	35
,, No. 2	,,	1,498	82,146	109	15
Pirillie No. 2	,,	645	18,052	96	65
,, No. 3	,,	630	11,782	85	23
Quambone No. 1	Coonamble	2,135	1,186,950	103¾	.....
,, No. 2	,,	2,026	1,107,870	101	66
,, No. 3	,,	1,849	729,665	98	52½
Quinyambi	Broken Hill	1,496	.....	.....	.....
Regenbah	Coonamble	1,889	464,390	108	30
Roma	Moree	1,848	495,272	99	53
Salisbury Downs No. 1	Broken Hill	1,365	.....	.....	.....
,, No. 2	,,	1,568	.....	.....	.....
Santa Paula	Coonamble	1,480	82,146	32	.....
Silendale	,,	735	36,448	84	4
Sunny Vale No. 1	,,	1,396	411,439	98	5
,, No. 2	,,	1,578	118,007	86	Nil.
Talawanta	Bourke	1,949	38,431	103	103
Terrigal	Coonamble	1,928	505,980	106½	65
Thurloo	,,	468	12,104	79	6½
Thurloo Downs No 1	Broken Hill	1,968	245,000	.....	15
,, No. 2	,,	2,217	.....	.....	.....
,, No. 3	,,	.....	.....	.....	.....
Tinapagie No. 1	Bourke	963	.....	80	.....
,, No. 3	,,	1,243	27,080	104	.....
Tooloon	Coonamble	1,550	107,318	99	17
Toorale No. 1	Bourke	730	.....	.....	.....
,, No. 2	,,	385	.....	.....	.....
,, No. 3	,,	2,120	.....	.....	.....
,, No. 5	,,	256	.....	.....	.....
,, No. 6	,,	375	.....	.....	.....
,, No. 10	,,	1,502	.....	.....	.....
,, (Martin's) No. 2	,,	1,393	112,677	95	17
Tundabarine No. 1	Coonamble	3,550	2,046	71	10
Tycannah	Moree	1,806	85,548	107	.....
Urella Downs No. 1	Broken Hill	1,874	.....	.....	.....
,, No. 2	,,	1,820	.....	.....	.....
Vatua	Coonamble	1,155	329,476	87	23
Wanaaring No. 1	Bourke	1,421	10,322	.....	.....
,, No. 2	,,	1,330	.....	.....	.....
Wapweelah No. 1	,,	720	4,787	89	50
,, No. 2	,,	1,433	30,595	108	60
,, No. 3	,,	1,470	175,529	105	25
,, No. 4	,,	1,672	908,090	118	61
Warrana No. 1	Coonamble	1,000	10,120	82½	6
,, No. 2	,,	1,100	163,497	88	15
,, No. 3	,,	1,660	601,515	89	45
Warraweena No. 1	Bourke	1,247	72,651	106	72
,, No. 2	,,	840	6,018	90	.....
,, No. 3	,,	997	8,342	94	45
Warren Downs	Walgett	2,014	542,540	102	.....
Weemabung	Coonamble	960	54,746	87	4
Weetalibah	,,	1,694	245,865	100	21
Weilmoringle No. 1	Bourke	2,005	12,104	101	.....
,, No. 2	,,	1,590	942,117	108	.....
,, No. 3	,,	2,446	42,672	105	30
Wingadee No. 1	Coonamble	1,544	151,718	99	37
,, No. 2	,,	2,297	581,770	110½	89
,, No. 4	,,	2,312	1,132,000	107	80
,, No. 5	,,	2,183	787,550	113½	68
,, No. 6	,,	2,126	702,790	108	69
Wonbobbie	,,	906	9,849	84	Nil
Woodlands	,,	2,030	128,962	92	.....
Woolscour	,,	1,400	266,123	96	32
Yancannia No. 1	Broken Hill	203	.....	.....	.....
,, No. 4	,,	727	.....	.....	.....
,, No. 5	,,	962	.....	.....	.....
,, No. 6	Wilcannia	917	.....	.....	.....
Yarraldool	Walgett	2,436	1,062,133	116	72
Yuma	Coonamble	2,171	729,665	97	.....
Youngerrina	Bourke	.....	4,787	80	.....

PRIVATE BORES (Pumping).

Bore.	District.	Depth.	Bore.	District.	Depth.
		feet.			feet.
Bootra No. 1	Wilcannia	1,105	Kerribree Creek No. 4	Bourke	880
Calga No. 1	Coonamble	1,823	Macksville	Coonamble	1,416
,, No. 2	,,	1,120	Marra No. 2	Wilcannia	895
Cruickshanks, Avondale	Moree	1,800	Meryon	Coonamble	1,070
Dunlop No. 6	Bourke	935	Momba No. 1	Wilcannia	1,261
Elsinora No. 1	Broken Hill	1,770	,, No. 3	,,	1,997
Goorianawa No. 1	Coonamble	1,550	Mount Tenandra No. 2	Coonamble	906
,, No. 2	,,	800	Nocolechi No. 2	Bourke	1,600
,, No. 3	,,	501	Pirillie No. 1	,,	803
,, No. 4	,,	500	Salisbury Downs No. 3	Broken Hill	1,400
,, No. 5	,,	357	,, ,, No. 4	Wilcannia	1,344
,, No. 7	,,	911	,, ,, No. 6	,,	1,404
Gurley No. 1	Moree	1,091	,, ,, No. 7	,,	1,473
,, No. 3	,,	2,503	Toorale No. 4	Bourke	1,485
Kallara No. 3	Wilcannia	600	Tunderbrine No. 2	Coonamble	1,100
,, No. 4	,,	820	,, No. 3	,,	1,100
,, No. 5	,,	900	Urisino No. 1	Broken Hill	1,680
,, No. 6	,,	1,411	,, No. 2	,,	1,755
,, No. 8	,,	931	,, No. 3	,,	1,475
,, No. 9	,,	676	Wangamana	Bourke	1,600
,, No. 11	,,	930	Yancannia No. 2	Broken Hill	1,130

FAILURES.

Bore.	District.	Depth.	Bore.	District.	Depth.
		feet.			feet.
Boorooma, No. 1	Walgett	1,493	Terry-hie-hie, No. 1	Moree	550
,, No. 2	,,	2,351	,, ,, 2	,,	3,002
Buckanbe	Wilcannia	725	Tinapagie, No. 2	Bourke	533
Dunlop, No. 7	Bourke	576	Toorale, No. 7	,,	1,700
,, No. 15	,,	751	,, No. 8	,,	900
Dunumbral	Walgett	2,480	,, No. 9	,,	890
Marra, No. 1	Wilcannia	1,482	,, Martin's, No. 1	,,	1,147
Momba, No. 2	,,	1,947	Yancannia, No. 3	Wilcannia	659
,, No. 5	,,	1,755	Yanda, No. 1	Bourke	750
Salisbury Downs, No. 5	,,	1,708	,, No. 2	,,	1,008

Summary.

Bores.	No.	Total Depth.	Total Flow per Diem.	Depth.		Temperature.	
				Max.	Min.	Max.	Min.
STATE.		Feet.	Gallons.	Feet.	Feet.	Deg. Fah.	Deg. Fah.
Public Watering Place—							
Flowing	46	73,160	11,136,334	3,747	89	139	78
Pumping	28	44,208	459,600*	3,925	482	105	96
Failures	17	26,346		3,615	318		
Artesian Wells Act—							
Flowing	13	22,091	4,995,032,	3,063	741	126	82
Failures	2	2,022					
Public Watering Place and Water and Drainage Act—							
Flowing	12	34,358	7,815,359	4,086	1,797	135	94
Water and Drainage Act—							
Flowing	35	90,903	23,242,857	4,341	968	140	77½
Country Towns Water Supply—							
Flowing	3	4,352	887,102	2,180	869	101½	70
Improvement Lease—							
Flowing	48	81,668	20,932,241	3,642	972	137	86½
Pumping	2	1,600	No data	778	720	No data	No data
Failures	4	1,703		661	280		
PRIVATE.							
Flowing	209	304,253	46,991,718	3,550	46	138½	71
Pumping	42	50,808		1,997	357	89	80
Failures	20	26,407		2,480	533		
		763,879	116,460,243				

* Approximate.

(1) Total depth of Bores=763,879 feet, or about 144 miles.

(2) Total flow of all Bores=116,000,643 gallons per diem, excluding pumping.

PUBLIC WATERING PLACES WESTERN DIVISION.

Stock Route.	Name.	Capacity in Cubic yards.	Depth in Feet.	Leased, Open, Subsidised	Cost.	Remarks.
					£	
Balranald—Euston	Waldaira Lake Tank			O	105	
	Abbotts' Tank	4,000		L	352	
Balranald—Oxley	Morven Tank	10,007		L	1,351	
Balranald—Pooncarie	Bidura Bore		1,387	L	2,437	
Bourke—Barringun	Gidgea Camp Bore		2,002	L	2,599	
	Lake Tank	17,000		L	2,845	
	Grass Hut Tank			L	3,662	
	Native Dog Bore		476	L	1,009	
	Enngonia Bore		1,666	L	3,079	
	Belalie Bore		1,565	L	2,882	
	Barringun Bore		1,711	L	3,786	
Bourke—Brewarrina	Dry Bogan Weir			O	960	
Bourke—Byrock	Waddell Tank	14,024		L	2,094	
	Byerock Tank	14,858		L	2,178	
Bourke—Hungerford	Walkden's Bore		1,605	L	2,060	
	Ford's Bridge Tank	22,666		L	3,958	
	Kelly's Camp Bore		1,577	L	2,188	
	Ford's Bridge Bore		1,616	L	1,990	
	Kerribree Creek Bore		1,193	L	1,603	
	Youngerrina Bore		165	L	763	
	Boongunyarra Springs			O		
	Yantabulla Bore		587	L	691	
	Mukudjeroo Waterhole			O		
	Kenmare Bore		1,539	L	1,672	
	Kilberoo Tank	20,000		O	2,360	
	Brindingabba Bore		1,211	L	1,439	
	Parragundy Bore		1,078	L		
	Waroo Bore		385	O	705	
Bourke—Wanaaring	Paka Tank	18,196		L	2,161	
	Sibraas Bore		1,059	L	1,555	
	Poison Point Bore		1,399	O	1,651	
	Goonery Bore		89	L	240	
	Gaffney's Bore		1,600	O		
	Dargle Bore		1,182	S	1,618	
	Tinchelooka Bore		1,231	L	1,690	
	Kulkyne Tank	13,200		L	1,165	
	Cuttaburra Bore		1,707	S	2,303	
Brewarrina—Byrock	Bendermere Tank	15,000		L	3,095	
	Mulga Tank	15,000		L	3,125	
Brewarrina—Enngonia	Brigalow Bore		2,292	L	3,233	
	Ledknappa Tank	18,219		L	3,533	
	Eighteen-mile Tank			L	2,321	
Brewarrina—Goodooga	Whitewood Bore		1,240	O	1,358	
	Wolfrey's Weir			L	913	
	Mackenzie's Point Bore		2,224	L		
	Goodooga Bore		2,812	L	5,608	
Brewarrina—Nyngan	Narrowin Bore		1,179	O	1,639	
Broken Hill—Menindee	Munka Munka Tank	14,153		L	1,289	
	Horse Lake Tank	16,224		L	1,018	
	Box Tank	14,146		L	1,151	
Broken Hill—Silverton	Limestone Bore		25	O		
	Silverton Tank	44,712		L		
Broken Hill—White Cliffs Road	Rowena Tank			O	683	
	Mount Wright Tank	11,077		L	473	
Broken Hill—Wombah	Stephen's Creek			O		
	Day Dream Tank	10,528		L	2,215	
	Kennedy's Tank	6,000		L	1,104	
	Purnamoota Tank	16,111		L	2,646	
	Gairdner's Creek Tank			O		Under construction.
	Euriowie Tank	8,986		L	870	
	Fowler's Gap Tank	14,000		S	1,471	
	Sandy Creek Bore		730	S	1,872	
	Bancannia Tank	13,087		S	1,405	
	Packsaddle Bore		1,942	S	3,982	
	Wonnaminta Tank	20,874		L	2,067	
	Palgamurtie Tank	4,590		L	1,443	
	Mount Brown Well		258	L	1,146	
	Warrata Tank	25,632		L	2,567	
	Allpress Dam	6,282		S	882	
	Tibooburra Bore		290	O		
	Tibooburra Well		250	L	2,222	
	Ooarnoo Bore		1,359	S	1,970	
	Yalpunga Tank	16,272		S	1,720	
	Warri Warri Bore		3,925	O		
Clare—Balranald	Dolmoreve Well		111	L	1,919	
	Til Til Tank	12,500		L	3,622	
	Youhl Plain Tank	13,000		L	3,659	
	Box Creek Tank	13,000		L	3,951	
	Penarie Tank	14,500		S	1,352	
	Yarrawal Tank	1,060		O	58	
Clare—Ivanhoe	Clare Tank	22,000		L	2,989	
	Gunnaramby Tank	20,000		S	3,086	
	Kilfera Tank					Authorised.
Clare—Menindie	Manfred Tank					"
	Linbee Tank					"
	Sayers' Lake Tank					"
	Huco Tank					"
	Toorincaca Tank					"

PUBLIC Watering Places, Western Division—*continued.*

Stock Route.	Name.	Capacity in cubic yards.	Depth in feet.	Leased, Open, Subsidised.	Cost.	Remarks.
					£	
Clare—Oxley	Younga Tank					Authorised.
	Bomarthong Tank					,,
	Kitcho Tank					,,
	Nandum Tank					,,
Cobar—Bourke	Nullamut Tank	5,688		L	1,732	
	Mount Drysdale Tank	9,680		L	1,055	
	Tinderra Tank	14,500		S	1,671	
	Helman's Tank	15,310		S	2,583	
	Curraweena Tank	8,434		L	1,909	
	Corilla Tank			S	1,791	
	Two Waterholes Tank	1,200		S	2,199	
	Quarry Bore		1,391	O	1,531	
Cobar—Hillston	Illewong Tank	13,620		L	1,265	
	Brura Tank	18,379		L	3,202	
	Shearlegs Tank	18,055		S	3,400	
	Priory Tank	20,256		L	2,976	
	Shuttleton North Tank			L	1,242	
	Sandy Creek Tank	18,219		L	3,193	
	Gilgunnia Tank	9,867		L	1,442	
	The Rock-holes Tank	17,875		L	3,197	
	Wagga Tank	18,055		L	3,478	
	Merri Merriwa Tank	19,104		L	3,501	
	North Roto Well		160	O	1,414	
	Roto Well		160	L	1,309	
Cobar—Louth	Cuttygullyaroo Tank	15,000		S	2,395	
	Booroondarra Tank	20,114		S	3,177	
	Kerrigundi Tank	19,616		S	3,314	
	Mulya Tank	15,000		S	1,975	
Cobar—Mossgiel	Bulgoo Tank			L	779	
Cobar—Nyngan	Booroomugga Tank	9,403		L	3,134	
	Canbelego Tank	4,181		L	3,232	
Cobar—Wilcannia	Amphitheatre Tank	6,308		L	1,648	
	Springfield Tank	18,218		S	2,229	
	Meadows' Tank			S	2,316	
	Barnato Tank	14,112		L	2,325	
	Bulla Bulla Tank	17,784		L	2,360	
	Donald's Plains Tank			O		Under construction.
	Keilor Tank					,,
	Coonavittra Tank			O		,,
	Yoree Tank					Authorised.
Cobar—Wilcannia	Caltigeena Tank					,,
Collarendabri—Angledool	Moongulla Bore		2,570	L	6,839	
	Dungle Ridge Bore		2,566	L	7,316	
Euabalong—Gilgunnia	Whoey Tank			O	712	
	Walters' Range Tank	7,160		O	111	
Euabalong—Mount Hope	One Eye Tank	1,664		L	338	
	Mount Hope Tank			L	2,926	
Euston—Pooncaire	Prungle Tank					Under construction.
	Mundonah Tank			O		,,
	Arumpo Tank			O	422	
Goodooga—Angledool	Fingerpost Bore		3,155	L	5,814	
Ivanhoe—Booligal	Holey Box Well		125	L	2,369	
	Mossgiel Tank			S	3,997	
	Polygonum Hut Well			L	2,647	
	Moolbong Tank			O		
	Jumping Sandhill Well		123	S	3,057	
	Tom's Lake Tank			L	3,648	
Louth—Wanaaring	Opera Bore		804	O	1,358	
	Barrona Bore		1,011	L	1,482	
Milparinka—Wanaaring	Warratta Bore		2,393	O	4,992	
	Tinneroo Bore		1,858	L	3,835	
	Clifton Bore		1,638	O	3,477	
	Birrigoolpa Tank	17,392		O	2,279	
	Osaca Bore		1,646	O	3,276	
	Ninety-one Mile Bore		2,002	O	4,013	
	Currabulla Bore		1,973	L	2,711	
	Mulgany Bore		1,700	S	1,446	
	Wanaaring Bore		1,645	L	2,702	
Mossgiel—Barnato	Waverley Tank					Authorised.
	Conoble Tank					,,
	Ninty Tank					,,
	Corowra Tank	19,104		L	2,908	
	Gidgeroo Tank					,,
	Winini Tank					,,
	Balarabon Tank					,,
	Tiltagara Tank					,,
	Carolina Tank					,,
Nymagee—Cobar	Nymagee Tank	17,597		L	5,957	
	Keighran's Tank	20,301		L	3,269	
Nymagee—Euabalong	Nymagee Small Tank	2,510		L	70	
	Beloura Tank	18,631		L	3,103	
Silverton—Menindie	Rat Hole Tank	16,139		L	1,460	
	Thackaringa Tank	20,448		L	2,803	
	Pinnacles Tank	5,570		L	854	
	Farmcoat Tank	14,408		S	1,661	
	Aldsborough Tank			O	16	
Walgett—Goodooga	Borah Tank	20,000		L	2,948	
	Wallangulla Tank	11,000		L	860	
	Lightning Ridge Tank	36,609		L	2,948	
	Glendon Tank	20,000		L	2,866	

PUBLIC Watering Places, Western Division—*continued.*

Stock Route.	Name.	Capacity in Cubic Yards.	Depth in Feet.	Leased, Open, Subsidised.	Cost.	Remarks.
					£	
Walgett, *via* Springs—Goodooga	Moramina Bore	.....	2,272	L	—	
	Benghill Tank	.....	.....	L	2,889	
	Cumborah Springs	.....	.....	O	109	
	Wilby Wilby Bore	.....	2,162	L	—	
Wilcannia—Broken Hill	Nineteen-mile Tank	16,272	.....	S	2,312	
	Dolo Tank	17,785	.....	L	2,037	
	Worungil Tank	16,272	.....	L	1,923	
	Scope's Range Tank	.....	.....	O	150	
	Little Topar Tank	39,980	.....	L	2,156	
	Myalla Tank	16,600	.....	L	1,733	
	Tara Tank	23,500	.....	L	1,383	
Wilcannia—Hungerford	Seaville's Tank	16,272	.....	S	5,113	
	Copago Tank	18,793	.....	O	3,167	
	Momba Bore	.....	482	O	1,099	
	Peri Springs Tank	13,447	.....	O	1,550	
	Coorpooka Tank	.....	.....	.....	—	Proposal.
	Yantabangee Tank	.....	.....	S	1,621	
	Warramurtee Tank	13,447	.....	S	1,584	
	Goomboolara Tank	13,447	.....	L	1,438	
Wilcannia — Ivanhoe	Forty-eight-mile Tank	7,890	.....	S	3,965	
	Thirty-five-mile Tank	18,246	.....	L	4,184	
	Twenty-six-mile Tank	18,688	.....	O	2,451	
	Twelve-mile Tank	21,888	.....	L	3,569	
	Mount Manara Tank	12,288	.....	L	2,638	
	Boonoona Tank	20,370	.....	L	3,170	
	Ivanhoe Tank	.....	.....	L	4,386	
Wilcannia—Milparinka	Mulga Valley Tank	19,852	.....	L	3,629	
	Dry Lake Tank	9,384	.....	L	2,048	
	Beefwood Well	.....	134	S	1,836	
	Menamurtie Well	.....	193	O	1,036	
	Tarella Tank	12,072	.....	S	2,230	
	Gemville Tank	.....	.....	S	1,069	
	White Cliffs Tank No. 1	12,391	.....	O	4,530	
	White Cliffs Tank No. 2	25,084	.....	L		
	Bunker Tank	16,272	.....	L	1,630	
	Peak Tank	12,000	.....	S	2,763	
	J. K. Tank	14,056	.....	L	3,864	
	Murlippa Tank	26,352	.....	L	2,997	
	Paldramatta Bore	.....	780	L	1,282	
	Cobham Tank	15,000	.....	L	2,207	
	One Tree Waterhole	.....	.....	O	—	
	Coally Dam	.....	.....	O	625	
	Millring Tank	.....	.....	O	—	
	Milparinka Dam	15,030	.....	L	668	
	Milparinka Well No. 1	.....	122	L	1,652	
	Milparinka Well No 2	.....	.....	L	—	

ARTESIAN BORE TRUSTS.

(COMPLETED.)

Name.	Area.	Length of Drains.	Flow of Bore per diem.	Cost of Drains, Culverts, Fencing, &c.	Cost of Bore, if in Trust.	Cost of water if Bore not in Trust per annum.	Total capital cost gazetted.	Annual liability to Crown.	Date when handed over to Trustees.	Remark
	acres.	mls. ch.	galls.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		
Comuckledi	48,640	25 20	297,772	780 18 0	1,923 4 2	.....	2,704 2 2	160 19 9	2 Sept., 1908	
Boobora	78,720	58 41	.....	1,229 2 0	3,286 14 9	.....	4,515 16 9	270 19 0	15 June, 1910	
Boomi	109,280	49 2	1,151,005	1,451 12 9	.....	273 0 0	1,451 12 9	359 8 4	2 Oct., 1907	
Bourbah	84,424	47 0	232,594	1,194 7 6	.....	112 0 0	1,194 7 6	183 1 9	23 ,, 1907	
Bugilbone	83,840	71 65	1,102,670	1,502 2 1	2,234 16 10	.....	3,736 18 11	222 9 8	28 July, 1909	
Bulyeroi	68,160	41 5	467,600	1,004 1 10	.....	143 0 0	1,004 1 10	202 15 8	15 ,, 1908	
Careunga	86,850	60 11	6 7,247	735 14 10	5,500 0 0	.....	6,235 14 10	371 5 0	5 Feb., 1908	£8,640 1s. 7d., actual cost of bore
Come-by-Chance	92,960	27 17	621,260	1,175 1 7	2,874 15 3	.....	4,049 16 10	243 15 0	12 Aug., 1905	
Dolgelly	60,900	32 25	637,121	579 11 2	.....	294 0 0	873 11 2	328 10 1	18 Dec., 1907	
Euraba	69,120	39 5	958,784	863 5 9	.....	273 6 0	1,136 5 9	324 14 0	1 May, 1907	
Eurie Eurie	75,520	36 7	875,840	1,229 13 6	3,881 3 2	.....	5,110 16 8	317 13 9	7 Dec., 1905	
Florida	53,440	29 10	745,403	825 10 2	2,158 13 7	.....	2,984 3 9	179 1 0	8 Feb., 1906	
Gil Gil	52,856	5 27	563,366	69 5 6	.....	214 0 0	69 5 6	218 2 6	28 Jan., 1909	
Hollywood	34,560	27 17	809,251	981 4 2	1,846 6 5	.....	2,827 10 7	168 6 8	2 Sept., 1908	
Kiga	118,720	61 40	637,124	1,149 3 8	4,704 5 4	.....	5,853 9 0	348 9 10	18 ,, 1906	
Mercadool	46,200	43 65	221,547	161 8 10	2,291 12 10	.....	2,453 1 8	146 1 0	3 ,, 1906	Drains cut by petitioners at own expense.
Millie	33,050	27 13	622,185	1,122 0 0	.....	126 0 0	1,122 0 0	192 16 0	29 July, 1903	
Moomin	51,500	30 74	251,011	849 11 4	.....	111 15 0	849 11 4	199 11 10	18 Dec., 1907	
Mungyer	66,980	36 48	924,990	1,130 0 10	2,728 15 4	.....	3,858 16 2	220 14 8	2 Sept., 1908	£6,048 13s. 4d., actual cost of bore.
Neargo	67,200	30 55	1,044,749	636 0 5	3,115 19 7	.....	3,812 0 0	226 19 0	24 April, 1907	£6,122 16s. 11d., actual cost of bore.
Old Gnomery	159,360	31 23	557,930	520 6 8	3,612 3 4	.....	4,132 10 0	246 0 8	4 Feb., 1908	
Oreel, No. 1	73,280	49 54	875,840	1,530 0 0	3,326 13 7	.....	4,856 13 7	289 2 11	21 Aug., 1907	
Oreel, No. 2	72,345	51 26	963,329	1,720 13 8	3,937 3 5	.....	5,657 17 1	336 16 11	15 Jan., 1908	
Talmoi	92,615	57 20	958,784	1,199 14 5	3,637 15 11	.....	4,837 11 4	288 0 1	2 Feb., 1910	
Telleraga	64,000	26 5	548,803	1,260 0 6	2,706 1 3	.....	3,966 1 9	236 2 6	9 Sept., 1908	
Three Corners	34,560	7 6	67,994	284 5 2	1,245 19 2	.....	1,530 4 4	91 16 4	30 June, 1905	
Tulloona	89,600	49 5	637,124	1,283 9 0	.....	220 0 0	1,283 9 0	296 8 2	12 ,, 1907	
Tycannah	54,720	36 5	137,604	886 16 3	2,255 16 2	.....	3,142 12 5	187 2 0	8 July, 1908	
Tyreel	91,520	59 31	793,093	1,405 10 11	3,038 9 1	.....	4,444 0 0	264 11 7	2 Feb., 1910	
Ulumbie	28,362	24 20	467,600	576 3 0	2,771 17 2	.....	3,348 0 2	199 8 6	8 Oct., 1906	
Uranbah	92,500	56 27	698,080	928 19 10	.....	150 0 0	928 19 10	205 6 2	16 Jan., 1907	
Walgett	693	Nil	1,163,710	2,530 0 9	.....	76 0 0	2,540 11 5	226 13 7	20 Mar., 1907	£2,530 0s. 9d. for reticulation.
Weetaliba	44,800	33 18	592,588	1,424 14 9	1,961 15 1	.....	3,386 9 10	201 12 4	28 April, 1909	
Welbondonga	70,599	46 22	1,097,420	908 4 9	3,926 5 5	.....	4,834 10 2	287 16 5	21 July, 1909	
Youendah	51,714	24 45	371,977	759 9 5	2,384 0 0	144 0 0	759 9 5	189 4 4	3 ,, 1907	
	2,348,683	1,838 57	22,794,389	35,948 5 0	71,350 7 10	2,137 1 0	104,925 3 6	8,440 17 0	.....	

ARTESIAN BORE TRUSTS—*continued.*

(UNDER CONSTRUCTION.)

Name.	Area.	Length of Drains.	Flow of Bore per diem.	Cost of Water per annum if bore not in Trust.	Estimated Cost.
	acres.	mls. ch.	gallons.	£	£
Baroma	74,880	39 66	.....	....	4,500
Boolooroo	43,360	33 33	....	....	4,600
Boronga	133,760	73 48	1,062,133	.....	6,725
Bunyah	78,720	58 5	.....	.....	4,260
Coolleearlee	78,720	60 15	....	.....	4,620
Coubal	106,560	66 57	1,097,420	.....	5,863
Currumbah	90,240	46 5	1,010,154	.. ..	5,420
Drildool	95,360	64 37	1,083,735	.....	3,820
Four Posts	99,680	57 60	.....	.....	6,410
Gurley Siding	49,920	35 15	.....	.....	3,725
Gilgooma	60,480	56 27	.....	.....	4,620
Nowley	109,280	74 15	....	.....	4,665
Sherwood	79,360	46 60	943,490	.....	3,800
3 B (Gorian)	55,520	41 25	1,229,915	154	1,175
Tunda	25,280	21 30	841,772	75	532
Yowie	31,440	33 5	.....	.....	3,834
	Proposals gazetted but not yet constituted.				
Beanbah	51,840	41 43	989,495	210	1,910
Munna Munna	86,720	53 42	825,410	253	1,675

LIST AND PARTICULARS OF SWAMPS.

Name.	River.	Approximate area of Trust District.	Total or Estimated Cost.	Annual Payment to Crown for 28 Years.	Remarks.
		acres.	£ s. d.	£ s. d.	
Duranbah	Tweed	4,800	1,900 0 0	.....	Works under construction.
Black's Drain	,,	2,155	836 19 0	49 16 8	Works handed over to Trustees.
Terranora	,,	1,535	179 7 7	10 13 8	,, ,,
Trutes	,,	2,500	2,620 0 0	.....	Proposal cancelled.
Murwillumbah	,,	700	1,615 0 0	.....	Trust constituted.
Lavender	,,	.....	.....	.....	Survey completed.
Cudgen	Coastal	.....	.....	.....	,, ,,
Cudgera	,,	.....	.....	.....	,, ,,
Mooball and Crabbe's	,,	6,560	8,600 0 0	.....	Works under construction.
Myocum	Brunswick	945	1,330 0 0	.....	Trust constituted.
Belongil	Byron Bay	2,390	2,700 0 0	.....	Proposal gazetted.
Newrybar	Richmond	8,746	12,950 0 0	.....	Works under construction.
Reedy Creek	,,	.....	.....	.....	Survey completed.
Tuckean	,,	13,050	.....	.....	Trust proposal prepared for gazettal.
North Casino	,,	6,205	6,660 0 0	.....	Works under construction.
Tuckean Flood Escape	,,	85,000	114,000 0 0	.....	Trust proposal prepared for gazettal.
Lake Swamp	Clarence	.....	.....	.....	Survey completed.
James Creek	,,	.....	.....	.....	,, ,,
Martin	,,	.....	.....	.....	,, ,,
Chatsworth	,,	.....	.....	.....	,, ,,
Shark Creek	,,	2,747	4,500 0 0	.....	Trust proposal gazetted.
Little Broadwater	,,	970	700 0 0	.....	Trust constituted.
Duck	,,	1,790	2,660 0 0	.....	Trust proposal gazetted and objected to.
Ulmarra	,,	13,920	3,970 0 0	.....	(As to actual cost, &c.)
Alipou	,,	900	900 0 0	.....	Trust constituted.
Gladstone	Macleay	5,660	5,374 0 0	.....	Proposal gazetted.
Cooroobongatti	,,	5,750	4,883 14 3	291 1 0	Works handed over to Trustees.
Frogmore	,,	.....	.....	.....	Proposal under preparation.
Glen Rock and Tennessee	,,	3,170	8,900 0 0	.....	Proposal cancelled.
Seven Oaks	,,	15,680	40,000 0 0	.....	,, ,,
Gumma Gumma	Nambucca	2,045	2,430 0 0	.....	,, ,,
Big Swamp	Manning	6,560	7,797 12 8	234 14 7	Works handed over to Trustees.
Anna Bay	Hunter	2,486	1,426 0 0	.....	Proposal gazetted.
Nelson's Plains	,,	1,826	200 0 0	18 6 8	Works handed over to Trustees.
Grahamstown	,,	12,380	16,660 0 0	.....	Work under construction.
Hinton	,,	3,207	6,665 0 0	.....	Proposal gazetted.
Louth Park	,,	.....	.....	.....	Survey completed.
Brundee	Crookhaven	6,030	980 11 4	43 8 9	Works handed over to Trustees.
Curl Curl	Manly	465	3,750 0 0	.....	Work under construction.
Sans Souci	Rockdale	485	3,500 0 0	.....	Proposal cancelled.
		220,857	263,073 4 10	648 1 4	

ANALYSES OF ARTESIAN AND SUB-ARTESIAN WATERS, NEW SOUTH WALES.

By John C. H. Mingaye, F.I.C., F.C.S., Analyst, and Harold P. White, Assistant Analyst, Chemical Laboratory, Department of Mines.

GRAINS per Imperial Gallon.

