ss DUCKENFIELD (1875 1889)

WRECK INSPECTION REPORT

COMMONWEALTH HISTORIC SHIPWRECKS ACT (1976)

Northern Beaches Resources Sydney Metropolitan Region

Heritage Branch Department of Planning

> David Nutley March, 1989

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1. HISTORICAL DETAILS

<u>General</u>

Shipname	Duckenfield	
When built:	May, 1875	
Date lost:	24 May 1889	
Age:	14 years	
Builder:	J & W Dudgeon (hull and engines)	
Owners:	J & A Brown - coal merchants, Newcastle, NSW	
Port of Registry:	Newcastle	
Master:	Thomas Hunter	
How lost:	Struck Long Reef, drifted off and foundered	
Location:	1.5 cables north of Long Point boat ramp.	
Crew:	14	
Passengers:	0	
Deaths:	1, James Struthers, donkeyman, drowned.	
Voyage:	Newcastle to Sydney ton coal	
Cargo:	285 ton coal	
	50 ton coke	
	50 ton copper ingots	
Insurance:	Nil	
Weather:	Moderate SW winds, heavy rain squalls and head sea	
Salvage:	Copper partly recovered by Biggs and May under command of Captain John Hall. 10-18 tons left behind. Ships lower mast towed into Watson's Bay by Pilot steamer Captain Cook.	
Technical Details		

Steam/sail (rig not determined) 2 cylinder vertical compound engine, single screw
368 gross, 251 net
161.20 feet.
24,00 feet
12,00 feet
iron hull, 1 deck, 4 bulkheads.

Administrative Details

Status:	Location known
Jurisdiction:	Commonwealth
Site File:	Data on site file
Comments:	The <i>Duckenfield</i> struck the lee side of Long Reef enroute to Sydney from Newcastle. There was a moderate southerly and poor visibility. The crew abandoned ship within 10 minutes while the vessel still lay

on the reef. The donkeyman was drowned in the process but the remainder of the crew were soon picked up by the SS *Hawkesbury* and taken to Sydney. Captain Hunter immediately returned on board the Pilot steamer *Captain Cook* as he perceived that the vessel might drift off the reef. When they arrived there was no sign of the ship.

A week after the event two masts were discovered exposed 8 feet above the water. Rough weather intervened and the masts disappeared for 2 months. Captain Melvey of the tug steamer *Grand* buoyed a single mast. Captain John Hall and his team then began salvage operations which lasted over a year. The operations were interrupted and finally' abandoned because of pressures to undertake salvage on more recent casualties - including the *Royal Shepherd* of which Captain Hunter was again the master.

2. Location

Duckenfield

33⁰ 43.2' S 151⁰ 19.5' E, 1.5 nm north of Long Point boat ramp (AUS 197, 809)

Sketch Map showing access to Site



3. SITE DESCRIPTION

VESSEL REMAINS:

The remains of the vessel lie in 23-24m of water on a vast area flat reef that dominates this segment of coastline. It is located approximately 1.5nm from the Long Point boat **ramp and** approximately 1.3nm from Narrabeen Beach. Orientation of the major segment of wreck is WSW by ENE. Large sections of wreckage are reported to be south of the major site - thought to be portion of the bow or stern. The location has yet to be confirmed.

The site has been predominantly broken up to the level of the keel. The keel and beams as far as the bilge keel are largely_intact. The engine is also intact and remains standing on its support frame. Copper ingots lie buried a midships. It is reported that they are four deep.

A few very isolated areas of fresh corrosion are evident. Other visible items include the forward anchors, anchor chain locker, winch over the remaining ingots, donkey boiler, 2-3 small kedge anchors, possibly associated with salvage operations, the rudder and the propeller. A propeller blade lies aft of the wreck but the longer portion including 3 blades and part of the propeller shaft lie forward.

SITE CONDITION AND INTEGRITY:

The evidence of fresh corrosion is in a few isolated places is largely associated with anchoring during initial visits by the finders.

