

# ***EVELEIGH GASWORKS***

## ***SITE HISTORY***


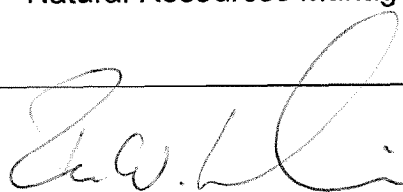
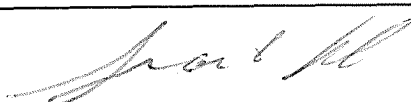


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## Document Certification

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## Introduction

The State Rail Authority of NSW engaged the Environmental Services of Rail Services Australia to prepare a report on the site history of the area known as the Eveleigh (sometimes incorrectly referred to as the McDonalddtown) Gasworks as part of a Phase 1 Preliminary Contamination Assessment of the site.

## Background

In 1878 the then Railway Commissioners entered into an agreement with a Mr. John Louis Castner to fit and maintain gas lights in carriages and to supply gas from his works at Redfern for a five year period.

Mr Castner went on to operate gasworks for the railways at Redfern, Newcastle, Bathurst, and Junee.

The Railway Commissioners took over Mr. Castner's works in 1884, and subsequently established works at Werris Creek, a second works at Junee, two further works at Redfern/Sydney, and one at Eveleigh (the subject of this study).

Railway gasworks are also reported to have been operated at Goulburn, Harden, Cootamundra, Wallerawang, and Blayney <sup>1</sup>.

Both railway yards and gasworks are potentially likely to be contaminated <sup>2</sup>.

## Objectives

The objectives of this site history report are to identify any past or present potentially contaminating activity on the site, so providing a basis for a more detailed site investigation.

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<sup>1</sup> Clark. L. 1972. *Passenger Cars of the NSWRR, a review of locomotive-hauled coaching stock*. Traction Publications, Canberra.

<sup>2</sup> DUAP. 1998. *Managing Land Contamination, Planning Guidelines SEPP 55-Remediation of Land*. DUAP, Sydney.

## Scope of Work

The scope of this work was to prepare a site history report on the former Eveleigh Gas Works located in the Macdonaldtown triangle shown highlighted on Figure 1.

All work was to be carried out according to the EPA Guidelines <sup>3</sup> as amended by the offer of service.

## Site History

<b>ZONING</b>	The land is currently zoned “20A Railways” <sup>4</sup> .
<b>LAND USE</b>	Previously – railway gasworks. Presently – vacant railway corridor land.
<b>BUILDING RECORDS</b>	The land was acquired by the railways from ‘Trust J. Wilson’ on 2 July 1888 <sup>5</sup> . The land has been in railway ownership ever since. None of the original parcel of land has been sold <sup>6</sup> .

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<sup>3</sup> EPA. 1997. *Contaminated Sites, Guidelines for Consultants reporting on Contaminated Sites*. EPA, Sydney.

<sup>4</sup> DUAP. Nd. *Sydney Regional Environmental Plan No. 26, City West – Eveleigh Precinct*.

<sup>5</sup> Plan 350. SRA. Rail Estate.

<sup>6</sup> SRA. Rail Estate GIS Plan MacDonaldtown.