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na_2CO_3).	Potassium Carbonate (K_2CO_3).	Calcium Carbonate ($CaCO_3$).	Magnesium Carbonate ($MgCO_3$).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride ($MgCl_2$).	Sodium Sulphate (Na_2SO_4).	Potassium Sulphate (K_2SO_4).	Iron Oxide and Alumina (Fe_2O_3 and Al_2O_3).	Silica (SiO_2).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts	Remarks
Angledool (P)	27 July, 1908	52·748	trace.	0·449	trace.	9·331	.....	.....	absent.	.....	trace.	2·072	64·600	·9228	
Artesia (G)	6 Aug., 1909	38·122	,,	1·400	·399	14·062	.....	.....	,,	.....	,,	1·176	55·159	·7850	B_2O_3 a trace.
Bancanya (G)	10 April, 1895	47·469	.....	5·150	10 697	171·912	.. ...	.....	17·743	.....	·210	·420	253·601	3·6226	
Bangate, No. 1 (P)	16 Nov., 1908	33·837	trace.	·299	trace.	7·646	.....	.....	absent.	.....	nil.	1·652	43·434	·6204	B_2O_3 a minute trace.
,, No. 2 (P)	19 ,, 1908	35 994	,,	·357	,,	7·395	.....	.....	,,	.....	trace.	1·680	45·426	·6489	B_2O_3 a strong trace.
Barringun (G)	3 Jan., 1893	23·932	6·104	·350	.....	6·739	.....	.....	.....	.....	·252	1·736	39·113	·5588	
Beanbah No. 1, deepened (P)	8 Dec., 1909	19·546	1·937	5·296	2·076	4·062	.....	.....	2·286	.....	·056	1·425	36·687	·5238	B_2O_3 absent.
,, No. 2 (I.L.)	9 Oct., 1905	24·577	1·419	4·050	1·303	3·503	.....	.....	1·450	.....	trace.	1·246	37·548	·5364	
,, No. 2 (I.L.)	4 June, 1907	21·884	1·890	3·599	1·217	3·925	.....	.....	1·466	.....	,,	1·596	35·577	·5083	B_2O_3 ,,
Belalie (G)	21 Nov., 1893	27·773	1·269	·649	trace.	7·909	.....	.....	.....	.....	,,	1·260	39·784	·5683	
,, No. 1 (P)	29 Jan., 1898	33·992	trace.	·642	,,	6 916	.....	.....	.....	.....	·112	1·792	43·454	·6208	
,, No. 1 (P)	26 Oct., 1909	34·966	,,	·649	,,	6·961	.....	.....	absent.	.....	·140	2·100	44·816	·6401	B_2O_3 a trace.
,, No. 2 (P)	29 Jan., 1898	29·040	,,	1·000	·317	6·699	.....	.....	.....	.....	·280	1·932	39·267	·5609	
,, No. 2 (P)	4 June, 1909	21·728	nil.	·500	nil.	7·601	.....	.....	nil.	.....	·112	1·288	31·229	·4461	B_2O_3 absent.
,, No. 3 (P)	4 May, 1899	24·308	trace.	·599	·105	6·573	.....	.....	.....	.....	trace.	1·540	33·125	·4732	
,, No. 3 (P)	8 June, 1909	24·578	,,	·449	trace	6·580	.....	.....	nil.	.....	,,	1·540	33·147	·4735	B_2O_3 a trace.
Benah (I.L.)	16 ,, 1906	29.011	,,	·589	·249	2·558	.....	.....	absent	.....	·140	1·428	33·975	·4852	
Biblah (P)	15 Jan., 1906	51·324	,,	·637	·204	8·730	.....	.....	,,	.....	trace	1·442	62·337	·8905	
,, (P)	3 May, 1907	50·105	,,	·700	·084	10·356	.....	.....	,,	.....	,,	1·484	62·729	·8961	
Bimble (P)	11 Jan., 1906	23·675	,,	3·000	·556	3·686	.....	.....	1·389	.....	,,	1·582	33·868	·4836	
,, (P)	26 Mar., 1907	22·619	·972	3·000	·576	3·578	.....	.....	1·466	.....	·112	1·876	34·199	·4884	
Bogamildi (P)	27 April, 1908	33·496	trace.	·338	trace.	6·987	.....	.....	·647	.....	trace.	1·540	43·008	·6143	A trace of boric acid (B_2O_3) detected.
Bogewong (G)	15 Dec., 1908	37·609	absent.	·199	,,	11·436	.....	.....	absent.	.....	·252	1·848	51 344	·7334	B_2O_3 a strong trace.
Bomuckledi (G)	12 Oct., 1908	36·093	,,	·399	,,	8·377	.....	.....	,,	.....	trace.	1·512	46·381	·6626	No B_2O_3 present.
Boobora (G)	3 Dec., 1909	29·446	·271	·799	,,	10·910	.....	.....	2·081	.....	·140	1·904	45·551	·6505	B_2O_3 a minute trace.
Boolooroo (P)	25 July, 1906	35·597	trace.	·550	·157	7·133	.....	.....	absent.	.....	trace.	1·540	44·977	·6426	
,, at a depth of 1,411 feet (G)	23 June, 1910	54·355	absent.	·499	trace.	17·877	.....	.....	,,	.....	·196	1·736	74·663	1·0666	B_2O_3 a trace.
,, at a depth of 2,215 feet (G)	24 Aug , 1910	36·315	0·214	·450	absent.	6·643	.....	.....	,,	.....	trace.	1·736	45·358	·6478	B_2O_3 absent; strontia a minute trace.
Boomi, (G)	31 ,, 1906	30·759	·142	·725	·156	8·514	... ..	.....	2·643	.....	,,	2·002	44·941	·6419	
Bourbah (G)	.....	23·36	.....	1·12	·84	2·96	trace.	.....	.....	.....	.....	1·26	29·54	·422	
Bouka (I.L)	24 July, 1907	40·123	trace.	·499	·127	7·065	.....	... ..	absent.	.....	trace.	1·764	49·578	·7082	
Bourke (G)	20 Jan., 1892	20·941	2·952	.....	trace.	8·445	.....	.....	.....	.....	,,	1·960	34·298	·4899	
Box Camp (I.L.)	31 July, 1906	35·607	trace.	·549	·084	2·389	.....	.....	absent.	.....	,,	1·344	39·973	·5710	
Brewon, No. 1 (I.L.)	4 Nov., 1904	41·060	absent.	1·000	trace.	7·375	.....	.....	. ...	... ..	,,	1·288	50·723	·7246	
,, No. 2 (I.L.)	4 ,, 1904	42·155	,,	·821	,,	6·888	... ..	.....	.....	.....	,,	1·260	51·124	·7303	
,, No. 3 (I.L.)	27 Dec., 1905	39·152	trace.	·407	,,	7·269	.....	.....	.....	.....	,,	1·274	48·102	·6871	
,, No. 4 (I.L.)	5 Feb., 1907	40 393	absent.	·499	·105	7·327	.....	.....	absent.	.....	,,	1·484	49·808	·7114	
Brigalow (G)	1 ,, 1896	31·254	2·674	·914	trace.	7·647	.....	.....	.....	.. ..	·476	1·540	45·387	·6484	
,, (G)	20 April, 1909	33·244	·349	·899	·190	7·994	.....	.....	absent.	.....	trace.	1·288	43·955	·6278	B_2O_3 a trace.
Brigalows (I.L.)	27 Dec., 1905	42·121	trace.	·562	trace.	7·212	.....	.....	.....	. ...	,,	1·232	51·127	·7303	
Bryanungra at a depth of 2,075 ft. (P)	28 June, 1910	56·484	absent.	·750	·296	25·952	.....	.....	·136	.....	·196	2·044	85·858	1·2264	B_2O_3 ,,
,, at a depth of 3,050 ft. (P)	6 Oct., 1910	34·793	trace.	·200	·190	7·167	.....	.....	·238	.....	·420	1·932	44·940	·6421	
Buckinguy, No. 1 (P)	19 Nov., 1908	38·296	,,	·775	·189	3·370	.....	.....	absent.	.....	trace.	1·204	43·834	·6261	B_2O_3 ,,
,, No. 2 (P)	23 ,, 1908	35·191	,,	·750	trace.	6·573	.....	.....	,,	.....	·112	1·512	44·138	·6305	B_2O_3 ,,
Bulgah (P)	15 Jan., 1906	36·523	1·714	3·437	·078	3·560	.....	.....	2·450	.....	trace.	1·498	49·260	·7036	
,, (P)	3 May, 1907	35·784	1·145	3·850	1·134	4·056	.....	.. ...	2·353	.....	..	1·876	50·198	·7170	B_2O_3 absent.

NOTE.—Government bores marked (G). Improvement lease bores marked (I.L.) Country Town Water Supply bores marked (C.T.W.S.) Private bores marked (P).

ANALYSES of Artesian and sub-Artesian Waters, New South Wales—*continued.*

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na_2CO_3).	Potassium Carbonate (K_2CO_3).	Calcium Carbonate ($CaCO_3$).	Magnesium Carbonate ($MgCO_3$).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride ($MgCl_2$).	Sodium Sulphate (Na_2SO_4).	Potassium Sulphate (K_2SO_4).	Iron Oxide and Alumina (Fe_2O_3 and Al_2O_3).	Silica (SiO_2).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts.	Remarks.
Bullagreen (P)	25 July, 1906	28·390	trace.	·649	·127	5·734	.....	.....	1·157	.....	·056	1·176	37·289	·5326	
Bulyeroi (G)	24 Dec., 1897	45·32	,,	·94	.....	6·27	.....	.....	.....	.....	·42	1·76	54·71	·782	
Bunaba (P)	29 Oct., 1908	36·352	·172	·400	trace.	5·889	.....	.....	trace.	.....	trace.	1·960	44·773	·6395	No B_2O_3 present.
Bundy (P)	5 Mar., 1906	27·837	·446	·900	·168	3·343	.....	.....	2·049	.....	,,	1·890	36·633	·5230	
,, (P)	4 June, 1907	29·808	·341	·750	·231	3·943	.....	.....	1·568	.....	·084	1·848	38·573	·5510	B_2O_3 absent.
Bungle Gully (I.L.)	17 Nov., 1909	38·867	·701	1·249	·593	3·537	.....	.....	1·603	.....	·168	2·380	49·098	·7013	B_2O_3 a trace.
Bunna Bunna, No 1 (P)	18 Sept., 1906	38·276	trace.	·450	·231	5·786	.....	.....	absent.	.....	trace.	1·456	46·199	·6599	A trace of boric acid (B_2O_3) detected.
,, No. 1 (P)	8 Jan., 1909	39·147	,,	·774	·127	5·408	.....	.....	nil.	.....	·042	1·624	46·922	·6703	B_2O_3 a minute trace.
,, No. 2 (P)	8 ,, 1909	44·804	,,	·685	·169	6·322	.....	.....	,,	.....	·034	1·764	53·828	·7689	B_2O_3 a trace.
Burrawang No. 2 (I.L.)	27 ,, 1905	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1802·000	25·7428	
Butterbone, No. 1 (P)	19 Nov., 1898	36·913	trace.	·899	210	3·468	.....	.....	.....	.....	trace.	1·428	42·118	·6017	
,, No. 2 (P)	22 Mar., 1899	31·467	,,	·649	·211	3·229	.....	.....	.....	.....	,,	1·428	36·984	·5283	
,, No. 3 (P)	24 July, 1907	37·461	absent.	·399	·169	3·428	.....	.....	absent.	.....	·168	1·078	42·703	·6100	B_2O_3 absent.
,, No. 4 (P)	7 Aug., 1907	34·067	trace.	·849	·296	3·081	.....	.....	,,	.....	·034	1·764	40·141	·5734	
,, No. 5 (P)	12 ,, 1907	30·784	,,	·900	·336	2·470	.....	.....	,,	.....	·112	1·176	35·758	·5107	B_2O_3 a trace.
,, No. 6 (P)	12 ,, 1907	40·139	,,	1·200	·189	3·464	.....	.....	,,	.....	·084	1·456	46·732	·6647	B_2O_3 absent.
Calga, No. 1 (P)	16 May, 1904	5·016	.....	4·225	2·900	4·314	.....	.....	.....	3·014	trace.	1·148	20·517	·2945	
Calga, No. 1 (P)	22 Mar., 1906	4·677	1·961	5·750	3·005	5·090	.....	.....	2·252	.....	·840	1·960	25·535	·3660	
,, No. 2 (P)	22 Mar., 1906	2·569	1·642	5·200	3·090	4·062	.....	.....	2·491	.....	·728	1·708	21·490	·3038	
,, No. 3 (P)	24 ,, 1906	6·178	2·551	6·750	3·746	2·168	.....	.....	1·151	.....	·364	1·456	24·364	·3478	
,, No. 4 (P)	2 May, 1907	2·722	2·302	4·499	2·860	4·217	.....	.....	2·490	.....	trace.	·980	20·070	·2865	B_2O_3 absent.
Careunga (G)	14 Feb., 1905	34·686	trace.	·275	trace.	7·897	.....	.....	·954	.....	,,	1·554	45·366	·6481	
Carinda (G)	17 June, 1897	42·529	2·379	·549	,,	10·226	.....	.....	.....	.....	·224	1·400	57·307	·8187	
Carney's Tree (P)	27 July, 1906	41·296	trace.	1·050	·336	4·679	.....	.....	absent.	.....	trace.	1·540	48·901	·6985	
Carwell (P)	18 Sept., 1906	45·755	·036	·650	·115	8·673	.....	.....	absent.	.....	·084	1·428	56·791	·8112	
Cherrigorang (P)	20 Aug., 1907	42·813	·175	·850	·357	7·156	.....	.....	absent.	.....	trace.	1·316	52·667	·7523	B_2O_3 trace.
Cherrigorang, at a depth of 1,558 feet (P)	8 Sept. 1910	36·723	·135	·950	·360	3·561	.....	.....	,,	.....	trace.	1·512	43·241	·6175	B_2O_3 a trace; a minute trace of strontia and lithia.
,, ,, 2,030 ,, (P)	8 ,, 1910	23·845	1·275	3·600	·974	1·575	.....	.....	·545	.....	,,	1·344	33·158	·4736	B_2O_3 absent; a minute trace of strontia and lithia.
,, ,, 2,062 ,, (P)	8 ,, 1910	22·876	1·411	3·450	·995	1·575	.....	.....	·580	.....	,,	1·204	32·091	·4582	B_2O_3 absent; a minute trace of strontia and lithia.
Cherrigorang (completed). All flows admitted, 2,082 feet. (P)	8 ,, 1910	24·408	1·132	3·300	·911	2·031	.....	.....	·580	.....	trace.	1·428	33·790	·4825	B_2O_3 absent; a minute trace of strontia and lithia.
Clifton (G)	20 June, 1895	98·180	1·641	1·699	·953	21·480	.....	.....	.....	.....	·166	1·708	125·830	1·7974	
Combadelo (P)	14 Sept., 1905	36·234	trace.	·700	·084	5·694	.....	.....	.....	.....	trace.	1·274	43·986	·6284	
Combogolong, (I.L. 823)	13 Mar., 1906	55·058	·154	·400	·190	11·469	.....	.....	absent.	.....	,,	1·652	68·932	·9846	
,, (I.L. 1,161)	6 April, 1906	55·312	trace.	·749	trace.	7·464	.....	.....	,,	.....	,,	1·764	65·289	·9327	
Come-by-Chance (P)	26 ,, 1906	50·171	absent.	·399	·084	8·994	.....	.....	.....	.....	,,	1·512	61·160	·8738	
,, ,, (P)	7 Mar., 1907	45·834	trace.	·550	trace.	7·202	.....	.....	absent.	.....	,,	1·876	55·462	·7922	A trace of boric acid (B_2O_3) detected.
Conimbia (P)	21 Aug., 1906	45·942	,,	·400	,,	9·071	.....	.....	,,	.....	,,	1·540	56·953	·8136	
Coolabah (G)	16 Nov., 1900	46·502	·237	·875	·982	8·873	.....	.....	.....	.....	·280	1·890	59·639	·8519	
Coonamble, No. 1, at a depth of 1,020 feet. (C.T.W.S.)	24 Aug, 1893	40·00	.....	1·12	trace.	6·91	.....	.....	.....	.....	.....	...	48·03	·6861	
,, No. 1 (C.T.W.S.)	24 Aug., 1910	8·878	3·333	10·700	2·370	2·602	.....	.....	1·569	.....	trace.	1·820	31·272	·4465	B_2O_3 a minute trace;

,, No. 1 (P)	10 Feb., 1892	27·813	7·170	1·000	·336	8·733	.....	.....	.....	.....	trace.	1·288	46·340	·6620		
,, No. 2 (P)	28 Nov., 1908	35·213	trace.	1·099	·635	11·255	.....	.....	,,	.....	trace.	1·568	49·770	·7110	B_2O_3	,,
,, No. 2 (P)	13 Mar., 1893	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50·316	·7188		
,, No. 3 (P)	28 Nov., 1908	33·714	,,	·850	·168	7·224	.....	.....	absent.	.....	,,	1·736	43·692	·6241	B_2O_3	,,
,, No. 3 (P)	13 Mar., 1893	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56·868	·8124		
Coubal (G)	27 Oct., 1908	29·494	trace.	·450	absent	7·961	.....	.....	nil.	.....	·084	1·792	39·781	·5682	B_2O_3 a minute trace.	
Currabulla (G)	20 Nov., 1895	43·212	·940	1·499	·678	10·818	.....	.....	.....	.....	trace.	1·512	58·659	·8380		
Cuttabunda (P)	22 Oct., 1908	33·715	trace.	·219	absent.	7·418	.....	.....	nil.	.....	trace.	1·904	43·336	·6189	B_2O_3 a minute trace.	
Cuttaburra (G)	22 Aug., 1889	6·712	.....	C 354	·336	349·040	trace.	4·190	.....	.....	·112	1·596	396·872	5·6696		
Darnley Chase (P)	23 June, 1908	33·967	·142	·887	·168	6·290	.....	.....	1·705	.....	trace.	1·652	44·811	·6399	A trace of boric acid (B_2O_3) detected.	
Dobikin (P)	11 Jan., 1909	40·384	trace.	·500	trace.	7·814	.....	.....	absent.	.....	,,	1·400	50·098	·7156	B_2O_3 a minute trace.	
Dolgelly (G)	17 June, 1897	33·819	,,	·348	,,	7·829	.....	.....	1·876	.....	,,	1·904	45·776	·6539		
Dolmoreve (from shaft by pump)	20 Feb., 1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	164·136	2·3448		
,, (well bore)	28 ,, 1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	163·632	2·3376		
Dungle Ridge (G)	18 Mar., 1895	52·564	6·945	·324	2·528	15·936	.....	.....	.....	.....	.....	1·792	80·059	1·1441		
Ellerslie (P)	28 Dec., 1908	17·458	1·857	2·599	1·186	1·552	.....	.....	·750	.....	·140	1·568	27·110	·3871	B_2O_3 absent.	
Emby (P)	25 July, 1905	43·972	trace.	·349	·275	9·770	.....	.....	.....	.....	trace.	1·484	55·850	·7978		
Enngonia (G)	21 Nov., 1893	30·367	4·741	1·199	.....	7·745	.....	.....	.....	.....	,,	1·694	45·746	·6535		
Erlside, Quigley's (P)	12 Sept., 1906	35·000	trace.	·549	·148	2·602	.....	.....	·237	.....	·084	1·596	40·216	·5743	,, a trace	
Eulawah (P)	14 Oct., 1907	31·133	trace.	·900	·273	4·975	.....	.....	·477	.....	·084	1·596	39·438	·5632	,, absent	
Euraba (G)	31 July, 1905	34·872	·295	·421	·140	8·388	.....	.....	2·046	.....	trace.	1·540	47·702	·6815		
Euroka (P)	16 June, 1896	45·561	5·577	·249	·286	6·721	.....	.....	.....	.....	,,	·980	60·326	·8615	Organic matter, 0·952.	
,, (P)	9 May, 1906	56·156	trace.	·500	·273	15·578	.....	.....	absent.	.....	,,	1·554	74·061	1·0579		
Federal Park (P)	7 Aug., 1907	45·817	·070	·700	·147	7·453	.....	.....	,,	.....	·084	2·016	56·287	·8040	B_2O_3 absent.	
Ford's Bridge Bore (G)	4 Dec., 1909	32·188	trace.	1·299	·466	20·611	.....	.....	·068	.....	·112	1·148	55·892	·7982	B_2O_3 a trace.	
Fort Bourke, No. 1 (P)	3 ,, 1908	33·888	,,	·899	·060	13·171	.....	.....	nil.	.....	·140	2·072	50·230	·7176	B_2O_3 trace.	
,, No. 2 (P)	3 May, 1907	31·111	,,	1·700	·252	25·861	.....	.....	absent.	.....	trace.	1·456	60·380	·8625	,,	
,, No. 3 (P)	12 Oct., 1908	34·579	,,	·549	trace.	7·669	.....	.....	,,	.....	,,	1·596	44·393	·6340	A minute trace of B_2O_3 detected.	
,, No. 4 (P)	25 Sept., 1908	35·917	,,	·500	·273	12·884	.....	.....	,,	.....	·168	1·260	51·002	·7285	B_2O_3 trace.	
,, No. 5 (P)	25 ,, 1908	35·243	absent.	1·750	·656	28·439	.....	.....	,,	.....	·084	1·176	67·348	·9622	B_2O_3 strong reaction.	
Gaffney's (G)	23 Mar., 1905	.....	.....	10·500	4·009	246·215	trace.	10·077	.....	.....	trace.	·448	271·249	3·8892		
Galargambone (G)	19 Aug., 1905	17·716	·435	3·187	·767	2·910	.....	.....	·830	.....	,,	1·463	27·308	·3901		
Gidgea Camp (G)	31 Mar., 1904	35·392	trace.	1·250	trace.	9·686	.....	.....	.....	.....	·091	1·351	47·770	·6824		
Gidgea Camp (G)	21 May, 1895	30·712	3·347	1·299	·267	10·431	.....	.....	.....	.....	·168	1·344	47·568	·6794		
Gilgandra (G)	13 July, 1897	20·070	trace.	3·946	1·991	149·219	.....	.....	19·269	trace.	·420	1·176	196·091	2·8013		
Gil Gil (G)	.....	32·630	1·701	·499	·127	7·258	.....	.....	.....	.....	trace.	1·764	43·979	·6282		
,, (G)	26 Aug., 1907	35·535	trace.	·200	·042	7·075	.....	.....	·170	.....	·028	1·400	44·450	·6348	B_2O_3 trace.	
Gilgoin, No. 1 (I.L.)	27 Dec., 1905	41·007	,,	·512	·063	7·098	.....	.....	.....	.....	trace.	1·302	49·982	·7140		
,, No. 2 (I.L.)	27 ,, 1905	43·013	,,	·700	·136	6·984	.....	.....	.....	.....	,,	1·372	52·205	·7456		
Ginghet (I.L.)	27 ,, 1905	42·383	,,	·525	·137	6·699	.....	.....	.....	.....	,,	1·022	50·766	·7251		
,, (G)	22 June, 1907	40·653	,,	·799	·127	7·068	.....	.....	absent.	.....	,,	1·792	50·439	·7205	,,	,,
Gingie (P)	13 May, 1908	36·753	,,	·475	trace.	7·509	.....	.....	,,	.....	,,	1·652	46·389	·6626	B_2O_3 absent.	
Glenalbyn (G)	25 Nov., 1908	35·567	,,	·803	·127	7·305	.....	.....	,,	.....	,,	1·764	45·566	·6509	B_2O_3 trace.	
Glengeera (P)	13 ,, 1908	34·635	nil.	·724	·127	7·052	.....	.....	nil.	.....	nil.	1·512	44·070	·6295	,,	,,
Gnomery (P)	8 ,, 1909	41·396	trace.	·399	trace.	7·395	.....	.....	absent.	.....	·056	1·946	51·192	·7312	,,	,,
Goangra (G)	10 Mar., 1904	55·185	·252	·500	·084	17·346	.....	.....	.....	.....	trace.	1·540	74·907	1·0701		
Goolring (P)	11 June, 1909	27·000	trace.	·446	trace.	6·985	.....	.....	absent.	.....	,,	1·596	36·027	·5146	B_2O_3 a minute trace.	
Goonal (P)	29 Mar., 1909	40·324	,,	·650	,,	6·032	.....	.....	,,	.....	,,	1·988	48·994	·6998	B_2O_3 a faint trace.	
Goonery (G.)	3 May, 1904	28·746	,,	·550	·360	9·038	.....	.....	.....	.....	,,	1·624	40·318	·5759		
Goorianawa, No. 1 (P)	5 April, 1906	3·893	1·447	5·149	5·212	2·785	.....	.....	1·091	.....	,,	1·326	20·903	·2986		
,, No. 6 (P)	11 Nov., 1908	2·640	1.693	6·299	3·729	2·259	.....	.....	1·022	.....	,,	1·624	19·266	·2750	B_2O_3 absent.	
Goondablui, No. 1 (P)	10 Sept., 1908	65·441	trace.	·446	trace.	19·153	.....	.....	absent.	.....	,,	1·820	86·860	1·2408	B_2O_3 strong reaction.	
,, No. 2 (P)	10 ,, 1908	63·031	·211	·450	,,	13·866	.....	.....	,,	.....	,,	2·072	79·630	1·1375	,,	,,
,, No. 3 (P)	12 ,, 1908	59·019	trace.	·300	,,	21·447	.....	.....	,,	.....	,,	1·736	82·502	1·1786	,,	,,

ANALYSES of Artesian and sub-Artesian Waters, New South Wales—*continued.*

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na_2CO_3).	Potassium Carbonate (K_2CO_3).	Calcium Carbonate ($CaCO_3$).	Magnesium Carbonate ($MgCO_3$).	Sodium Chloride ($NaCl$).	Potassium Chloride (KCl).	Magnesium Chloride ($MgCl_2$).	Sodium Sulphate (Na_2SO_4).	Potassium Sulphate (K_2SO_4).	Iron Oxide and Alumina (Fe_2O_3 and Al_2O_3).	Silica (SiO_2).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1,000 parts	Remarks.
Gurley, No. 2 (P)	8 Jan., 1907	33·825	trace.	·599	·635	6·557	.....	.....	absent.	.....	trace.	1·484	43·100	·6145	B_2O_3 trace.
Haddon Rigg (G.)	30 Sept., 1903	28·974	,,	·400	·137	2·761	.....	.....	.....	.....	,,	·994	33·266	·4752	
,, No. 1 (P.)	19 Oct., 1899	33·943	,,	·750	trace.	5·734	.....	.....	.....	.....	,,	·980	41·407	·5915	
,, No. 2 (P.)	6 April, 1900	41·684	,,	·900	·402	9·154	.....	.....	.....	.....	,,	1·260	53 400	·7626	B_2O_3 a slight trace.
,, No. 2 (P.)	10 Sept., 1906	27·694	·219	·975	·283	3·857	.....	.....	trace.	.....	,,	1·372	34·400	·4913	,, ,,
Hollywood (G.)	28 July, 1908	21·762	5·325	4·899	3·538	3·126	.....	.....	1·808	.....	·014	1·624	42·096	·6011	B_2O_3 absent.
Hungerford, No. 2 (in Q'sland) G.	10 Mar., 1904	28·365	·528	1·650	2·265	48·678	.....	.....	.....	.....	trace.	1·050	82·536	1·1791	
Jew's Lagoon (P.)	8 Jan., 1909	41·675	trace.	·549	·042	5·632	.....	.....	absent.	.....	,,	1·456	49·354	·7049	B_2O_3 a trace.
Kelly's Camp (G.)	21 Nov., 1893	16·869	5·666	·689	trace.	7·909	.....	.....	.....	.....	·196	1·316	35·081	·5011	
Kenmare (G.)	16 Dec., 1898	25·966	trace.	1·050	,,	7·235	.....	.....	.....	.....	.....	1·372	35·623	·5088	
Kensington (G.)	10 Mar., 1904	48·301	·448	·450	·243	6·904	.....	.....	.....	.....	trace.	1·330	57·676	·8239	
Kerribree (G.)	21 Nov., 1893	17·596	6·377	·649	.....	7·745	.....	.....	.....	.....	,,	·980	34·335	·4905	
Kialgara (I.L.)	21 Mar., 1907	32·572	·334	1·050	·357	4·717	.....	.....	trace.	.....	·168	1·540	40·738	·5819	B_2O_3 absent.
Kiameron, (I.L.)	27 July, 1906	43·861	trace.	·600	·210	4·508	.....	.....	absent.	... ..	trace.	1·456	50·635	·7233	
Kiga (G.)	1 ,, 1904	32·806	,,	·196	trace.	6·937	.....	.....	1·020	.....	,,	1·484	42·443	·6063	
Krui (P.)	24 Dec., 1906	40·453	,,	·299	·127	5·637	.....	.....	absent.	.....	·028	1·428	47·972	·6852	
Kurrawa (P.)	12 Aug., 1907	7·074	1·411	6·100	1·714	2·484	.....	.....	1·227	.....	·168	1·624	21·802	·3113	B_2O_3 trace.
Landers(P.)	25 June, 1906	34·832	trace.	1·250	·296	5·934	.....	.....	trace.	.....	trace.	1·526	43·838	·6261	
,, (P.)	7 Aug., 1907	32·324	,,	·750	·252	5·151	.....	.....	·443	.....	·168	1·372	40·460	·5779	,, ,,
Lila Spring, No. 1 (Cuttabulla No. 1) (P.)	21 Nov., 1908	33·902	,,	·649	·148	8·051	.....	.....	absent.	.....	·224	1·540	44·514	·6358	B_2O_3 a strong trace.
Lila Springs No. 2 (Cuttabulla No. 2) (P.)	4 ,, 1908	35·469	,,	·650	·147	7·190	.....	.....	Nil	.....	·084	1·288	44·828	·6404	
Lila Springs No. 3 (Wiree) (P.)	12 April, 1908	34·370	,,	·400	·168	6·779	.....	.....	Nil	.....	trace.	1·456	43·163	·6167	B_2O_3 absent.
Lissington No. 1 (P.)	9 Feb., 1909	38·877	,,	·450	trace	5·529	.....	.....	absent.	.....	,,	2·128	46·984	·6711	B_2O_3 a trace.
,, No. 2 (P.)	30 Dec., 1908	33·987	,,	·849	·127	6·893	.....	.....	,,	.....	,,	1·764	43·620	·6231	B_2O_3 a strong trace.
,, No. 3 (P.)	9 Feb., 1909	33·334	,,	·896	trace.	6·886	.....	.....	nil.	.....	,,	2·044	43·160	·6165	B_2O_3 a trace.
,, No. 4 (P.)	25 Nov., 1908	31·652	,,	·700	,,	7·372	.....	.....	absent.	.....	trace.	1·400	41·124	·5874	B_2O_3 a trace.
Llanillo (P.)	7 Aug., 1908	44·499	,,	·300	,,	7·612	.....	.....	,,	.....	,,	1·680	54·091	·7727	,, ,,
Loma (P)	2 Dec., 1907	42·257	,,	1·100	·252	6·642	.....	.....	,,	.....	,,	1·344	51·595	·7370	,, ,,
Lower Quambone (I.L.)	1 June, 1905	53·353	,,	·632	·196	6·537	.....	.....	.....	.....	trace.	1·512	62·230	·8890	
Mackenzie Point (G.)	8 Dec., 1904	40·268	,,	·575	trace.	7·782	.....	.....	.....	.....	·196	2·744	51·565	·7366	
Macsville (P.)	10 Sept., 1906	34·094	,,	·800	·189	4·268	.....	.....	·604	.....	·168	1·372	41·495	·5926	,, ,,
Marra (P.)	23 July, 1907	40·905	,,	·749	·317	7·008	.....	.....	·255	.....	·070	1·260	50·564	·7223	B_2O_3 absent.
Martindale (P.)	17 April, 1906	40·752	absent.	·449	trace.	7·099	.....	.....	.....	.. ...	trace.	1·708	50·008	·7144	
Mascotte (P.)	25 Sept., 1906	37·581	trace.	·700	,,	5·729	.....	.....	absent.	.....	·168	1·344	45·522	·6502	B_2O_3 a faint trace.
Merimba (P.)	30 Nov., 1907	42·175	,,	·709	·169	8·720	.....	.....	,,	.....	trace.	1·428	53·201	·7600	
Middle Paddock (I.L.)	26 July, 1907	34·385	absent.	·624	·105	3·458	.....	.....	,,	.....	·154	1·232	39·958	·5708	B_2O_3 a trace.
Midkin (No. 1) (P.)	6 April, 1906	35·456	trace.	·575	trace.	7·121	.....	.....	,,	.....	trace.	1·946	45·098	·6442	
,, No. 2 (P.)	26 Oct., 1908	33·247	,,	·549	,,	7·122	.....	.....	,,	.....	,,	1·596	42·514	·6072	B_2O_3 absent.
,, No. 3 (I.L.)	26 ,, 1908	34·721	,,	·298	,,	6·027	.....	.....	,,	.....	·140	2·072	43·258	·6179	,, ,,
Milchomi (G.)	9 Dec., 1904	51·082	,,	·799	·339	6·322	.....	.....	.....	.....	trace.	1·456	59·993	·8571	
Millie (G.)	28 ,, 1904	37·999	absent.	·425	·179	5·797	.....	.....	.. ...	.....	,,	1·218	45·618	·6517	
Mole, No. 1 (P.)	21 June, 1907	36·423	·671	·175	·148	8·926	.....	.....	absent.	.....	·294	1·484	48·121	·6873	B_2O_3 a trace.
,, No. 2 (I.L.)	21 ,, 1907	43·267	·689	·499	·189	6·299	.....	.....	,,	.....	trace.	1·512	52·455	·7492	,, ,,
,, No. 3 (P.)	20 Aug., 1907	39·693	·373	·700	·756	7·293	.....	.....	,,	.....	,,	1·400	50·215	·7173	,, ,,
Momba (G.)	20 Nov., 1905	... ..	.....	.....	.....	181·295	$\{(CaCl_2)\ 22·178\}$	27·965	$\{(CaSO_4)\ 11·971\}$	12·813	·140	·700	257·062	3·6722	
Moomin (G.)	24 Dec., 1906	43·866	trace.	·650	trace.	5·566	.....	.....	absent.	.....	trace.	1·624	51·706	·7386	
Moongulla (G.)	24 Jan., 1893	54·795	5·457	·800	.....	19·930	.....	.....	.....	.....	.....	2·072	83·063	1·1866	
Moorlands (P.)	15 June, 1906	7·731	2·129	6·100	2·919	3·994	.....	.....	1·228	.....	·112	1·148	25·361	·3622	
Moramina (G.)	22 April, 1898	45·56	trace.	1·00	·38	7·25	.....	.....	.....	.....	·28	1·68	56·15	·8021	
,, (G.)	14 May, 1908	45·355	,,	·168	trace.	7·395	.....	.....	absent.	.....	trace.	1·596	54·514	·7788	
												1·624	43·954	·6278	B_2O_3 absent.