Some portholes, copper ingots, broken crockery, a stick of dynamite and a steam whistle have been removed by the finders and are being held by them pending a decision on a suitable institution/s to undertake custody, conservation and storage.

One small piece of fishing line was wrapped around a portion of the engine. However, there was no other evidence of the site being used for fishing.

SUBSTRATE AND SITE CONDITIONS

The wreck lies on flat reef which is scattered with large slabs of free rock. It is evident that these slabs move around in high seas as some were located on top of parts of the wreck.

However, the finders report that the current is characteristically negligible and while the site is exposed to easterlies and north easterlies, it receives some southerly protection from Long Reef.

Visibility is generally high by Sydney region standards.

4. SITE PLAN

The site plan, prepared by Allan McLennan, is approximate only but is deemed a fair representation of the wreck. Minor additions to the original plan include the propellerand rudder details.



- KEY
- I. Propeller
- 2. Hawser pipes
- 3. Boulder atop forecastle
- 4. Chain locker
- 5. Bulkhead
- 6. Ships' anchors
- 7. Anchor winch
- 8. Bitts
- 9. Davit
- 10. Bilge keel
- 11. Keel
- 12. Kedge anchors from salvage
- 13. Winch
- 14. Longitudinal extent of copper ingots across amidships.
- I5. Boiler
- 16. Remains of donkey boiler
- 17. Davit
- 18. Surface condensing compound engine
- 19. Wreckage extends in these directions
- 20. Drive shaft
- 21. Single propeller blade
- 22. Rudder

5. IDENTIFICATION COMMENTS

The identity of the wreck is not in doubt. Its position, description of cargo and engine are well documented.

6. SITE HISTORY

CONTEMPORARY SALVAGE

Intensive salvage of copper ingots was undertaken by Captain 111~,~,~,~,~, ~M and his team in the 12 months following the wrecking. The operation included dynamite. One stick of dynamite was on the site at the time of finding in 1987. Approximately 10-18 tons of copper remain.

MODERN SALVAGE

The finders have removed:

- ingots lying lose
- broken crockery
- steam whistle
- stick of dynamite
- portholes

RECREATIONAL USE Presently Nil.

7. ASSESSMENT OF SIGNIFICANCE

The significance of the *Duckenfield* has been assessed by criteria based on the terms used to describe significance in the Commonwealth Historic Shipwrecks Act 1976, the New South Heritage Act 1977 and the International Council of Monuments and Sites, (ICOMOS) Burra Charter of 1981 (revised 1988.

HISTORICAL SIGNIFICANCE

• The ability of the site to demonstrate its history by virtue of its physical survival.

The ss *Duckenfield* was built specifically for J & A Brown's Sydney/Newcastle run and was named after the principal Duckenfield mine that was sunk in 1874. The name Duckenfield was brought to the area by coal miner and landowner John Eales of Duckenfield Park (Minmi file.) Duckenfield Park, where the estate house is still standing, was near Morpeth.

.As a regular coaster between Newcastle and Sydney over 13 years of service, the *Duckenfield* played an important role in the development of the town of Minmi 12 miles west of Newcastle. When the *Duckenfield* began service in 1876 the population of Minmi was approximately 600. (Bairstow, 1981) At the height of the Minmi mines operations, 1000 tons of coal were produced daily. J and A Brown owned an area of 6,000 and leased their land to 3,000 residents in the town. There were six hotels, several churches and the shops and factories needed to run the town and mines.

The presence of copper ingots from Wallaroo is a reflection of developments in copper smelting in Australia. Copper ore from South Australia had initially been shipped to Newcastle for smelting. Three years prior to the loss of the *Duckenfield* a smelter became operational at Wallaroo (Lockhardt, J.). Ships of the South Australian Black Diamond line began supplying the smelter works with coal from Newcastle. It appears that they would then return to

Newcastle with copper ingots as ballast. The copper ingots on the *Duckenfield* were being transhipped for overseas export.

The fabric content and context of the *Duckenfield* site demonstrate the history of the vessel in terms of its the coal and copper industries with which it was and key personalities of the time including the salvage operators.

