

Guidelines for Realistic Traffic Workings For the Main Illawarra Route V3.0 for MSTS

This document came about as a series of notes that I wrote for my own information when creating and running trains on my MSTS NSWGR Main Illawarra route V3.0. As more information came to hand, I decided to make it available to the general MSTS NSWGR community, to enhance their enjoyment of running trains in MSTS over this route. Please note that this document is considered a 'work in progress', and that in some sections there is currently little or no information to hand.

General Notes

Although the Illawarra Main Line was generally double track throughout between Sydney and Wollongong, there were two traffic working 'bottlenecks'.

At Como the rail bridge over the Georges River used gauntlet trackwork, which necessitated the equivalent of Single Line Working. Block signalling was provided at both the north and south approaches to ensure that no two trains were in the 'single line' section together. However as the MSTS signalling system cannot simulate this, take care not to allow two trains to work over this section simultaneously.

The other main problem was the single line section, through the Coal Cliff Tunnel, from just south of Coal Cliff station to just north of Scarborough station. In this route, the MSTS signalling is setup to work correctly over the single line section. However, for realistic working, the following should be carried out.

All trains, both Up and Down, were required to either slow to 15 mph in daylight (10mph at night), or stop opposite Scarborough and Coal Cliff signal boxes to allow the exchange of the single line section Staff. These points are shown clearly in the route by a boarded crossing with handrails, and are illuminated by lamps during night operations. For heavy Down goods trains, the Coal Cliff signalman often stopped the train in Coal Cliff Down platform, and exchanged the staff there. This was done to allow the Down goods a longer run-up before entering the Coal Cliff Tunnel, and reduce the risk of stalling in the tunnel.

South of Wollongong, the lines divided with a short double track branch serving Port Kembla, and the adjacent steelworks, Lysaghts and Commonwealth Rolling Mills amongst other industrial users – this also included a large export coal facility at Port Kembla Inner Harbour (opened in 1963). The Main line continued south to Nowra (Bomaderry) as a single line section with passing loops at strategic locations. A further single track branch line diverged from Unanderra over the Illawarra Escarpment to Moss Vale.

Traffic Paths in MSTs

The following traffic paths have been provided with the route, to assist you in making your own Activities – these Paths are generally based on the lines that the trains took as shown in the Illawarra Line Working Timetable 1956:

Passenger

Sydney - to Nowra (also to Kiama) and return / to Port Kembla and return / to Wollongong and return / to X-Main and return (the route ends at X-Main (Newtown) representing all other passenger trains to/from the North, the West and the South).

Wollongong – to Coal Cliff and return / to Kiama and return / to Moss Vale and return / to Port Kembla and return / to Thirroul and return

Thirroul - to Mittagong (via Moss Vale) and return / to Nowra and return / to Port Kembla and return / to Sydney and return

Coal Cliff - to Port Kembla and return

Sutherland RM – to Helensburgh RM and return / To Coal Cliff RM and return

Scarborough ECS - to Thirroul ECS and return

Nowra Milk - to Darling Harbour Milk

Goods [including Trip Train traffic on the Metropolitan Goods Lines]

Enfield - to Alexandria Gds and return / Botany Gds and return / Cooks River Gds and return / Darling Harbour Gds and return / Darling Island Gds and return / Mortdale Gds and return / Rozelle Gds and return / Thirroul Gds and return / Waterfall Gds and return.

X-Main – to Darling Harbour Gds and return (the route ends at X-Main (Enfield North) representing all other goods trains to/from the North, the West and the South).

Waterfall - to Thirroul Gds and return

Thirroul - to Port Kembla Gds and return / to Kiama Gds and return / to Nowra Gds and return

Alexandria Gds – Nowra Gds and return – for the Wirth Brothers Circus Train

Wollongong – to Moss Vale Gds and return / to Dunmore Quarry and return / to Bombo Loop and return

Collieries

Metropolitan Colliery to Waterfall Gds and return

Scarborough (Clifton Tunnel Colliery) to AIS Port Kembla and return

Coal Cliff Cokeworks to Waterfall Gds

Coal Cliff X Sidings to AIS Port Kembla

Old Bulli Colliery to Old Bulli X Sidings and return

Old Bulli X Sidings to AIS Port Kembla and return

South Bulli Colliery to Bellambi X Sidings and return / to Bellambi Jetty and return

Bellambi X Sidings to Port Kembla and return / to Figtree Cokeworks and return

Corrimal Colliery to Corrimal X Sidings and return

Corrimal X Sidings to Inner Harbour Coal Loader and return

AIS Mt Kembla Colliery to AIS Coal Stack and return

AIS Wongawilli Colliery to AIS Coal Stack and return

Electric [mainly to allow AI traffic on the electric lines as a supplement to Main Illawarra line Activities]

Sydney - to Bankstown (Belmore) and return / to Cronulla (Kirrawee) and return / to East Hills (Turella) and return / to Royal National Park and return / to X-Sub and return – (the route ends at X-Sub (Newtown) representing all electric trains to the North (Hornsby), the West (Penrith) and the South (Liverpool).