„ (G.)	28 Aug., 1895	39·259	1·101	·642	·295	7·029	.....	.....	.....	.....	„	1·456	49·782	·7112	
Morendah (P.)	18 Nov., 1908	34·505	trace.	·350	trace.	7·715	.....	.....	absent.	.....	„	1·736	44·306	·6329	„ „
Morton's Plains (P.)	1 Oct., 1909	33·260	„	·349	„	7·304	.....	.....	„	.....	·140	1·456	42·509	·6071	„ trace
Morton Plains at a depth of about 750ft. (P.)	19 Jan., 1898	29·457	„	1·299	·720	35·956	.....	.....	.....	.....	·560	1·456	69·443	·9921	
„ at a depth of between 1658–1668ft. (P.)	19 „ 1898	34·198	„	·650	trace.	6·962	.....	.....	.....	.....	trace.	1·764	43·574	·6225	
Mount Tenandra, No. 1 (P.)	20 July, 1906	5·839	1·387	6·150	1·974	1·997	.....	.....	1·262	.....	·728	1·764	21·101	·3013	B_2O_3 absent.
„ No. 2 (P.)	28 Nov., 1906	5·757	·842	4·100	1·869	2·735	.....	.....	absent.	.....	·224	1·330	16·857	·2406	„ „
Muckerawa No. 1 (I.L.)	18 Dec., 1905	41·148	trace.	·312	·079	7·667	.....	.....	.....	.....	trace.	1·302	50·508	·7215	
„ No. 2 (P)	20 April, 1909	36·854	„	·399	·127	7·555	.....	.....	absent.	.....	„	1·792	46·727	·6675	B_2O_3 a trace.
Mulgany (G).	26 Nov., 1895	37·599	2·370	1·149	·127	8·788	.....	.....	.....	.....	„	1·680	51·713	·7387	
Multagoona, No. 1 (P)	24 Nov., 1909	25·168	trace.	·649	trace.	7·920	.....	.....	absent.	.....	·196	1·484	35·417	·5058	B_2O_3 a trace.
„ No. 2 (P)	19 „ 1909	30·954	„	1·149	·084	6·573	.....	.....	„	.....	·112	1·120	39·992	·5713	B_2O_3 a minute trace.
Mumblebone, No. 1 (P)	26 July, 1907	34·259	„	·399	·148	4·747	.....	.....	„	.....	·084	1·050	40·687	·5812	B_2O_3 a trace.
„ No. 3 (G)	6 Aug., 1907	32·588	·965	·799	·169	5·660	.....	.....	„	.....	trace.	1·112	41·293	·5898	„ „
Mundado (P)	24 July, 1907	48·890	·672	·875	·656	5·866	.....	.....	„	.....	·154	1·176	58·289	·8326	„ „
Mungie Bundie (P)	14 Mar., 1906	35·503	trace.	·450	·200	6·733	.....	.....	„	.....	·140	1·540	44·566	·6366	
Mungrabambone (I.L.)	17 Jan., 1906	43·182	·109	·675	·220	6·002	.....	.....	trace.	.....	trace.	2·016	52·205	·7456	
„ (I.L.)	12 April, 1906	43·195	trace.	·775	·199	6·026	.....	.....	„	.....	„	1·666	51·861	·7407	
Mungyer (G)	4 Nov., 1907	52·893	„	·300	·084	8·091	.....	.....	absent.	.....	„	1·624	62·992	·8999	„ „
Munna Munna (I.L.)	11 Jan., 1906	51·995	„	·575	·210	6·219	.....	.....	·451	.....	„	1·512	60·962	·8707	
Nardoo (P)	19 Nov., 1909	17·140	2·368	6·545	1·695	3·823	.....	.....	1·603	.....	·140	1·400	34·714	·4958	B_2O_3 a minute trace.
Narrabri (G)	26 Mar., 1907	670·851	trace.	3·349	5·742	86·744	.....	.....	absent.	.....	·280	1·820	768·786	10·9826	A strong alkaline water. B_2O_3 present.
Narraway (I.L.)	25 July, 1905	33·977	·256	·575	·211	2·596	.....	.....	.....	.....	trace.	1·498	39·113	·5585	
„ (I.L.)	22 Mar., 1909	33·032	trace.	·800	trace.	2·696	.....	.....	absent.	.....	„	1·708	38·236	·5462	B_2O_3 a trace.
Native Dog (G)	12 Nov., 1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45·108	·6444	
„ (G)	13 Feb., 1907	36·591	trace.	·700	·252	6·666	.....	.....	absent.	.....	·168	1·414	45·791	·6541	B_2O_3 absent.
Neargo (G)	28 Dec., 1906	42·719	„	·785	·127	6·299	.....	.....	„	.....	trace.	2·408	52·338	·7475	
Nebea (P)	9 April, 1906	8·727	3·426	5·798	3·475	4·656	.....	.....	2·729	.....	„	1·204	30·015	·4285	
Nedgera (G)	9 Oct., 1905	27·066	·667	1·612	·540	1·574	.....	.....	·314	.....	„	1·183	32·956	·4708	
„ (G)	22 Mar., 1907	26·701	·462	1·075	·345	1·777	.....	.....	·386	.....	·070	1·498	32·314	·4615	B_2O_3 a minute trace.
Nelgowrie (P)	19 Sept., 1906	20·830	1·242	1·499	·741	1·735	.....	.....	·715	.....	·084	·980	27·826	·3973	
Nevertire (G)	7 May, 1896	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	119·564	1·7080	
Ninety-one Mile (G)	31 Mar., 1904	49·490	trace.	·825	trace.	11·930	.....	.....	.....	.....	·126	·861	63·232	·9033	
Noonbah, (I.L.)	7 June, 1906	33·025	„	·800	·126	2·328	.....	.....	absent.	.....	trace.	1·498	37·777	·5395	
„ (Newman's No. 1) (P)	1 June, 1906	51·128	„	·500	·168	7·418	.....	.....	trace.	.....	·084	1·050	60·348	·8620	
Nullawa (P)	7 April, 1909	40·265	„	·300	trace.	6·923	.....	.....	absent.	.....	trace.	2·156	49·644	·7092	B_2O_3 a trace.
Nulty, No. 1 (P)	3 May, 1907	25·282	„	1·050	·252	10·096	.....	.....	„	.....	„	1·176	37·856	·5407	„ „
„ No 2. (P)	24 July, 1909	27·257	„	1·049	·084	21·422	.....	.....	„	.....	·112	1·736	51·660	·7379	B_2O_3 a strong trace.
Nyngan Experimental Farm (G)	24 June, 1910	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	1,752·352	25·0336	
Old Gnomery (G)	10 Mar., 1904	34.834	·275	·450	·084	7·331	.....	.....	.....	.....	trace.	1·932	44.906	·6415	
Opera (G)	.....	.....	.....	8·190	.....	278·382	12·274	6·580	5·838	.....	.....	·996	312·260	4·4608	
Osaca (G)	2 Oct., 1895	56·508	2·437	·899	·699	11·368	.....	.....	.....	.....	trace.	1·596	73·507	1·0501	
Ottendorf, (I.L.)	6 Mar., 1906	51·407	trace.	·875	·199	20·679	.....	.....	absent.	.....	„	1·274	74·434	1·0633	
„ (I.L.)	4 June, 1907	52·999	„	1·000	·252	20·406	.....	.....	„	.....	·112	1·260	76·029	1·0861	B_2O_3 a trace.
Parragundy (G)	3 April, 1905	31·991	„	·800	·285	7·621	.....	.....	.....	.....	trace.	1·456	42·153	·6022	
Paldrumata (G)	6 Jan., 1898	19·750	„	6·100	8·897	321·300	.....	.....	.....	.....	·420	1·176	357·643	5·1092	
Pera, No. 1 (G)	12 Feb., 1895	33·118	1·225	·849	·402	7·600	.....	.....	.....	.....	·252	1·064	45·076	·6439	
„ No. 1 (G)	18 Dec., 1906	33·725	trace.	1·375	·273	17·781	.....	.....	absent.	.....	·112	1·232	54·498	·7785	„ „
„ No. 2 (G)	18 „ 1906	35·107	„	1·300	·189	12·140	.....	.....	„	.....	trace.	1·484	50·220	·7173	„ „
Pillicawarrina, (I.L.)	31 May, 1905	40·433	·079	·650	·233	4·188	.....	.....	.....	.....	„	1·218	46·081	·6686	
Pilliga (G)	10 Mar., 1904	40·935	·497	·550	·285	7·532	.....	.....	.....	.....	„	1·190	50·989	·7284	
Poison Point (G)	4 „ 1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	296·632	4·2376	
Polly Brewan, (I.L.)	7 „ 1906	40·716	·103	·625	·147	7·589	.....	.....	absent.	.....	trace.	1·876	51·056	·7292	
Quabathoo, (I.L.)	12 Jan., 1906	49·406	·334	·687	·084	7·269	.....	.....	„	.....	„	1·288	59·068	·8439	
Quambone, No. 1 (P)	17 May, 1901	40·145	trace.	·599	·317	7·099	.....	.....	.....	.....	„	1·260	49·420	·7060	
„ No. 1 (P)	8 Aug., 1906	41·064	„	·600	·252	7·315	.....	.....	absent.	.....	„	1·288	50·519	·7216	
Quambone, No. 1 (P) at a depth of 1,619 feet.	26 Aug., 1910	33·703	0·247	1·100	0·165	2·967	.....	.....	·102	.....	trace.	1·540	39·824	·5687	B_2O_3 absent; strontia and lithia a minute trace.

ANALYSES of Artesian and sub-Artesian Waters, New South Wales—*continued.*

Name of Bore.	Date of Analysis.	Sodium Carbonate (Na_2CO_3).	Potassium Carbonate (K_2CO_3).	Calcium Carbonate ($CaCO_3$).	Magnesium Carbonate ($MgCO_3$).	Sodium Chloride (NaCl).	Potassium Chloride (KCl).	Magnesium Chloride ($MgCl_2$).	Sodium Sulphate (Na_2SO_4).	Potassium Sulphate (K_2SO_4).	Iron Oxide and Alumina (Fe_2O_3 and Al_2O_3).	Silica (SiO_2).	Total Solid Matter. Grains per gallon.	Total Solid Matter. In 1000 parts.	Remarks.
Quambone, No. 1 (P) at a depth of 1,760 feet.	26 Aug., 1910	27·776	·502	1·050	·252	2·008	.....	.....	·443	.....	·056	1·708	33·795	·4827	B_2O_3 absent; strontia and lithia a trace.
Quambone, No. 1 (P) at a depth of 2,135 feet (compl.). (P)	26 ,, 1910	21·624	1·260	3·000	·987	1·438	.....	.....	·477	.....	trace.	1·624	30·410	·4343	,, ,,
,, No. 2 (P)	9 July, 1901	42·638	trace.	·475	trace.	7·201	.....	.....	.....	.....	,,	·924	51·238	·7319	
,, No. 2 (P)	10 Aug., 1906	50·494	,,	·800	·147	14·197	.....	.....	absent.	.....	,,	1·316	66·954	·9564	
,, No. 3 (P)	14 ,, 1906	28·280	·493	1·800	·399	2·099	.....	.....	·504	.....	,,	1·596	35·171	·5022	
Quambone, No. 4 (I.L.)	9 Oct., 1905	39·246	·183	·650	·286	6·927	.....	.....	·575	.....	trace.	1·435	49·302	·7043	
,, No. 4 (I.L.)	4 June, 1907	38·113	·372	1·100	·210	6·950	.....	.....	·716	.....	·140	1·736	49·337	·7047	B_2O_3 a trace.
Quondong, (I.L.)	30 July, 1906	41·734	trace.	·599	·060	4·839	.....	.....	absent.	.....	trace.	1·260	48·492	·6926	
Regenbah (P)	21 Nov., 1906	28·003	·250	1·150	·273	1·891	.....	.....	,,	.....	·112	1·680	33·359	·4764	B_2O_3 absent.
Roma (P)	8 Jan., 1909	41·280	trace.	·700	trace.	5·466	.....	.....	,,	.....	trace.	1·456	48·902	·6986	B_2O_3 ,,
Rowena (G)	13 April, 1905	46·347	,,	·825	·233	7·027	.....	.....	.....	.....	,,	1·820	56·252	·8036	
Sandy Creek (G)	30 Jan., 1896	.....	.....	.....	5·185	108·914	3·886	6·687	28·118	(Mg SO_4) 6·477	·280	·558	160·135	2·2876	
Sandy Camp, (I.L.)	9 Oct., 1905	40·853	·462	·878	·095	6·675	.....	.....	absent.	.....	trace.	·722	49·685	·7097	
Santa Paula (P)	10 Sept., 1906	41·246	trace.	·850	trace.	9·312	.....	.....	,,	.....	,,	1·344	52·752	·7535	B_2O_3 a faint trace.
Sibraas (G)	21 Nov., 1893	24·951	8·289	2·799	,,	30·321	.....	.....	.....	.....	·308	2·240	70·112	1·0016	
,, (G)	2 May, 1907	28·976	trace.	2·367	·227	38·353	.....	.....	absent.	.....	trace.	1·992	71·915	1·0271	B_2O_3 a strong trace.
Silendale (Newman's, No. 2) (P)	27 June, 1906	20·999	trace.	1·000	·315	1·711	.....	.....	·836	.....	trace	1·526	26·387	·3768	
Sunny Vale, No. 1 (P)	2 Oct., 1908	33·010	,,	·750	·252	2·233	.....	.....	,,	.....	·084	1·288	37·617	·5373	B_2O_3 a trace.
,, No. 2 (P)	8 July, 1909	34·107	,,	·703	·211	1·872	.....	.....	,,	.....	·084	1·344	38·321	·5473	B_2O_3 ,,
Talawanta (P)	4 Nov., 1903	42·068	,,	1·149	·275	14·494	.....	.....	,,	.....	·196	1·624	59·806	·8542	,, ,,
Talmoi (G)	16 June, 1909	32·083	,,	·300	trace.	6·391	.....	.....	,,	.....	·056	1·596	40·426	·5775	B_2O_3 absent.
Telleraga (G)	25 Mar., 1909	38·447	,,	·600	·189	5·415	.....	.....	,,	.....	trace.	1·680	46·331	·6617	B_2O_3, a trace.
Tenandra (G)	21 Jan., 1897	31·135	3·747	1·250	·741	3·994	.....	.....	.....	.....	,,	1·400	42·267	·6035	
Terrigal (P)	21 Nov., 1906	22·742	1·052	1·449	·487	1·049	.....	.....	absent	.....	,,	1·036	27·815	·3972	
38 (Gorian) (I.L.)	15 Jan., 1906	38·513	trace	·339	·233	7·022	.....	.....	.....	absent	·224	2·184	48·515	·6930	
Thurloo (P)	10 Jan., 1906	43·842	·830	1·999	·339	9·679	.....	.....	,,	.....	absent.	1·400	58·089	·8294	
,, (P)	27 June, 1906	44·911	absent.	1·049	·275	9·656	.....	.....	,,	.....	·028	·931	56·850	·8120	
Tineroo (G)	22 July, 1896	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	205·912	2·9416	
Tooloon (P)	19 Aug., 1905	37·624	trace.	·737	·079	7·646	.....	.....	·812	.....	trace	1·113	48·011	·6859	
,, (P)	27 Mar., 1907	34·118	,,	·650	·168	3·487	.....	.....	1·023	.....	,,	1·428	40·874	·5839	
Tooloora (G)	.....	45·561	5·577	·249	·286	6·721	.....	.....	.....	.....	,,	·980	59·374	·8482	
Toorale (Martin's, No. 2) (P)	12 May, 1908	23·332	trace.	·800	trace.	7·931	.....	.....	absent	.....	,,	1·568	33·631	·4804	B_2O_3, a trace
Trialgara (I.L.)	27 June, 1907	41·512	trace.	·300	·126	6·905	.....	.....	,,	.....	·168	1·316	50·327	·7189	B_2O_3 absent.
Tubba (G)	24 July, 1907	63·889	·285	1·000	·402	17·372	.....	.....	,,	.....	·112	1·008	84·068	1·2008	B_2O_3 a trace.
Tulloona (G)	5 April, 1900	30·267	trace.	·525	trace.	8·097	.....	.....	2·169	.....	trace.	1·442	42·500	·6069	
Tunda (I.L.)	14 Feb., 1905	46·675	,,	·650	,,	2·134	.....	.....	·912	.....	,,	1·400	51·771	·7396	
,, (I.L.)	4 June, 1907	42·024	·494	·700	·231	4·239	.....	.....	1·909	.....	·112	1·652	51·361	·7335	B_2O_3 a trace.
Tundebarine, No. 1 (P)	17 July, 1906	124·749	5·668	9·249	4·916	9·508	.....	.....	absent.	.....	·084	1·176	155·350	2·2191	
,, No. 3 (P)	19 ,, 1906	1·461	1·571	3·300	2·142	2·442	.....	.....	·785	.....	·588	1·316	13·605	·1942	
Tuon (G)	27 Oct., 1909	31·558	trace.	·549	absent.	7·418	.....	.....	absent.	.....	·252	1·652	41·429	·5917	B_2O_3 a trace.
Tycannah (P)	8 Aug., 1907	37·364	,,	·732	·252	6·723	.....	.....	,,	.....	·056	1·344	46·471	·6637	
,, (G)	20 Oct., 1908	34·863	,,	·399	trace.	7·943	.....	.....	,,	.....	trace.	2·016	45·221	·6459	B_2O_3 a minute trace.
Tyreel (G)	13 ,, 1908	32·611	,,	·550	,,	6·621	.....	.....	,,	.....	,,	1·792	41·574	·5938	B_2O_3 absent.
Urawilkie, No. 1 (I.L.)	6 April, 1906	3·761	2·659	4·399	2·860	4·381	.....	.....	2·660	.....	,,	1·372	22·002	·3141	
,, No. 2 (I.L.)	7 ,, 1906	7·934	2·596	4·299	1·991	3·584	.....	.....	1·262	.....	,,	1·288	22·954	·3278	
Vatua (P)	1 June, 1906	8·412	2·312	5·125	2·923	3·880	.....	.....	2·730	.....	·280	1·540	27·202	·3884	
Walkdens (G)	21 May, 1895	37·025	1·215	·999	·254	9·290	.....	.....	.....	.....	trace.	1·330	50·113	·7159	

Wallon (G)	19 Dec., 1898	58·722	trace.	·749	·275	15·796	.....	.....	.....	.....	·224	2·912	78·678	1·1239	
Wanaaring (G)	12 ,, 1895	35·792	1·280	1·299	·190	10·386	.....	.....	.....	.....	trace.	1·680	50·627	·7231	
Wangrawally (I.L.)	15 Jan., 1906	40·684	trace.	·449	trace.	6·893	.....	.....	absent.	.....	,,	1·512	49·538	·7076	
Wapweelah, No. 4 (P)	26 July, 1907	25·805	absent.	·099	·105	6·651	.....	.....	,,	.....	·112	1·316	34·088	·4869	
Warrana, No. 1 (P)	14 Feb., 1906	12·738	1·416	5·299	1·144	2·414	.....	.....	·818	.....	·252	1·960	26·041	·3719	
,, No. 2 (P)	14 ,, 1906	16·890	·861	1·599	·275	2·625	.....	.....	·646	.....	trace.	1·624	24·520	·3502	
,, No. 3 (P)	3 Mar., 1906	13·244	3·029	5·450	·346	4·896	.....	.....	2·118	.....	,,	1·134	30·212	·4313	
Warratta (G)	25 Jan., 1897	16·670	.....	3·049	·805	150·768	22·126	.....	.....	6·899	·280	2·128	202·125	2·8874	
Warraweena, No. 1 (P)	9 Dec., 1908	35·800	trace.	·624	·151	8·924	.....	.....	absent.	.....	·154	1·764	47·417	·6769	B_2O_3 a trace.
,, No. 3 (P)	12 ,, 1908	25·694	,,	1·050	·147	7·802	.....	.....	,,	.....	trace.	1·708	36·401	·5199	B_2O_3 ,,
Warren (C.T.W.S.)	24 ,, 1897	38·34	,,	1·21	·26	7·23	.....	.....	.....	.....	·19	1·37	48·60	·6940	
Warren Downs (P)	7 April, 1908	44·021	trace.	·600	trace.	6·473	.....	.....	absent.	.....	trace.	1·708	52·802	·7543	
Waroo (G)	18 Dec., 1893	19·211	4·558	·599	·614	8·404	.....	.....	.....	.....	·252	1·288	35·794	·5113	
Weemabung (P)	 1898	34·861	trace.	·599	·338	3·857	.....	.....	.....	.....	trace.	1·456	41·111	·5873	
,, (P)	10 Sept., 1906	35·280	,,	·849	·275	3·674	.....	.....	absent.	.....	,,	1·400	41·478	·5924	
Weetalibah (P)	10 Jan., 1906	50·866	1·393	·949	·466	2·956	.....	.....	1·721	.....	·112	1·876	60·339	·8618	
,, (P)	19 April, 1907	49·137	1·153	1·325	·651	3·168	.....	.....	2·762	.....	·168	1·512	59·876	·8551	B_2O_3 a mere trace.
Weetaliba (G)	3 Dec., 1909	8·276	4·210	4·846	3·030	3·583	.....	.....	1·603	.....	·084	1·232	26·864	·3837	B_2O_3 absent.
Weilmoringle, No. 1 (P)	5 Oct., 1909	34·244	trace.	1·124	·105	13·946	.....	.....	absent.	.....	·140	1·890	51·449	·7349	B_2O_3 a trace.
Welmoringle, No. 2 (P)*	7 ,, 1908	28·950	,,	·599	·317	8·140	.....	.....	,,	.....	trace.	1·400	39·406	·5629*	See note.
Weilmoringle, Yamba (P)	10 Nov., 1909	41·081	,,	1·998	·317	23·647	.....	.....	,,	.....	·196	1·932	69·171	·9881	
Welbondongah (G)	20 Oct., 1908	30·960	,,	·550	trace.	7·316	.....	.....	·511	.....	trace.	1·932	41·269	·5895	No B_2O_3 detected.
Wilby Wilby (G)	4 May, 1899	33·745	,,	·224	·084	7·441	.....	.....	.....	.....	,,	2·688	44·182	·6311	
,, (G)	20 Feb., 1905	35·638	,,	·487	trace.	7·246	.....	.....	.....	.....	,,	1·505	44·876	·6410	
Willie (G)	10 Jan., 1906	43·146	,,	·549	·275	6·642	.....	.....	absent.	.....	,,	1·456	52·068	·7438	
,, (I.L.)	11 ,, 1906	40·653	,,	·700	·189	5·249	.....	.....	,,	.....	,,	1·232	48·023	·6859	
Willow Camp, Gandymungydel (I.L.)	15 Mar., 1907	34·890	,,	·550	trace.	2·666	.....	.....	·907	.....	trace.	1.400	40.413	·5722	B_2O_3 absent
Wingadee, No. 1 (P)	15 Aug., 1906	56·124	,,	·600	·126	9·061	($FeCO_3$) ·812	.....	absent.	.....	.....	1·372	68·095	.9727	
,, No. 1 (P)	15 April, 1907	55·182	,,	·850	·252	9·344	.....	.....	,,	.....	trace.	1·568	67·196	·9599	
,, No. 2 (P)	18 Aug., 1906	46·753	·111	·600	trace.	4·809	.....	.....	·238	.....	·196	1·876	54·583	·7797	
,, No. 2 (P)	15 April, 1907	47·231	trace.	·850	·168	4·877	.....	.....	trace.	.....	trace.	1·624	54·750	.7821	B_2O_3 trace.
,, No. 2 Deepened (P)	9 Nov., 1909	37·839	,,	·849	·211	3·697	.....	.....	2·252	.....	·196	1·400	46.444	·6633	B_2O_3 ,,
,, No. 3 (I.L.)	20 Aug., 1906	54·630	,,	·600	trace.	11·213	.....	.....	absent.	.....	trace.	1·288	67·731	·9675	
,, No. 3 (I L)	16 April, 1907	53·558	,,	·700	·261	10·669	.....	.....	trace.	.....	,,	1·232	66·420	·9488	B_2O_3 absent.
,, No. 4 (P)	20 Aug., 1906	47·411	,,	·750	·294	7·464	.....	.....	·224	.....	,,	1·624	57·767	·8252	
,, No. 4 (P)	16 April, 1907	46·037	,,	1·100	·336	7·658	.....	.....	·705	.....	,,	1·596	57·432	·8204	B_2O_3 a trace.
,, No. 4, Deepened (P)	16 July, 1909	20·108	3·118	7·400	3·114	4·181	.....	.....	3·037	.....	trace.	1·568	42·526	·6074	B_2O_3 a minute trace.
,, No. 5 (P)	20 Aug., 1907	28·610	1·940	4·600	3·222	3·008	.....	.....	2·830	.....	·224	1·904	46·338	·6618	B_2O_3 absent.
,, No. 6 (P)	10 July, 1909	41·673	trace.	·950	·147	4·009	.....	.....	2·046	.....	trace.	1·708	50·533	·7217	B_2O_3 ,,
Womboin, No. 1 (I.L)	21 June, 1907	42·660	,,	·450	·219	6·997	.....	.....	absent.	.....	,,	1·792	52·118	·7444	B_2O_3 ,,
,, No. 2 (I L)	21 ,, 1907	43·655	·071	·650	·252	6·381	.....	.....	,,	.....	·084	1·484	52·577	·7510	B_2O_3 ,,
,, No. 3 (I L)	27 ,, 1907	47·574	trace.	·700	·315	5·743	.....	.....	trace.	.....	·112	1·204	55·648	·7949	B_2O_3 ,,
Wonbobbie (P)	10 Sept., 1906	39·377	,,	·549	·106	3·744	.....	.....	absent.	.....	trace.	·980	44·756	·6392	B_2O_3 a trace.
Woodlands (P)	28 Aug., 1907	10·853	2·838	3·175	1·440	1·255	.....	.....	·511	.....	·084	1·204	21·360	·3050	B_2O_3 absent.
Woolabra (G)	27 May, 1906	31·572	3·259	·299	·190	6·049	.....	.....	.....	.....	·308	2·492	44·169	·6308	
Woolscour (P)	10 April, 1907	17·106	1·732	7·450	1·218	2·028	.....	.....	1·534	.....	·196	1·764	33·028	·4716	B_2O_3 ,,
Yantabulla, No. 1 (G)	21 Nov., 1893	17·369	6·615	1·549	·930	9·557	.....	.....	.....	.....	trace.	1·456	39·996	·5713	
Yarraldool (P)	8 Dec., 1908	37·094	trace.	·500	trace.	7·105	.....	.....	absent.	.....	,,	1·974	46·673	·6667	
Youendah (G)	20 Oct., 1903	41·397	absent.	·300	,,	7·211	.....	.....	.....	.....	,,	1·260	50·168	·7167	
Youngarrina (G)	12 Nov., 1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32·984	·4712	
Yuma (P)	10 Jan., 1906	32·513	trace.	·749	trace.	3·811	.....	.....	1·643	.....	·112	1·960	40·788	·5822	
,, Deepened (P)	26 Aug., 1910	26·795	2·328	3.350	2·351	3·538	.....	.....	1·706	.....	0·336	1·568	42·172	0.6021	B_2O_3 absent; strontia and lithia a trace.

*Note.—Strong trace of P_2O_5, B_2O_3 and organic matter detected. Free ammonia 0·064 parts in 100,000 parts. Albuminoid ammonia 0·006 parts in 100,000, parts. Oxygen absorbed in 15 minutes, 0·0076. Oxygen absorbed in 4 hours, 0·0320.

Analyses compiled by G. Peterson, Chemical Laboratory, Clyde.

National Works (exclusive of Wharves), Closer Settlement Roads, and Roads, Bridges, Ferries, and Public Watering Places in the Western Division.

I HAVE the honor to submit the following report on the construction and maintenance of the above works during the year ended 30th June, 1910.

The expenditure under each heading was as follows :—

	£	s.	d.
Bridges.—Construction	41,413	9	10
Maintenance	19,748	19	10
Roads.—National, Tourist, and others within incorporated areas—			
Construction ...	4,433	12	1
Maintenance ...	1,211	7	5
Closer settlement—Construction	32,035	17	11
Maintenance	911	3	4
Western Division	12,132	4	6
Ferries.—National works and Western Division—			
Construction	4,629	8	6
Maintenance	9,788	9	4
Public Watering Places.—Caretaking (Western Division)	982	8	0
Total	£127,287	0	9

Bridges.—Contracts were let for the following new works :—

Name.	Contract Price.			Description.
	£	s.	d.	
Towamba River at Sturt	4,462	8	3	Three 92 feet composite truss spans, one 35 feet, and two 30 feet timber beam spans.
Narrabri Creek at Narrabri	4,090	0	0	Two 92 feet composite truss spans, four 30 feet and two 25 feet timber beam spans.
Pyrmont (alterations)	3,969	16	9	Reducing gradients on approaches and wood blocking.
Sportman's Creek.....	3,450	5	0	Two composite truss spans, each 105 feet c to c, two 30 feet, and one 28 feet timber beam spans.
Murray River at Bringenbrong.....	2,891	0	0	Five 35 feet and two 30 feet timber beam spans.
Lagoon at Howlong.....	2,340	10	0	Seven 35 feet and two 30 feet timber beam spans.
Tweed River, Middle Arm, at McKenzie's Crossing.	2,219	10	0	One 91 feet composite truss span, and five 35 feet and one 28 feet timber beam spans.
Bungawalbyn Creek	1,895	0	0	Five 45 feet and four 30 feet timber beam spans.
Peel River at Somerton	1,610	15	10	Five 40 feet and two 30 feet timber beam spans.
Ghinni Ghinni Creek	1,397	2	10	Four 45 feet and two 35 feet timber beam spans.
Black Creek	883	0	0	Six 35 feet timber beam spans.
Peel River at Moore	846	5	6	Repairs and extension due to flood, including five 30 feet timber beam spans.

Tenders were also invited for the construction of the causeway and approaches in connection with the Merimbula Lake Bridge referred to in last year's report, but as a satisfactory offer was not obtained the work was carried out by day labour.

The coal strike which took place during November, December, and January was responsible for considerable delay at several of the bridges, and the usual trouble was experienced by contractors in securing delivery of timber. This was particularly noticeable at Severn River, where the contractor, at end of June, was about nine months over time.

At Narrabri Creek work was interrupted soon after commencement by floods, which rose above all previous records. The old bridge was carried away, and foot traffic was accommodated by boat until a temporary suspension bridge could be completed. In view of the new record it was decided to raise the deck level of the new bridge and provide additional waterway in the minor approach bridge over flood-channel.

Similar interruption was occasioned at Somerton, where the flood rose 2½ feet above the highest previous record. In this case also, the work being at a stage which permitted the alteration, deck-level was raised.

The alterations carried out at Pyrmont Bridge, Darling Harbour, provided for reducing the gradients on the approaches from 1 in 15 on the City side, and 1 in 17 on the Pyrmont side, to 1 in 21, and involved the partial raising of the parapet walls. Also, wood blocking was substituted for the metalled surface, an improvement which will effect a very considerable saving per annum in maintenance.

Tenders for an opening bridge over the Wakool River, on the Balranald-Swan Hill road, were invited twice during the year. In each case the tenders were much in excess of the estimate, and further investigation was decided upon with a view to, if possible, reduce cost by modifying or altering the design.

With the exception of the high-level truss bridge over the Macquarie River, at Scabbing Flat, the low-level bridge at Severn River, and the small structure at Tandora Creek, in the Western Division, the whole of the bridges tabulated in last year's report were satisfactorily completed, and made available to traffic.

During the exceptionally heavy floods which occurred in January, 1910, the timber truss bridge, constructed in 1879, over the Cudgegong River, at Yamble, was carried away; as also were the low-level bridges over Myall Creek and the Manilla River, at Upper Manilla, and a smaller structure over the Cockburn River, at Moonbi. The bridges at Barne's Gully and Union Inn, Tamworth, were seriously damaged, and the approaches to the bridge over the Peel River, at Moore, were carried away.

With

With the exception of the bridge at Yamble, the wrecked or damaged bridges were under control of the respective Shires, the Councils of which would, under ordinary circumstances, be responsible for repair or renewal. The floods, however, were so high, and the damage to roads and bridges so widespread and extensive, that special assistance to the Councils affected was considered to be fully warranted. It was therefore arranged that, in addition to granting direct financial assistance to the Councils, any work required in restoring or repairing the bridges should be carried out by, or at cost of, the Department.

Approval was given during the year for the construction of ten new bridges, and the renewal of five existing structures, including those wrecked by flood, at a total estimated cost of £34,635.