It was associated with the activities of industrialists, James and Alexander Brown. Following its loss, salvage operations by Captain John Hall, (Marine Surveyor of the Sydney Marine Underwriters and Salvage Association) provide an insight into the early work of the Association which only began its role in salvage work in 1886.

It was also associated with a significant period of growth and change -

- In the coal industry with the growth of the Minmi tields
- in the copper industry with the smelting of South Australian copper ore at Wallaroo rather than Newcastle
- In shipbuilding technology with the short period of Iron hulled ships.

ARCHAEOLOGICAL SIGNIFICANCE

• The ability of the site to reveal important evidence mt earlier human activity and to expand iinderstanding nf human society,

Although the site has suffered considerable damage from forces and Initial salvage operations, the integrity of the *Duckenfield* site is very high. There has been minimal human intervention since initial salvage in 1889/90. These operations concentrated on the valuable cargo of copper ingots. There is a likelihood that items associated with general ship operations and general crew possessions remain buried in the shallow sand caught between the surviving hull frames.

There are sufficient structural remains which, when combined with historical records will enable an overall impression of the original ship to be developed. No plans have been located to date,.

The engine is possibly one of the most complete surviving of its type in Australia.

The in-situ remains from the salvage operations, including dynamite and evidence of the effect of dynamite, illustrate aspects of the development of this craft in the late 19th Century,

TECHNOLOGICAL STGNIFTCANCE

.The ability of a site to represent a particular era in technology or design innovation.

James and Alexander Brown were noted for their use of the latest available technology - both in their collieries and their steamships. This practice was inherited by James Brown's son John Brown and is represented in the Richmond colliery which is now subject to a Permanent Conservation Order under the Heritage Act 1977. (Civil & Civic et al, 1983)

The iron hull and compound engine of the *Duckenfield* were bullt by J & W Dudgeon of London. They were built at a time when Britian led the world in shipbuilding technology. The use of iron hulls was a short transitional phase in ship construction. Wooden hulls could not supply the strength or capacity required by shipowners. They were superseded first by composite ships (wooden hulls, iron frames), then by full iron hulls and, by the 20th century, steel hulls had become the norm.

While the hull and engine represent British technology, it is possible that some other fittings including winches were of local manufacture - possibly at Newcastle where the first foundary was built in 1854 by Archibald Rodgers. (Bairstow, 1981)

SCIENTIFIC SIGNIFICANCE

• The potential of a site for controlled scientific research into the process of deterioration through mechanical, chemical and biological degradation.

The behavouir of metals following prolonged immersion is a matter of continued metallurgical study. The *Duckenfield* has been submerged for over 100 years and provides, in its particular context, an opportunity to study the quality of metallurgy of the rnid 19th Century.

SOCIAL SIGNIFICANCE

• The qualities for which the site has become a focus of spiritual, political, national or other cultural sentiment to a minority or majority group (Burra Charter).

The *Duckenfield* site is currently of little social significance except to the divers associated with its recent findng. Like Minmi which became a ghost town after the closure of the mines in 1922, it was quickly forgotten. It has no history as a fishing location.

AESTHETIC SIGNTFICANCE

The ability of a site to stimulate aspects of sensory perception concerning form, scale, colour, texture and material.

The remains of the *Duckenfield* have acquired a degree of value through the scale and dominance of the compound engine and through the regular layout of frames and that define the shape and general extent of the wreck site. The presence of copper ingots on site greatly contributes to the visual appeal with its inevitable association with valuable cargo.

RECREATIONAL SIGNIFICANCE

• the ability of a site to evoke the shipwreck event or Of providinig subjects/backdrops for artistic photography or of providing three dimensional space,/light shade experience.

The *Duckenfield* site has a great variety of visual interest – anchors, propeller, davits, rudder, winches, copper ingots, boiler, donkey boiler and the quite dominating presence of the upright compound steam engine. It is highly accessible to divers, of reasonable depth and in an area which generally has relatively high visibility under water and minimal current,

In addition, with, its strong historical background, the site will be of prime interest to divers, dive charter operators dive clubs.