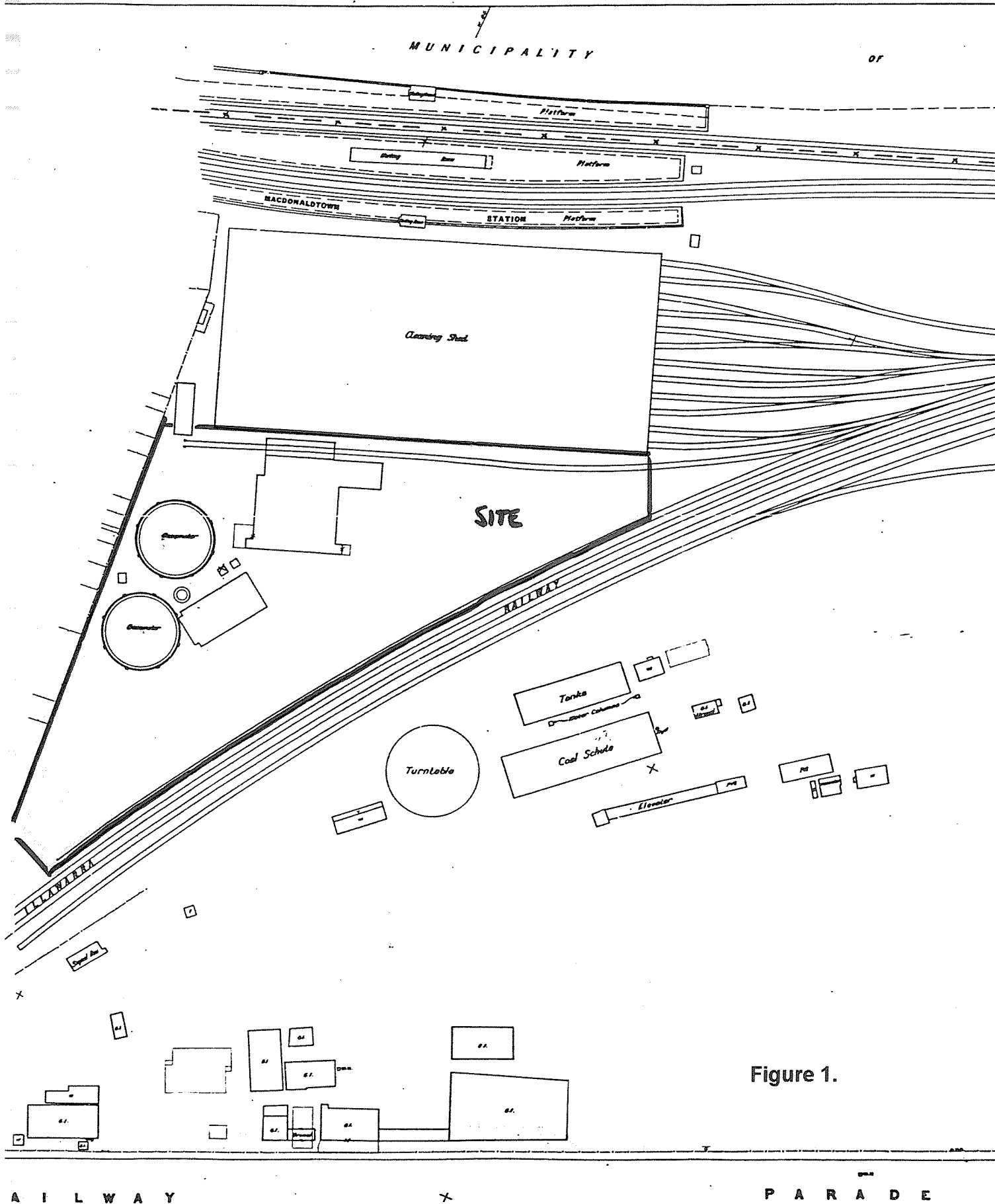


Figure 1.

**CHRONOLOGY OF  
SITE USES**

1891 – Plans signed-off on the 8<sup>th</sup> of January (Appendix A) <sup>7</sup>.

1892 – Completion of the Eveleigh gasworks <sup>8</sup>. The Eveleigh gasworks were erected to meet the increased demands for lighting of carriages and yards <sup>9</sup>. While the location and overall form of the works was built as designed, the detailed layout of the various components that comprised the works as finally built was slightly different to that as originally proposed.

About 1942 – Two tar wells in use, and proposed connection of the ‘Aeration Cylinder for Waste Water’ to the sewer (Appendix A) <sup>10</sup>.

1943 – Two tar tanks in use (Appendix A) <sup>11</sup>,

During 1944, 1945, 1949, 1950, and 1952, minor modifications were made to the works <sup>12</sup>.

1950s – Using inferior coal damaged the machinery <sup>13</sup>, and on-site production of gas ceased <sup>14</sup>.

1950s – Tanks were used to store gas that was piped from the Mortlake gasworks <sup>15</sup>.

About 1958 – Plant demolished <sup>16</sup>.

1962 – Only the southern gas holder (for storing gas for station lighting) is shown as extant <sup>17</sup>,

Mid 1970s – Closed down as a pumping and gas storage plant <sup>18</sup>,

Current – Vacant railway corridor land with the southernmost gas holder still extant.

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<sup>7</sup> Plans NSWGR, New Gas Works, Eveleigh. SRA Archives.

<sup>8</sup> NSWGR&T. *Annual Report*. 1892.

<sup>9</sup> NSWGR&T. *Annual Report - Supplement*. 1894.

<sup>10</sup> Plan 1011 – 33,065. RSA Plan Room.

<sup>11</sup> Plan 170-50. RSA Plan Room.

<sup>12</sup> MacDonalstown. Large Station Card. SRA Archives.

<sup>13</sup> Don Godden & Associates. Nd. *Eveleigh Railway workshops, Heritage Study*.

<sup>14</sup> Don Godden & Associates. Nd.

**SITE  
PHOTOGRAPHS**

See Appendix B.

**INVENTORY OF  
CHEMICALS &  
WASTES  
ASSOCIATED WITH  
SITE USE &  
LOCATION OF  
STORAGE**

The site has not been used as a gasworks for some time, though coal, shale, retort ash, tar, tarry oils, water, ammonia, sulphuretted hydrogen, lime, native oxide of iron, sawdust, coal-gas, shale-gas, would have been found on-site in the past. No chemicals or wastes are knowingly stored on the site now. Residual chemicals and wastes are addressed under 'Possible Contamination Sources' and should be addressed in Stage 2 Detailed Site Investigation.

**POSSIBLE  
CONTAMINANT  
SOURCES**

Areas of fill around the works (possibly boiler ash), coal and shale raw material stockpile areas, retort house, scrubbers, condensers, tar wells, tar tanks, purifier boxes, buried pipe-work, gas-holders<sup>19</sup>.

**SITE LAYOUT**

See Appendix C.

**MANUFACTURING  
PROCESSES**

The gasworks consisted of two separate but parallel works. One works produced gas from coal for lighting nearby stations and signals, and the other works produced a much richer gas from shale for carriage lighting. The manufacturing process used in both works is described in detail in the two articles in Appendix D<sup>20</sup>.

**LOCATIONS OF  
STORAGE TANKS**

Gas holders (see Appendix C),  
Tar wells (see Appendix A),  
Tar tanks (see Appendix A).

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<sup>15</sup> Don Godden & Associates. Nd.

<sup>16</sup> Don Godden & Associates. Nd.

<sup>17</sup> Plan 184-195. RSA Plan Room.

<sup>18</sup> Bruce J. Personal interview. 25 October 1999.

<sup>19</sup> Turczynowicz L. 1993. The assessment and management of gasworks sites. In: Langley A. & van Alphen M. Eds. *The Health Risk Assessment and Management of Contaminated Sites*. SA Health Commission, Rundle Mall.

<sup>20</sup> Anon. 1898. Railway Gas Works. In: *The NSW Railway Budget*. 20 October 1898., and Brooks H. 1917. Railway Gasworks and Gasmaking, MacDonalddtown. In: *N.S.W. Railway and Tramway Magazine*. December 1917.

<b>PRODUCT SPILL &amp; LOSS HISTORY</b>	Not available.
<b>DISCHARGES TO LAND, WATER, AIR</b>	Gas to air, tar, and waste to ground, wastewater to sewer.
<b>DISPOSAL LOCATIONS</b>	None identified in located records.
<b>COMPLAINTS</b>	Not available.
<b>LOCAL KNOWLEDGE</b>	None found.
<b>LOCAL LITERATURE</b>	See articles on the manufacturing process.
<b>BUILDING PERMITS, LICENCES, APPROVALS, AGREEMENTS</b>	Not available (probably predated the need for such).
<b>HISTORICAL USE OF ADJACENT LAND</b>	North – Carriage sheds, MacDonalddtown Railway Station, and multi track Main Western railway line.  East – Railway corridor, and temporary materials storage site.  South – Multi track Illawarra railway line.  West – Residential terrace housing.
<b>GROUND &amp; SURFACE WATERS</b>	The site is on the ‘Blacktown’ soil landscape, which comprises a gently undulating topography over Wianamatta shales (dark grey siltstones, shales, calcareous claystones, laminite, and coal) <sup>21</sup> .
<b>ASSESSMENT OF ACCURACY</b>	High.