Among the more important of the works of maintenance may be mentioned the repairs carried out at Cowra and Gundagai Bridges, at costs of £1,598 and £2,282 respectively. The Gundagai Bridge, it may be mentioned, is 3,030 feet in length. The repairs in each case included sheathing the deck with 2½ inch planking, laid on a bed of fine asphalt, as described in a former report. Similar work was carried out on the truss bridge over the Tweed River, at Murwillumbah, at a cost of £500; and the bridge over the Hunter River at Belmore was redecked at a cost of £515. The repairs to the superstructure of the respective bridges, although of so extensive a character, were carried out without appreciable interruption to traffic.

Closer Settlement Roads.—As shown by the year's expenditure (£32,036), good progress has been made with these works, and, in addition to the actual expenditure, liabilities had been incurred to the extent of £12,790. The total length of the roads covered by this expenditure is 153 miles, of which 106 miles were completed and made available. Forty-eight miles were still in hand at close of the year, and 92½ miles had been handed over to the shires concerned. About 66½ miles of new road were also graded.

Tourist and other roads within Incorporated Areas.—The cost of maintaining the road to Mount Kosciusko being too heavy for the finances of the Shire in which it lies, and the road being considered of sufficient general importance to justify its upkeep by the State, approval was given to proclaim it a national work, and during the year a considerable amount of metalling and gravelling was carried out, the total expenditure amounting to £1,850.

Work on the roads giving access to Crown lands about Toonumba, Tooloom, Woodenbong, &c., was continued, the expenditure for the year amounting to £2,588, in addition to further contract liabilities, totalling £2,427.

The work included about 15½ miles of grading.

Preliminary investigation was also made with a view to opening up Crown land about Bonalbo, &c., and providing the fast-increasing settlement with more direct access to Casino.

The deviations on the Scone-Gundy road, including the Gundy Bridge approaches, were completed at a total cost of £5,550, the expenditure for the year being £1,859 14s.

National Ferries.—The new punt for use on the Coraki Ferry was completed at a cost of £1,826, and placed in commission on 12th October, 1909. Minor alterations and improvements were found desirable on the approaches and boat jetties, and were carried out at a cost of £175.

As previously described the contract was originally let in March, 1908, but the punt was lost at sea whilst being towed from Newcastle to the Richmond River. The second contract stipulated that the work of construction should be carried out locally, and so avoid the risks and delays incident to a sea voyage. Loss of the first punt was fully covered by insurance, but the accident occasioned a delay of about eleven months.

A contract was let on 18th November, 1909, for a larger punt for the Hexham Ferry, the old punt being too small to accommodate the large and increasing traffic. The hull of the new punt will be of steel, and will be 64 feet long by 31 feet beam, with movable flaps 15 feet long at each end. A roadway 17 feet 6 inches wide between kerbs will be provided for vehicles. Contract price, £2,745.

Plans were also prepared and work commenced on a new punt for The Spit Ferry, at which it is anticipated the already heavy traffic will be greatly increased on completion of the tramway extension now under construction to Manly. At time of writing the work, which is being carried out at the Government Dockyard, is well in hand. The new punt is of special design, and in addition to a roadway, 18 feet wide, for vehicles, will provide accommodation for 250 foot passengers. The hull, of steel, will be 70 feet long by 35 feet wide.

As mentioned in my report for the preceding year, it was originally proposed to adapt this punt for the transfer also of tram cars from side to side of the channel, but approval has now been given to the construction of a separate punt and approaches to be used entirely for tramway purposes.

Approval was also given to the substitution of an oil-engine punt for the present hand-geared punt at the Shire ferry at Blackman's Point, on the Hastings River, and a contract for construction of the hull, &c., was let on the 18th April, 1910, at £877 5s. 6d., the ferry being then proclaimed a national work. When finished and fitted with engines, &c., the total cost will amount to, approximately, £1,200.

Public Watering Places.—Of the 196 proclaimed public watering places under control of the Department, comprising all those within the unincorporated area in the Western Division, 116 were leased at rentals totalling £2,587 per annum, 40 were subsidised at various rates totalling £1,018 14s. per annum, and the remaining 40 were open, *i.e.*, not in charge of a resident caretaker. A revenue of £143 10s. per annum was also obtained from four artesian wells within the Shire's area, which were formerly included within public watering places under control of the respective Councils.

Flood Damage.—In January, 1910, exceptionally heavy and continuous rainfall occurred, resulting in extensive floods in many portions of the State, and more or less general destruction or damage to roads and bridges. The areas affected embraced a considerable part of the incorporated portion of the State, and, as before stated, special assistance to the Councils concerned in restoring traffic and effecting the more urgent repairs was absolutely necessary. Funds were accordingly made available, and, at close of the year, £13,365 had been distributed among twelve shires and eleven municipalities, whilst additional claims totalling £18,262, lodged by fourteen shires and eight municipalities, were under consideration. At time of writing the total amount granted was £18,123.

W. J. HANNA.

5th November, 1910.

Report

Report of the Government Land Valuer.

I HAVE the honor to submit a brief summary of the work engaging the attention of my Branch during the past twelve months.

The cases of disputed compensation, which were referred to the Law Courts, were limited to two, the rest of the matters being amicably adjusted.

Several purchases have been made for the Federal Government for postal purposes.

I have personally been occupied for two considerable periods as a member of the Appeal Court in the Closer Settlement acquirements at Larras Lake and Brookong.

A large number of parks have been purchased for the Department of Lands—as too many school sites for the Instruction Department in various parts of the colony.

Most of the claims on the North Coast, Cowra to Canowindra, and Lockhart to Clear Hills Railways, have been dealt with so far as the reports upon title have been received.

There has been no change in the personnel of the staff.

Notifications of resumption have been issued in respect of the following works :—

Tramways.—Miller-street to M'Mahon's Point, Wallsend to West Wallsend.

Railways.—Kyogle to Casino, Maitland to Dungog, Dungog to Gloucester, Gloucester to Taree, Mudgee to Dunedoo, Lockhart to Clear Hills, Cowra to Canowindra, Bogan Gate to Bulbodney.

Bores.—Gurly Siding, Boolocroo.

Reservoir.—Barren Jack.

Public Watering Places.—Seven Miles Spring.

Water Supply.—Singleton, Nowra, Kiama, Mittagong, Mudgee, Bathurst, Sydney, Quirindi, Medlow Bath, Batlow, Wollongong, Rutherford.

Sewerage.—Kurri Kurri Hospital, Sydney, Illawarra, Western Suburbs of Sydney.

Irrigation.—Murrumbidgee Northern.

Technical College (Extension).—Sydney.

Weirs.—Condobolin West, Nepean River.

Children's Court.—Surry Hills.

Reclamation.—Cook's River.

Drainage.—Curl Curl Lagoon, Wandsworth-street, Parramatta.

Dredying Depôts.—The Broadwater, Richmond River.

Sanitary Depôts.—Murrurundi, Wyong.

Railways Proclaimed and Confirmed.

Dungog to Gloucester, Parts 1 and 2; Casino to Kyogle, Lockhart to Clear Hills, Parts 1, 2 and 3; Cowra to Canowindra, Cooma to Bombala *via* Nimmitabel, Part 1.

Tramways.

Wallsend to West Wallsend, Manly to Brookvale, Part 2; The Spit to Manly, Baulkham Hills to Castle Hill, Botany-road to Rosebery Park Racecourse, Harris-street to Evans-street, Balmain, Sutherland to Cronulla.

Lands Purchased for undermentioned Works.

Police Stations.—Stroud, Canterbury, Rookwood, West Maitland, Drummoyne, North Richmond, Young.

Fire Brigade Station.—Vaucluse.

Railway.—Maitland to Dungog.

Court-house.—Kogarah, Paddington.

Hospital for Insane.—Kenmore.

One hundred and forty-six (146) standing over from previous years have been finally settled; 236 valuations in various parts of the State have been made; and 224 cases were advanced to a stage for valuation.

EDWARD J. SIEVERS,
Government Land Valuer.

Under Secretary for Public Works,
20th October, 1910.

Government Dockyard, Biloela.

Report of the Managing Committee for the year ending 30th June, 1910.

Public Works Department,
Sydney, 16th November, 1910.

We have the honour to submit the following report, covering operations of the Government Dockyard for the year ending 30th June, 1910.

During the year considerable extensions have been carried out at the Government Dockyard, all of which have turned out very successfully, and will, undoubtedly, be instrumental in increasing the efficiency of the works and the reduction of cost in the manufacture.

Amongst the principal improvements might be mentioned the construction of two building slips adjacent to the Fitzroy Dock. These slips are commanded by cantilever electrically-driven cranes which are able to serve both slips for a length of 300 feet, the clear span of the cranes being 75 feet each. The cranes we believe to be the first of their kind manufactured in Australia, and were specially designed for their present positions, and we are happy to state have turned out most successful, and undoubtedly will be a great factor in the economical construction of vessels in the future. One of the berths is capable of allowing the construction of a vessel of 50 feet beam, 450 feet in length, and 30 feet moulded depth, the other being capable of taking a vessel of a similar beam and moulded depth and length of 350 feet.

The machinery required for construction, which is situated between the cantilever cranes, has been wholly constructed at the Docks, and consists of one set of bending rolls, 20 feet 6 inches long; one shearing and punching machine of a 4 feet gap; two countersinking machines, one capable of countersinking at a setting a plate 30 feet long; also a radial drilling machine of the same capacity as the countersinking machine, besides other minor machines, making practically a complete plant for this class of work, and it is interesting to state that the various machines constructed have, in every case, come out considerably below that of a similarly imported article. The plate furnace in connection with these slips is capable of dealing with plates 6 feet wide by 40 feet long, and the angle-iron furnace is capable of dealing with bars 60 feet long.

Besides the above-mentioned cranes there are several other electrical cranes in course of construction, which will provide for building operations being carried out the full length of these slips.

In the machine shops, by the introduction of modern high speed lathes and patent boring machines, facilities are now provided for the construction of engine work up to the most modern requirements, with a degree of accuracy which hitherto would have been hard to obtain.

A very fine steel-framed shed, measuring 200 feet x 60 feet, has been constructed for the shipwrights and joiners, and a complete plant of woodworking machinery, electrically-driven, installed therein, and is a vast improvement on the previous shops, which, through the construction of the aforementioned building slips, had to be removed.

Amongst the most important works carried out during the year might be mentioned the following:—

Water tube boiler for the torpedo boat "Countess of Hopetoun."

Special designs were prepared at the Dock for this boiler, it being the first water tube boiler built in the Colonies, and, after its completion, most successful trials were carried out to the entire satisfaction of the Commonwealth officials, both as regards steaming capacity of the boiler, and also the stability of the vessel under the necessary structural alterations.

For the Water Conservation and Sewerage Branch of the Public Works Department a complete set of Channoine Shutters for Berembed Weir were completed from the designs provided by that branch, and we understand that both as regards workmanship and cost very satisfactorily. These are the largest shutters at present in use in Australia, being 14 ft. high and having combined width of 165 ft., each shutter being 3 ft. wide.

For the same branch a large number of cast-iron pipes 4 ft. 6 in. diameter were constructed for the outlet pipes of the Barren Jack Dam, weighing in all 260 tons.

To increase the dredging plant required by the Chief Engineer for Harbours and Water Supply, we have been entrusted with the construction of a new light draft sand-pump dredge. This vessel is to be an ocean-going, self-propelling dredge, fitted with twin engines, and when carrying a load of 200 tons to have a draft of 4 ft. 9 in. To ensure this draft being procurable it has become necessary to very carefully design, not only the vessel, but the main engines and auxiliary engines and boilers specially, so as to reduce dead weight to the lowest possible point; and, in order to obtain this result, the engines have been designed for a working pressure of 250 lb., and are triple-expansion, fitted with piston valves to all cylinders running at a normal speed of 300 revolutions per minute. Water-tube boilers of special design have been introduced, and it is interesting to note that the whole of the auxiliary engines and machinery are being specially designed for this vessel in order to keep down weights, and it is the intention of the Dockyard to complete the vessel, entirely manufacturing all portions of same, with the exception of the anchors, chains, and compasses. Good progress has been made with the construction, and it is anticipated that during the ensuing twelve months the vessel will be completed. Much interest will be attached to the trials of this vessel, owing to her very shallow draft.

The construction of a ferry-punt, to be used in connection with the tramway from Spit to Manly, has been entrusted to the Dock. This punt, when completed, will be far the largest of its class hitherto built in the State.

For

For the same branch the extension of the tramline from Drummoyne to Ryde necessitated the strengthening of the steel bridge across the Parramatta River at Gladesville; and it also became necessary to bodily lift the existing swing-span in order to renew the roller parts and carry out other structural alterations, including the working of the swing span electrically. This work has been successfully completed, and, owing to the necessity of keeping both road and river traffic open during the alterations, was a work that entailed considerable anxiety to the Dock officials.

In connection with the Railway Construction Branch a considerable amount of work has been entrusted to the Dock in the construction of points and crossings required, both for tramway and railway purposes, and we think the work has proved satisfactory, both as regards workmanship and cost.

With the Commonwealth Government the Dock entered into a contract for the supply of new boilers and structural alterations of a considerable extent to H.M.A.S. "Protector," and good progress has been made in connection with the same.

During the year, in connection with the factory for the production of small arms at Lithgow, tenders were called for the generating plant required, and feeling that there was little probability of any private firm giving a satisfactory tender for this plant to be constructed locally, the Honorable the Minister for Public Works was asked to allow a tender to be submitted by the Government Dockyard. This tender comprised the manufacture and erection of the whole of the generating plant to be manufactured at the Dock, with the exception of the electrical generators, and, being the lowest received, has been accepted, and detailed plans specially prepared at the Dock for the construction of this work, which is the first of its class ever attempted in the State. Great interest, therefore, will attach to the completion of the contract.

The various shops have been kept very busy during the twelve months, and in fact if it had not been for the foregoing extensions and improvements we should not have been able to have kept pace with the work entrusted to us.

The total expenditure for the twelve months amounts to £86,847, and the average number of men employed was 477.

Attached to the end of this report will be found some photographs of considerable interest. Amongst others, the water tube boiler for the "Countess of Hopetoun," and photographs of the new cantilever cranes with the building slips adjacent thereto, one of which is where the third torpedo destroyer will be built.

Attached to this report are statements showing in detail the operations of the Government Dockyard for the year 1909–10.

The Committee wish to express their appreciation of the zeal displayed by the general body of workmen, and also of the services rendered by the Dockyard Staff.

ROBERT HICKSON, I.S.O., M. Inst. C.E.,
Chairman.

W. J. HANNA.
E. M. DE BURGH, M. Inst. C.E.
A. E. CUTLER, Assoc. M. Inst. C.E., M.I.M.E.

"A."

STATEMENT showing Actual and Estimated Receipts and Expenditure for year ended 30th June, 1910.

ACTUAL RECEIPTS.

Particulars.	£ s. d.	£ s. d.	£ s. d.
ocking Charges—			
Merchant vessels		193 1 6	
epairing Men-of-war, &c.	925 4 11		
Percentage charged		96 9 7	
ommonwealth Government—			
Contracts	2,777 9 9		
Profit on Contracts		740 13 4	
Not Contracts.....	95 16 0		
Percentage charged		9 6 4	
iscellaneous Tests, &c.	24 7 4		
Percentage charged		6 5 9	
se of plant and dock gear	76 15 8		
se of Electric Light	265 0 0		
„ „ Power	90 18 6		
		432 14 2	
iscellaneous Receipts—			
Ingot metal, &c....	602 18 1		
Scrap-iron, &c. ...	81 9 0		
Use of "Cyclops" (lighter)	208 16 6		
Use of "Ruby" (launch)	85 4 0		
Other receipts ...	34 3 0		
		1,012 10 7	
			2,491 1 3

ESTIMATED RECEIPTS.

ocking Charges—			
Dues if chargeable)			
Men-of-war	6,649 9 2		
Commonwealth and State	6,879 6 2		
		13,528 15 4	
ipping Charges—			
Dues if chargeable)		1,010 0 0	
Works carried out—			
Public Works Department	56,169 2 2		
Other Departments	21,620 9 11		
	77,789 12 1		
stimated profit, 10 per cent.		7,778 19 3	
			22,317 14 7
			£24,808 15 10

ACTUAL EXPENDITURE.

Particulars.	£ s. d.	£ s. d.	£ s. d.
Expenses in Docking—			
Merchant vessels	57 8 5		
Men-of-war	425 5 5		
Commonwealth and State vessels (material only) ...	161 17 1		
		644 10 11	
Pumping Station—Maintenance, &c.		307 0 5	
Docks Maintenance—			
Fitzroy Dock	51 6 5		
Sutherland Dock	177 7 2		
Travelling Cranes	66 18 10		
		295 12 5	
Electric Light—			
Maintenance and repairs ...	62 10 1		
Vessel's use	199 16 4		
		262 6 5	
Shops, Maintenance and Repairs—			
Carpenters' shop and sawmill	161 0 10		
Machine shop.....	110 0 10		
Power house and Elec. plant	132 7 2		
Boiler shop..... ..	339 7 3		
Pattern shop and Moulding shop.....	20 4 3		
Blacksmiths' shop	87 15 1		
Fitting Shop	12 7 6		
		863 2 1	
No. 1 Slip—(Maintenance and Repairs)		11 16 7	
Launches, &c.—			
Working Expenses. £ s. d. / Repairs. £ s. d.			
"Ruby" 542 13 7 / 66 14 6	609 8 1		
"Cyclops" 389 13 9 / 66 6 5	456 0 2		
		1,065 8 3	
Miscellaneous expenses—			
Yard and Quarry	76 0 10		
Office, Store, &c.	190 1 3		
Officers' Quarters	369 9 9		
Holidays	1,763 14 11		
		2,399 6 9	
Dock Punts and Buoys—Overhauls and repairs		326 16 0	
			6,175 19 10
Working up Material	328 14 6		
Expenses in Slipping Vessels	21 11 10		
Labour, &c., in docking— Commonwealth and State vessels	199 11 9		
		549 18 1	
Salaries of permanent officers and foremen...	2,637 15 0		
			3,187 13 1
			9,363 12 11
Balance			15,445 2 11
			£24,808 15 10

"B."

"B."

DOCK Establishment Vote for year ended 30th June, 1910.

Particulars.	Amount. £ s. d.	Amount. £ s. d.	Amount. £ s. d.
Pumping Station—			
Machinery	187 6 11		
Boilers	70 14 5		
Maintenance, &c.	48 19 1		
		307 0 5	
Docks' Maintenance and Repairs—			
Fitzroy Dock	51 6 5		
Sutherland Dock	177 7 2		
Travelling Cranes	66 18 10		
		295 12 5	
Docking of Vessels—			
Fitzroy Dock	201 11 11		
Sutherland Dock	442 19 0		
		644 10 11	
Electric Light—			
Maintenance and Repairs	62 10 1		
Vessel's use	199 16 4		
		262 6 5	
Shops' Maintenance—			
Carpenters' Shop and Sawmill	161 0 10		
Machine Shop	110 0 0		
Power House and Electric Plant	132 7 2		
Boiler Shop	339 7 3		
Pattern Shop and Moulding Shop	20 4 3		
Blacksmiths' Shop	87 15 1		
Fitting Shop	12 7 6		
		863 2 1	
Miscellaneous Expenses—			
Yard and Quarry	76 0 10		
Office and Store	190 1 3		
Holidays	1,763 14 11		
Officers' Quarters	369 9 9		
		2,399 6 9	
Cradle Slip (Dock No. 1)—			
Maintenance and Repairs	.....	11 16 7	
Dock Punts and Buoys—			
Overhauls and Repairs	.....	326 16 0	
Launch, Lighter, &c., Maintenance and Repairs—			
"Ruby"—Repairs, &c.	66 14 6		
" Working Expenses (driving, &c.)	542 13 7		
		609 8 1	
"Cyclops"—Repairs, &c.	66 6 5		
" Working Expenses (driving, &c.)	389 13 9		
		456 0 2	
			6,175 19 10
Permanent Improvements.			
Wharves in General (renewals and repairs)		729 13 7	
General Improvements to Establishment Plant		556 10 3	
Extensions and Alterations to Permanent Way		377 1 6	
Miscellaneous Minor Works		308 6 2	
			1,971 11 6
			£8,147 11 4

"C."

ALTERATIONS and Extensions for year ended 30th June, 1910.

Particulars.	Amount. £ s. d.	Total. £ s. d.
Cantilever Cranes	2,744 5 7	
Extensions to Machinery Appliances and Buildings	2,833 15 0	
New Machinery	2,268 19 0	
New Points and Crossings Shop	733 18 7	
New Shipwrights' and Joiners' Shop	1,954 4 5	
New Building Slip	575 8 7	
New Water Closets	258 15 3	
Shearlegs and Gear for same	124 17 2	
		£11,494 3 7

"D."

"D."

STATEMENT showing Expenditure during year ended 30th June, 1910.

Service.	Expenditure 1909–10.	Percentage of Expenditure.	
		Excluding Dockyard Works.	Including Dockyard Works.
	£ s. d.	per cent.	per cent.
Dredge Service	18,253 19 2	27·8377	21·0183
Harbours and Rivers	970 4 9	1·4796	1·1171
Roads, Bridges, Punts and Ferries, &c.	2,751 9 11	4·1960	3·1682
Railways and Tramways	13,176 18 10	20·0951	15·1725
Water Supply and Drainage	7,798 6 2	11·8925	8·9793
Miscellaneous (Public Works Department)	1,001 7 0	1·5264	1·1529
Total of Public Works Department (excluding Dock) £	43,952 5 10	67·0273	50·6083
Public Instruction Department	933 12 3	1·4237	1·0749
Government Printing Office	93 2 8	·1421	·1074
Police and Prisons Department	62 17 8	·0958	·0725
Navigation Department	2,822 11 8	4·3045	3·2501
Sydney Harbour Trust	12,930 1 3	19·7187	14·8882
Agriculture and Mines Department	75 13 5	·1154	·0872
Explosives Department	660 11 6	1·0074	·7608
Public Health Department	190 10 6	·2906	·2194
Commonwealth Government	2,873 5 9	4·3819	3·3084
Stores Supply Department	11 15 0	·0179	·0135
Lunacy and Asylums	16 5 1	·0248	·0187
Repairing Men-of-war, &c.	925 4 11	1·4120	1·0653
Repairing Merchant Vessels	0 10 11	·0008	·0006
Miscellaneous Services	24 7 4	·0371	·0280
£	65,572 15 9	100·0000	75·5933
Dockyard Extensions	11,494 3 7	.....	13·2348
Dockyard Contingencies	8,147 11 4	.....	9·3814
Dockyard, Vote on Account of Fire	1,000 0 0	.....	1·1514
Dockyard Store Advance Account	633 5 5	.....	·7291
£	86,847 16 1	100·0000	100·0000

"E."

STATEMENT of Docking Operations for the year ended 30th June, 1910.

Fitzroy Dock.

Class.	Vessels.		Receipts.			Expenditure.	
	No.	Tonnage.	Total.	Excess over Expenditure.	If dues chargeable in all cases.	Total.	Per ton.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	d.
Merchant Vessels	...	.....	.....	.....	.....	.....	.....
Men-of-War	4	8,670	191 3 7	67 2 7	1,120 11 8	124 1 0	3·4339
Commonwealth and State Vessels	26	8,394	192 11 11	.....	4,507 8 4	192 11 11	5·5066
Totals	30	17,064	383 15 6	67 2 7	5,628 0 0	316 12 11	4·4535

Sutherland Dock.

Class.	Vessels.		Receipts.			Expenditure.	
	No.	Tonnage.	Total.	Excess over Expenditure.	If dues chargeable in all cases.	Total.	Per ton.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	d.
Merchant Vessels	3	7,723	193 1 6	135 13 1	193 1 6	57 8 5	1·7845
Men-of-War	10	43,575	548 1 9	246 17 4	5,528 17 6	301 4 5	1·6591
Commonwealth and State Vessels	18	6,871	168 15 8		2,371 17 10	168 15 8	5·8955
Totals	31	58,169	909 18 11		8,093 16 10	527 8 6	2·1761

Totals.

Class.	Vessels.		Receipts.			Expenditure.	
	No.	Tonnage.	Total.	Excess over Expenditure.	If dues chargeable in all cases.	Total.	Per ton.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	d.
Merchant Vessels	3	7,723	193 1 6	135 13 1	193 1 6	57 8 5	1·7845
Men-of-War	14	52,245	739 5 4	313 19 11	6,649 9 2	425 5 5	1·9535
Commonwealth and State Vessels	44	15,265	361 7 7	.....	6,879 6 2	361 7 7	5·6816
Totals	61	75,233	1,293 14 5	449 13 0	13,721 16 10	844 1 5	2·6926

"F."

STATEMENT of Slipping Operations on Docks No. 1 large Slip for the year ended 30th June, 1910.

Class.	Vessels.		Receipts.			Expenditure.	
	No.	Tonnage.	Total.	Excess over Expenditure.	If dues chargeable in all cases.	Total.	Per ton.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	d.
Commonwealth and State Vessels	34	1,328	21 11 10	.....	1,010 0 0	21 11 10	3·9021

"G."

STATEMENT showing comparison between Expenditure during years 1908–9 and 1909–10.

Service.	Expenditure.	
	1908-9.	1909-10.
	£ s. d.	£ s. d.
Dredge Service	24,452 7 0	18,253 19 2
Harbours and Rivers	1,675 1 0	970 4 9
Roads, Bridges, Punts and Ferries, &c.	1,232 0 5	2,751 9 11
Railways and Tramways	4,611 4 11	13,176 18 10
Water Supply and Sewerage	6,676 0 1	7,798 6 2
Miscellaneous, Public Works Department	1,146 15 11	1,001 7 0
Total of Works Department (excluding Dockyard)	39,793 9 4	43,952 5 10
Public Instruction Department	2,271 3 9	933 12 3
Government Printing Office	154 0 2	93 2 8
Police and Prisons Department	110 10 8	62 17 8
Navigation Department	3,506 4 0	2,822 11 8
Sydney Harbour Trust	6,429 17 8	12,930 1 3
Agriculture Department	115 4 4	75 13 5
Explosives Department	248 16 1	660 11 6
Public Health Department	158 3 10	190 10 6
Commonwealth Government	12,652 0 11	2,873 5 9
Stores Supply Department	29 14 0	11 15 0
Lunacy and Asylums	6 0 2	16 5 1
Repairing Men-of-War, &c.	677 8 5	925 4 11
Chief Secretary's Department	8 6 0	.....
Repairing Merchant Vessels, &c.	142 9 1	0 10 11
Miscellaneous Services	56 16 7	24 7 4
	66,360 5 0	65,572 15 9
Dockyard Extensions	5,727 12 7	11,494 3 7
,, Contingencies	7,088 4 10	8,147 11 4
,, Fire Vote	.....	1,000 0 0
,, Store Advance Account	560 14 6	633 5 5
Totals	79,736 16 11	86,847 16 1

Engineering Drawing Office and Ironwork Inspection.

During the past year the Drawing Office has continued to be very busy as will be seen from the detailed lists of the works dealt with, as given in appendices. These lists do not include sketches and estimates of a preliminary character for works for which funds have not been made available. Irrespective of these latter, the total value of the works dealt with is approximately as under:—

	£	s.	d.
Irrigation and Drainage Branch	445,707	10	6
Railway and Tramway Construction Branch	445,875	18	0
Harbours and Water Supply Branch	89,112	0	6
Roads, Bridges, and Public Watering Places Branch...	61,770	14	1
Quotations for minor works	1,464	11	4
Total	£1,043,930	14	5

On 30th June, 1910, the staff consisted of Mr. Bradfield, Assistant Engineer, twenty-four permanent draftsmen, four cadets, and twenty-seven temporary draftsmen, or 56 in all, as against a staff of 52 officers on 30th June, 1909, on which date, however, there were three (3) vacancies on the Staff remaining to be filled.

Percentage Cost of Office.

The total amount of salaries paid to draftsmen and cadets was £12,474, including overtime, and adding to this one-half of my own salary against design work (the balance against ironwork inspection and other duties), makes a total of £12,770 for salaries in connection with designs for authorised works, preliminary estimates, and work of a miscellaneous character.

Taking, as in past years, the value only of the works actually sent on for tender, or put in hand by day labour as a basis, the percentage cost of designs has been as under:—

	£
Estimated value of Contract work	1,043,930
Amount of salaries of designing officers	12,770
Percentage of cost of salaries on value of contract work	1·22 per cent.

Owing to the transfer in March, 1910, of Mr. R. S. Littlejohn to the position of Acting Superintendent of Stores, it was necessary to somewhat alter the administration of the Drawing Office, and Mr. Elder was placed in sub-charge of Harbour work; Mr. Hayley in sub-charge temporarily of Water Supply and Irrigation work; and Mr. Rutlidge in sub-charge of Sewerage work.

Work for the Railway and Tramway Construction Branch has been under the sub-charge of Mr. Bradfield, as before, and Mr. Renshaw has been called upon to supervise the draftsmen engaged upon the details of Road Bridges.

Thanks to the able supervision of these officers and to the attention to duty of the staff as a whole, it has been possible to deal with a large amount of work, some of it of an intricate and novel character.

Inspection of Ironwork.

At Messrs. G. and C. Hoskins' foundry, the quantity of material inspected amounted to 1,525 tons, representing 16,888 articles, valued at £14,616.

Inspection was made also under a number of other contracts, including several for bridges for the North Coast Railway, the ironwork for the large Sewage Pumping Station at Newcastle, and various road bridges and other works.

On 30th June there were three permanent and three temporary inspectors of ironwork in addition to the Lithgow staff.

Steam Ferry Punts.

During the year a steam ferry punt for Hexham was built at Balmain, the construction of which was supervised under my charge by Mr. Brunton, as was also the construction of the new steam ferry punt for the Spit, which was in progress at Fitzroy Dock at the end of the financial year. Both these ferry punts are designed with steel hulls instead of with timber hulls as in the case of previous ferry punts constructed during late years. This change has been made on account of their increased size. The Spit ferry punt is of special design, with accommodation for a large number of foot passengers, in addition to affording greater space for vehicular traffic than exists on the present punt. It is being built with a view to transferring the passengers using the Spit to Manly tramway, now in course of construction.

Plan Room.

During the year 3,115 plans and 856 field-books were registered, showing a substantial increase on the preceding year.

The Plan Room is under the charge of Mr. Fraser, as heretofore, and owing to the increasing volume of work, an assistant is now employed.

Steel and Iron Contract.

Progress of the Steel and Ironworks.—During the past twelve months, steady progress has been made with the remodelling of the mills, and installation of new and improved plant.

Messrs G. and C. Hoskins returned on 6th August, 1909, from a visit to Europe and America, where they obtained a quantity of information upon modern systems of iron and steel production which has had

had a beneficial effect upon the output. The firm has now sent Mr. Hoskins, junior, and the Works Manager, Mr. Douglas, on a similar tour of inspection through England and America, with the special object of securing information upon rail production and improved machinery for the manufacture of bolts and other rail connections.

The new 24-inch mill has been improved by the addition of stronger pinion housings and improved saws for cutting billets and sections whilst hot. One of the latter is controlled by a special engine of 30 horse-power. Additions have also been made to the live-rollers, and a battery of eleven high-pressure boilers installed to supply steam to this important mill, which is now successfully working on modern lines.

The general mills have also received constant attention during the year. A large number of new rolls have been cast, new heavy bed-plates have been supplied, and new housings put in where required; and every effort has been made with the available machinery to increase the quantity and quality of the output.

During the months of April and May, 1910, the outputs from the various mills were the largest since the initiation of the contract.

Blast Furnace.—The blast furnace resumed operations on 9th June, 1909, after a stoppage of four months for relining. During the past twelve months the furnace, under the supervision of Mr. J. Henderson, has worked very satisfactorily, and, under favourable conditions, the output has reached 1,000 tons per week. The quality of the pig-iron produced has been excellent.

Steel Furnaces.—The product from the steel furnaces has shown considerable improvement. The chief difficulty experienced has been in the insufficient quantity. The contractors are, however, pushing on rapidly with the erection of a modern 30-ton basic open-hearth Siemens furnace which it is expected will largely increase the output.

Puddling Furnaces.—Six new puddling furnaces have been constructed, and new sheds built to cover them. The plant now consists of thirteen furnaces.

General.—Large sheds have been erected for the storage of galvanised iron and also sheds for storing steel and graded ingots. The scrap-cutting machines have been covered in, and many other improvements made whereby work can proceed with economy, and without interruption owing to weather conditions.

General Output under the Contract.—The total value of the material supplied during the year ending 30th June, 1910, is as follows :—

Table showing complete deliveries to Government Departments, including material supplied to private Contractors under Government Departments.

	Weight. Tons. cwt. qrs. lb.	Value. £ s. d.	£ s. d.
Government Departments	15,069 12 0 1	77,808 7 5	
Chief Railway Commissioner	6,985 11 2 0	70,665 8 0	
Sydney Harbour Trust...	264 5 3 6	3,156 7 2	
Total	22,319 9 1 7	£151,630 2 7	
Supplied direct to—			
Government Departments		18,174 10 11	
Chief Railway Commissioner		43,278 1 2	
Sydney Harbour Trust		1,993 14 2	
			63,446 6 3
Supplied to Contractors under—			
Government Departments		50,413 14 6	
Chief Railway Commissioner		26,936 1 7	
Sydney Harbour Trust		1,162 13 0	
			78,512 9 1
Railway Construction and Material not in Contract—			
Government Departments		9,220 2 0	
Chief Railway Commissioner		451 5 3	
			9,671 7 3
			£151,630 2 7

Table showing total output of various Manufactures under the Contract.