EDUCATIONAL SIGNIFICANCE

• The ability of a site to illustrate at least one of the above criteria.

The site has marked significance under most of the above categories. In particular, its involvement in the development of the Newcastle coal industry, association with the copper industry and association with intriguing personalities such as salvage operator Captain John Hall, have a potential for considerable educational possibilities through on-site interpretation, research and publications.

8. STATEMENT OF CULTURAL SIGNIFICANCE

The cultural significance of the ss *Duckenfield* site is linked directly with the transportation networks that were part of the general industrial and social growth of the region in the mid to late 19th Century. With the presence of copper ingots from Wallaroo, further links are established with the development of intercolonial trade between NSW and South Australia. Through the integrity and extent of the site, the remains retain an appreciable scultural ignificance in themselves as well as being an expression of maritime social and industrial history.

9. ASSESSMENT OF THREAT

HUMAN

An undisturbed site with a valuable cargo is under greatest threat from treasure hunters and souvenir collectors. It is also tinder threat from anchors and mooring lines that are likely to generate renewed corrosion of the engine components and remaining hull, winches, and ship's anchors.

The threats are four fold:

- loss of historical and scientific information from the site into unrecorded custodionship.
- loss or alteration of physical materials through lack of conservation knowledge in preserving the items.
- damage or obliteration of other equally important site materials by divers dislodging/destabilizing material of no interest to them with subsequent dispersal by wave and current action.
- loss of recorded context within the site.



Evidence of damage from anchors on the *Duckenfield* site. (Photo by D Nutley)

ENVIRONMENTAL

The site lies on unprotected flat reef subjected periodically to heavy swell. It is not subject to substantial tidal movement and appears to be in a generally stable condition. Sea urchins while present, are not numerous and do not appear to be significantly contributing to corrosion.

10. RECOMMENDATIONS

- 1. Declaration of the wreck, wreck site and associated remains of the *Duckenfield* (1875 1889) pursuant to Section 5 of the Commonwealth Historic Shipwrecks Act 1976.
- 2. Declaration of a 200m protected zone around the wreck site pursuant to Section 7 of the above Act.
- 3. Development of a system of permits to facilitate controlled recreational diving on the site.

11. SOURCES OF FUTHUR INFORMATION

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Bairstow, *D*, *A Short History of European Settlement and Development of the Hunter Region of New South Wales 1818 1940*, NSW Department of Environment and Planning, November 1981.

Civil and Civic et al, Richmond Main Colliery - NSW: Feasibility Study, Vol I, for meeting of the Board of Management. 12 April, 1983.

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Log of Captain Cook I, State Archives.

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Newcattle Morning Herald, 31 June, 1930, 19 July 1950.

Payton, P: Australia's Little Cornwall, Rigby Ltd, Aust 1978

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Pemberton, B, Australian Coastal Shipping, University Press, Melbourne, 1979.

Sydney Marine Underwriters and Salvage Association records, Mitchell Library

12. APPENDIX

BACKGROUND NOTES ON DUCKENFIELD PREPARED BY ALAN McLENNAN 1988

The WALLAROO Connection

The *Duckenfield* ingots weigh about 5 kilograms each and are all stamped by hand with the name 'WALLAR00'. Wallaroo was part of the famous South Australian copper fields on the York Peninsular which were discovered in 1859. The fields were so rich that they were credited with saving the colony from bankruptcy. With her sister towns of Kadina and Moonta, the district became known as 'Little Cornwall' as a result of the thousands of Cornish miners who left the poverty of their homeland and brought their expertise in mining to the new colony. Most of the copper went to Britain and it is ironic that the output of these mines, worked by Cornish immigrants, helped force the closure of the many long established copper mines in Cornwall,

thus encouraging the emigration of many more Cornishmen.

Wallaroo had a port and a smelter to which the ore would be brought to be processed and shipped overseas. The South Black Diamond line supplied the Wallaroo smelter with coal from

Newcastle and the coal ships would apparently take a load of copper on board as ballast for the return trip. The *Duckenfield* copper came via this route and was to be transhipped in Sydney for London.