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<sup>21</sup> Chapman G. & Murphy C. 1989. *Soil Landscapes of the Sydney 1:100 000 Sheet*. SCS, Sydney.



## Conclusion

The above site history has confirmed that a railway gasworks operated on the site between 1892 and about 1958.

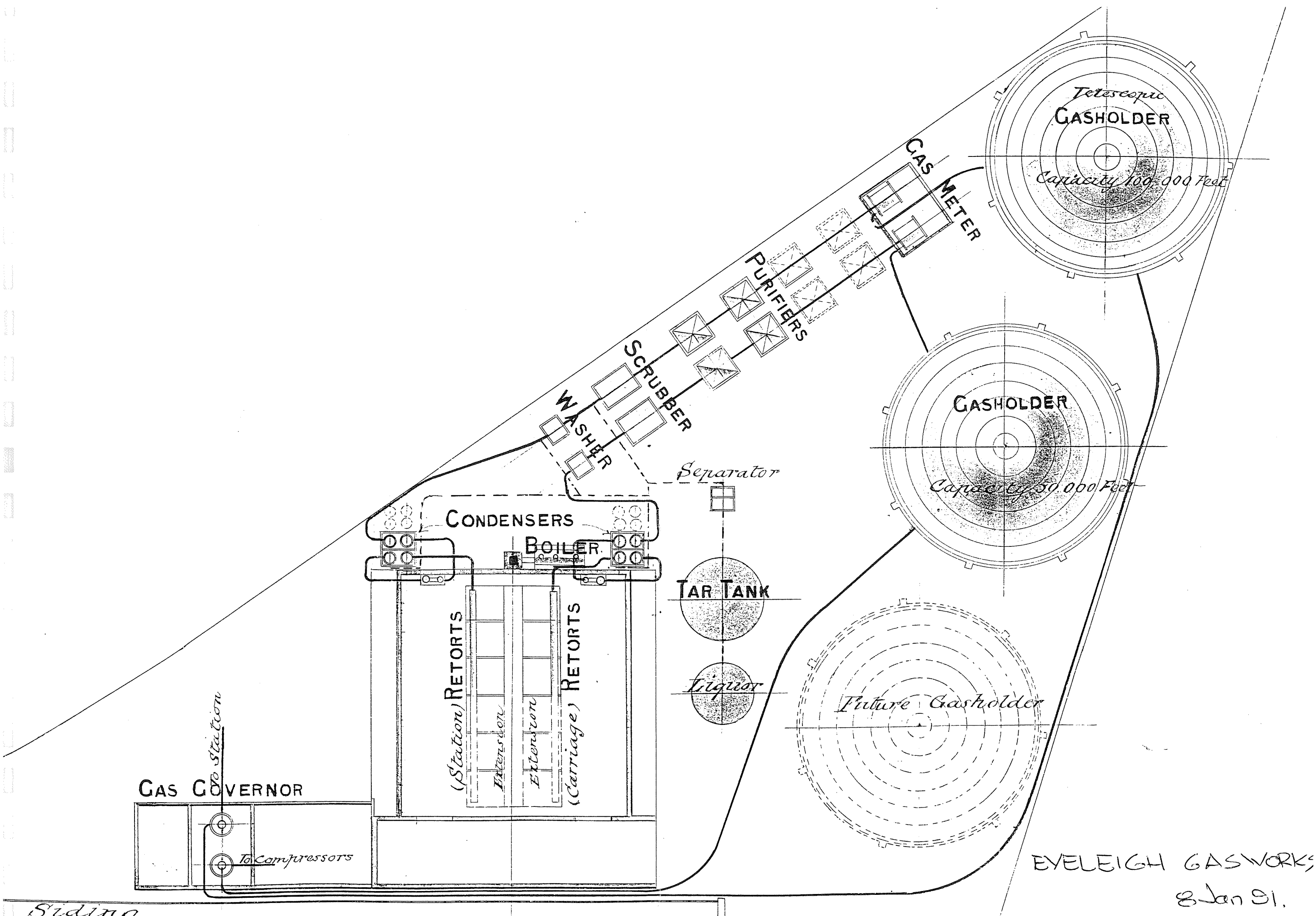
The Eveleigh railway gasworks site is likely to have been contaminated by both organic and inorganic residuals.

The remaining gas holder is listed as “*gasometer at McDonaldtown end*” as an item within the Eveleigh Railway Workshops Precinct on the SRA Section 170 Heritage and Conservation Register<sup>22</sup>.