	Tons. cwt. qrs. lb.
Pig iron	12,883 17 0 0
Iron and steel bars and sections and plates	8,766 11 1 21
Railway connections	669 0 3 14
	22,319 9 1 7

In addition to the above, scrap-iron and steel amounting to 6,737 tons received from the Railway Department has been inspected and classified.

To show the growth of business, the following figures are given for the three and a half years ending at the financial year 30th June, 1910 :—

	Total Value of Output to all Departments. £ s. d.
Six months ending 30th June, 1907	17,641 5 4
Twelve months ending 30th June, 1908	118,744 5 1
Twelve months ending 30th June, 1909	107,553 3 0
Twelve months ending 30th June, 1910	151,630 2 7
Total	£395,568 16 0

The output for the twelve months ending June, 1909, was somewhat less than for the twelve months ending June, 1908. This was due to the stoppage of the blast furnace, and also to the fact that very little railway construction material was required during this period.

Omitting

Omitting the railway construction material from the figures, there is shown a steady growth in the general output of merchant bars and sections.

Work of the Testing Office.—This year has been a very heavy one as regards the material passed through the office for testing.

The following table shows the physical tests made for the three full years, 1908, 1909, and 1910 :—

	1908.	1909.	1910.
Machine tests made—tensile	525	1,141	2,290
Forge tests in conjunction with machine tests	353	1,141	2,290
Independent forge tests	321	383	357
Other special tests	...	...	12
Test Certificates issued to Departments	243	525	949

In addition to the above, a large number of forge tests are made daily to test the general product, but of which no record is kept.

At the request of the Victorian Government a drop-test machine was designed and added to the testing-plant for the purpose of testing fish-plates for the Victorian Government, manufactured by Messrs. G. and C. Hoskins, Ltd.

An Avery's impact testing machine has also been added to the plant, and a small bending machine by Sankey.

A new high-speed milling machine for the rapid preparation of flat specimens for testing has recently been designed by the Government Dock, and when installed the machine-room will be able to cope promptly with the daily increasing work.

Chemical Laboratory.—During the past year alterations have been made in the contract schedule whereby provision has been included for limiting the percentages of phosphorus and other impurities contained in the steel.

A Chemical Laboratory was accordingly established, and for the last six months has been in full working order, and has proved of great service in improving the general quality of the output.

For the first few months the chemical analyses were made entirely by the Testing Engineer, with the help of a lad from the machine-room, who was trained in the office, but in May last a Laboratory Assistant was appointed.

During the last six months the following work has been dealt with in the Chemical Laboratory :—

Analyses of Pig-iron	13
Do Steel	323
Do Wrought-iron	5
Sundry Analyses	23
	364

In addition to the above, there have been many daily tests for carbon contents for the purpose of steel grading, which were not recorded in the card index.

Office Routine.—The growth of business in connection with the forwarding department is shown by the following table :—

	1908.	1909.	1910.
Railway Consignment Notes issued in duplicate	1,376	1,865	1,466
Inspector's Certificates of material passed, duplicate ...	2,161	3,241	4,622
Forwarding or Advice Notes, duplicate and triplicate ...	1,939	2,065	2,745
Vouchers passed for payment	1,133	1,158	1,298
Orders signed	...	...	2,098

It will be noted that the number of Consignment Notes appears smaller than last year, but this is due to the fact that separate Consignment Notes were made out last year for each branch of the Railway Department in the metropolitan area. This year, however, instructions have been received that one Consignment Note is to be issued covering all railway material, provided it is for the metropolitan area.

The growth of business is shown by the Inspector's Certificates.

Cost of Supervision.—The cost of inspecting and forwarding, including physical and chemical tests, based on the salaries paid, has been 1.08 per cent. on the output value.

This economy of management has been largely due to the good work accomplished by Mr. W. F. Burrow (Testing Engineer) and Staff, who, in many cases, have had to work for very long hours to prevent delay in the execution of business.

Conferences.—During the year Conferences, presided over by the Under Secretary for Public Works, have been held on six occasions of representatives from the various Government Departments interested, when matters of importance affecting the Steel and Iron Contract have been discussed.

H. H. DARE,
Assistant Engineer.

Appendix No. 1.

IRRIGATION AND DRAINAGE BRANCH.

	Name of Work.	Estimated Value. £ s. d.
1.	Murrumbidgee N. Irrigation.—Berembed Diversion Weir, Lock, and Regulator—estimated	50,000 0 0
2.	" " " Regulator and Escape at Roach's	4,923 0 0
3.	" " " Regulator on Main and Branch Canal at Yanko	3,082 0 0
4.	" " " Bridges (6) Contracts, 881, 886, 889, 925, and 927	5,136 1 6

	Name of Work.	Estimated Value.
5.	Canals and Embankments—Contracts 905, 907, and 929	8,930 12 7
6.	Nepean R. Compensation Weirs at Brownlow Hill and Mount Hunter Rivulet	3,568 11 3
7.	Great Anabranch Cutting, Bridges, and Regulators—estimated	6,150 0 0
8.	Hungerford Bore Pumping Appliances	345 0 0
9.	Bore at Tunda—Distributing Works—Estimated ...	314 0 0
10.	„ Currumbah „ „ „	1,092 12 3
11.	„ Bunyah „ „ „	1,058 14 0
12.	„ Nowley „ „ „	1,255 0 0
13.	„ Boolooroo „ „ „	691 0 0
14.	„ Gurley Siding „ „ „	699 0 0
15.	„ 3 B „ „ „	953 0 0
16.	Raymond Terrace Viticultural Station Water Supply ...	340 0 0
17.	Sewerage of Newcastle—Reticulation of Wickham and Hamilton, Contract 822 ...	24,892 4 2
18.	„ Katoomba	10,807 17 10
19.	„ Kurri Kurri Hospital—Estimated	297 2 2
20.	„ Wagga Wagga Hospital—Estimated ...	882 0 0
21.	„ Newington Asylum—Effluent Channel ...	368 15 0
22.	„ Lismore Extensions	6,871 2 10
23.	„ Rookwood Asylum—Alterations	673 11 0
24.	„ Penitentiary Male Prison	1,012 1 8
25.	„ Murwillumbah	789 1 11
26.	„ Sydney—Western Suburbs—Fernhill Extension	10,232 9 4
27.	„ „ Southern and Western Suburbs Outfall—1st Section... ...	117,020 0 0
28.	„ „ Southern and Western Suburbs Outfall—2nd Section ...	172,750 2 9
29.	Stormwater Channel at Brown's Creek, Lismore	1,071 19 7
30.	Swamp Drainage at Ulmarra—Bridges and Lifting Gate	318 0 0
31.	„ „ Curl Curl Lagoon	3,404 10 8
32.	„ „ Duranbar	900 0 0
33.	„ „ Mooball and Crabbe's Creek, 2nd Division...	4,848 0 0
	Total	£445,707 10 6

Appendix No. 2.

RAILWAY AND TRAMWAY CONSTRUCTION BRANCH.

		£ s. d.
1.	North Coast Railway—Maitland to Dungog—Erection of Station Buildings... ...	5,848 0 0
2.	„ „ Maitland to Dungog—Manufacture of Switches and Crossings	1,860 1 0
3.	Casino to Kyogle Railway—Erection of Station Buildings	4,331 0 0
4.	„ „ 2-ton Crane	95 0 0
5.	„ „ Kyogle Water Supply ...	600 0 0
6.	Narromine to Peak Hill Railway—Erection of Station Buildings	7,898 0 0
7.	„ „ Excavated Tank at Peak Hill	2,717 0 0
8.	Lockhart to Clear Hills Railways (Part 1)—Erection of Station Buildings... ...	2,730 0 0
9.	„ Clear Hills Railways—Supply of 80,000 Ironbark Sleepers	12,000 0 0
10.	„ Clear Hills Railways (Part 2)—Construction of Permanent Way ...	53,917 10 4
11.	Bogan Gate to Bulbodney Railway, Trundle to Tullamore—Excavated Tank at Tullamore additional	553 0 10
12.	Mudgee to Dunedoo Railway—Gulgong to Dunedoo—Excavated Tank at Dunedoo	2,442 5 0
13.	„ „ Gulgong to Dunedoo—Dunedoo Water Supply	400 0 0
14.	Cowra to Canowindra Railway—Canowindra Water Supply	400 0 0
15.	„ „ Railway—Manufacture of Gates	67 10 0
16.	Cooma to Bombala Railway—Cooma to Nimmitabel—Construction of Permanent Way ...	99,879 10 0

NOTE.—These lists represent the value of works as taken in the Drawing Office returns, and should not be confused with the Accountant's statements. They include only such works as were sent on for Tenders or put in hand by day-labour.

APPENDIX No. 2—*continued.*

		£	s.	d.
17.	Arncliffe to Bexley Steam Tramway—Gates and Fencing	67	6	4
18.	Wallsend to West Wallsend Steam Tramway—Erection of Car and Engine Shed	2,335	17	0
19.	„ West Wallsend Steam Tramway—Manufacture of Special Crossing, &c.	115	13	8
20.	Manly to Brookvale Steam Tramway—Construction of Permanent Way	5,644	7	6
21.	„ Brookvale Steam Tramway—Manufacture of Switches and Crossings	270	0	0
22.	Baulkham Hills to Castle Hill Steam Tramway—Construction of Permanent Way	3,147	16	1
23.	„ to Castle Hill Steam Tramway—Supply of White Metal Ballast..	2,493	15	0
24.	„ to Castle Hill Steam Tramway—Switches and Crossings	255	0	0
25.	Drummoyne to Ryde Electric Tramway—Alterations and Additions to Parramatta River Bridge	1,483	0	0
26.	Botany Road to Rosebery Park Electric Tramway—Construction of Permanent Way ...	5,840	0	0
27.	„ to Rosebery Park Electric Tramway—Manufacture of Switches and Crossings	707	13	0
28.	„ to Rosebery Park Electric Tramway—Erection of Overhead Wiring... ...	796	14	8
29	Harris-street to Evans-street—Balmain Electric Tramway—Construction of Permanent Way	12,873	6	3
30.	„ to Evan-street—Balmain Electric Tramway—Special Switches and Crossings and Catch Points	2,118	0	0
31.	„ to Evans-street—Balmain Electric Tramway—Alteration and Electrical Connection to Glebe Island Bridge.. ...	2,659	0	0
32.	„ to Evans-street—Balmain Electric Tramway—Erection of Overhead Wiring ...	2,088	0	0
33.	The Spit to Manly Electric Tramway—Construction of Permanent Way..	20,520	16	5
34.	„ Electric Tramway—Special Crossings and Switches..	584	0	0
35.	„ Electric Tramway—Erection of Overhead Wiring	3,087	10	0
36.	Waverley to Bronte Electric Tramway—Construction of Permanent Way	7,402	0	0
37.	„ Electric Tramway—Erection of Overhead Wiring	570	0	0
38.	Maitland Steam Tramway, Church-street to West Maitland Railway Station—Construction of Permanent Way..	1,939	11	2
39.	„ Tramway, Church-street to West Maitland Railway Station—Switchings and Crossings	82	10	0
40.	Sutherland to Cronulla Steam Tramway—Construction of Permanent Way	17,349	5	5
41.	„ to Cronulla Steam Tramway—Switches and Crossings	793	0	0
42.	„ to Cronulla Steam Tramway—Erection of Car Shed..	2,799	6	10
43.	Spikes for 60-lb. Rails, 400 tons	5,900	0	0
44.	Rails for 80-lb., 12,560 tons	65,312	0	0
45.	Rails for 60lb., 12,000 tons	70,050	0	0
46.	Cast-iron Tanks and Tank Stands	5,223	10	0
47.	Rails, 60-lb. Guard (Toole), 125 tons	750	0	0
48.	Switches, 60-lb. and 80-lb., and 60-lb., Stub. and Junction Fishplates...	1,330	5	6
49.	Platform and Cart Weighbridges, Tie Bars, Throw-off Rails, and C.L. Letters..	1,803	10	0
50.	5-ton Gantry Cranes, Swinging Jibs, Ball Valves, Railway and Tramway Gauges	1,273	0	0
51.	Electrical Equipment	471	6	0
	Total	£445,875	18	0

Appendix No. 3.

HARBOURS AND WATER SUPPLY BRANCH.

		£	s.	d.
1.	Wharf and approach at Port Stephens	1,695	15	0
2.	,, H. R. S. W. Co. at Newcastle, New Cargo Shed...	1,296	7	0
3.	,, at Merewether-street, Newcastle—Offices and Lavatory—Estimated	400	0	0
4.	,, at Milson Island	153	16	4
5.	,, at Goodwood Island...	490	6	1
6.	,, at Coraki—Additions	1,169	11	2
7.	Jetty at Byron Bay—Additions	6,687	7	8
8.	,, at Coff's Harbour—Additions	552	10	0
9.	,, ,, Locomotives and Trucks—Estimated	1,115	0	0
10.	,, at Woolgoolga—Additions	420	0	0
11.	,, at Merimbula—Additions	5,834	13	9
12.	,, at Port Kembla—Supply of Piles	4,900	14	6
13.	,, at Brooklyn—Estimated	200	0	0
14.	Wollongong Coal Handling Plant—Original Design ...	1,113	0	0
15.	Kiama Sea Wall Extensions	649	6	0
16.	Dredges—Leather Sleeves—Estimated	1,000	0	0
17.	,, "Dorus"—Boiler—Estimated	900	0	0
18.	,, "Midget"—Pontoon Hull Crane and Pontoons—Estimated	800	0	0
19.	,, "Pion"—Priestman Crane Dredge—Estimated	850	0	0
20.	,, "Ulysses"—Sand Pump and alterations to Hull and Machinery	3,000	0	0
21.	,, "Zeta"—Mouth Piece with Jets—Estimated...	150	0	0
22.	Water Supply for Lithgow—Extensions—Estimated ...	1,405	0	0
23.	,, Wollongong—Extension to Mt. Pleasant Cokeworks—Estimated	192	0	0
24.	,, Unanderra and Port Kembla Jetty—Estimated	586	0	0
25.	,, Gundagai—Extensions—Estimated ...	620	0	0
26.	,, Murwillumbah—Extensions—Estimated	515	0	0
27.	,, Goulburn—Extensions—Estimated ...	1,314	0	0
28.	,, Dungog—Extensions—Estimated ...	9,735	0	0
29.	,, Towns North of Wollongong—Cordeaux R. Dam—Estimated...	30,000	0	0
30.	,, Towns North of Wollongong—Distribution of Pipes	396	13	0
31.	,, Forbes—Additions—Estimated ...	7,350	0	0
32.	,, Nowra—Additions—Estimated ...	3,620	0	0
	Total	£89,112	0	6

Appendix No. 4.

ROADS, BRIDGES, AND PUBLIC WATERING PLACES BRANCH.

		£	s.	d.
1.	Bridge over Sportsman's Creek	3,493	15	0
2.	Murwillumbah Bridge—Sheathing Deck...	339	0	0
3.	Bridge over Towamba River	4,462	8	3
4.	,, Middle Arm, Tweed River	2,129	10	0
5.	Alterations to Approaches—Pyrmont Bridge	3,937	0	0
6.	Hexham Steam Punt	2,745	0	0
7.	Bridge over Ghinni Ghinni Creek	1,397	2	10
8.	Bridge over Narrabri Creek, including Additions ...	5,021	0	0
9.	Blackman's Point, Oil-driven Punt	1,200	0	0
10.	Bridge over Murray River at Bringenbrong	2,891	0	0
11.	Penrith Bridge Lighting—Estimated by Fitzroy Dock at	25	0	0
12.	Spit Ferry Steam Punt ,, ,,	3,500	0	0
13.	Bridge over Black Creek	883	0	0
14.	,, ,, Peel River at Moore—Additions	496	5	6
15.	,, ,, Lagoon in Approach to Howlong B. ...	2,540	10	0
16.	,, ,, Wakool River (Lowest Tenders for two Contracts, Original Design)... ...	17,835	12	6
17.	,, ,, Cudgegong River at Yamble	3,804	10	8
18.	,, ,, Cockfighter's Creek—Estimate	5,060	0	0
		£61,770	14	1

Survey

Survey Branch.

16th August, 1910.

The past year has been a busy one for the Survey Staff throughout the Department, and considerable progress has been made in obtaining information for the reporting on schemes for the construction of different works that have been in abeyance for some years.

A few temporary surveyors and five field assistants have been appointed during the year. The employment of private surveyors still continues, and gives satisfactory results with regard to expedition and cost. At one time five private surveyors were engaged.

Amongst the numerous surveys carried out during the past year for the branches of the Department, the following might be mentioned :—

(1) Further resumption surveys have been made in connection with the North Murrumbidgee Canal works for the Hay branch, over 9 miles in length, and instructions have been issued for extension of the Mirrool branch over 30 miles. Surveys and levels are being taken for the proposed Edwardes River improvements, but it will take some time before a Trust proposal can be formulated.

A number of surveyors have been employed upon the proposed Warragamba storage scheme, and the advisability of erecting a large dam near the junction with the Nepean River will shortly be dealt with.

(2) The drainage of the swamps on the North Coast rivers has also been proceeded with, and Trusts have been formed to utilise these areas of valuable land.

(3) Surveyors have been engaged on artesian bore drains, and numerous Trusts have been gazetted.

(4) Surveys have been effected throughout the State in connection with Lismore storm-water channel; weirs on the Nepean River; dedication of roads for access, Narrandera; resumptions, easements, and occupations required for the outfall sewer for Botany; Lithgow sewerage and resumptions for land for a storage reservoir on the Cordeaux River, required in connection with water supply for villages north of Wollongong.

(5) Survey and levels in connection with the following water supply schemes have been made and transmitted, viz.:—Murwillumbah, Inverell, Cooma, Berry, Temora, Dungog, Cootamundra, and villages north of Wollongong.

(6) The National Detail Survey has made progress for the year; four Surveyors have been employed. The suburbs of Newcastle have been completed to satisfy the requirements of the extension of the sewerage scheme for some time to come, and North Botany and Botany are being detailed for the sewerage construction shortly to be commenced.

(7) Surveys have been made throughout the State in connection with sites for police stations, court-houses, asylums, powder magazines, Technical College, dental hospital, school sites, post offices, and fire stations; also the surveys for the acquisition of lands in connection with all the within mentioned works, and have been satisfactorily carried out.

A. L. LLOYD,
Chief Surveyor, Department of Public Works.

The Under Secretary,
Department of Public Works.

Survey Drafting Branch.

THE past year has been an exceptionally busy one in this Branch, and it was found necessary to increase the staff to cope with the work.

Miscellaneous matters for the whole of the Branches always form a large portion of the work, and it would be difficult to give particulars of all done within reasonable bounds.

Following is a brief statement of the larger matters dealt with :—

Railways.—Working plans and sections, usual lithographic copies, proclaimed and police district plans, with books of reference, for the extensions, Cooma–Bombala (part 1), and Lockhart–Clear Hills (part 2); and similar work is in hand for the following :—Taree–Wauchope, Wauchope–Kempsey, Glenreagh–South Grafton, Cooma–Bombala (part 2), Moree–Mungindi (part 1).

Trial survey plans and sections of the following proposals :—Bowning–Burrowa, Boogong–Ballina, Collarindabri–Angledool, Muswellbrook–Merriwa, and Perthville-Rockley–Burraga.

Estimates for the following have been furnished:—Gilgandra–Curlewis, Richmond–Kurrajong (parts 1 and 2), Perthville–Rockley–Burraga, Wagga–Humula–Tumbarumba, Mount Horeb–Tumbarumba, Paika–Tumbarumba.

Tramways.—Working plans, sections, &c., completed :—High-street, *via* Church-street, to West Maitland Railway Station, Spit–Manly (part 1), Sutherland–Cronulla (part 1), Miller-street–M'Mahon's Point, Harris-street–Evans-street (Balmain), Waverley–Bronte, Botany-road–Rosebery Park Racecourse, and Castlereagh-street–Flinders-street, while the following are in course of completion: Military-road–Cremorne, and Sutherland–Cronulla (part 2). Trial survey plans and sections of projected lines: Petersham–Darling-street (Balmain), Randwick–Little Coogee, Broadmeadow to Show Ground, Military-road–Balmoral Beach, Enfield–Strathfield, and West Maitland–Homeville–Rutherford.

Drawings, descriptions, schedules, &c., that have been prepared for—

(*a*) *Bore Trusts.*—Beanbah, Brewon, Combogolong, Gilgooma, Gilgoin, Kialgara, Mungyer extension, Munna Munna, New Yarawa, Pagan Creek, Talmoi extensions (2), Tunda, Youandah extension, Yowie and Welbondonga extensions (2).

(*b*) *Water Conservation Trusts.*—Barooga, Little Merran Creek, and Nidgery Weir.

(*c*) *Swamp Drainage Trusts.*—Alipou, Anna Bay, Gladstone, Murwillumbah, Myocum, and Frogmore

Sewerage Schemes.—Plans, sections, &c., made. Southern and Western Outfall, Brown's Creek, Lismore, Wickham and Hamilton (2nd division), Fernhill and Newington Asylum, and some of the preliminary work has been done in connection with Lithgow, Goulburn, Bathurst, Orange, Wagga, Vaucluse, Botany, Hornsby, and Wahroonga, and Leura.

Water Conservation.—Contour drawings, with sections and tables of capacity, have been run out for proposed storage dams on Warragamba River, on Colo River, at Blowering on Tumut River, on George's River, at "Illaroo" on Shoalhaven River, at "Mingay" on Murrumbidgee River, and at "Woodlands" and "White Rock" on Macquarie River.

A great deal has been done also in connection with the Murrumbidgee Northern Irrigation Scheme Subdivision, and the project to supplement Sydney Water Supply from the Warragamba River.

Much valuable data has been collected and tabulated relating to the question of decrease of flow in bores in the State. Many Public Watering-places have been established during the year in the Western Division, and also at instance of the Shire Councils.

Country Town Water Supply.—Plans, sections, &c., are either completed or well forward for the following :—Blackheath, Broken Hill, Bowral, Cootamundra, Dungog, South Coast Villages, Cooma, Grafton, Gosford, Goulburn, Helensburgh, Junee, Katoomba, Kiama (supplementary), Peak Hill, Quirindi, Springwood, and Temora. And much was also done as to the Federal Capital Water Supply.

Ports and Harbours.—Many drawings with soundings and new proposals have been furnished in connection with Newcastle Harbour, Port Kembla, Port Stephens, &c.

For use in connection with the Royal Commission on Decentralisation of Railways and Ports, a State map, showing all existing lines, also those under construction, authorised, proposed, or explored, and thirteen drawings of the principal ports and harbours on the coast, have recently been made.

Plans and sections have also been drawn in connection with Parramatta Park roads, Pyrmont Bridge Approaches, Hawkesbury River Jetty, improvements to streets at Randwick, &c., &c.

The computations, descriptions, plans, searches, and certificates of identity for easements and resumptions for all branches have been particularly heavy. Searches in connection with Trust proposals alone run into several thousands.

Detail Survey Drafting, Newcastle and Suburbs Sewerage.—Fifty-three sheets have been revised and four new sheets drawn, also fifty-seven tracings revised and three new ones made by three draftsmen, who, in addition, have prepared standard traverse sheets, index maps, &c.

Heliographic and Plan Mounting.—The heliographer and assistants have on several occasions had great difficulty in meeting requisitions made by the various branches. The large quantities of 21,340 square yards of heliographic paper and 3,150 square yards of mounting linen have been used during the twelve months.

Applications

Applications for licenses and renewals under the Water Rights Act number 166.
Over 6,500 files of papers have passed through the Branch.
The employees in the Branch are as under :—

Draftsmen and Searchers' Staff	20
" " Temporary	26
" Contract	3
Cadets	2
Clerk	1
Heliographer and Assistants...	5
Total	57

J. MARSHALL,
Chief Survey Draftsman, Public Works Department.

Local

Local Government.

Fifth Annual Report of Officer-in-charge, Local Government, period ended 30th June, 1910.

1. The year under review has been a period of quiet, steady, administrative progress in the conduct of Local Government throughout the State, without legislative change in the machinery or powers of Local Authorities, except the change made by the Fire Brigades Act of 1909, which reconstructed the Fire Brigades Board, and extended its jurisdiction practically over the whole of the districts which previously provided their own protection from fire, and requires the Local Authorities to contribute to the revenues of the Board, instead of providing their own fire services.

2. The work of the Local Government Branch shows a steady increase, contrary to the expectations expressed by some people when the office was established. The cause of this increase is to be found in the better knowledge possessed by Councils and the public of the provisions of the new law, and in this knowledge leading to advantage being taken of provisions and powers not previously generally understood or known. Thus the public and Councils are more frequently asking for alterations of boundaries of Shires and Municipalities, Ridings, and Wards. The Shire and Municipal organisations and finances having year by year become more efficient, the Councils have shown a tendency to take up more and more departments of local government work; and every such extension means usually additional correspondence with this office, either by applications for additional powers, or for the Governor's approval to borrow, or for Departmental advice.

3. Perhaps the outstanding feature of the extension of the sphere of operations of Councils is the steady increase in the number of towns in Shires to be provided by the Shire Councils with "sanitary services" for the removal and disposal of fœcal matter. In Shires the Councils were quite unfamiliar with this class of work: the very limited borrowing powers given to Shire Councils seemed to cast apparently insuperable difficulties in the way of financing the first cost of the appliances and depôts necessary before the services could be instituted, and the provisions of section 103 prohibiting the use of the general fund for sanitary or garbage removal services intensified these difficulties. Nevertheless, one or two Shire Councils essayed to blaze the new track, and overcame the financial difficulty either by temporary loan under section 176, or by a time-payment arrangement under sub-section 2 of section 87. During 1909–10 this example has been followed by quite a number of other Councils, and still more are preparing to fall into line. In all such cases the services are being installed in accordance with the provisions of ordinance No. 45, and a covered-pan weekly-removal system is established.

Urban Areas in Shires.

4. Proposals for the establishment of ten urban areas were received from nine Shire Councils. Of these, seven were approved, and the urban areas established, while one proposal was defeated at a poll of ratepayers. The remaining two were, at the 30th June, 1910, still under consideration. For particulars of these proposals see Appendix I.

Endowment of Shires.

5. Section 161 of the Local Government Act provides that on or before the 31st December, 1906, and every third year thereafter Shires shall be classified for purposes of endowment. Under the classification made on 31st December, 1906, some 87 Shires were entitled to receive endowment at varying rates in the £ on their general rate collection for the preceding year. The amount of endowment paid to each Shire in 1909, in pursuance of this classification is shown in Appendix II hereto, the total amount being £262,146 3s. 11d.

6. Reclassification.—The first classification of Shires having been made on 31st December, 1906, a fresh classification was required by the law to be made during the year 1909. For the purpose of making that reclassification the Minister appointed a Committee consisting of the Under Secretary for Public Works (Mr. W. J. Hanna), the Local Government Engineer (Mr. R. E. Jones), the Chief Inspector of Lands Department (Mr. C. E. Rennie), and an officer of the Crown Solicitor's Office (Mr. W. H. Forrest).

7. The reclassification was proclaimed in the *Gazette* of 29th December, 1909. By it one hundred and seven (107) Shires were given endowment rights. No Shires previously receiving endowment were deprived of it; but twenty (20) additional Shires which previously did not receive endowment were so classified that during the triennium 1910–11–12, they will be endowed at varying rates in the £ on their general rate receipts. The estimated amount of endowment payable to Shires in the first year of the first classification was £179,135. The amounts actually paid yearly under that classification, however, exceeded the estimates, as a number of Councils levied higher rates than were anticipated. Thus, the endowments paid in the triennium were:—

Year (January to December).

	£	s.	d.
1907	179,135	0	0
1908	162,447	16	8
1909	262,146	3	11

The amount of endowment payable yearly to Shires under the second (or new) classification is estimated at £290,030. A comparison of the amounts paid in 1909 under the old classification, and the estimated amounts payable yearly under the new is given in Appendix II hereto.

Temporary

Temporary Loans.

8. During the period which intervenes between the spending of the previous year's revenue and the collection of that for the current period, Councils are frequently without sufficient funds to meet their current expenses in carrying on ordinary road, bridge, and administrative work. In order to tide themselves over this temporary difficulty a large number of Councils annually have to take advantage of the provision in the Local Government Act which permits them, with the Minister's consent, to temporarily borrow. The amount which may be temporarily borrowed by a Council in any one year must not exceed one-third of the estimated revenue to be received from rates. "Consent" was given by the Minister during the year ended 30th June, 1910, to sixty-three (63) Shire Councils to temporarily borrow sums aggregating £50,808 5s. 7d. as shown in Appendix III, and to thirty-four (34) Municipal Councils to temporarily borrow £33,660 14s 8d, as shown in Appendix IV.

9. In dealing with applications of this character the Department's practice is to take into account all existing temporary loans of the Council concerned, and "Consent" is not given for any sum which, if added to the existing temporary loans, would raise the total of temporary loans above one-third of a year's revenue. While this care is taken by the administration the temporary borrowing provisions of the law can never lead to an excessive accumulation of Shire or Municipal loan debts.

Renewals of Fixed Loans—Municipalities.

10. Approval was given by the Governor, on the recommendation of the Minister during the year ended 30th June, 1910, to twenty-eight municipal councils to borrow various sums, totalling £137,137 5s. 6d., for the purpose of repaying loans falling due, which originally amounted to approximately £152,137 5s. 6d. The difference between these two amounts (£15,000) represents the amounts which the councils had since the time when the loans were first obtained, already paid off the loans out of revenue or had set by in cash for purposes of repayment. Particulars of these renewal loans are shown in Appendix V.

New Fixed Loans.

11. Twenty-six proposals from councils for new fixed loans were dealt with during the period under review. Eleven of these proposals were, after the necessary preliminaries had been complied with, and an inquiry held by an officer appointed by the Governor, submitted to a poll of the ratepayers affected. As a result of the polls three of the proposals were vetoed by the ratepayers, and the proposals were then necessarily abandoned by the councils concerned. The remaining eight proposals were passed at the polls, and the loans, aggregating £29,580, were approved by the Governor. In the case of Broken Hill, the Government, on the Premier's authority, dated 10th July, 1909, made an advance of £2,000 to provide relief work for the unemployed. This loan was repayable in July, 1910, but four months' extension of time was given the Council in which to make the repayment. Of the remaining fourteen proposals not dealt with above, ten were, at the close of the financial year, still under consideration, two were adversely reported upon by the officer appointed by the Governor to inquire into them, and two were abandoned by the councils concerned. Particulars of the proposals will be found in Appendix VI hereto.

Alteration of Boundaries of Municipalities and Shires.

12. During the year the boundaries of the municipalities of Canterbury, East Maitland, Marrickville, West Maitland, and Shellharbour were altered under the provisions of section 15 of the Local Government Act. (For additional details, see Appendix VII). The boundaries of the shires of Apsley, Bolwarra, Gilgandra, Hastings, Nattai, Wakool, Windouran, and Wingadee, were also altered. (For details, see Appendix VII.)

13. In addition to the above, proposals for the alteration of the boundaries of forty-six areas were dealt with during the year. Of these, proposals affecting ten areas were subsequently withdrawn, fourteen were disapproved by the Minister, and twenty-two were, at the close of the financial year, still under consideration.

Applications for new Municipalities.

14. Applications were received during the year ended 30th June, 1910, for the incorporation as municipalities of the towns of Kurri Kurri (in Cessnock Shire), Hornsby (in Hornsby Shire) and Boggabri (in Namoi Shire). Owing to opposition on the part of the Tarro Shire Council to the incorporation of Kurri Kurri, this proposal was not proceeded with. The Hornsby and Boggabri proposals were, at 30th June, 1910, still under consideration.

15. The proposal for the incorporation of the town of West Wallsend, which was under consideration at the time of the last annual report has since been inquired into by the Officer-in-charge and the Local Government Engineer, who were appointed by the Governor for that purpose. As the result of a painstaking inquiry, the officers named reported adversely, and the proposal was not proceeded with.

Applications for new Shires.

16. Proposals have been made during the year for Bellingen Shire to be divided into two new Shires; for parts of Bellingen and Dorrigo Shires to be formed into a new Shire; for parts of Boree and Waugoola Shires to be formed into a new Shire, and for Erina Shire to be divided into two Shires. The first two of these proposals were, after special investigations had been made locally, not proceeded with. The two latter proposals were at 30th June, 1910, still under consideration.

Alterations of Ward Boundaries.

17. During the year ended 30th June, 1910, the Ward boundaries of the municipalties of Bankstown, Kogarah, Marrickville, and Shellharbour were altered.

Abolition

Abolition of Wards in Municipalities.

18. Since the last report nine proposals have been made for the abolition of Ward boundaries. Of these, four were vetoed when submitted to the decision of a poll of electors, the consideration of one was postponed for twelve months, three were approved and the Ward boundaries abolished, and the remaining application was at the close of the period under review still under consideration. For particulars of these proposals see Appendix VIII.

Alterations of Riding Boundaries.