Other

Loco – at Delec / Enfield 1, 2 and 3 / Eveleigh / Port Kembla / Thirroul / Wollongong – provided for light engine Explore Mode driving sessions.

Shunter – at Alexandria Gds / Botany Road Car Sidings / Cooks River / Darling Harbour / Darling Island / East Car Sidings / Enfield East / Enfield West / Inner Harbour Coal Loader / Lysaghts / Macdonaldtown / Rozelle / Sydney Yard 1, 2 & 3 / White Bay – provided for light engine and shunting Explore Mode driving sessions.

Thirroul LE to Wollongong LE and return – for banking locos for Moss Vale goods trains (refer to Timetable)

Notes:

RM= Rail Motor

ECS=Empty Carriage Stock

LE=Light Engine or Light Engine and Brake van

X=Exchange Sidings

Traffic Deviations

Whilst the Main Illawarra line was generally used in isolation, from the remainder of the NSWGR network, from Sydney to Nowra, the connection over the Illawarra Escarpment from Unanderra to Moss vale was sometimes used as an emergency alternative, when the Main South was blocked due to derailments, accidents, or other reasons. For example, I have a photo of a double 44 hauled 'Southern Aurora' passing north through Bulli in Dec 1967, due to a derailment at Picton. Obviously, the line's curve, grade and weight restrictions would prevent the largest and heaviest locomotives and stock from using the Moss Vale line. This occasional deviation, could lead to some interesting workings in MSTS from Moss Vale/Unanderra to Sydney, or vice versa.

Passenger Workings

Unlike the goods traffic workings, which were split into two sections Enfield to Thirroul (worked by Enfield crews), and Thirroul to Nowra (worked by Thirroul crews), the passenger traffic from Sydney was worked by Eveleigh crews throughout from Sydney to Nowra. Locomotives were usually worked the full length of the line, except for the South Coast Daylight Express, which changed locomotives at Thirroul, but retained the original rostered crew after the locomotive change. Thirroul depot only provided crews for local passenger trains from Coal Cliff / Scarborough to the southern sections of the line.

Specific details of Passenger Train Formations, the type of passenger cars used and basic histories, as applied to MSTs, can be found in a supporting document, "NSWGR General Passenger Traffic Workings", which can be found for download on the 'Coals to Newcastle' and UKTrainSim websites.

Express and Fast Passenger

There was only one Express Passenger working daily (except Sunday), the South Coast Daylight Express, using a 7-car air-conditioned HUB set. The Down train No.55 left Sydney at 9:25am and arrived in Nowra at 12:41pm. The return Up train No.198, left Nowra at 2:00pm and arrived in Sydney at 5:18pm. The Sydney-Thirroul section was worked by 38 (or 36) class locos, and the Thirroul-Nowra section was worked by 32 class locos. After full dieselisation of the Illawarra line, the diesel-hauled train was worked right through without change.

Several principal passenger trains over the line were designated as Fast Passenger trains with limited stops: these included No.137 Down, No.96 Up, No.196 Up, No.234 Up, No.304 Up, and No.326 Up. These trains were usually worked by 32 class locos, but often used a variety of passenger car types, such as L-type (CUB sets), R-type (SUB or SEB sets) and N-type (NAB or NOB sets).

Ordinary Passenger

All other passenger trains between Sydney / Wollongong / Port Kembla / Kiama / Nowra were classed as ordinary passenger, and stopped at most, if not all, stations along the route. These trains were almost always composed of a 32 class loco (from Eveleigh) and an 8-car end-platform LUB set (from Macdonaldtown).

Workman's Trains

Because of the proximity to the Port Kembla steelworks, harbour and adjacent industrial complexes, there was a heavy traffic in workman's trains from Scarborough to Port Kembla. Most were in the southbound direction in the mornings, and the northbound direction in afternoon, but also some trains around lunch-time and late evening, catered for those who worked the late shift. These were mainly end-platform sets, often with an extra two cars to bring the train up to 10-cars, usually worked by 30 class 4-6-4T locomotives from Thirroul depot. In off-peak periods, the cars were stored in the Up sidings at Wollongong (ready for northbound workings) and the Up sidings at Thirroul (ready for southbound workings).

Railmotor Services

Normal Sydney suburban traffic by electric train worked only as far south as Sutherland; however, a series of railmotors worked an extension 'shuttle-service' from Sutherland to

Helensburgh, serving the intermediate stations along this section of the route. One early afternoon working extended through to Coal Cliff and return. When not in service, the railmotors were stored and serviced in a dedicated siding on the Up side of Sutherland station.

Sporting Fixtures

Regular greyhound racing events were held at Dapto, the 'Dapto Dogs' had several specially scheduled trains in the Working Timetables for race days. It would seem appropriate that at least one RG racing greyhound car would be attached to these special trains.

Special Carriage workings

Westinghouse Email had two mobile exhibition carriages – it would seem appropriate that at some stage these could have been railed south under Special Traffic Notice (STN) to be exhibited in a suitable siding at Wollongong, Kiama and Nowra.