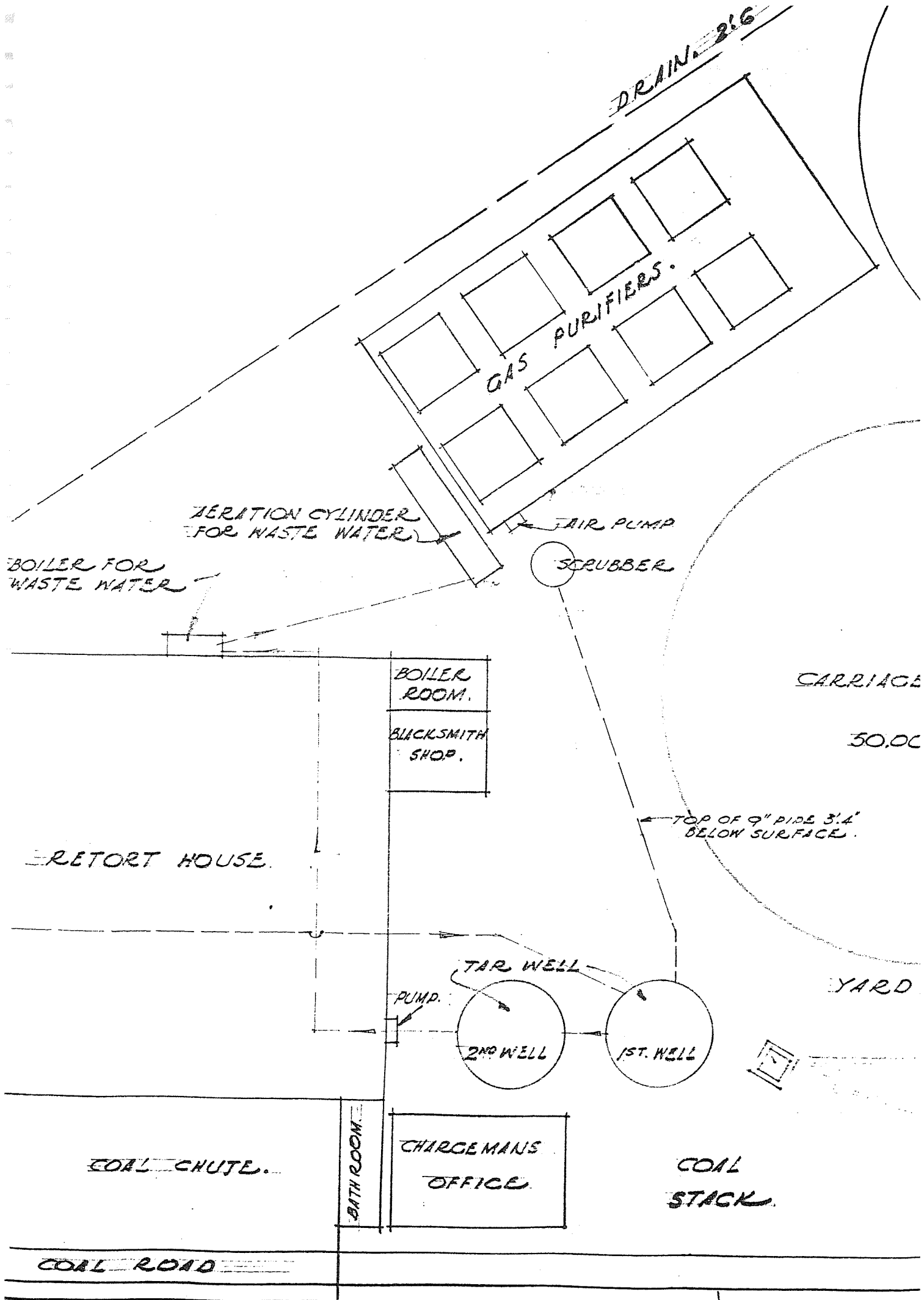
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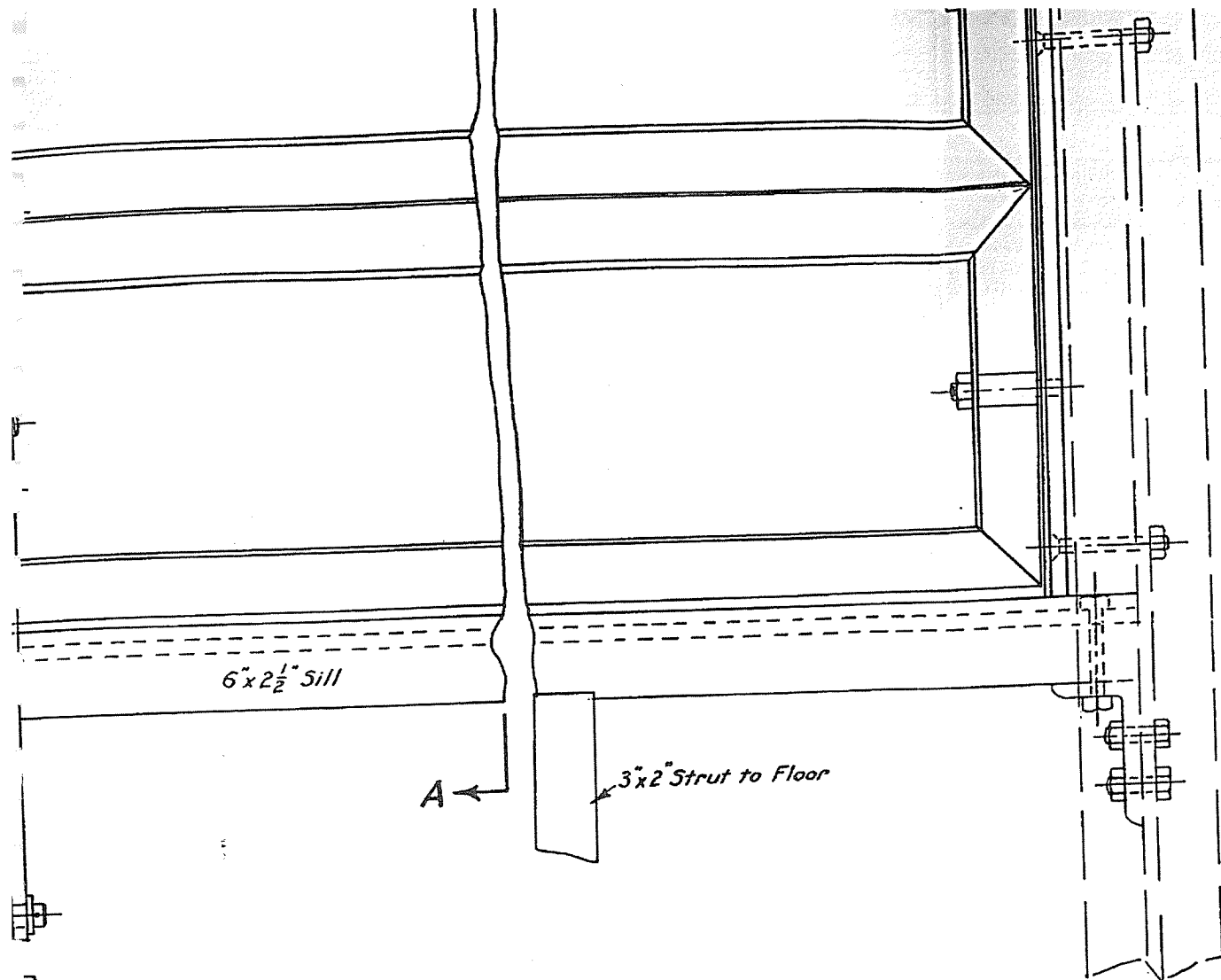
<sup>22</sup> SRA. *Heritage and Conservation Register, State Rail Authority of N.S.W.* October 1993.