19. The boundaries of the ridings of the Apsley, Barraba, Bolwarra, Byron, Cessnock, Gadara, Hastings, Muswellbrook, Nattai, Tintenbar, Tumbarumba, Tweed, Wakool, and Windouran Shires were altered during the year. In each case these alterations were rendered necessary by alterations which had been made in the boundaries of the Shire.

20. As the result of a petition from the Shire Council, the riding boundaries of the Mulwaree Shire were altered during the year.

Accounts of Councils.

21. The examination in detail of the statements of accounts of the various Councils is a permanent feature of the work of the Local Government Office. This has proceeded smoothly and efficiently during the year. The practice is to advise the Town and Shire Clerks of all defects discovered in the statements, whether important or unimportant, as the departmental oversight is intended more for educational than inquisitorial purposes. When errors are found in the accounts for the half year ending 30th June, the Town and Shire Clerks are not asked to furnish fresh or corrected statements; but the errors are pointed out to both the Clerk and the Auditor, and they are requested to correct them and adjust the books before the close of the year, in order that these errors shall be eliminated from the accounts to be prepared for the full year ending 31st December. When these latter accounts are examined, the Department requires all errors to be corrected, and, if necessary ,fresh statements to be furnished, before the Statistician is advised that the accounts may be passed for publication.

22. Each year that passes reveals a distinct improvement in the condition of the Shire and Municipal account-keeping. In the Shires the work has up to the present consisted in almost all cases of three funds (General, Trust, and Temporary Loan), and it is in only one of these that there is any appreciable number of transactions. Further, the Shires were started aright, with double-entry account-keeping. There is, therefore, little opportunity or excuse for a Shire clerk to go astray in his account-keeping, and, as a general rule, it is found he does not, except in minor matters.

23. The Town Clerks in Municipalities had no such advantages, and in view of the conditions which are known to have existed before the introduction of the system laid down in Regulation No. 6, under the Local Government Act, it is an achievement for which the Town Clerks are deserving of the highest praise that the accounts presented to the Department show such evident care in preparation, and such a general effort to appreciate the requirements of commercial accountancy as applied to Local Government work as is to be found on examination of the statements periodically furnished to this office. These men were handicapped by the effect of the habit of keeping their accounts in another way; by the necessity, in some cases, of learning what double entry is and how such accounts are kept, and at the same time by the increase of work, due to increased revenue, leading to increased expenditure, and the added burden of becoming familiar with a new set of municipal machinery and new methods of expressing it. Notwithstanding these drawbacks, it is possible now to say that the Town Clerks have risen splendidly to the emergency, have qualified themselves, and by their work have justified themselves. Speaking generally, and taking no account of the few exceptions, the Shire and Municipal Clerks are a very efficient body of men.

24. During the year ended 30th June, 1910, there were 638 original and 331 revised statements of accounts examined.

Audit.

25. It has been found necessary, in the interests of Local Government account work, to administer salutary lessons to a few of the Auditors by threatening them with suspension or cancellation of their certificates as Auditors under the Local Government Act if further evidence of carelessness or neglect on their part in connection with audits of Councils' accounts came to light; but the work of the Auditors has, generally speaking, been fairly well performed, and in some cases exceptionally well.

26. The Local Government Examiners of Accounts (Inspectors of the Audit Department) have done good work during the year.

Cancellation of Certificates of Clerks and Auditors.

27. Owing to carelessness and neglect on the part of Auditors and Clerks, it has been found necessary, in the interests of Councils, and indirectly of the public, to call upon the offenders to show cause why their certificates as Clerks or Auditors, as the case may be, should not be suspended or cancelled. During the year eight Auditors were called upon to show cause. Of these three have, on the recommendation of the Committee appointed to hear their cases, had their certificates cancelled; four have been severely censured and cautioned against a repetition of the carelessness and neglect displayed by them, whilst the case against the remaining Auditor was not proven.

28. The three Auditors referred to above whose certificates have been cancelled also held certificates of qualification as Clerks. Consequent on gross neglect on the part of one of these men his certificate as Clerk has been cancelled, whilst the case against a second is to be reconsidered upon the receipt of the next report by an Examiner of Accounts on the manner in which his work as Clerk is carried out.

Examinations for Council Clerks, Auditors and Engineers.

29. Examinations for certificates of qualification as Council Clerks, Auditors and Engineers, were held as follows during the twelve months ended 30th June, 1910 :—

For Clerks and Auditors, two examinations—on 1st October, 1909, and 31st March, 1910; for Engineers, one examination, on 27th June, 1910. The result of these examinations were as follow :— Clerks' examinations,—130 candidates, 26 passes. Auditors' examinations,—19 candidates, 7 passes. Engineers' examinations—6 candidates, 1 pass.

30. During the year certificates under the Local Government Act were issued as follows :— Clerks, 55, 2 without examination and 53 after examination. Auditors, 19, 11 without examination and 8 after examination. Engineers—All certificates issued during the year were issued without examination. Five interim certificates were issued during the year, one being issued after examination. Five certificates of service have also been issued during the period under review.

Conclusion

31. In conclusion, I would like to say that there are many aspects of the development of Local Government which is now proceeding which could be interestingly, and I think, profitably, reviewed in the report of the Local Government Office, but, in deference to the wishes of the Under Secretary that the report be shortened, discussion of them is omitted.

J. GARLICK,
Officer-in-Charge, Local Government.

The Under Secretary,
Public Works Department.

Appendix I

URBAN AREAS IN SHIRES.

Shire.	Name of Proposed Urban Area.	Whether Application granted or refused.	Date of Gazettal.	Remarks.
Abercrombie	Mt. David	Granted	8 Sept., 1909	
Adjungbilly	South Gundagai	...	..	Still under consideration.
Blue Mountains	Blackheath	Granted	23 Feb., 1910	
,,	Leura	,,	5 Jan., 1910	
Bolwarra	Lorn	Refused	.....	Proposal defeated at poll of ratepayers.
Crookwell	Crookwell	...	.....	Still under consideration.
Lockhart	Lockhart	Granted	2 Mar., 1910	
Tumbarumba	Tumbarumba	,,	5 Jan., 1910	
Walgett	Burren Junction	,,	23 Feb., 1910	
Wingadee	Quambone	,,	20 April, 1910	

Appendix II.

ENDOWMENT paid under old "Classification" in the year 1909, and endowment (estimated) payable yearly under the new "Classification."

Shire.	Amount of Endowment paid under old "Classification" in the year 1909.	Estimated Amount of Endowment payable yearly under new "Classification."	Shire.	Amount of Endowment paid under old "Classification" in the year 1909.	Estimated Amount of Endowment payable yearly under new "Classification."
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Abercrombie	3,777 14 10	3,200 0 0	Lake Macquarie	1,347 16 6	4,424 0 0
Adjungbilly	Not endowed.	Not endowed.	Liverpool Plains	Not endowed.	Not endowed.
Amaroo	1,241 11 0	1,321 0 0	Lockhart	,, ,,	,, ,,
Apsley	810 15 11	1,310 0 0	Lyndhurst	1,802 12 2	1,781 0 0
Ashford	2,519 2 11	2,421 0 0	Macintyre	1,840 7 0	2,475 0 0
Bannockburn	1,423 16 8	1,570 0 0	Macleay	9,524 19 6	5,100 0 0
Barraba	605 16 2	1,080 0 0	Macquarie	243 19 6	1,275 0 0
Baulkham Hills	1,225 17 6	1,562 0 0	Mandowa	709 10 4	1,135 0 0
Bellingen	11,967 11 2	11,638 0 0	Manning	16,417 2 8	7,125 0 0
Berrigan	Not endowed.	440 0 0	Marthaguy	Not endowed.	Not endowed.
Bibbenluke	2,466 15 3	1,320 0 0	Meroo	1,685 10 0	1,662 0 0
Blacktown	1,516 14 3	2,078 0 0	Merriwa	Not endowed.	590 0 0
Bland	Not endowed.	552 0 0	Mitchell	,, ,,	Not endowed.
Blaxland	4,754 17 8	2,500 0 0	Monaro	1,654 7 7	2,300 0 0
Blue Mountains*	2,165 15 0	4,175 0 0	Mulwaree	2,768 18 8	2,850 0 0
Bogan	Not endowed.	205 0 0	Mumbulla	1,510 6 4	1,450 0 0
Bolwarra	,, ,,	342 0 0	Murray	Not endowed.	Not endowed.
Booloooroo	,, ,,	Not endowed.	Murrumbidgee	,, ,,	,, ,,
Boomi	,, ,,	,, ,,	Murrungal	1,375 1 4	1,368 0 0
Boree	1,720 13 4	2,407 0 0	Muswellbrook‖	335 8 4	1,150 0 0
Bulli	Not endowed.	1,600 0 0	Namoi	Not endowed.	Not endowed.
Burrangong	,, ,,	Not endowed.	Narraburra	1,220 17 0	1,195 0 0
Byron	5,502 17 4	8,100 0 0	Nattai	1,561 12 6	2,060 0 0
Cambewarra	1,066 7 6	1,252 0 0	Nepean	877 2 8	1,605 0 0
Canobolas	3,221 17 4	3,125 0 0	Nundle	Not endowed.	1,117 0 0
Carrathool†	Not endowed.	Not endowed.	Oberon	2,645 13 2	2,470 0 0
Cessnock	3,539 3 8	3,114 0 0	Orara	3,733 7 2	3,570 0 0
Clyde	3,053 0 2	3,220 0 0	Patrick Plains	740 16 10	975 0 0
Cobbora	330 4 0	1,065 0 0	Peel	Not endowed.	2,375 0 0
Cockburn	696 13 10	1,650 0 0	Port Stephens	2,140 6 6	3,280 0 0
Colo	3,208 14 2	3,190 0 0	Rylstone	964 17 4	1,020 0 0
Conargo	Not endowed.	Not endowed.	Severn	5,122 8 5	4,931 0 0
Coolah	,, ,,	243 0 0	Stroud	3,569 12 10	3,780 0 0
Coolamon	,, ,,	228 0 0	Sutherland	1,505 11 6	2,302 0 0
Coonabarabran	1,619 5 6	1,275 0 0	Talbragar	Not endowed.	712 0 0
Copmanhurst	3,446 14 3	3,443 0 0	Tallaganda	5,008 12 6	3,250 0 0
Coreen	Not endowed.	Not endowed.	Tamarang	Not endowed.	Not endowed.
Crookwell	1,777 12 8	2,906 0 0	Tarro¶	,, ,,	1,987 0 0
Culcairn	Not endowed.	497 0 0	Tenterfield**	9,015 9 3	6,240 0 0
Dalgety	3,316 16 2	2,900 0 0	Terania	3,806 17 0	5,985 0 0
Demondrille	Not endowed.	253 0 0	Timbrebongie	Not endowed.	850 0 0
Dorrigo	14,297 6 2	13,950 0 0	Tintenbar	5,529 7 8	7,020 0 0
Dumaresq	3,841 6 0	3,862 0 0	Tomki	4,131 6 3	5,311 0 0
Erina	6,204 3 8	7,621 0 0	Tumbarumba	1,459 18 6	2,116 0 0
Eurobodalla	4,086 16 4	4,445 0 0	Turon	2,845 18 10	2,745 0 0
Gadara‡	4,090 8 8	4,200 0 0	Tweed	9,564 17 2	9,313 0 0
Germanton	944 8 8	712 0 0	Urana	Not endowed.	Not endowed.
Gilgandra	195 12 8	985 0 0	Wakool	,, ,,	,, ,,
Gloucester	1,069 2 3	2,534 0 0	Walgett	,, ,,	,, ,,
Goobang	Not endowed.	650 0 0	Wallarobba	2,719 8 8	2,801 0 0
Goodradigbee	1,373 12 0	1,980 0 0	Waradgery	Not endowed.	Not endowed.
Gostwyck	1,142 3 4	1,750 0 0	Warrah	,, ,,	,, ,,
Gundurimba	4,652 0 6	4,575 0 0	Warringah	2,645 2 11	2,850 0 0
Gunning	1,060 4 3	1,460 0 0	Waugoola	193 19 7	800 0 0
Guyra	3,818 16 0	3,750 0 0	Weddin	423 10 10	678 0 0
Gwydir	1,692 11 4	1,740 0 0	Windouran	Not endowed.	Not endowed.
Harwood	4,413 4 8	4,152 0 0	Wingadee	,, ,,	,, ,,
Hastings	7,995 4 0	7,938 0 0	Wingecarribee	2,821 8 11	2,488 0 0
Hornsby	713 1 6	1,627 0 0	Wollondilly	3,028 10 9	3,980 0 0
Hume	291 16 0	558 0 0	Woodburn	4,009 12 8	4,437 0 0
Illabo	Not endowed.	Not endowed.	Woolooma	Not endowed.	277 0 0
Imlay	3,298 14 0	3,469 0 0	Wunnamurra	,, ,,	Not endowed.
Jemalong	Not endowed.	Not endowed.	Wyaldra	1,485 0 10	1,740 0 0
Jindalee§	,, ,,	330 0 0	Yallaroi	249 1 0	1,040 0 0
Ku-ring-gai	,, ,,	1,520 0 0	Yanko	Not endowed.	Not endowed.
Kyeamba	,, ,,	310 0 0	Yarrowlumla	1,362 9 0	1,310 0 0
Kyogle	4,390 5 6	6,435 0 0			
Lachlan	Not endowed.	Not endowed.	Totals	262,146 3 11	290,030 0 0

* Formerly called Kanimbla. † Formerly called Willandra. ‡ Formerly called Yarrangobilly. § Formerly called Cowcumballa.
‖ Formerly called Wybong ¶ Formerly called Kurri Kurri. ** Formerly called Koreelah.

Appendix III.

TEMPORARY LOANS.

Shires.

Shire.	Amount.	Date of Consent.	Shire.	Amount.	Date of Consent.
	£ s. d.	1909–1910.		£ s. d.	1909–1910.
Apsley	700 0 0	3 February.	Macintyre	950 0 0	6 January.
Bannockburn	500 0 0	23 March.	Mandowa	550 0 0	10 November.
Barraba	600 0 0	10 ,,	Do	700 0 0	31 January.
Bellingen	400 0 0	6 December.	Manning	1,000 0 0	2 July.
Berrigan	1,500 0 0	13 January.	Monaro	700 0 0	30 March.
Blue Mountains	600 0 0	1 February.	Mumbulla	900 0 0	25 October.
Bolwarra	250 0 0	10 ,,	Nundle	497 6 7	3 July.
Booloorоо	1,000 0 0	18 ,,	Orara	337 0 0	10 June.
Boree	150 0 0	28 January.	Patrick Plains	1,000 0 0	25 February.
Burrangong	800 0 0	12 ,,	Peel	1,000 0 0	23 March.
Cambewarra	275 0 0	12 ,,	Rylstone	200 0 0	18 August.
Canobolas	1,000 0 0	19 ,,	Severn	1,178 15 2	1 February.
Cockburn	1,000 0 0	16 October.	Stroud	400 0 0	24 January.
Colo	181 10 0	31 July.	Sutherland	300 0 0	20 December.
Do	380 0 0	19 January.	Talbragar	676 13 10	13 January.
Coolah	540 0 0	4 February.	Tamarang	1,500 0 0	1 February.
Coonabarabran	750 0 0	7 January.	Terania	1,200 0 0	1 September.
Coreen	1,500 0 0	28 ,,	Tumbarumba	586 0 0	10 March.
Crookwell	1,400 0 0	15 March.	Tweed	1,300 0 0	28 January.
Culcairn	400 0 0	25 August.	Urana	1,100 0 0	7 ,,
Dorrigo	150 0 0	12 July.	Wakool	1,000 0 0	29 April.
Gadara	650 0 0	31 January.	Walgett	500 0 0	22 November.
Germanton	300 0 0	5 August.	Do	907 0 0	21 February.
Gilgandra	654 0 0	25 October.	Wallarobba	500 0 0	5 ,,
Gloucester	675 0 0	6 December.	Do	500 0 0	26 April.
Gundurimba	1,000 0 0	21 January.	Waradgery	600 0 0	26 ,,
Guyra	200 0 0	20 October.	Warringah	300 0 0	19 January.
Hastings	200 0 0	31 January.	Waugoola	1,000 0 0	27 April.
Hume	700 0 0	28 ,,	Wollondilly	800 0 0	24 March.
Illabo	500 0 0	26 May.	Woodburn	500 0 0	11 ,,
Jemalong	800 0 0	1 February.	Wunnamurra	1,330 0 0	19 January.
Liverpool Plains	1,200 0 0	5 October.	Yanko	1,000 0 0	29 April.
Do	1,000 0 0	25 February.	Yarrowlumla	950 0 0	6 January.
Lockhart	1,000 0 0	16 ,,			
Do	1,000 0 0	25 ,,	Total £	50,808 5 7	
Lyndhurst	770 0 0	3 March.			

Appendix IV.

TEMPORARY LOANS.

Municipalities.

Municipality.	Amount.	Date of Consent.	Municipality.	Amount.	Date of Consent.
Metropolitan—	£ s. d.	1909–1910.	*Country (continued)*—	£ s. d.	1909–1910.
Alexandria	2,000 0 0	16 March.	Inverell	50 0 0	8 March.
Balmain	3,000 0 0	15 January.	Kempsey	300 0 0	24 ,,
Burwood	500 0 0	24 December.	Kiama	189 16 5	30 September.
Do	500 0 0	1 February.	Lithgow	2,000 0 0	1 February.
Concord	700 0 0	12 January.	West Maitland	1,000 0 0	23 March.
Drummoyne	1,000 0 0	9 February.	Moree	250 0 0	1 ,,
Enfield	500 0 0	3 ,,	Moss Vale	400 0 0	26 April.
Glebe	1,000 0 0	31 January.	Mudgee	312 18 3	22 ,,
Kogarah	1,200 0 0	31 December.	Murwillumbah	450 0 0	27 ,,
Lane Cove	250 0 0	21 January.	Narrandera	200 0 0	8 March.
Paddington	3,500 0 0	5 ,,	*Newcastle Suburbs*—		
Petersham	4,000 0 0	24 ,,	Carrington	390 0 0	24 December.
Randwick	2,000 0 0	5 ,,	Stockton	250 0 0	15 January.
Woollahra	2,800 0 0	12 September.	Wallsend	100 0 0	19 November.
Do	3,000 0 0	12 January.	Orange East	150 0 0	7 January.
Country—			Tenterfield	300 0 0	7 April.
Camden	150 0 0	26 September.	Ulmarra	200 0 0	18 September.
Do	50 0 0	30 December.	Uralla	100 0 0	19 July.
Carcoar	68 0 0	20 January.	Young	200 0 0	15 March.
Cobar	300 0 0	17 March.			
Do	300 0 0	17 April.	Total £	33,660 14 8	

Appendix V.

Appendix V.

FIXED LOANS.—Renewals.

Municipality.	Purpose of original Loan.	Date Loan first authorised.	Original Amount.	Amount paid off since borrowed.	Present amount for which approval has been given to borrow.	Remarks as to provision for repayment.
Metropolitan—			£	£	£	
Balmain...	Permanent improvements.	No information available.	No information available.	No information available.	4,500	£450 per annum from General Fund and Town Hall and Permanent Improvement Loan Fund.
Botany	,, ,, ...	18 Nov., 1889	5,000	Nil	5,000	£100 per annum from General Fund (Sinking Fund).
Botany North	,, ,, ...	26 ,, 1892	2,000	Nil	2,000	£45 per annum from General Fund (Sinking Fund).
,, ,, ...	,, ,, ...	4 Aug., 1889	2,500	Nil	2,500	£55 per annum from General Fund (Sinking Fund).
Concord..... ...	,, ,, ...	23 May, 1884	2,000	Nil	2,000	£125 5s. 8d. half-yearly from General Fund.
Erskineville	,, ,,	£1,000—No information. £4,000—19 Aug., 1889 £5,000—No information.	10,000	Nil	10,000	Sinking Fund—sum not fixed.
Kogarah	Carrying out regular services.	Unauthorised and validated by Local Government (Amending) Act, 1908.	1,226/14/8	Nil	1,226/14/8	£100 per annum from General Fund.
Mosman..... ..	Permanent improvements.	15 July, 1902	2,500	Nil	2,500	No Sinking Fund.
Woollahra...	General works and expenses.	12 Aug., 1909	2,800	Nil	2,800	£400 per annum, 1911-12, and renewal.
,, ...	Permanent improvements.	14 Sept., 1888	2,000	Nil	2,000	No Sinking Fund.
Country—						
Armida'e	Town Hall ..... Permanent improvements. Gas Works	31 July, 1879 31 Oct., 1889 29 April, 1891 29 June, 1892	18,000	Nil	18,000	From General Fund, 2 per cent. Town Hall and Permanent Improvements Loans Renewal Loan, £8,000, and from Gas Works Trading Account 2 per cent. of Gas Works Loan Renewal Loan, £10,000.
Bombala	Permanent improvements.	20 Mar., 1893	1,000	Nil	1,000	£25 per annum from General Fund.
Carcoar	,, ,, ...	14 Dec., 1905	200	Nil	200	No Sinking Fund.
Dubbo	Permanent improvements. Gas Works	13 Sept., 1878 6 ,, 1880 18 ,, 1885	15,000	3,000	12,000	£120 per annum Permanent Improvements Loan Fund. £180 per annum Gas Works Loan Fund.
Forbes	Gas Works	20 Nov., 1893 16 May, 1903	10,500	881/4/1	9,618/15/11	£250 per annum from General Fund.
	Town Hall	30 Nov., 1888 5 Aug., 1890	2,500	2,118/15/11	381/4/1	Earnings from Town Hall.
Glen Innes	Gas Works	29 ,, 1892	6,000	1,500	4,500	£200 per annum from Gas Works Trading Account.
Gundagai	No information available.	No information available.	No information available.	No information available.	1,000	No Sinking Fund.
Illawarra, Central..	Permanent improvements.	12 Aug., 1891	5,000	500	4,500	£200 per annum from General Fund.
,, North...	,, ,, ..	8 Jan., 1889	2,500	1,000	1,500	£100 per annum from General Fund.
Inverell	Erection of Town Hall	31 Aug., 1903	4,000	Nil	4,000	£25 per annum from General Fund (Sinking Fund).
	Permanent improvements.	30 April, 1888	5,000	Nil	5,000	£100 per annum from General Fund (Sinking Fund).
Lismore.....	Permanent improvements and Gas Works.	3 Dec., 1885 16 Aug., 1880 10 Oct., 1884 30 April, 1888	6,000 2,000 2,000 2,000	Nil	12,000	£200 per annum from General Fund. £200 per annum from Gas Works Trading Account.
Maitland West ..	General expenditure ...	No information available.	1,910/10/10	Nil	1,910/10/10	£500 per annum from General Fund.
Moss Vale	Permanent improvements.	20 May, 1889	2,000	Nil	2,000	£100 per annum from General Fund (Sinking Fund).
Newcastle Suburbs—						
Hamilton	,, ,, ...	No information available.	No information available.	No information available.	2,500	Permanent General Sinking Fund for debt of £6,600.
Wickham	,, ,, ...	,, ,,	,,	,,	2,500	No Sinking Fund.
Country—						
Penrith	,, ,, ...	21 July, 1900	3,000	Nil	3,000	,, ,,
Tamworth.....	,, ,, ...	27 June, 1887	5,000	Nil	5,000	,, ,,
Temora	Permanent improvements and Council Chambers.	23 Oct., 1899 28 June, 1898 29 ,, 1897 18 April, 1900	250 450 300	Nil	1,000	£100 per annum from General Fund (Sinking Fund).
Ulladulla	Permanent improvements.	8 Dec., 1891	2,000	Nil	2,000	£100 per annum from General Fund (Sinking Fund).
Wagga Wagga.....	Gas Works	30 June, 1887 28 Feb., 1888	15,000	6,000	9,000	£500 per annum from Gas Works Trading Account.

Appendix VI.

FIXED LOANS—NEW.

Council.	Purpose Proposed Loan.	Act under which obtained.	Date of Governor's Approval where granted.	Amount.	Remarks.
etropolitan Municipalities—				£	
Drummoyne	Erecting Council Offices, constructing Road Works, and Wharf for landing blue metal.	Local Government Acts, 1906-7-8.	1 Feb., 1910...	10,000	Sinking Fund, £141 11s. 5d. per annum from Loan Rate and £200 per annum from General Fund.
Eastwood	Erecting Town Hall and Council Offices.	.....	.....	1,000	Preliminary procedure informal; proposal abandoned, and undertaking carried out by instalment payments.
Kogarah	Kerbing and guttering in North Ward.	.....	.....	1,500	Proposal vetoed at a poll of ratepayers.
Manly	Roads and Drainage Works	....	.....	7,000	Consideration pending.
Redfern	Wood-blocking streets, and Park improvements.	.....	.....	21,500	Proposal vetoed at poll of ratepayers.
untry Municipalities—					
Barraba	Forming and draining streets, kerbing and guttering and constructing footpaths.	.....	.....	3,000	Consideration pending.
Bega	Purchase of Lyceum Hall, and alteration for use as Town Hall and Council Offices.	.....	.....	1,500	Adverse report made by officer appointed to hold inquiry into matter. Proposal subsequently fell through.
Blayney	Establishment of Sanitary service.	.....	.....	£397 2s. 6d.	Preliminary procedure informal. Proposal abandoned.
Broken Hill	Relief works for unemployed.	Premier's authority (in very special circumstances).	Date of Premier's authority, 10 July, 1909.	2,000	Repayable July, 1910. Four months extension of time to November, 1910, subsequently granted.
Casino..... ..	Road works and improvements, market building, and cattle sale-yards.	.....	....	7,500	Adverse report made by officer appointed to hold inquiry into matter. Loan not recommended.
,, ...	Market buildings and cattle sale-yards.	....	.....	2,000	Consideration pending.
Corowa	Cattle sale-yards.....	Local Government Acts, 1906-7-8.	Date of Govenor's approval, 6 Jan., 1910.	1,380	Sinking Fund, £208 per annum from Loan Rate and £176 13s. 4d. per annum from undertaking.
Cudal	Establishment of Sanitary system.	.....	.....	300	Consideration pending.
Glen Innes.....	Cattle sale-yards	Local Government Acts, 1906-7-8.	20 July, 1909.	1,000	Not used. Undertaking paid for out of General Fund.
Grafton	Road improvements and Office accommodation.	.....	.....	8,000	Proposal vetoed at poll of ratepayers.
Inverell	Electricity Works for street lighting and supply to private consumers.	.....	.....	8,700	Consideration pending.
Jamberoo	Establishment of Sanitary system.	.. ..	....	300	,, ,,
Katoomba	Erection of Town Hall.....	Local Government Acts, 1906-7-8.	3 Jan., 1910.	3,000	Sinking Fund, £200 per annum from Loan Rate and £150 per annum from General Fund.
Moss Vale	Purchase of and additions to Electricity Works for street lighting and supply to private consumers.	,, ,, ...	31 May, 1910.	2,800	Sinking Fund, £48 per annum from Loan Rate and £70 per annum from undertaking.
Parkes	Gas Works	,, ,, ...	17 Feb., 1910.	7,500	Sinking Fund, £52 10s. per annum from Loan Rate and £41 10s. from General Fund, and interest on Sinking Fund and profits.
Peak Hill	Erection of Council Chambers.	,, ,, ...	28 Dec., 1909.	400	Sinking Fund, £50 per annum from Loan Rate.
,, ...	Establishment of Sanitary service.	.....	.....	250	Consideration pending.
Shellharbour	,, ,, ..	.. ..	.....	500	,, ,,
Tamworth	Extension of Electricity Works.	Local Government Acts, 1906-7-8.	24 May, 1910.	3,500	Repayment provision, £233 6s. 8d. per annum from Loan Rate.
res—					
Bellingen	Wharfage accommodation, Bellingen and Bowraville, and establishment of Sanitary service in Bellingen, Bowraville, and Macksville urban areas.	.....	.....	1,200	Consideration pending.
Adara	Establishment of Sanitary service in Adelong urban area.	....	.....	650	,, ,,

Appendix VII.

ALTERATION of Boundaries of Municipalities and Shires.

	Municipality.	Alteration.	Date of Proclamation, 1909-1910.
1	Canterbury Marrickville	Part of Marrickville Municipality united to Canterbury Municipality	13th October.
2	East Maitland West Maitland	Part of East Maitland Municipality united to Bolwarra Shire. Unincorporated land added to East Maitland Municipality. Unincorporated land added to West Maitland Municipality.	29th December.
3	Shellharbour	Part of the Municipality united to Nattai Shire	29th December.

	Shire.	Alteration.	Date of Proclamation, 1909-1910.
1	Apsley Hastings	Part of Hastings Shire united to Apsley Shire, and part of Apsley Shire united to Hastings Shire.	15th September.
2	Wakool Windouran	Part of Windouran Shire united to Wakool Shire	22nd December.
3	Bolwarra	Part of East Maitland Municipality united to Shire	29th December.
4	Nattai	Part of Shellharbour Municipality united to the Shire	29th December.
5	Gilgandra Wingadee	Part of Wingadee Shire united to Gilgandra Shire, and parts of Gilgandra Shire united to Wingadee Shire.	22nd June.

Appendix VIII.

ABOLITION OF WARDS.

Abolished.	Proposed Abolition vetoed at Poll of Electors.	Refused by Minister.
Municipality of Glebe. Do Manly. Do Yass.	Municipality of Adamstown. do Balmain. do Grafton. do Newcastle.	Municipality of Junee.

Report of Superintendent of Plant and Stores for the Year ended 30th June, 1910.

Plant and Stores, Cement Testing, and Timber Inspection.

Sir,

I have the honor to submit the following report covering the operations of this Branch for the year ended 30th June, 1910.

The number of requisitions registered for all services—materials, stationery, furniture, draftsman's requisites, &c.—number 16,387, being a decrease of 1,283 on the previous year; whereas the orders issued totalled 20,212 as against 18,490, showing an increase of 1,722 over the previous year.

The average value of the requisitions for material is £24 0s. 3d., and that of orders £15 4s. 4d.

The table subjoined is a summary of the requisitions submitted, and their value. Besides these, 3,417 stationery requisitions for Departmental Stock were received for which no orders were issued.

SUMMARY.—Material and Services requisitioned for during period 1st July, 1909, to 30th June, 1910.

Branch.	Requisitions.	
	Number.	Estimated Value.
		£ s. d.
Government Architect's	3,235	24,493 4 5
Rivers, Water Supply, and Drainage	5,104	100,731 12 7
Railway and Tramway Construction	1,311	161,400 0 2
National Works—Bridges	593	6,828 13 5
,, ,, Metropolitan	346	2,018 16 1
Labour Commissioners	776	3,720 16 8
Head Office and General	1,106	8,411 7 4
Totals	12,471	307,604 10 8
To Stores Supply and Tender Board—		
Maintenance, Dredges and Ferries	8	25 10 11
Other Services	491	3,829 13 11
Stationery	3,417	.....
Grand Totals	16,387	£311,459 15 6

Number of Orders issued..... 20,212.

Preparation of Orders.

The method now in vogue for preparing the Departmental Orders was first instituted in 1908, and during the period from that time to date has proved eminently satisfactory.

Supplies.

There have been no complaints as to inferior supplies, the required standard having been generally maintained.

Although 109 cancellation notices were issued, only in 13 cases were articles purchased at the contractor's risk.

In regard to supplies of iron from Lithgow, there are necessarily delays on account of the distance of the works from Sydney. The disabilities, however, have been minimised by keeping a small stock at the Depôt of the sizes mostly used. In the case of urgent orders, when required, the firm purchases in Sydney and forwards, thus preventing loss of time in delivery.

Contractors generally have in very few cases caused inconvenience through delay in supply; of course, where the operations are so extensive, there must at times occur a hitch, but altogether deliveries have been well within the time allowed under the order.

Crane and cable chains for 219 different localities were inspected, weighed, forwarded, and Admiralty tests obtained. In all, 3,852 fathoms were supplied.

Quotations.

Quotations, as per Departmental Regulations, were invited for 266 different requirements, 1,664 forms were prepared and posted, the average number of requests for each service being 6, whilst 878 quotations were received, giving an average number of 4 responses for each inquiry, thus showing that competition has been well maintained.

The total value of goods and material purchased under this system amounted to £15,728 19s. 4d., an increase of £413 9s. over the previous year.

Where the value of the material required was under £5 and was not under annual contract, prices were arranged verbally, the value of articles purchased in this way being £1,624 13s. 1d; while for amounts over £5, the value of articles purchased amounted to £1,105 4s. 4d.

Customs.

Customs.

The Customs returns show that 65 entries were passed, and the amount of duty paid £13,428 4s. 9d. Altogether to date the sum of £91,316 9s. 3d. has been paid to the Commonwealth on State imports.

The total value of the imports on which duty was claimed and paid during the year was £102,155 5s. 10d.

Stamps—Postage and Railway.

	£	s.	d.
Postage stamps distributed during year	2,979	10	10
„ used „	3,026	6	6
Total value of purchases of postage stamps since October, 1902, to 30th June, 1910	28,052	16	1
Expenditure for above period	27,478	19	6½
Average disbursement per annum	3,545	13	5
Railway stamps distributed „	303	11	6
„ used „	300	1	9

Telephone Services.

On the 30th June, 1910, there were 70 connections with the Departmental switchboard, 8 trunk lines, and 4 direct extension services; the number of telephones in operation on 30th June, 1910, being 73.