The Dynamometer Car could be occasionally seen attached directly behind the locomotive when running special Test Trains – these would also be run under STN's.

Apart from the small jail cells attached to local police stations and courthouses, there were no Prison facilities in the Illawarra District. Therefore any criminals convicted of serious crimes were taken to Sydney for processing, and in the case of criminals given long sentences, they would be more than likely moved to the large country Prisons, such as Maitland, Cessnock, Bathurst and Goulburn. The prisoners were moved in one of the bogie BKD Prison Vans – these were normally attached to any suitable Fast Passenger train serving the Illawarra, and coupled directly behind the locomotive, mostly to and from the principal District Courts in Wollongong, rather than from Kiama or Nowra - it is assumed that prisoners from the far South Coast were transported by road to Wollongong, and transferred to rail for the remaining distance to Sydney.

In times of urgent or high-security prisoner transfer, the BKD could be attached to the South Coast Daylight Express (photo evidence near Stanwell Park shows a BKD coupled between 3801 and the HUB set on the Down 'South Coast Daylight Express' during the 1950's). The rather rural nature of passenger traffic services over the Moss Vale line would seem to preclude movement of BKD prison vans over this line – it would be more likely the prisoners would be taken to Sydney for initial processing, and then transported to Goulburn via suitable passenger trains on the Main South line.

The Main Illawarra line did not have any scheduled 'dedicated' Mail Trains – any important mail to or from the Illawarra would be carried in bogie passenger brake vans (EHO, MHO and CHO) which were attached to most scheduled passenger services – therefore the special Mail Postal or Sorter vans were not seen working over the Illawarra lines.

Additionally, as there were no long distance (exceeding 100 miles) passenger trains over the Illawarra, especially during hours of darkness, Sleeping Cars would never be seen in the Illawarra.

Goods Workings

Goods traffic working on the Main Illawarra line was divided into two distinct sections:

Enfield to Thirroul – worked by Enfield crews

Thirroul to Port Kembla/Moss Vale/Nowra – worked by Thirroul crews

Firstly, it must be pointed out, that the normal method of working any goods trains on any line within NSW was to load the trains to their **maximum** loading tonnage for each section of line. Only a select few fast goods trains used a 75% loading factor. This meant that both locomotives and crews were worked to their limits, i.e. basically they were 'flogged'.

Thirroul was the principal division point on the Illawarra line, and served as the main changeover point for both locomotives and crews. For example a goods train ex-Enfield would arrive in the Down Sidings at Thirroul, the locomotive would uncouple and move over to the loco depot on the Up side of the yard for servicing. The crew, after their rostered 'grub break', would then either return to their previous locomotive (if it had been serviced by then), or change to another Enfield based locomotive, which had already been serviced, and couple to any waiting northbound train for return to Enfield.

The southbound traffic left in the Down Sidings by the Enfield locos, would be taken over by a locally based Thirroul locomotive and crew for working southward to the required destinations, then the loco and crew would return with any northbound traffic, and leave it in the Up Sidings at Thirroul for onwards working by Enfield locos and crews returning home.

To facilitate the volume of southbound traffic, a number of 'staging' runs were made from Enfield / Darling Harbour / Alexandria to the Down Sidings at Waterfall. The locomotive left the goods train stored in the Down Sidings, it was then watered, and the fire cleaned and the loco turned if necessary, then moved over to the Up Sidings. If any northbound traffic was on offer, the locomotive worked this back to the main marshalling yard at Enfield – if no traffic was on offer, the locomotive normally worked back light engine to Enfield locomotive depot.

Many of these 'staging' workings were hauled by AD60 Class 4-8-4+4-8-4 Garratt locomotives. Garratts were not worked any further south of Waterfall, as the Engineman's Union placed a ban on them working through the tight single line Coal Cliff Tunnel. If a Garratt stalled in the tunnel, the clearances were so tight that a crew could not escape from the cab – the only escape route was via the cab roof ventilator opening.

The southbound traffic left in the Down Sidings was lifted by any southbound goods train that started as reduced loading for the uphill working from Sydney to the summit just north of Waterfall. As the line to Thirroul was downhill, the load of trains between Waterfall and Thirroul was increased accordingly. In a similar manner, northbound traffic could also be temporarily 'staged' in the Up sidings, and combined with other northbound trains to increase the total train loading for the generally downhill run from the line summit back to Sydney.

The goods train workings on the Illawarra were almost exclusively in the hands of the 'Standard Goods' classes, the 50's and 53's, with the occasional 55's. Even in the later years, as steam was being phased out, the use of passenger locomotives (displaced by diesels) on goods train working was a rare occurrence. The only major variation from the use of the 'Standard Goods' was the principal fast through goods trains from Enfield to Thirroul often used the heavy D57 Class 4-8-2's (banned South of Thirroul), the similar 58 Class was however not normally used on the Illawarra.