# Appendix A

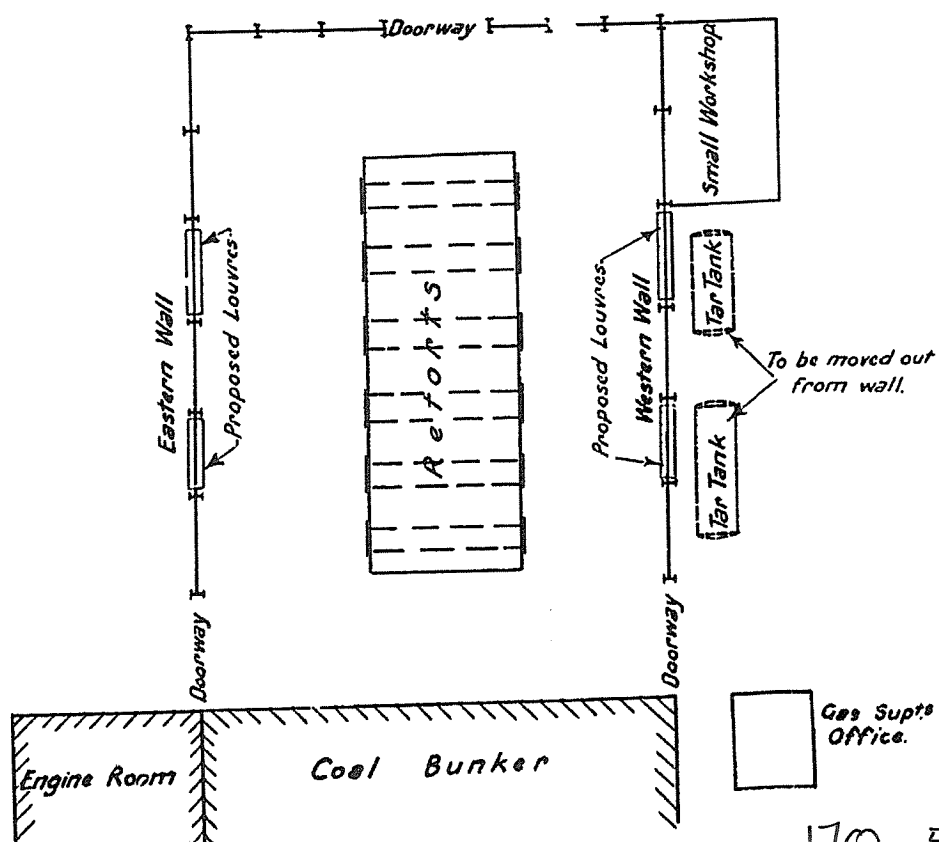


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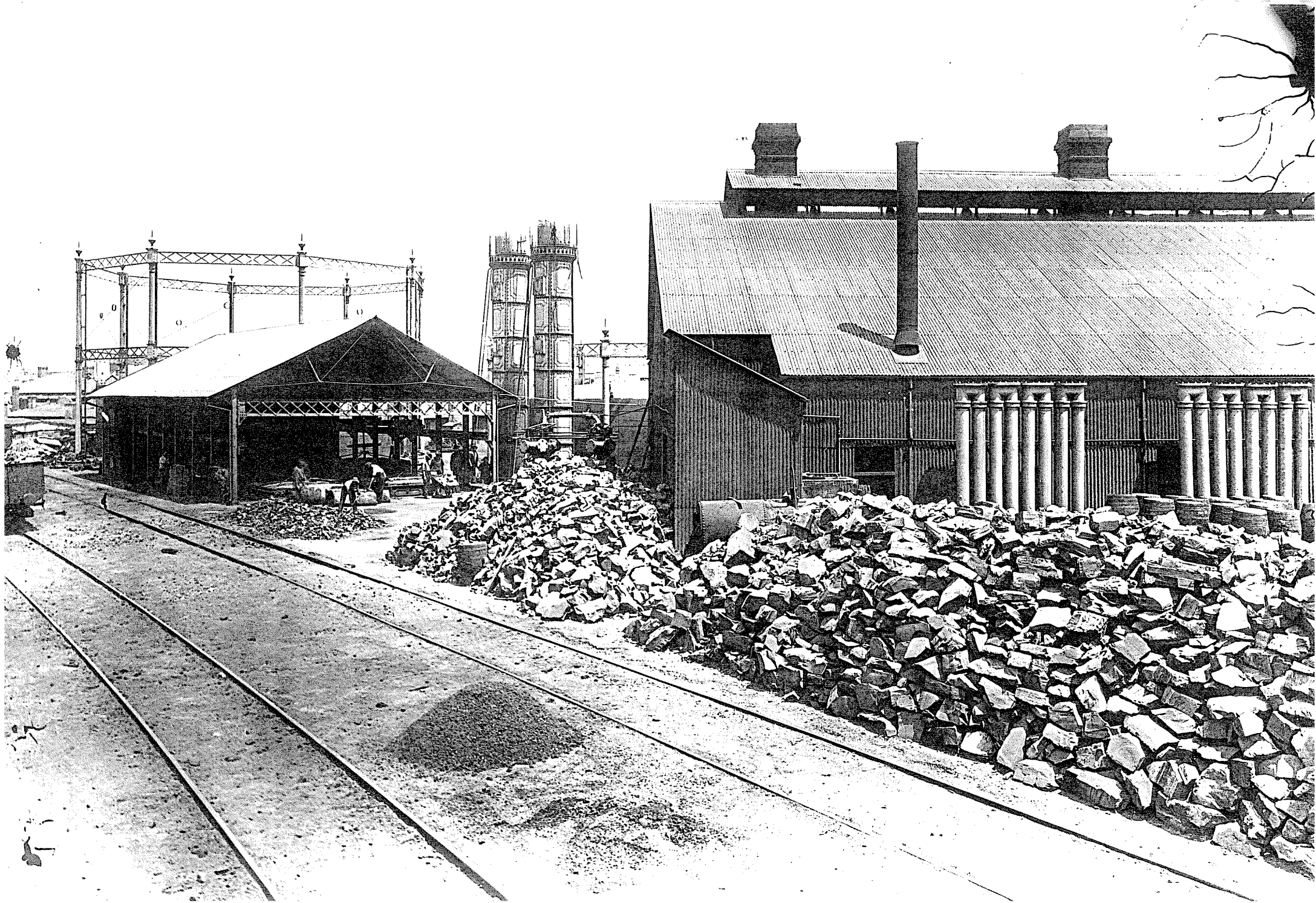