The mines lasted only until, 1923 but the heritage of the Cornishminers, known as 'Cousin Jacks' lingers on in the names and building styles of 'Little Cornwall,. This is celebrated every other year by the Kernewek Lowender Festival.

References: Australia's Little Cornwall, P. Payton. Rigby Limited 1978 Copper Mines and Mining – Wallaroo, J.R. Lockhart

Coal Mining at Minmi

Coal was first discovered in the Sydney basin at Coalcliff by survivors of the *Sydney Cove* wreck in Bass Strait as they fought their up the coast on foot in 1797. It was not until the 1850's however, that mining was undertaken on a large scale around Wollongong to the south and Newcastle to the north. The industry then grew rapidly and soon a fleet of colliers was employed to move the coal and later coke to Sydney. Before direct rail links or good roads these small

ships were the only means of transport possible. Most of the ships were owned by the mine owners and often were named after one of the companys' mines, as was the case with the *Duckenfield*.

The Minmi complex of mines, which included the Duckenfield mine, were located 13 miles west of Newcastle. Mines were f[rst begun in the area by Edward Turner of Maitland who hauled coal to Hexham by bullock dray. In 1850 the first coal to be taken by ship from Hexham was loaded on the coaster *Currency Bay*. Coal from the Minmi area was of high quality and known as `cannel' coal because it could be lit with the flame of a candle. In later years Duckenfield

coal became well known, for spontaneous combustion on long voyages.

The name "Duckenfield." Became associated with the area when wealthy landholder John Eales of Duckenfield Park (the estate house still stands near Morpeth) opened a pit at

minmi. In 1854 Eales and an A. Christie succeeded in having 'Act of Council', passed to construct a rail line between Minmi and the wharf at Hexham. In 1859 James & Alexander Brown bought out all the Minmi collieries. The brothers had emigrated from Scotland in 1839 and were to become synonomous with Newcastle Coal Co.. However, in 1864 disastrous floods put the mines out of action for eighteen months. During this time the Browns bought their partners out a handsome profit. The principal Duckenfield mine was sunk in 1874. The main entrance went into the hill on an incline of 1 in 16 for 1 1/4 miles. The area was ideal for mining with the seam following the contour of the gently sloping countryside only a short distance below the surface.

In the week of the *Duckenfield's* first run to Sydney in 1876, the Duckenfield mine had the following exports:

Sydney 603 tons Lyttleton 541 tons Hong Kong 340 tons Steamer's bunkers 57 tons

At the height of the Minmi mines operation, 1,000 tons of coal were produced a day. Browns owned an area of 6,000 acres and leased their land to the 3,000 souls who lived in the town. The town boasted six hotels, several churches and all the shops and factories needed to run the town and mines. In 1922, despite ah abundance of coal, James and Alexander's heir John Brown closed the mines after a bitter pay dispute with the miners. Because no one owned land in Minmi and there was no other industry besides the mines, Minmi quickly became a ghost town.

The ss *Duckenfield* was built to the order of J & A Brown for their Sydney - Newcastle run. The coal she brought south was used for many purposes; to supply the bunkers of steamers in Sydney, to produce coal gas to light the streets and to provide energy for steam engines and heating. She was a typical 'sixty miler, (the distance between Nobby's Head and North Head) of 251 tons net, 368 gross. Her dimensions were 161.2 feet in length, breadth 24 feet , with a draught of 1.2 feet. She had four bulkheads and a raised quarter deck. The decks were sealed by cement. A single fire tube boiler provided steam for the compound engine and single screw. She was built by J & W Dudgeon of London in May, 1875 and was delivered to Newcastle under sail in March 1876. She was then towed to Sydney by the ss *Waratah* where her propeller was fitted and made her run to Sydney with coal on March 29th, 1876. The ss *Duckenfield* made about 100 round trips a year until her sinking thirteen years later.

The *Duckenfield* was well liked by those who knew her, being described as a smart little collier, and a good little ship'. She was certainly the most modern ship in the J & A Brown fleet at the time of her sinking. The other ships the fleet were..