The main grades affecting southbound trains were from Como Bridge to Sutherland, and from Loftus Junction to Waterfall. As the section from Como to Sutherland was in a heavily-trafficked suburban area, most southbound goods trains were assisted from Enfield to Sutherland, to speed up their transit and avoid delaying other traffic, but often they were assisted all the way through to Waterfall; if northbound traffic was not on offer, the assist loco either worked light engine back to Enfield, or sometimes, to save a traffic path in the Timetable, attached as light engine to a scheduled northbound train.

The main grades affecting northbound trains were from Thirroul to Scarborough and from Stanwell Park to Waterfall. Because of the confined clearances in Coal Cliff Tunnel (and the other six double-track tunnels over this section), goods trains were not assisted. The crews had to work extremely hard, simply 'slogging' their way up the grades to Waterfall with maximum loads. As northbound traffic over this section was not as frequent as the Sutherland-Tempe section, this was an accepted method of working. One problem that occurred frequently was that trains carrying steel products from Port Kembla often weighed above the declared loads, making the progress of the train even harder and slower.

Major Goods facilities – Sydney Metropolitan Area

Enfield – Enfield was the principal goods marshalling yard for the whole NSWGR system. It acted as the central arrival / departure point for the majority of goods trains over the four main lines, Main North, Main West, Main South and Main Illawarra. Practically all goods went through Enfield yards, except for Perishables and Export goods, which usually went direct to Darling Harbour. Goods trains leaving Enfield went to further marshalling yards in other regions – to Goulburn in the South, Lithgow in the West, Broadmeadow in the North and Thirroul in the Illawarra.

Enfield Marshalling Yards was also the location of the principal locomotive depot for goods workings into/out of Sydney. A large depot was situated on the western flank of the yards with 3 'roundhouse' style loco sheds, and full servicing, watering and coaling facilities. A second depot was situated on the eastern flank of the yards to service the electric & diesel loco fleet (Delec).

For the Illawarra services, the goods trains worked over the Metropolitan Goods Lines from Enfield to Meeks Road Junction, then turned South onto the Illawarra Main Line.

Enfield was also the source for a number of 'trip workings' within the Sydney Metropolitan Area. Regular trip workings between:

Enfield to Darling Harbour was arranged as:

No876 Darling Harbour (via Sydenham) – engine – Darling Island – Darling Harbour - Brakevan

No13 Trip (via Sydenham) – engine – Darling Island – Darling Harbour – Perishables - Brakevan

No984 (SAT only, via Balmain) – engine – GW Milling – Mungo Scott – Darling Island – Darling Harbour - Brakevan

No946 (SAT only, via Balmain) – engine – Tancreds??? – Wattle St wine/bag cement/bag lime/RH lime/RH cement – Darling Island – Darling Harbour – Brakevan

Enfield to Rozelle was arranged as:

No898 (MON only) – engine – Dulwich Hill meat – Mungo Scott – Rozelle – Brakevan

No898 (MONs excepted) – engine – Rozelle – Rudders??? – Brakevan

No904 – engine – Dulwich Hill meat/cement – GW Milling – Mungo Scott – Sanitarium??? – Loveridge & Hudson – Rozelle – Brakevan

No974 – engine – Dulwich Hill cement – GW Milling – Mungo Scott – Sanitarium??? – Loveridge & Hudson – Rozelle – Brakevan

Enfield to Cooks River was arranged as:

No29a (52 long) – engine – Cooks River – ex-South traffic – Brakevan

Enfield to Botany was arranged as:

No22 (MONs only) – engine – Botany tanks - Brakevan

No24 – engine – coal – Total tanks – loco??? – Boral – AOR – Email – Brakevan

No7b – engine and van only

No11 – engine – Gelco – Hardies – Froline – Mascot – Sims – AOR – Bunnerong coal – Boral – Sleigh – loco??? – Total – Botany yard – Kelloggs – Email – Stewart & Lloyds??? – canal??? – Brakevan

No11a (SUN only) – engine – Bunnerong coal – loco tanks – Boral – AOR – Total - Brakevan

Enfield to Bankstown Line (round trip) was arranged as:

No1a – engine – Canterbury Meat – Brakevan – Homebush tip – State Brickworks – Bankstown – Punchbowl – Belmore – Campsie – Canterbury – Brakevan. This train worked to Canterbury, placed the meat traffic, then ran-around its train, finished placing other traffic at Canterbury Down sidings, and then headed west via Campsie, etc, through Regents Park and Lidcombe to the Abattoirs/Brickworks branch, then it returned via Enfield North.

Main Illawarra to Mortdale was arranged as:

No24 – arranged as: engine – brake van – Rockdale Goods traffic – Rockdale Meat traffic (sic) – Kogarah traffic – Hurstville traffic – Mortdale traffic (presumably for the electric train depot) – brakevan. (Note: This trip working is shown in the 1969 Enfield Marshalling documents. This is unusual, as most of the goods facilities along this section had been abandoned before then!!!)

Some timetabled coal trains from the west (Lithgow) and the south (Glenlee) passed through Enfield without stopping, on the Up and Down through roads, to Rozelle and Balmain / White Bay yards.