— ELEVATION FROM INSIDE —



## **Appendix B**



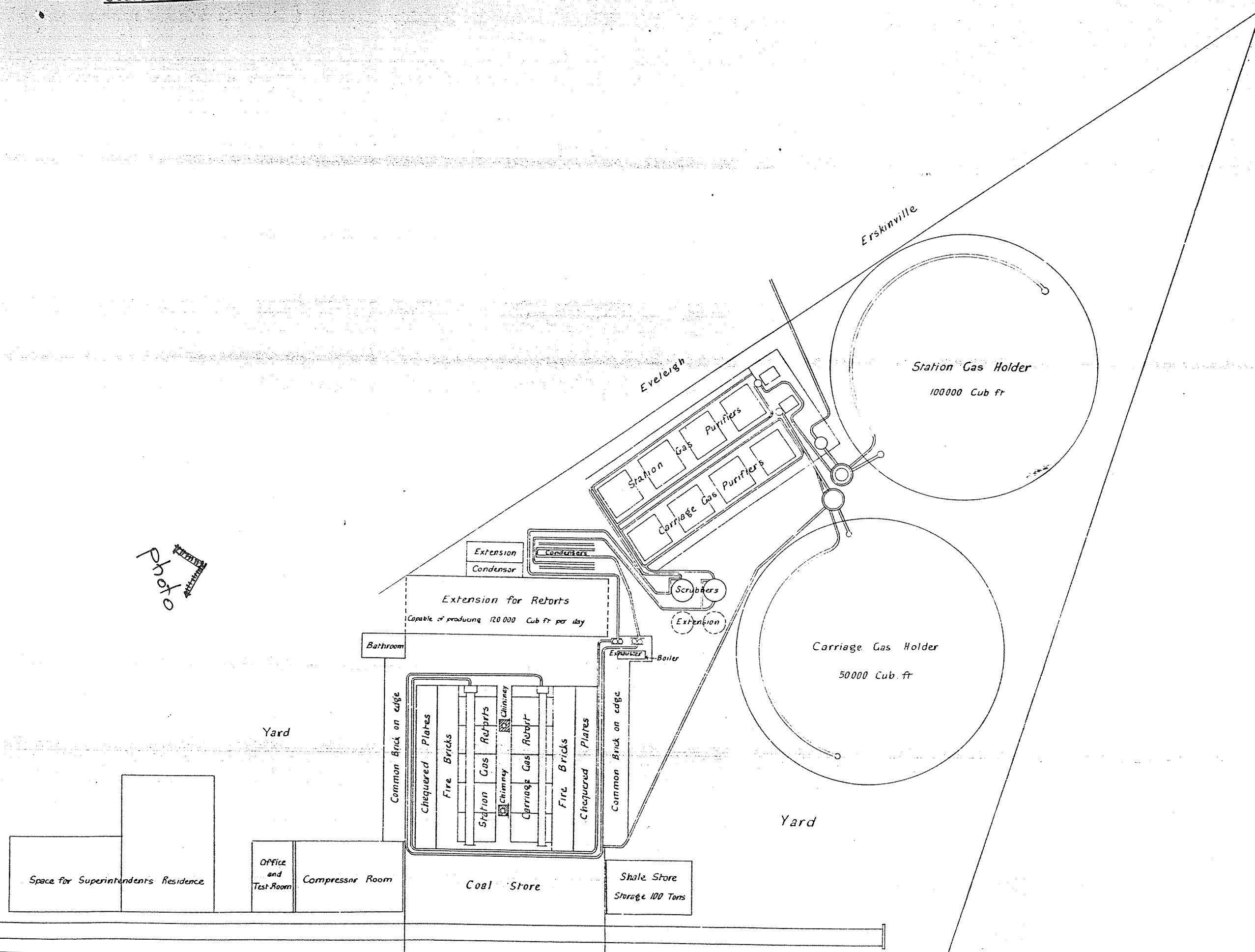
## **Appendix C**



# GAS WORKS EVELLEIGH

## General Arrangement

Scale 16 feet to one inch



## **Appendix D**

## Railway Gas Works.

COMPARATIVELY few of the readers of THE BUDGET have any idea of the size and capabilities of the Gas Works belonging to the Department. Although it is necessary to have a large plant to supply such a large concern as the railway system of N.S.W., it will be news to most, to learn that the works situated on the triangle between McDonaIdtown and Erskineville stations are capable of supplying a town with a population of from 20,000 to 30,000 inhabitants.

Last year the gas made at these works for departmental use amounted to over 22,000,000 cubic feet, while the coal and shale used for this purpose was about 1,000 tons of each, but the plant was not anything like fully used. The works having been erected with a view to allow for considerable extension being made in our lighting requirements.

The works comprise two separate and complete plants—one for the manufacture of gas from coal for use at stations and in signals from Sydney to McDonaIdtown; the other for the manufacture of a very much richer gas made from shale, for use in our carriages.