- ps *Bungarre* 85 tons, built in 1861.
- ps Goolwa 116 tons, built in 1864.
- ss *Phoebe* 391 tons, built in 1851.

A second ss *Duckenfield* arrived in Sydney in November 1890. She was not a replacement being a much larger vessel with twin engines. She was used on the Newcastle - Melbourne run and had a long life with J & A Brown, not being sold until 1930 to Mollers of Hong Kong. In 1941 she was scuttled in Hong Kong Harbour and later raised by the Japanese only to be sunk the China Sea in 1944.

References:

Newcastle Morning Herald 31/6/1930 And 19/7/1950 Newcastle District Historical Society – Monthly Journal - January 1949 MINMI file - Newcastle Public Library Australian Coastal Shipping, B. Pemberton, Melbourne University Press 1979.

SYDNEY MARINE UNDERWRITERS AND SALVAGE ASSOCIATION

The SydneyUnderwriter's Association was created by a group of companies in 1876 to represent their interests in maritime matters. Later a salvage section was established in response to the growing list of shipwrecks along the coast which might have been saved if they had urgent assistance.

Captain John Hall was employed as the Associations, Marine Surveyor in 1886. His principal job was to survey ships for seaworthiness and provide reports to the Association. However, it also it fell to him to undertake the majority of the salvage work. He was expected to rush off to ships in distress at a moments notice, besides performing his normal surveying duties, His work was mostly on the river bars of the North Coast where strandings were regular occurrences, however, he also was called as far away as New Caledonia and Gabo Island. Some ships such as the ss *Tomki* and ss *Rosedale* were refloated several times on different occasions by Captain Hall. The work was primitive and dangerous with salvage gear often having to be hauled through the bush by bullock teams. Especially on river bars and beaches, working on wrecks such as the ss *Tweed* at Byron Bay and on the ss *Wellington*, at the Nambucca bar, Captain Hall was caught by a change in sea conditions and only 'just escaped with his life'.

The *Duckenfield* salvage was not at first a straight forward affair. A week after the wreck two masts were discovered poking eight feet above the surface 'a little NE of Long Reef'. Rough weather intervened however and the masts disappeared. Both Captain Hall and Diver Briggs claimed later to have dived to over 26 fathoms in search of the wreck! Two months passed

with no sign of the wreck until Captain Melvey of the tug steamer *Grand* discovered a single mast poking just three feet above the surface. At once Hall, and his team began their salvage. On the 21st August the first 117 ingots were recovered. However, work appears to have proceeded in spurts and urgent jobs kept cropping up. Only a week after the second discovery of the wreck, the ss *Centennial* sank in Taylors Bay, Port Jackson. Efforts involving Briggs and May to raise the vessel lasted for over a year before being abandoned. The copper did come up though. Briggs claims to have dived for a continuous 4 hours and 20 minutes and recovered 10 1/4 tons in one spell. The June 1890 Annual Report of the SMUA states that '32 tons of copper ingots had been recovered to date valued at 2000 pounds'. In an interview in 1896 diver May

states that they recovered "just under 40 tons" so it is probably safe to assume that between 10 and 18 tons remained.

Captain Hall salvaged over 65 vessels in his 11 years as Marine Surveyor. His career culminated in August 1896 with the successful recovery of gold from the strongroom of the ss *Catterthun* sunk in 30 fathoms at Seal Rocks. Captain Briggs and diver May were greeted as heroes on their return to Sydney. Unfortunately Captain Hall took ill during the salvage and the *Catterthun* was his last job. He took six months leave and returned to his native England. He died in May 1897.

The Association was to continue its salvage work until the salvage section was wound up and its equipment sold off in the early nineteen sixties. The Sydney Marine Underwriters ceased operations in June 1975 when it was amalgamated into the Insurance Council of Australia. A scrap book of their many salvage efforts as well as the company records are now in the Mitchell Library.

References

Sydney Marine Underwriters and Salvage Association records - Mitchell Library kv 6607 - kv 6632.

Austratian Banking and Insurance Record