Special Note: As Enfield Marshalling Yard was a very vast complex of sidings spread over a large area, the depiction of Enfield in this MSTS route is a very much simplified version, and only concentrates on the southernmost 'nests' of sidings, simply to allow

scheduled goods trains to depart and arrive to suit actual Timetabled scenarios, and to allow a bit of 'freelance' shunting.

There is also a basic representation of the 3 Enfield roundhouses – however, because MSTS turntables DO NOT WORK and with the space constraints, the actual radial roads from each turntable are not included, except for a rudimentary representation of the open roads around Turntable No3. Additionally, the diesel and electric serving depot at Delec is 'off-stage' in the area not modelled – however, the two departure roads from Delec are partially modelled, so that light engine (diesel or electric) movements can be worked to Sydney Yard / Darling Harbour / etc. via Sydenham.

As a special concession to improve the locomotive handling at Enfield for use in Activities, I have included a totally fictional dummy transfer track (DTT) at the extreme northern end of the modelled area.

I see this 'DTT' working in two ways:

Down Arrivals from the south-east can run into the Down Through road, then turn into the long yard lead above the Down Assembling Sidings, stop and uncouple. The loco can then draw forward into the DTT, reverse and run down the Up Engine Road to the engine headshunt at the extreme southern end of Enfield yard. The loco can then draw forward onto the No1 Down Engine Road and proceed to the examination area adjacent to No2 Roundhouse. The locomotive can then simulate the procedures through the examination area, to coal and water, then de-ash, and finally be driven onto Turntable No1, No2 or No3 to end the scenario.

The second scenario is for Up Departures – the train can be made up complete with brake van in the Up Departure Sidings or the Z-Section Departure Sidings, and the locomotive standing on Turntable No1, No2 or No3. The loco proceeds from the turntable to the DTT, reverses and runs down the Up Engine Road to the Up Yard Shunting Neck. The loco then reverses and runs up to couple to its train in the yard – at the appointed time, the locomotive and its train departs Enfield yard onto the Up Main to continue its outwards journey.

Rozelle / White Bay – Rozelle was another large goods yard, which was accessed from a secondary branch line off the Metropolitan Goods Lines at Wardell Road Junction, it swung round through suburban Dulwich Hill, Lewisham (passing under the Main West Lines), Leichhardt and Balmain to Rozelle. A further connection swung round the south of Rozelle bay through Glebe and connected to the north-western end of Darling Harbour / Darling Island. This connection substantially eased the flow of traffic to Darling Harbour / Darling Island causing congestion over the Main West lines through Strathfield - Newtown, Eveleigh, Redfern and Central areas.

The principal traffic working through Rozelle was grain, with a large silo complex to handle all types of grain – there was also an export coal loader situated here which was fed mainly from the western coalfields over the Blue Mountains. Other regular traffic through Rozelle / White Bay was – coal for White Bay Power Station, Atlantic Union oil traffic, Southern Blue Metal, Australian Roads, and traffic to Rozelle Bay timber wharf.

Most traffic over this line was worked to and from Enfield – however when circumstances required, special workings from the Illawarra Lines could be diverted at

Meeks Road Junction, through Wardell Road Junctions to Darling Harbour / Darling Island, but this was not a normal method of working.

Darling Harbour / Darling Island – Darling Harbour / Darling Island was the principal yard serving the City area itself, including most perishables traffic, but its primary purpose was to serve the Import/Export traffic from the extensive shipping wharves situated adjacent. Other regular traffic through Darling Harbour / Darling Island was – coal for Ultimo and Pyrmont Power Stations, meat traffic to TA Field's Meat Market and Riverstone Meat, milk to Dairy Farmers, rice to the Rice Shed, and baled wool to the Wool Shed.

Cooks River / Botany – Cooks River Goods Yard opened in 1947, and initially was a prime loading point for cement, steel and cars. In later years, the yard became a principal container terminal. Large transport companies (like TNT) made common use of the Cooks River Goods Yard to transport their goods.

The Botany goods line served a considerable number of industries:

- just south of Cooks River yard on the northern bank of the Alexandria Canal, a siding and loop was installed to serve the Frome Lime Company . Later this passed ownership to BHP By Products Pty. Ltd. for tar and tar products, and later still passed ownership to BORAL. A siding was later extended off this for a Southern Portland Cement distribution centre.
- Between the canal and Mascot, there were other private sidings for A.G.Sims scrap metal merchant, A.C.I. glass manufacturers and J. Murray More steel wholesalers.
- Mascot goods siding was located on the northern fringe of Kingsford Smith Airport, just before the line crossed over Botany Road
- north of Bay Street a number of sidings were laid for Bayley's Leather works, 'The Commonwealth Sidings', a siding for Hardies and one for Stewart & Lloyds steel distributors.
- just south of Bay Street a loop siding, known as Gelco (for the Gelatine Company) served sidings for Kellogg's, Email, Ready Mixed Concrete, and the Total Oil Products depot.
- South of Gelco, other sidings served the I.C.I.A.N.Z. chemical works and Bates (Australasia)
- Botany yard served as the 'terminus' of the line, and served several local industries, however, there was also an exchange yard for private traffic from the Bunnerong Power Station and the adjacent Boral bitumen refinery, and several oil companies depots (Australian Oil Refineries, Golden Fleece, Esso), which were piped under Botany Bay from the oil refineries at Kurnell.