The Retort House, where the gas is made, is a building 80 feet by 60 feet, containing two benches of retorts. Each bench has 5 ovens, and each oven contains 5 retorts, built in fire bricks over a furnace, from which they are heated. The heat necessary for economical work is described as a "bright orange color," about 2,200 degrees Fahrenheit—the melting point of cast iron. To stand this heat the retorts are made of fire clay; they are D shaped and measure 14 by 22 inches by 9ft. long. Each retort is fitted with a mouthpiece of cast iron, and pipes necessary to carry off the gas as it is made, conveying it into a large pipe called the hydraulic main, standing on iron supports on the top of and running the entire length of the bench—the gas is delivered into this pipe through a water seal—hence its name—to prevent it rushing back when the door of the mouthpiece is opened to recharge the retorts. From the hydraulic main the gas passes by means of a 9 inch cast iron pipe to the exhauster, a very useful, if, at the same time, a rather insignificant part of the plant. Its principle is the same as the injector, with which many of the Railway men are familiar, and its work is to draw the gas away from the retorts as soon as it is generated, otherwise the

pressure caused by other parts of the plant, preventing the easy get-away of the gas, would result in a considerable part of it being decomposed and deposited in the shape of solid carbon in the retorts, and, as the carbon would grow quickly, it would mean a loss of fuel, in having to heat an extra thickness of material before the coal or shale could be treated, to say nothing of the loss of retort room—a very serious consideration, because as a rule, it is not profitable to have much spare room of this kind. An idea of the pressure on the retorts may be gathered from the fact, that the weight of the gas-holder is from 18 to 20 tons, and it is raised only by the gas being forced into it. From the exhauster the gas passes to the condensers (9 rows of cast iron pipes—each row 25 feet long) arranged zig-zag fashion on iron supports, and all having a "fall," or inclination in one direction. Here the gas is gradually and thoroughly cooled. While this is being done, it parts with some of its impurities, principally tar, tarry oils, and water in combination with ammonia; these are drained into a small well near the inlet to the condensers, and eventually drawn off to a large tank, provided for storing them, until they can be further dealt with. The gas still contains as impurities, ammonia—free or in combination—and sulphuretted hydrogen. To deal with the former the gas is passed on to the scrubber (a circular iron vessel 6ft. in diameter by about 30ft. high). It enters at the bottom and has an outlet at the top. As it ascends, water (which is connected at the top) descends in a continuous shower, and as the ammonia has a very strong affinity for water it readily leaves its combination with the gas and takes to the water. In order to rid the gas of its remaining impurity it is now passed through the purifiers; these are four in number, and are really four great cast iron boxes, 9ft. square and 4½ft. deep, fitted with trays (or sieves) on which the purifying material is spread, and the gas, passing through it, leaves its impurity behind. If this is not completely effected in the first or second it is passed on to the third, before passing which it must stand the purity test. The material used for purifying is native oxide of iron, mixed with sawdust, to keep the particles separate. It has quite superseded the use of lime, because, although more costly in the first instance, it lasts for years. When thoroughly saturated with impurity it is taken out of the purifier and exposed to the action of the air and weather, and in time, is revived and ready again for use. To allow of this cleaning work being done there is a convenient arrangement of valves, which provides for one purifier always being off for the purpose, and also provides for any one of the remaining three being first or last as occasion may require, the last one always connecting with the meter where the "make" is registered and then passed on to the gas-holder (or as it is sometimes rather incorrectly called, the gasometer.) The holders are both 60ft. in diameter; one is 20ft. deep, the other 40ft., and capable of containing 50,000 and 100,000 cubic feet respectively. The weight of the holders, which is an inconvenience in the process of manufacture, is now utilised to drive the gas through the mains and services to points where it may be used for either heating or lighting.

It may be noted that in the gas department in Sydney and the country, in all, 50 hands are employed—the country including four smaller stations at Junee, Bathurst, Newcastle, and Werris Creek.

## RAILWAY GASWORKS AND GASMAKING, MACDONALDTOWN.

(By H. C. Brooks, Gas Superintendent.)

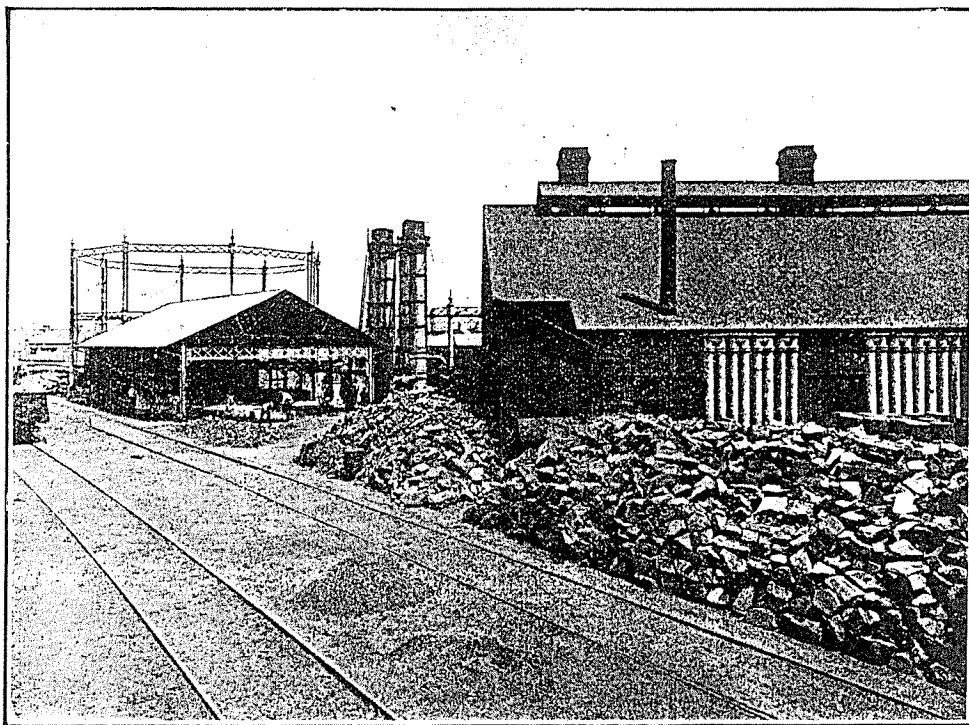
Many railway men will remember the old gasworks situated in the Sydney yards.