The amount paid in connection with these services for the year is £505 17s. 10d., while that for the last year amounted to £498 2s. 10d.

Library Operations.

Since the date of last report 81 new books have been added to the Library; 793 engineering and architectural periodicals have been received and distributed, six volumes of engineering periodicals have been prepared for binding, and 630 books have been issued.

Stationery, Draftsmen's Material, &c.

During the year, 3,417 requisitions for stationery have been submitted, being a decrease of 1,505 on those of 1908–9. Requisitions to the number of 935 were forwarded to the Government Printer, and 2,215 parcels were made up and despatched. The railway freight on parcels amounted to £63 16s. 3d., steamer freight £19 7s. 6d., postage £47 0s. 9d., and cartage £23 4s. 6d., giving a total expenditure of £153 9s., or approximately 1s. 4½d. per parcel. Cartage on surveyors' equipment was also paid to the amount of £10 5s.

	£	s.	d.
1. The value of stationery and draftsmen's materials in stock 1st July, 1909	489	10	3
2. The value of stationery and draftsmen's materials received during 1909–10	1,138	11	8
3. The value of stationery and draftsmen's materials issued during 1909–10	1,359	11	2
4. Balance of stock on hand, 30th June, 1910	268	10	9
Surveying instruments in stock, 30th June, 1910	418	1	6
„ „ field, „ „	3,000	0	0
Total value Dept. instruments, 30th June, 1910 ...	£3,418	1	6

A number of obsolete instruments were disposed of at satisfactory prices, the amount realised being £68 17s. 6d.

Property on Works.

Returns have been received from all Departmental Officers in charge of Government plant, &c. Each separate article has been valued, and the following statement shows under the proper headings the value of all property belonging to each Branch.

A comparison with the returns of 1908–9 shows an increase in some services, while in others there is a decrease. On the whole, there is a decrease to the extent of £4,363 12s. 2d. This is accounted for principally by the lower valuation of plant, by articles becoming worn out and obsolete, and by reason of plant, material, or property becoming no longer of use to the Department.

STATEMENT showing value of Departmental assets at 30th June, 1910.

Section.	Buildings.	Plant and material.	Boats, punts, tugs and launches, pipes, pontoons.	Dredges.	Docks.	Artesian casing in country.	Fencing	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Irrigation and Drainage	5,539 7 6	101,345 6 9	190 5 0	.....	.....	....	....	107,074 18 9
Public Watering Places	3,903 7 0	14,426 6 6	.....	.....	.....	....	3,429 10 0	21,759 3 6
Artesian Plant	.....	.....	.....	.....	.....	1,352 4 4	....	1,352 4 4
Harbours and Rivers	10,265 17 1	94,066 0 4	13,228 15 8	.....	13,260 0 0	....	....	130,820 13 1
Dredge Service	.....	.....	132,307 0 0	242,700 0 0	.....	....	....	375,007 0 0
National Works	2,522 14 0	6,652 12 1	6,612 3 0	.....	.....	....	....	15,787 9 1
Railways and Tramways	49 10 0	4,902 11 10	.....	.....	.....	....	....	4,952 1 10
Government Architect	25 0 0	2,585 19 4	.....	.....	.....	....	....	2,610 19 4
Miscellaneous	8,280 0 0	3,802 18 10	1,600 0 0	.....	.....	....	2,010 0 0	15,692 18 10
Stationery and Instruments	.....	3,686 12 3	.....	.....	.....	....	....	3,686 12 3
Public Works Stock	.....	134,833 18 6	.....	.....	.....	....	....	134,833 18 6
Totals.....£	30,585 15 1	366,302 6 5	153,938 3 8	242,700 0 0	13,260 0 0	1,352 4 4	5,439 10 0	813,577 19 6

General Depôt.

The general depôt has now been in operation for a period of seven years, and has proved beyond doubt that its creation has been more than justified. Its utility and convenience are manifested in numbers of different ways, of which advantages the various branches constituting the Public Service are not slow to avail themselves. The last year or two have shown a marked extension in the operations of the depôt, and a greater desire on the part of the branches to use what they all admit to be an excellent institution.

The following are some of the uses to which the depôt is being put:—

1. As a depôt and store for all classes of machinery plant, stores, railway and tramway materials.
2. As a distributor of plant materials to the various works.
3. As a transmission agency.
4. As a repairing and fitting shop.
5. As a cement, sand, and stone testing laboratory.

It also provides excellent opportunities for experimenting and testing any mechanical devices which are from time to time suggested. It also plays an important part in the disposal of old plant, instruments, and materials by auction sale, the amount realised last year from this source being £530 12s. 3d.

The original intention was that it be a centre for the repair, storage, and distribution of second-hand tools and plant, but the diversity of departmental operations have necessitated an extension of its utility in the storage of new stock for water conservation works, sewerage, country towns water supplies, diamond drills (Mines Department), railway and tramway construction, &c.

The distribution of the iron received from Lithgow for all Government Departments is still managed from the depôt. This is a very economical system, although considerable work is entailed in checking and forwarding. The iron deliveries for the metropolitan and coastal districts are also controlled from the depôt.

The diamond drills have been in active operation during the year, there being several in the field at the present time. It frequently happens that extraordinary demands are made on the depôt resources in this connection, as special tools and machinery are very often required at short notice, and in many cases repairs and overhauls are effected.

The Lands Department has made considerable use of the depôt for the storage of imported wire netting, accommodation being found for 5,574 rolls, valued at £6,178. This convenience meant a considerable saving to the department concerned. The receipts and issues of all this netting were controlled by the officers at the depôt, and the handling was done by the workmen. The whole of this stock has now been issued.

Tools and plant have been returned from a great many works, and the issues have been practically to every large public work in operation.

Authority having been given to store tramway material at the depôt instead of under the Comptroller of Stores at Eveleigh, the stock has materially increased. The poles, fittings, and cable are included under this heading, and this arrangement has met with such success that steps are now being taken to take all of the material from Clyde stores to the depôt. It has also been found convenient to store a quantity of permanent-way material for railway construction.

Since the visit of the American Fleet to Sydney all the decorative material has been stored at the depôt, and the extraordinary demand from public functions in all parts of the State entails considerable labour and control. During the year there have been 254 issues, totalling 12,648 flags and 11,106 yards of streamers.

The office work of the depôt has been heavy, as there are so many details to be attended to in receiving and issuing. During the year the consignments by rail were 736, and by steamer 354, for all and each of which weigh-bills, freight-notes, &c., had to be made out.

As all of the material delivered to the depôt for despatch is paid for on the depôt certificate, the checking of the vouchers is a responsibility of considerable importance. The vouchers passed during the past year numbered altogether 1,563, as against 1,448 for the previous year, and they represented in value £33,438 6s. 9d. and £30,366 15s. 6d. respectively, or an increase of £3,071 11s. 3d.

The expenditure during the year on account of salaries, wages, and other expenses amounted to £1,729 14s. 6d. This does not include the cement-testing branch.

Of the wages paid, £1,223 14s. 6d., only £867 14s. 3d. is directly chargeable to the maintenance of the depôt, the remainder being on account of repairs, renewals, &c.

Cement Testing, Pipe Inspection, &c.

This branch has been very active during the year, an inordinately large number of tests, issues, and inspections having been made.

The work, especially during the latter part of the year, has been very heavy. Owing to the coal strike the cement works were closed for about seven weeks. This had the effect of depleting our stocks of tested cement. In order to keep the work going, approval was given to use cement tested for seven days instead of twenty-eight days; so that all tests had to be completed in eight days, instead of twenty-eight days. Up to the present time we have been unable to get sufficient cement to increase the stock so as to admit of the twenty-eight days test being made, the demand for cement still being exceptionally heavy.

The number of tests were:—Cement 168, sand 28, mechanical 257, chemical 70, making a total of 525. Of the 168 tests, only nine were not approved by the Board, showing, on the whole, that the quality of the cement submitted was well up to standard.

The quantity of cement tested totalled 360,450 bags of locally manufactured, 455 bags and 16,100 casks of imported, being an increase of 12,250 casks on last year. This is due to the shortage of local supplies.

The cement issued on account of private orders was 109,334 bags, for departmental orders 114,148, and for the Railway Commissioners 139,968.

Besides the recognised tests usually made before cement is brought into use, long period tests of concrete and experimental tests of sand and other materials are being made every month for Barren Jack and Cordeaux Dams, and for Broken Hill. Concrete

Concrete cubes for various works, have been made and tested for compression at the depôt. It has been found, however, that owing to the excellent quality of the cement and the rich mixtures of concrete, after the early periods, our machine is not sufficiently powerful to effectively deal with these blocks. As these tests are a necessary preliminary to every new water supply work that is initiated, the question of providing a more powerful machine should now be considered.

The fees received for cement testing and seals amounted to £750 0s. 6d., whilst the expenditure on account of salaries, wages, travelling, and other expenses, totalled £917 7s. 6d.

Experimental tests have been made with trass, in pursuance of those done last year.

Samples of earthenware pipes, eight in all, were tested for porosity.

The bricks submitted for crushing and porosity test numbered 152, made up as follows, namely :— Cement bricks, 7 ; Lime bricks, 11 ; Ordinary double-pressed, 134.

Earthenware Pipe Inspection.

Pipe inspection is in itself becoming one of the most important branches at the depôt, owing to the large numbers of pipes used annually on sewerage works. The pipes are all tested by hydraulic pressure, and, in addition, a test for porosity is also made. The following tabulated statement will show the magnitude of the work of testing during the past year :—

Earthenware Pipes inspected and tested—

Diameter of Pipes.	Length of Line.	
18 inches	54 feet	
16 ,,	68 ,,	
12 ,,	2,226 ,,	
9 ,,	15,790 ,,	Total, 68,044 feet
6 ,,	39,892 ,,	
4 ,,	2,894 ,,	(about 13 miles).

Special Pieces inspected and tested—

Article.		
Junctions and Tapered Pipes	2,782 feet	
Perforated Pipes	4,338 ,,	
Bends and Cleaning Eyes	833	
Gullies	62	
Traps	25	
Discs	169	
Roofing Tiles	26,800	
Ridge Pieces	730	

Chemical Tests.

The following are the chemical tests which were made last year :—

1. The specific gravity of all stone and sand submitted for test.
2. ,, ,, ,, kerosene samples in connection with cement tests.
3. Various samples of turpentine.
4. ,, ,, terebene.
5. ,, ,, dryers.

In addition to the chemical tests these were also tested practically.

6. Samples of water to be used in cement mixing, tested for lime and sulphates.

Imported Cements.

The analysis of all imported cements is also made at the depôt. A statement of the year's operations is shown below :—

Analysis of Cements Imported.

Nature of Test.	Name of Make or Brand.										
	A.P.C. Co.	Invicta.	Saturn.	Hemmoor.	C.C.D.	Lion.	Lee	Peters.	Anchor.	Ship	Pyramid.
Loss on calcination (H_2O, CO_2) ...	1·30	1·25	1·35	1·40	2·36	4·20	2·60	2·94	2·10	4·74	1·20
Insoluble residue (sand, &c.)	1·60	4·00	0·73	0·80	1·04	2·10	1·50	3·30	2·90	1·10	0·83
Silica (SiO_2)	20·20	22·35	21 06	21·92	21 70	18·70	20·60	20 82	20·49	20·26	22·15
Alumina and Iron (Al_2O_3, Fe_2O_3)...	10·30	8·30	8·68	9 02	9·27	11·30	10·70	10·56	10·97	10·17	9·07
Lime (CaO)	63·77	59·90	63·98	63·78	62·54	58·08	60·30	58·90	59·90	58·90	63·90
Magnesia (MgO)	1·31	1·25	1·46	0·54	1 01	2·24	1·40	1·12	0·95	1·66	1·26
Sulphuric Anhydride (SO_3)	1 24	1·76	1·61	1·26	1·40	1·81	1·47	1·74	1·54	2·70	1·13
Alkalies and loss	0·23	1·19	1·13	1·28	0·68	1·57	1·43	0·62	1·15	0·47	0·46
Totals.....	100·00	100·00	100·00	100·00	100 00	100 00	100·00	100·00	100·00	100·00	100·00

Analysis of Lime Bricks from Bondi.

Nature of Test.	No. 1.	No. 2.
Loss on calcination (after drying at 100° C. till constant, H_2O, CO_2 organic matter)	2·40	4·43
Insoluble residue (sand)	86·51	86·19
Silica (SiO_2)	2·85	1·91
Iron and alumina (Al_2O_3, Fe_2O_3)	0·27	0·63
Lime (C_2O)	7·29	6·59
Magnesia (MgO)	0·68	0·25
Total	100·00	100·00

Analysis of Insoluble Residue in Cement (Test 3,151).

Nature of Test.	
Loss on calcination (after drying at 100° C., volatile matter and unburnt fuel)	13·40
Silica (SiO_2)	59·03
Iron (Fe_2O_3)	6·78
Alumina (Al_2O_3)	13·95
Lime (CaO)	6·84
Magnesia (MgO)	trace
Sulphuric anhydride (SO_3)	trace
Total	100·00

The insoluble residue in the above cement has been checked by the Victorian standard method, against that of N.S.W. The results are as follows :—

N.S.W. method ... ... 4·37 per cent. residue.
Victorian method ... ... 2·60 per cent. insoluble residue.

The insoluble residue by N.S.W. method after treatment with $HNO_3 + HCL$ for 48 hours gave 2·71 per cent. of residue.

Artesian Casing.

Further efforts have been made to reduce the stock of artesian casing stored at country bores and depôts, with the results that during the year 14,800 feet were disposed of. The quantity now remaining on hand totals 41,555 feet, of an estimated value of £1,621 3s. 2d.

Stock-taking.

The annual stock-taking at the various stores under Departmental control has been carried out as usual, and the results generally are satisfactory. The stocks dealt with were :—Railway Construction Stores at Clyde, Eveleigh, and George Street North, Government Architect's Store, Government Dockyard, General Depôt, Newcastle Harbour Works, Ballina Harbour Works, and Stationery and Instruments at Head Office.

PUBLIC WORKS STORE ADVANCE ACCOUNT, £257,000.

Operations 1909-10.

The subjoined statement shows that the stock under this account on the 30th June, 1910, amounted to £134,833 18s. 6d., being a decrease of £15,809 5s. 2d., as compared with the previous year.

Stock.	Amount allotted from General Vote.	Value of Stock 30th June, 1909.	Purchases and Returns.	Issues.	Inter-Stock Transfers.		Value of Stock, 30th June, 1910.
					Debits.	Credits.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
ailway and Tramway Construction	193,000 0 0	112,096 3 9	109,019 18 3	127,206 18 11	843 13 5	11,345 7 8	83,407 8 10
eneral Depôt, Pyrmont	35,500 0 0	19,943 6 8	11,941 1 4	13,790 18 3	11,420 8 4	223 0 7	29,290 17 6
overnment Dockyard	14,000 0 0	8,323 2 6	20,500 3 1	16,899 0 5	65 19 10	609 5 9	11,380 19 3
overnment Architect's Yard	7,000 0 0	5,521 9 9	5,663 19 6	6,556 9 10	100 19 9	15 11 10	4,714 7 4
ewcastle	3,000 0 0	3,360 3 3	7,623 11 8	7,231 12 1	84 17 5	0 6 2	3,836 14 1
ithgow	3,000 0 0	.....	18,601 7 10	17,162 14 4	.....	351 13 6	1 087 0 0
allina	1,500 0 0	1,038 10 11	1,039 11 4	983 2 11	21 12 2	.....	1,116 11 6
esumed Properties	.....	360 6 10	193 5 0	561 6 5	7 14 7	.....	....
Totals	257,000 0 0	150,643 3 8	174,582 18 0	190,392 3 2	12,545 5 6	12,545 5 6	134,833 18 6

Timber Inspection.

The activity in railway construction has made the work of classification very heavy during the year. For the convenience of suppliers, inspections have been made on the North Coast Rivers and in the Dubbo district, besides at the timber depôts between Sydney and Newcastle for these works.

Numerous inspections have been made in connection with timber for irrigation and national works, and also of timber for the use of the Government Architect's branch.

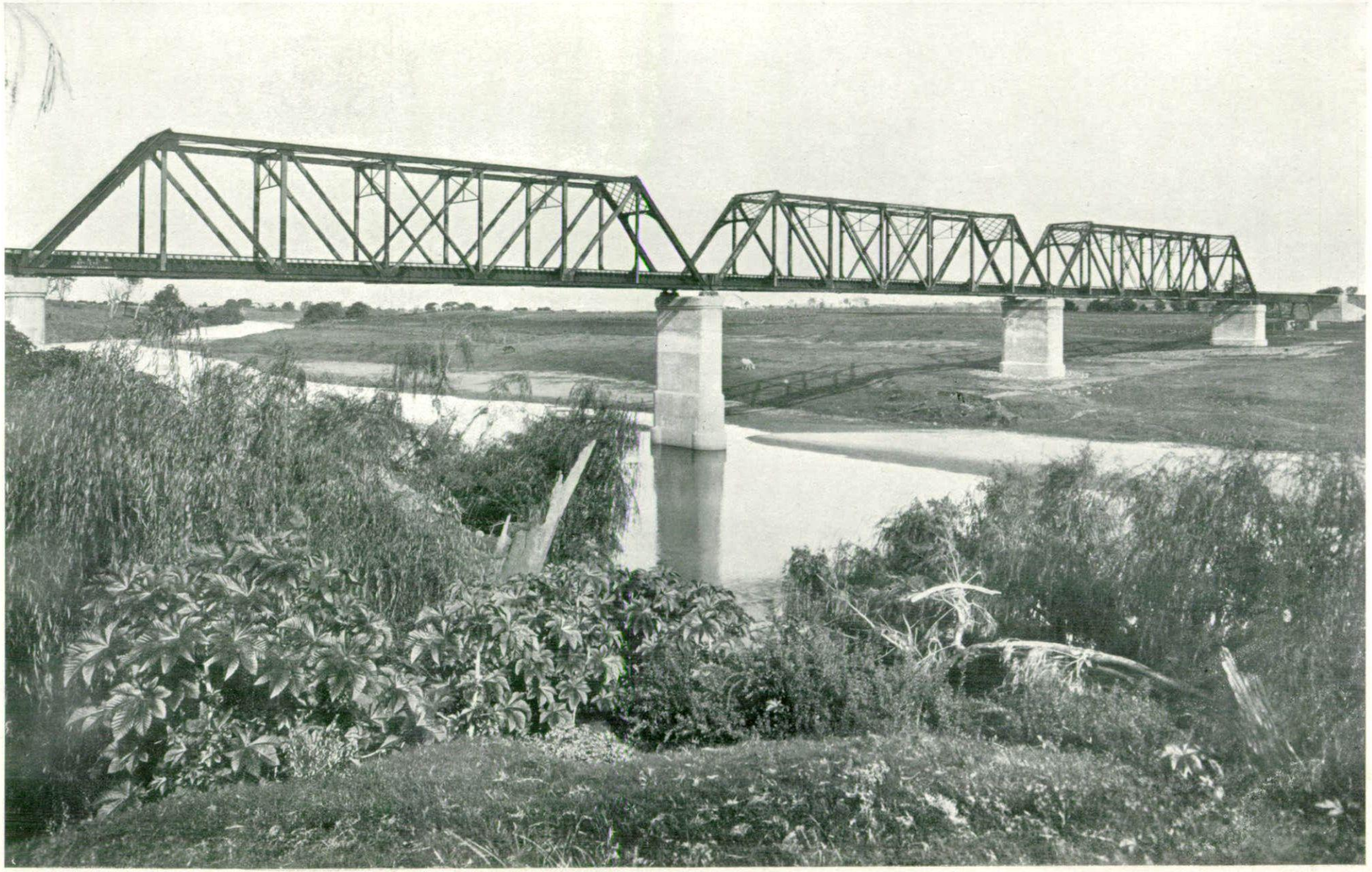
The details are : 2,359 inspections made, 161,236 sleepers, 27,731 lineal feet of round timber for piles, 2,190,208 super. feet of sawn and hewn timber, 673 tramway poles, and 101,000 wood-blocks, passed and branded.

R. S. LITTLEJOHN,
Acting Superintendent of Stores.

The Under Secretary.

[21 illustrations, 2 maps.]

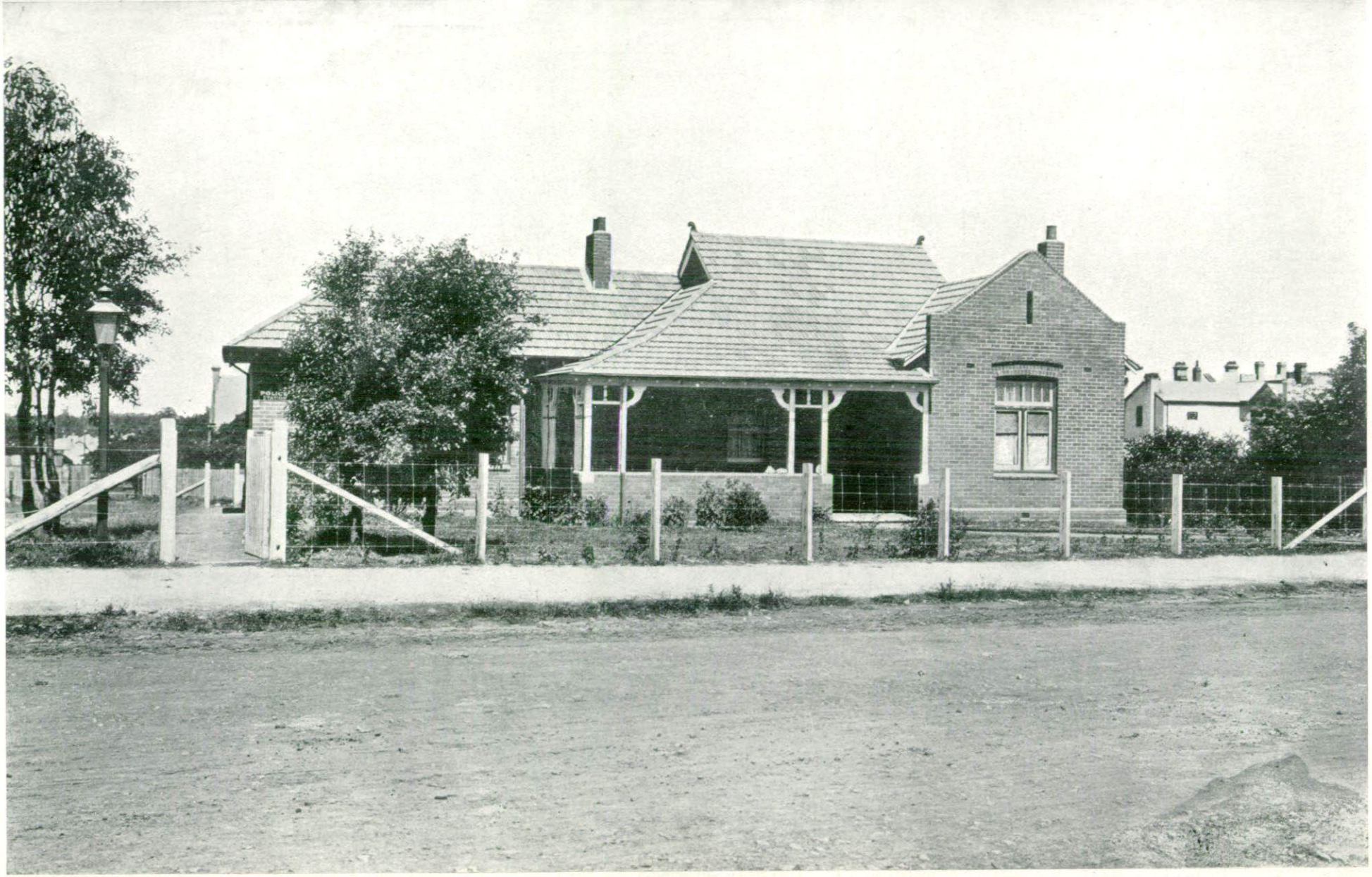
Sydney : William Applegate Gullick, Government Printer.—1911.



BRIDGE OVER THE HUNTER RIVER, NORTH COAST RAILWAY.

THE SPOUT, NORTH COAST RAILWAY WORKS.

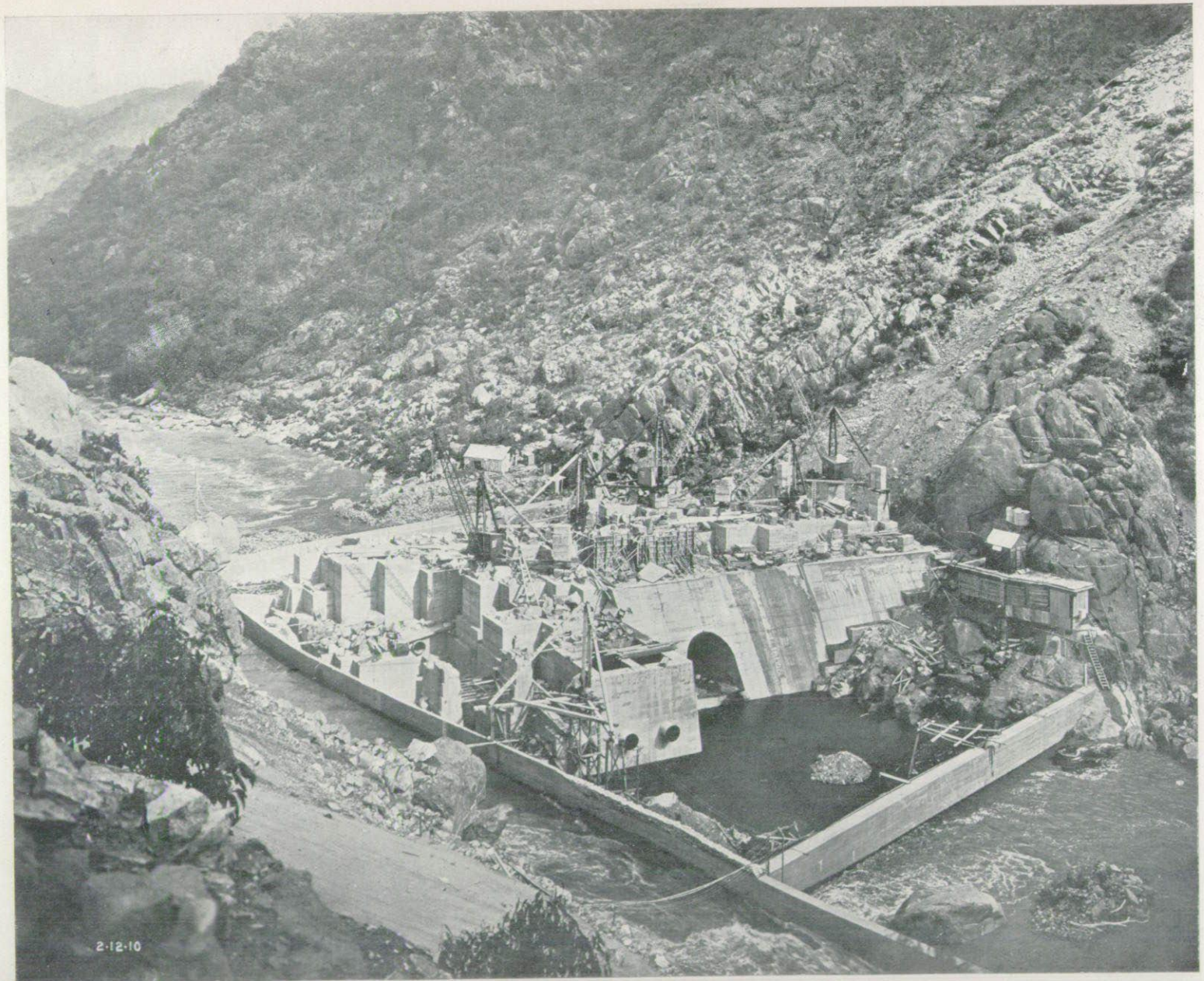
FIRE STATION, DRUMMOYNE



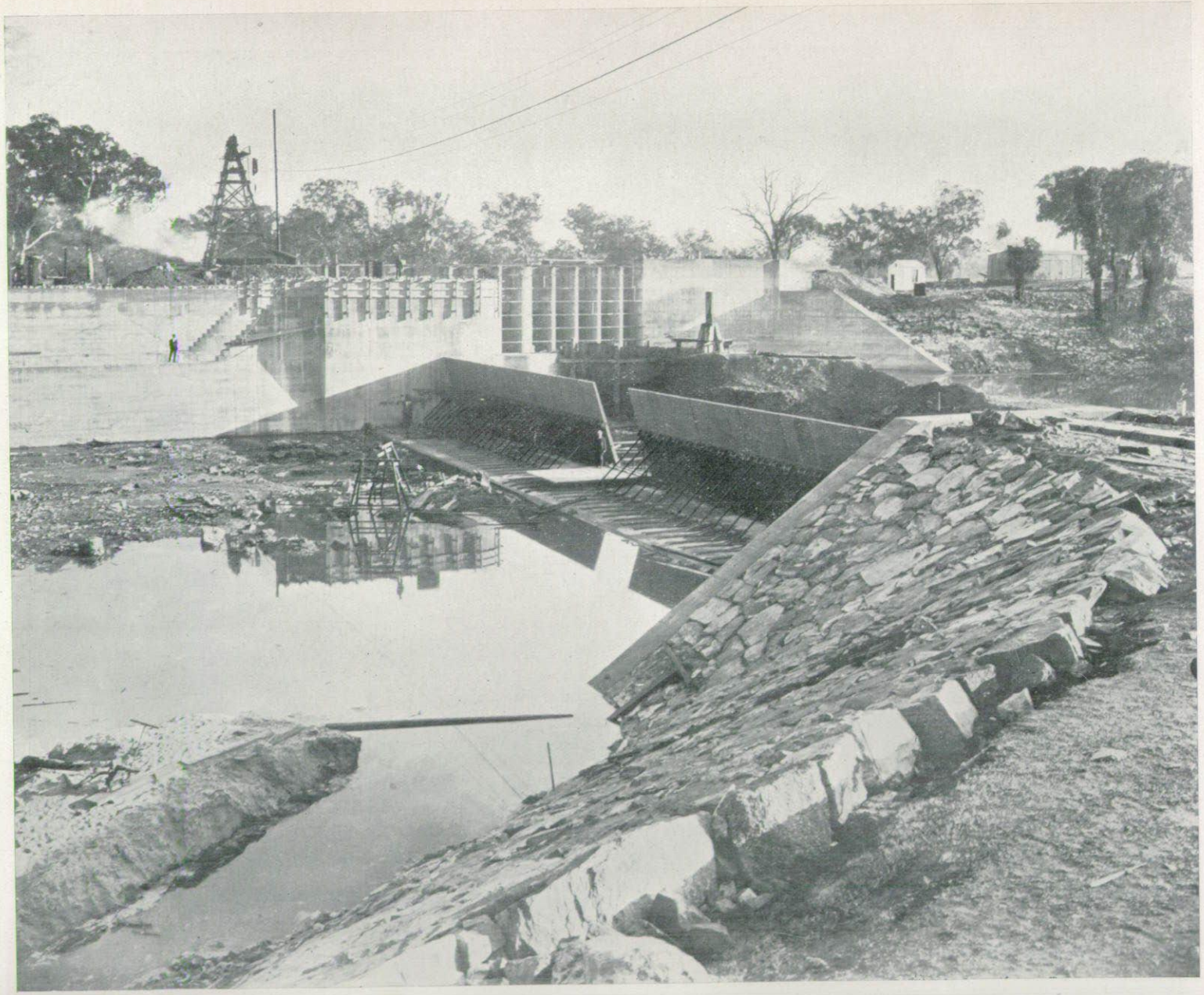
POLICE STATION, HORNSBY.