Special Note – locomotives used on the Botany line as evidenced in photos: Standard Goods D50's & D53's and 41 class Bo-Bo diesel electrics were the most common - but occasionally other locomotives were seen, 1902 0-6-0, 5904 & 5914 2-8-2's, 6008 & 6032 Beyer-Garratts, 3134 4-6-4T, 3304 & 3324 4-6-0's, 3644 4-6-0, and 3827 4-6-2.

Alexandria – Alexandria Goods Yard served the inner south-eastern suburbs of Sydney, and was situated directly south of the vast Eveleigh locomotive facilities and workshops complexes. A number of parallel sidings were situated here and ended in a pair of large goods sheds. One of the more unusual workings from Alexandria, was the

special train for Wirth Brothers Circus. I do not have much detail about Wirth's, but all the special trains carrying the Circus to country venues originated / terminated at Alexandria, so their 'home base' must have been somewhere nearby. I am presuming that when the Circus Train was not 'On-the-Road', the rolling stock must have been stored in one of the adjacent sidings.

Specific Goods Provisions at Stations

Next we look at the specific goods facilities at each station along the line:

Modelled sections of the Bankstown Line:

Marrickville – had no goods facilities

Dulwich Hill – had no goods facilities (these were along the Metro Goods Lines heading towards Rozelle)

Hurlstone Park – had no goods facilities

Canterbury – a meat cold storage facility shared the eastern-most storage siding of the racecourse traffic storage sidings north of the station, and could only be shunted by Up trains. South of the station, a small goods yard provided a Horse Dock siding, a general goods siding and two sidings for local timber traffic. These sidings were shunted only by Down trains.

Campsie – had a single general purpose goods siding, which was shunted only by Down trains.

Belmore – provided a siding for the substation, one for the Canterbury Council and the Belmore Timber siding, all shunted only from Down trains. On the Up side of the line there was a general goods siding (with shed) which could be shunted by both Down and Up trains, although generally only worked by the westbound trip train 1a.

Modelled sections of the Illawarra Line:

Erskineville – had no goods facilities – all local traffic used the adjacent Alexandria Goods Yard.

St. Peters – had no goods facilities.

Sydenham – had a series of facing sidings on the Up side for the Sydney Steel Company and could only be worked from the Up Illawarra Local line. On the Down side of the Illawarra Main Lines there was a small goods yard with dedicated sidings for cement, metal and ash and private sidings for the PMG Department and a local merchant. These could be worked by both Up and Down trains. The Down yard was closed in December 1947, when the nearby Cooks River Goods yard opened.

Meeks Road Junctions – within this triangular space were a small number of local sorting and storage sidings for both Up and Down traffic, along with a siding for the Electricity Substation, one for the Pumping Station and one for the Permanent Way Department.

Tempe - had a short Goods Siding on the northern side of the station on the Down side, and could be shunted only by Down trains.

Wolli Creek Junction – had several parallel looped sidings on the eastern side of the line, with connections that could be worked by both Up and Down trains. These sidings were principally for use of the Tramways Department.

Arncliffe – had no goods facilities

Banksia – had no goods facilities.

Rockdale – had a double-ended siding off the Down line, north of the station, which could only be worked by Down trains.

Kogarah – had a pair of looped sidings with a long headshunt on the Down side south of the station, which could only be shunted by Down trains. There was also a single siding on the Down side north of the station with a loading bank and horse dock, later Riverstone Meat had a cold store here.

Carlton – had no goods facilities.

Allawah – had no goods facilities.

Hurstville – originally had several goods sidings, but these were removed when the Illawarra Local lines were extended south to Hurstville, which became a terminating and storage point for suburban electric trains. However, there was a trailing siding off the Down Illawarra Local north of the station to serve the local Brickworks.

Penshurst – had no goods facilities.

Mortdale – had no goods facilities – however trip goods worked to here (presumably for any stores/materials required for the adjacent Electric Car Depot).

Oatley - had a short Goods Siding on the eastern side of the station on the Down side, and could be shunted only by Down trains.

Como - had a short Goods Siding some distance south of the station on the Down side, and could be shunted only by Down trains.

Jannali – had no goods facilities.

Sutherland – had a single double-ended Goods Siding on the Down side of the line, with a dead-end siding adjacent to the Electricity Substation, and could be shunted by both Up and Down trains.

Loftus – had no goods facilities.

Royal National Park – has a single siding with a loading bank (presumably for any goods transferred to road for Audley, and other local communities south of the Hacking River).

Engadine - had a short Goods Siding just south of the station on the Up side, and could be shunted only by Up trains.

Heathcote - had a short Goods Siding on the eastern side of the station on the Down side, and could be shunted only by Down trains.