Traffic requirements necessitated its removal, the site selected being at Macdonaldtown, where the exist-

General view No. 1 gives the western end of retort house, condensers, washers, purifiers and gasholders.

Illustration No. 2 gives the southern view of retort bench, illustrating the old system of retort drawing

The following is a brief treatise on gasmaking. In the distillation of the raw material (namely coal) a chemical operation takes place. During this operation the coal vanishes, and various products of the gas industry appear in its stead. The process is really



Gas Works M'Donaldtown—Western end of Retort House, Condensers, Washers, Purifiers and Gasholders

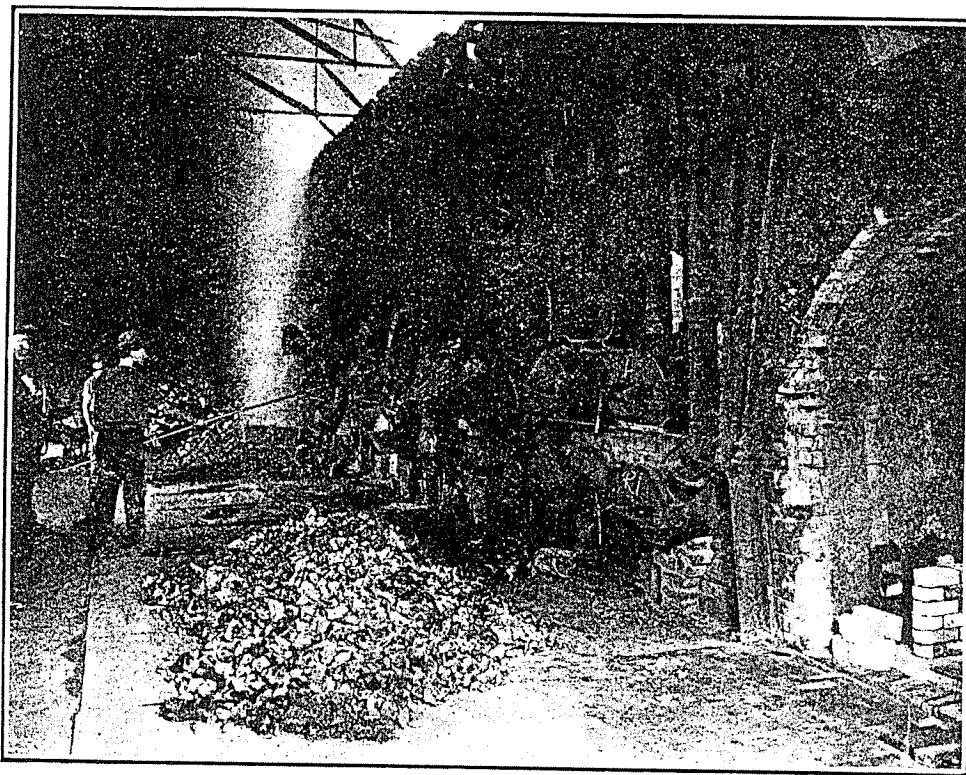
ing works were erected in the year 1892. Very little additions beyond renewals have been made since the date of erection. The type of settings are of generator principal, retorts and furnaces being shovel fed.

a rearrangement of atoms, whereby oxygen originally present in the coal is for the most part made to enter into combination with hydrogen and yield water; while the remainder of the hydrogen of the coal

volatilizes, partly in the free state, and partly in combination with carbon, nitrogen and sulphur. The fixed residue in the retort is impure carbon (namely coke).

To secure these results, the heat of the retorts must be properly maintained, and the practice of extracting

view is seen the retort settings, each having an independent furnace for retaining the required heat to retorts, by the medium of coke, or liquid fuel. Each retort is charged with an even layer of coal, and with the door tightly closed, the volatile products are forced through the ascension pipes into the hydraulic main.



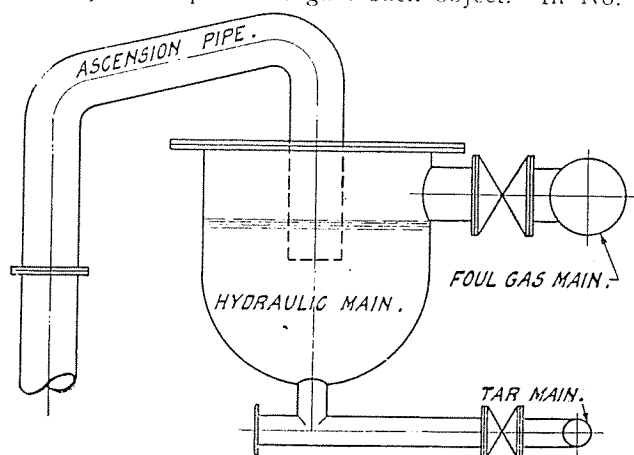
Gas Works M'Donaldtown - Retort Settings

the gas as quickly given off, must be closely watched, in the attainment of the utmost yield of gas, from a given weight of coal.

The foregoing gives the reader an insight into the requirements to be accomplished, and contingencies in the plant required to gain such object. In No. 2

the time of burning off being between five and five and a half hours, or according to the quantity of the charge and heat of retorts.

On the gas entering the hydraulic main, the heavy volatile matter dissimulates from the hot foul gas, and flows with the liquid; the gas travelling forward through the foul main to the condensers, its temperature becoming considerably reduced, thereby allowing the lighter volatile vapour to fall and be extracted at this point, the gas going forward to be washed and purified, after which it passes into the gasholder, where it is stored as a floating supply ready for use.



METHOD OF SEALING GAS AFTER LEAVING RETORTS.