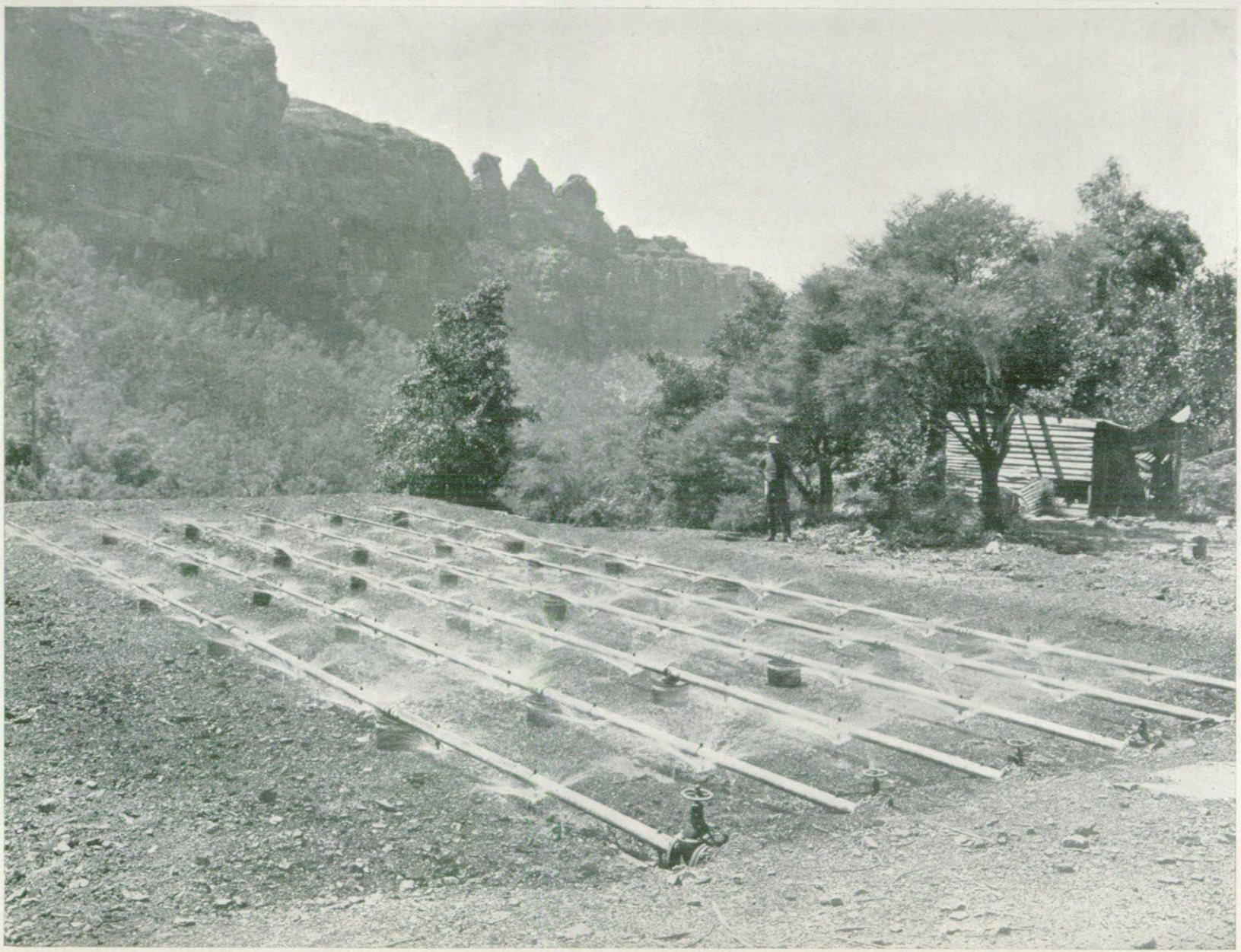
HOSPITAL FOR INSANE MORRISSET.

SHOP PREMISES, GEORGE-STREET NORTH.

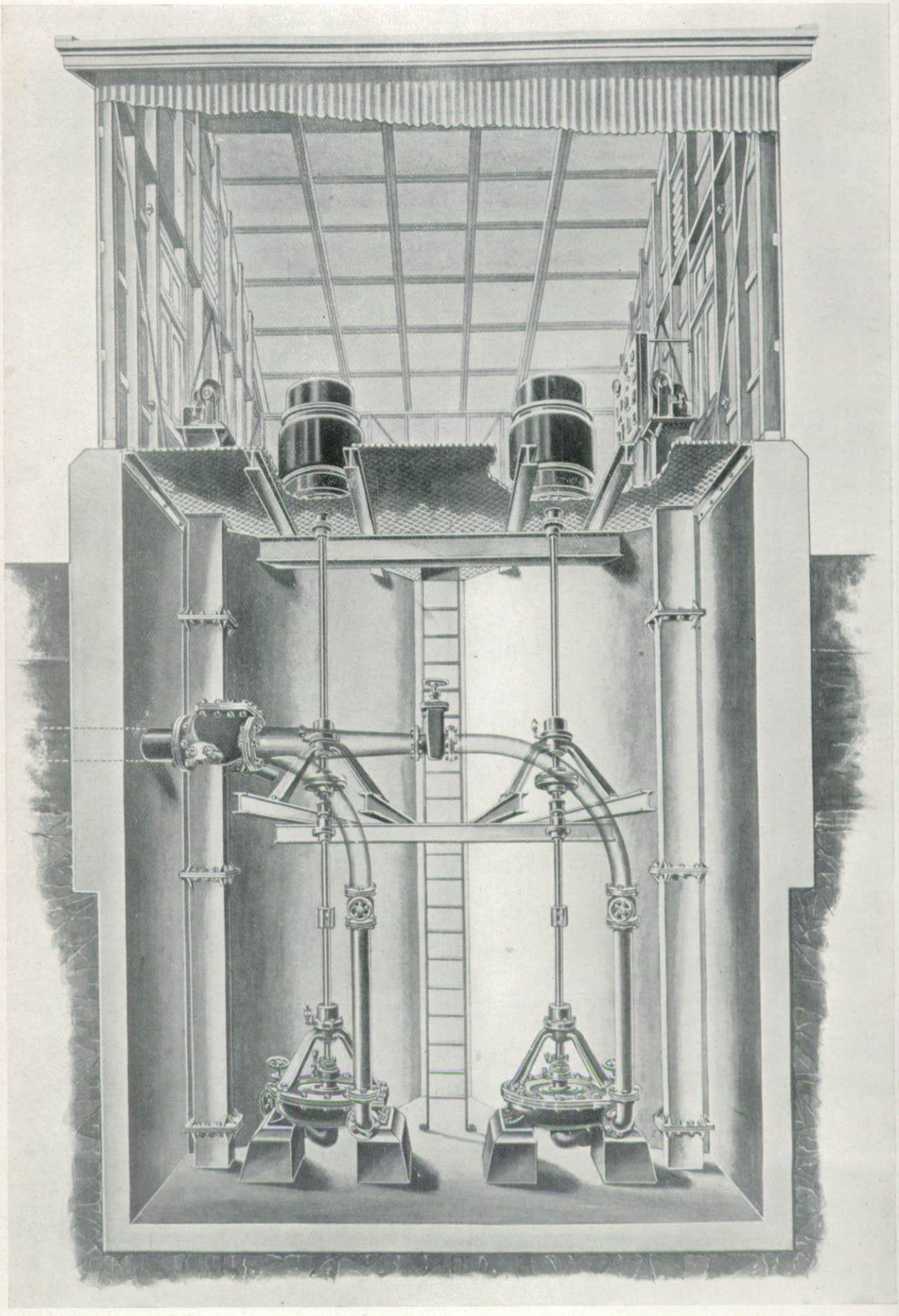

2-12-10

BARREN JACK DAM—UNDER CONSTRUCTION.

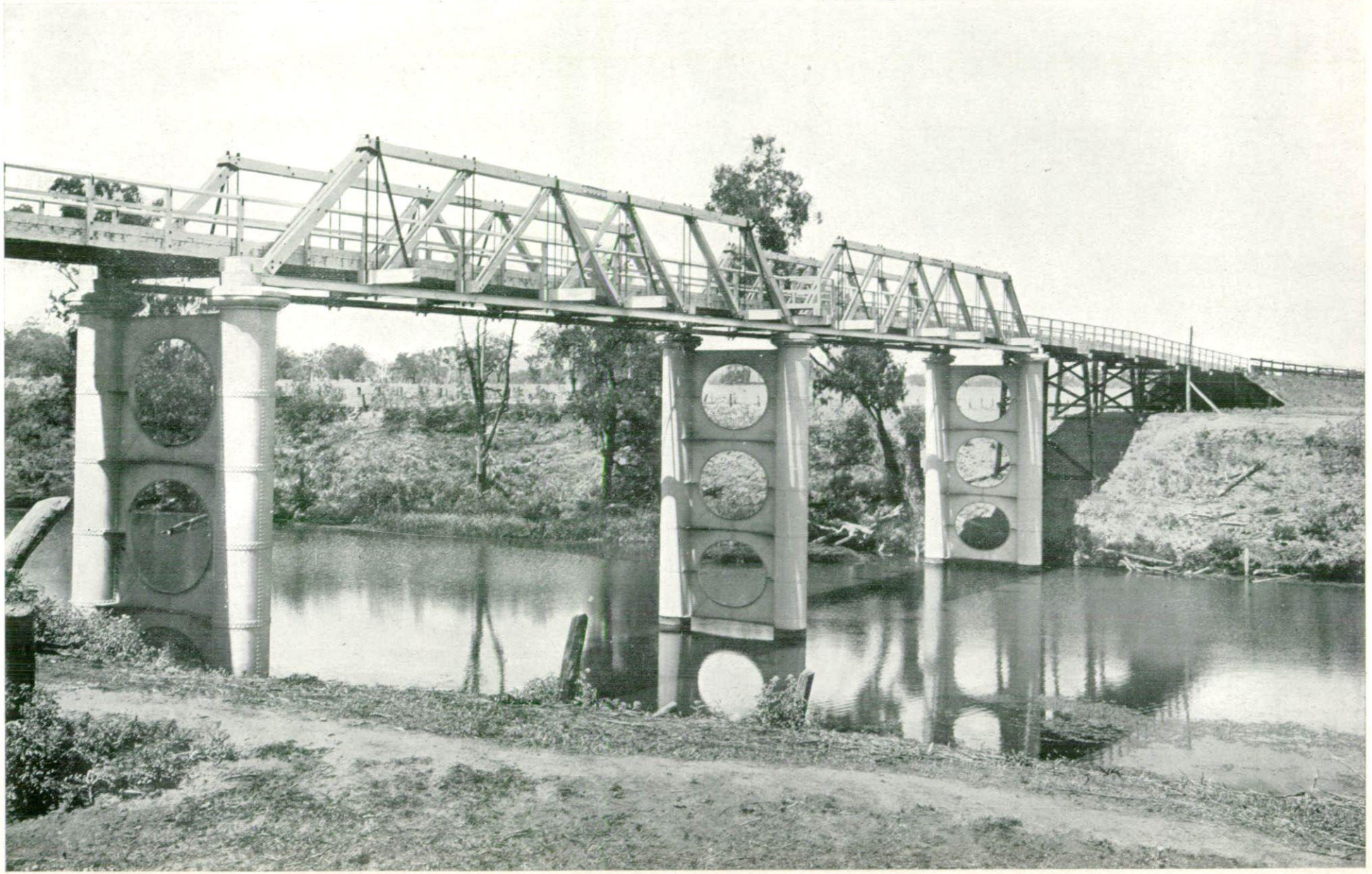




FILTER BEDS KATOOMBA.

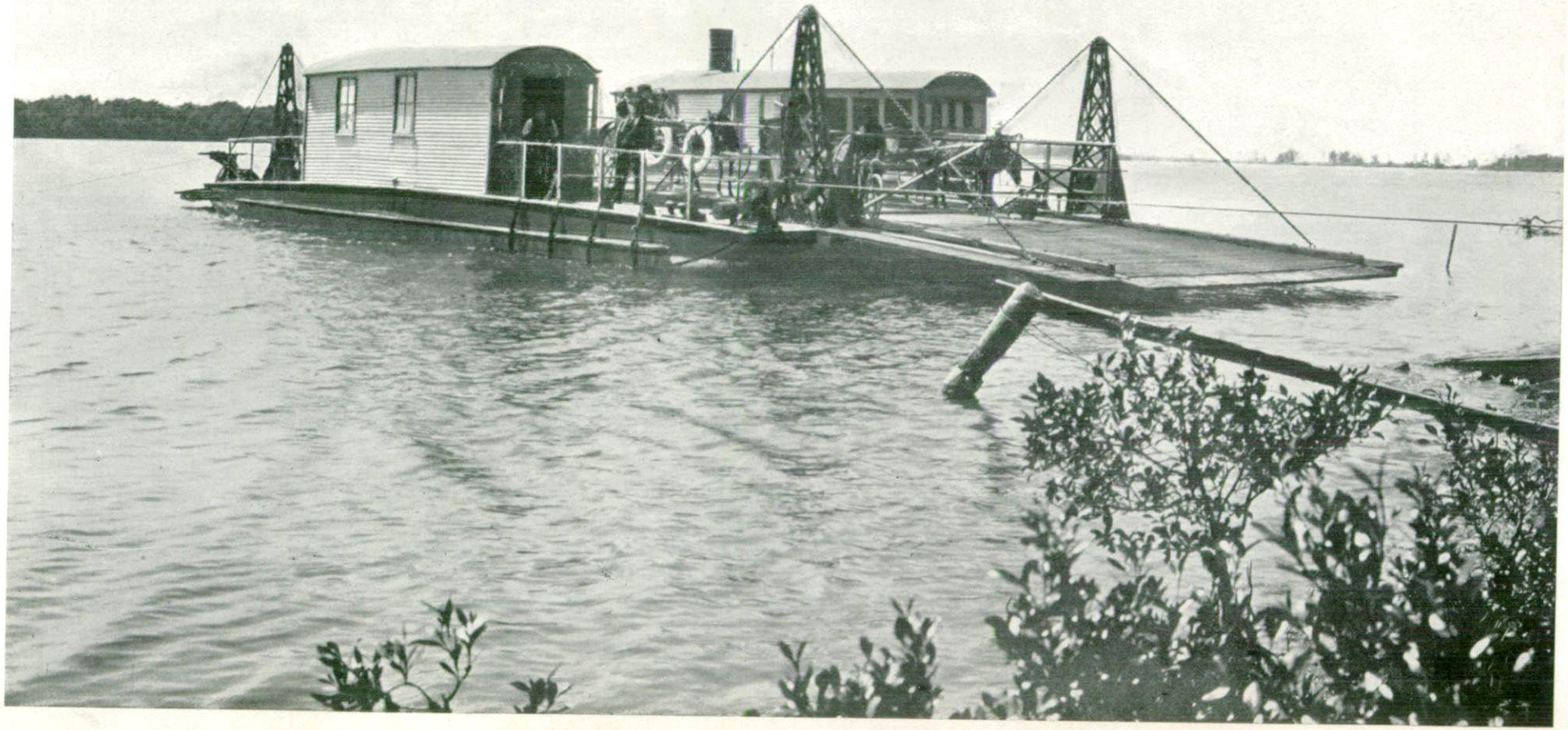


LOW-LEVEL SEWERAGE PUMPING STATION. IRON COVE CREEK.

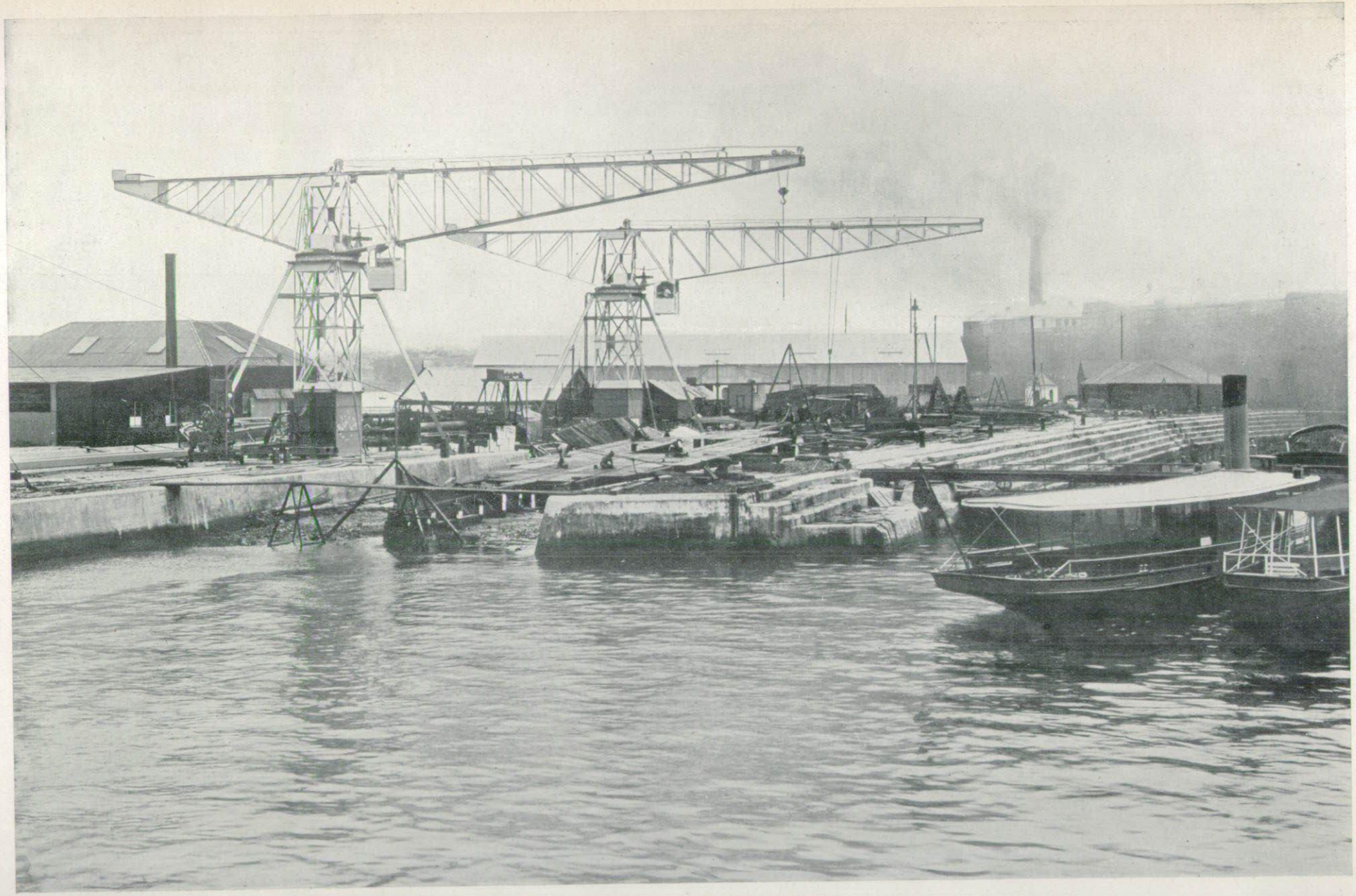


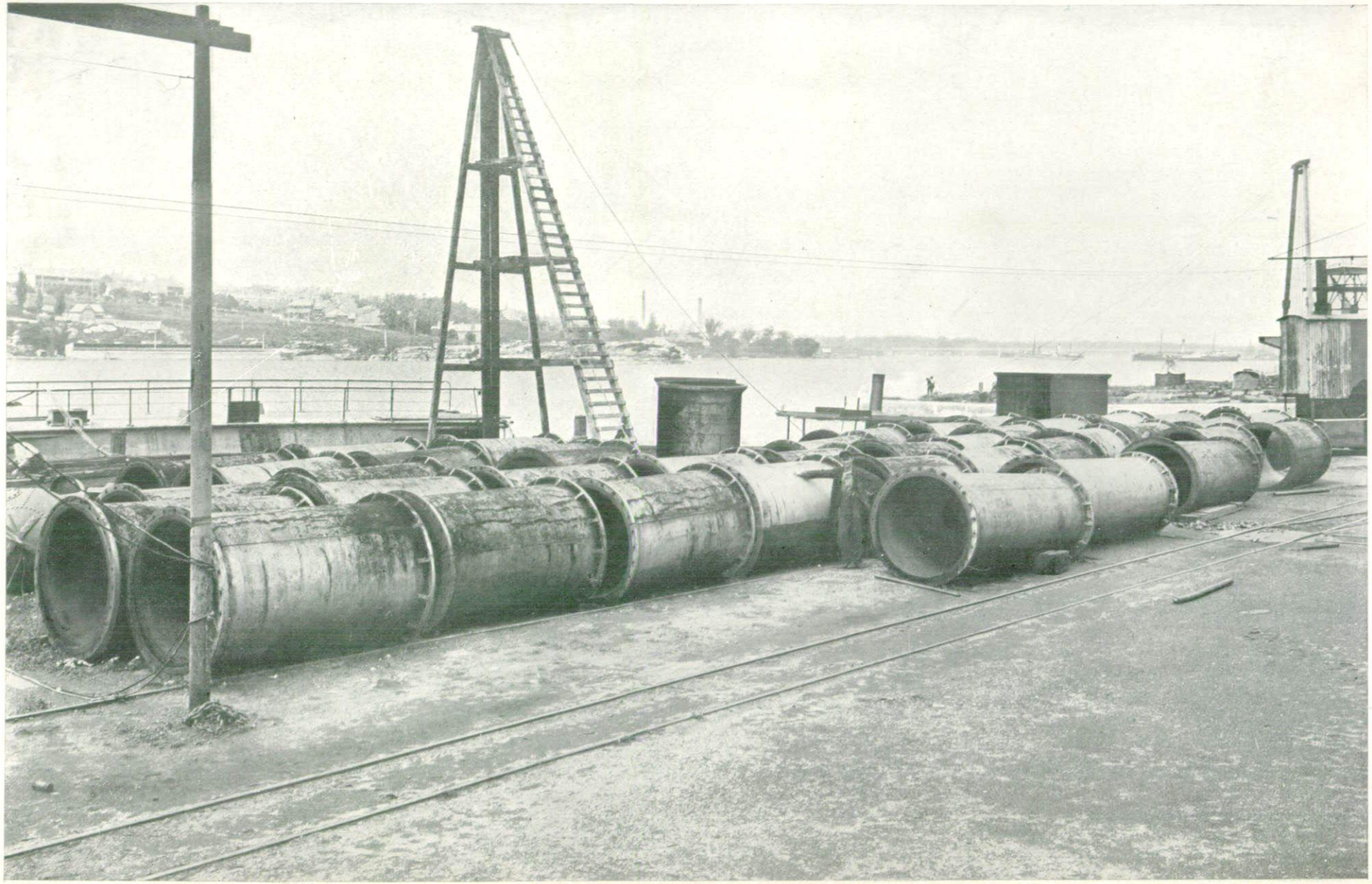
BRIDGE OVER THE MACQUARIE RIVER NEAR GEURIE.

BASCULE BRIDGE, SWANSEA.

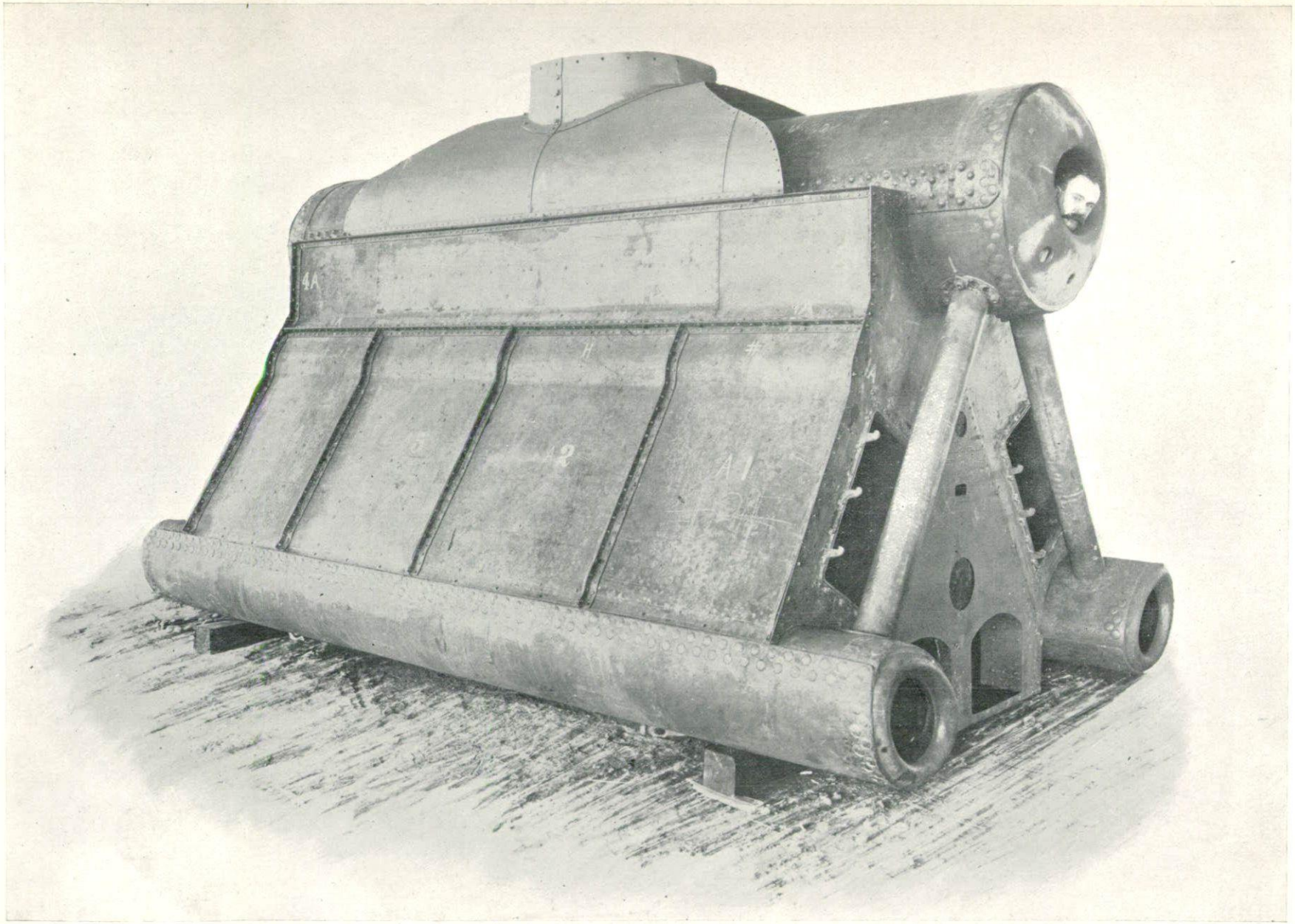


STEAM FERRY PUNT, HEXHAM, HUNTER RIVER.

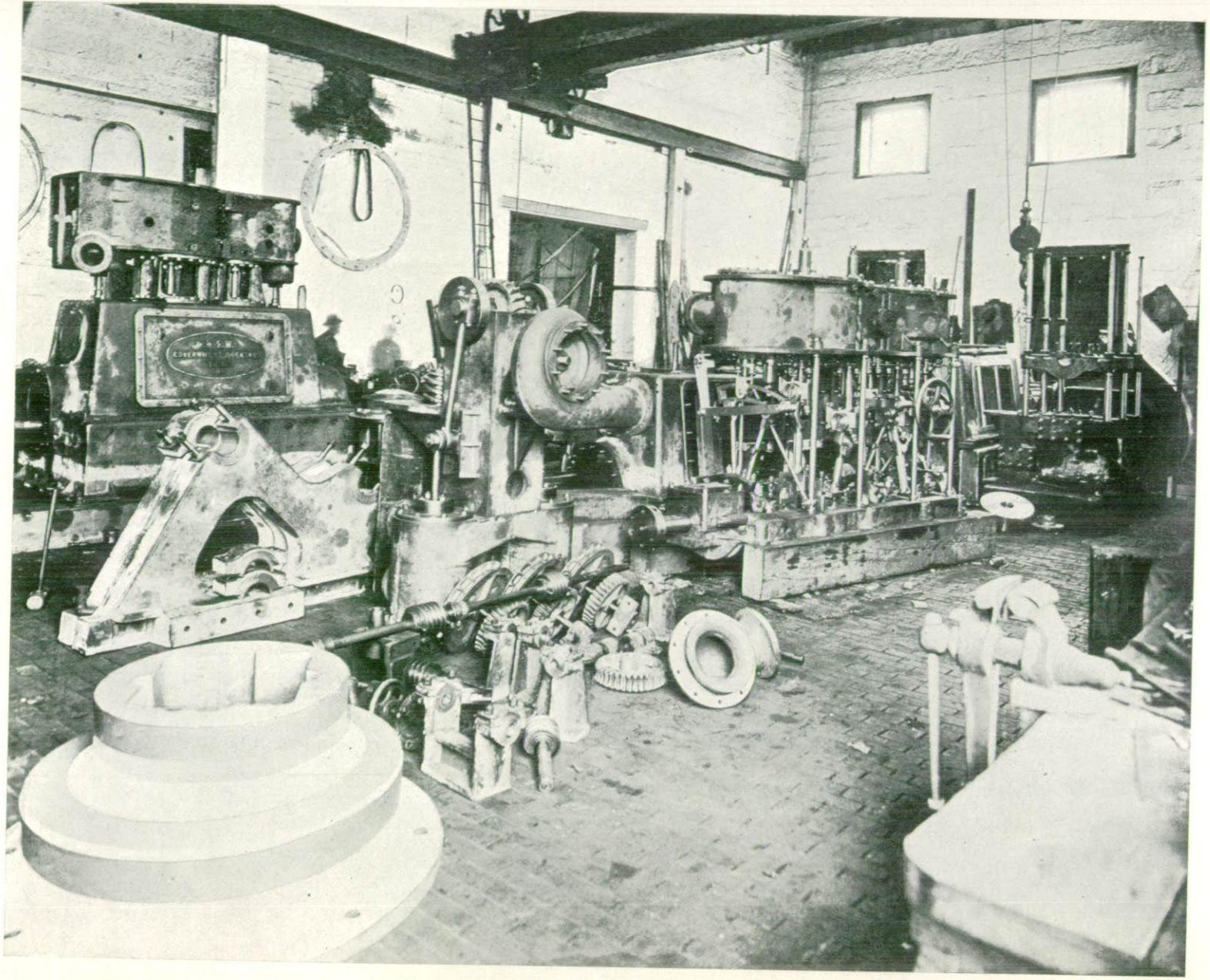




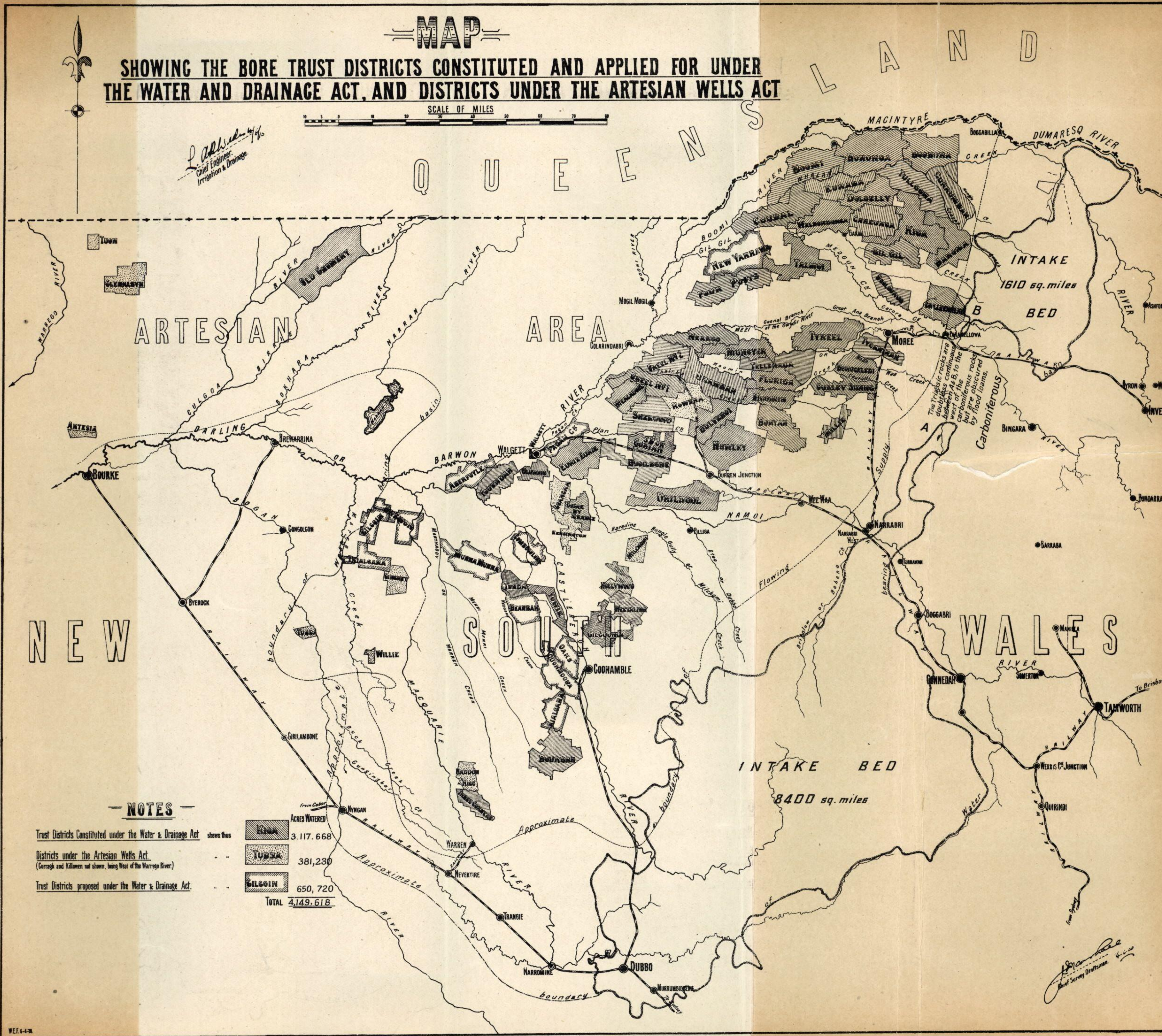
CAST-IRON PIPES FOR BARREN JACK DAM



WATER-TUBE BOILER.



CORNER OF ERECTING SHOP FITZROY DOCK.



80783

PHOTO-LITHOGRAPHED BY W. A. GULLICK, GOVERNMENT PRINTER, SYDNEY, N.S.W.

Photo-lithographed by W. A. Gullick, Government Printer, Sydney, N.S.W.