Waterfall – was a secondary division point, and the sidings on both the Up side and the Down side were primarily to hold through trains being ‘staged’ over the line’s summit. The Up side yard had a through road with weighbridge, which was used to check total train load for the steel traffic from Port Kembla – it was often found that northbound trains had been overloaded beyond the timetable imposed maximum limits, incurring significant delays to the train and any following services. At the northern end of the Up yard the Water Board had a pair of looped sidings.

A Goods Siding with a pair of short ‘storage’ roads was situated just south of the station on the Down side. Crossover connections allowed this to be shunted by both Up and Down trains.

Helensburgh – had a single double-ended Goods Siding on the Up side of the line, and could be shunted by both Up and Down trains.

Metropolitan Colliery Junction – between Helensburgh and Otford, a separate single line branched off to the Metropolitan Colliery. Two exchange sidings were located adjacent to the main line with cross-overs to allow traffic to work to and from Waterfall.

Otford – had a short Goods Siding just south of the station on the Up side, and could be shunted only by Up trains.

Stanwell Park – had a short Goods Siding just south of the station on the Down side, and could be shunted only by Down trains.

Coal Cliff – had no general goods facilities; however it was the location of the Coal Cliff Colliery sidings on the Down side, and the Illawarra Cokeworks sidings on the Up side.

Scarborough – had a loop siding on the Down side, with a Dock road at the north end and a Coal road at the south end. Cross-over connections allowed this to be shunted by both Up and Down trains. A small yard was on the Up side, but this was for use with the traffic from the Clifton Tunnel Colliery which was situated about half a mile south of the yard.

Wombarra – had no goods facilities.

Coledale – has no general goods facilities; however, the North Bulli Colliery sidings were on the Up side.

Austinmer – had no goods facilities.

Thirroul – was the principal division point, and the yards on both the Up side and the Down side were primarily for locomotive and crew changeovers for through traffic. A single Goods Siding was situated on the Down side adjacent to the passenger station,

and was shunted only by Down trains. At the northern end of the Up yard was situated the Excelsior Colliery sidings.

Just south of Thirroul, there was a trailing connection on the Down line to the Newbold General Refractories sidings, shunted only by Down trains.

Bulli – had a single double-ended Goods Siding on the Up side of the line, and could be shunted by both Up and Down trains.

Just north of Bulli, there was a facing Up cross-over connection to the Old Bulli Colliery exchange sidings on the ocean side of the line, and subsequent connection to the private line to the Old Bulli colliery in the foothills of the escarpment.

Woonona - had a single double-ended Goods Siding on the Up side of the line, and could be shunted by both Up and Down trains.

Just south of Woonona, a trailing connection to the Up line served the Illawarra Fireclay and Brick Company's siding, shunted only by Up trains.

Bellambi – had a Goods Siding on the Down side of the line, and was shunted only by Down trains.

Just north of Bellambi, the private South Bulli Colliery line crossed the Main Illawarra line at right-angles, and ran down to the exchange sidings and jetty at Bellambi Point. On the Up side of the line a set of exchange sidings were located, and these had cross-over connections for working by both Up and Down trains. The private South Bulli Colliery line connected to these sidings and ran to the South Bulli colliery in the foothills of the escarpment. The old Bellambi Cokeworks also connected to these exchange sidings.

Corrimal - had a single double-ended Goods Siding on the Up side of the line, and could be shunted by both Up and Down trains.

Just south of Corrimal on the Up side, the private Corrimal Colliery line connected to a pair of exchange sidings, with cross-over connections for working by both Up and Down trains. The private colliery line ran to the colliery loading screens in the foothills of the escarpment. The Corrimal Cokeworks also connected to these exchange sidings.

Towradgi – had no goods facilities

Fairy Meadow – had no goods facilities

North Wollongong – had a number of goods sidings scattered over a wide area. On the Down side of the line north of the station, and north of the Princes Highway overbridge, a facing connection allowed access to the Mt. Pleasant Cokeworks (also known as the Figtree Cokeworks). On the Up side of the line north of the station, but south of the road-overbridge, was the old siding connections to the abandoned Mt. Pleasant Colliery, accessible to both Up and Down trains. On the Down side just north of the station, a trailing connection served the Vacuum Oil Company siding.

On the Down side just south of the station, a trailing connection served the Shell Oil Company siding. Slightly further south on the Down line, the old triangle connection to the abandoned Mt. Keira Colliery line (to Wollongong Harbour) was retained for access and storage for the adjacent Wollongong Gasworks.

On the Up side of the line a series of exchange sidings trailed into the Up line from the Mt. Kiera Colliery line and the Federal Cokeworks sidings.

Wollongong – had a medium-small sized yard on both the Down side and the Up side. A Goods Siding was situated on the Down side yard, and storage sidings for wagons were situated in both yards. Wollongong yards were not generally considered a division point as far as traffic workings were concerned (except for traffic over the Moss Vale line), and the goods sidings were shunted just like any other smaller station facility by through goods trains to and from other destinations.

Coniston – had no goods facilities

Unanderra (including a main line Loop Line) - had a single double-ended Goods Siding on the Up side of the line, and could be shunted by both Up and Down trains, with a storage loop adjacent. There were two Commonwealth Sidings off the Down side of the Loop Line, and were shunted mainly by Down trains. Also adjacent to Unanderra station was the A.I.S. Exchange Sidings, which allowed connection between the NSWGR and the private A.I.S. railways for coal trains from the A.I.S. Wongawilli Colliery to the steelworks lines.

Kembla Grange - had a double-ended Siding on the Down side of the line (for racehorse traffic), and could be shunted by both Up and Down trains – this was disused by the mid-1940's. Between Kembla Grange and Dapto, a long headshunt (facing to Down trains) led to a privately owned pipeworks (later taken over by Tubemakers) with two parallel sidings. This could only be shunted by Down trains. Just north of Dapto, a private line led off to the west to the A.I.S. Wongawilli Colliery.

Dapto (including a main line Loop Line) - had a double-ended Siding on the Down side of the line north of the station, and could be shunted by both Up and Down trains, and which also served a Butter factory and a small stockyard. Also there was a single storage siding on the Down side of the line south of the station, and could only be shunted by Up trains.

Yallah – had no goods facilities.

Albion Park (including a main line Loop Line) - had a double-ended Siding on the Up side of the line north of the station, and could be shunted by both Up and Down trains – an extension of this siding served a Butter factory and a Creamery.

Oak Flats – had no goods facilities.

Shellharbour /Dunmore (including a main line Loop Line) – had a single siding north of the station on the Down side and could only be shunted by Up trains. A connection (facing to Down trains) led west off the Loop Line to Blue Metal Quarries Limited loading sidings.

Minnamurra – had no goods facilities.

Bombo (including a main line Loop Line) – had a single Goods Siding on the Up side of the line south of the station, and could only be shunted by Up trains. There was also a long storage siding off the Loop Line on the Down side, trailing to Up trains, for storage of loaded ballast trains from Bombo Railway Quarry or Bombo New Quarry. Just north of Bombo, a connection (facing to Up trains) led west to the ballast and gravel loading sidings at Bombo New Quarry, and a further connection (facing to Up trains) led east to the ballast and gravel loading sidings at Bombo Railway Quarry on the local landmark of the prominent basalt headland.

Kiama – had three looped Goods Sidings south of the station, trailing to Down trains. Sidings No1&2 also had a trailing connection to the Up Main Line leading into the Up station platform. An extension southward of Siding No1 served Dairy Farmers Co-Op Milk Co. depot. A Dock siding paralleled the Up platform, and could only be shunted by Up trains. A short distance south of Kiama, a single siding for loading from Carson's Quarry was located on the Up side of the line and could only be shunted by Up trains, but was disused by the mid-1940's.

Omega – had a single Goods Siding on the Up side of the line north of the station, and could only be shunted by Up trains.

Gerringong – had a double-ended Goods and Stock Siding on the Down side of the line north of the station, and could be shunted by both Up and Down trains. Also a siding, trailing to Up trains, led off on the Down side to the Gerringong Co-operative Dairy Society Ltd's dairy factory east of the station.

Toolijooa - had a single Goods Siding on the Down side of the line north of the station, and could only be shunted by Up trains.

Berry (including a main line Loop Line) - had a double-ended Goods Siding, also serving the Berry Co-operative Dairy Society dairy factory, on the Down side of the line opposite the station, and could be shunted by both Up and Down trains. There was also a double-ended Stock Siding on the Up side of the line south of the station, and could be shunted by both Up and Down trains.

Jaspers Brush - had a single Goods Siding on the Up side of the line south of the station, and could only be shunted by Down trains.

Bomaderry – was the terminus of the line and had a variety of goods facilities:

Modelled sections of the Port Kembla Line:

Lysaghts – had no goods facilities – but an extensive industrial network.

Cringilla – had no goods facilities – but an extensive industrial network.

Port Kembla North – had no goods facilities.

Port Kembla - had a single Goods Siding adjacent to the station on the Down side, and could be shunted only by Up trains.

Modelled section of the Moss Vale Line:

I have included a seven mile long section of the Moss vale line from Unanderra to Illawarra Range Tunnel No1 (a nice place to end the route gracefully!!!), including the unique refuge sidings at **Dombarton** – there are no goods facilities in this modelled section of the line. However, the operation of passing trains at the Dombarton refuge roads was particularly interesting.

Down trains (up the range) drew forward into the No1 refuge siding until clear of the siding points, then backed down under the Main Line into either No2 or No3 refuge siding. Once the 'passing' train was clear, the refuged train was then able to draw forward onto the Main Line and continue its journey to Moss Vale.

Up trains (down the range) drew forward into either No2 or No3 refuge siding until clear of the siding points, then backed up under the Main Line into No1 refuge siding. Once the 'passing' train was clear, the refuged train was then able to draw forward onto the Main Line and continue its journey to Unanderra.

Colliery Traffic Workings

Colliery and Cokeworks traffic was worked either by 'dedicated' timetabled train between the two points (where detailed below), or the empty and loaded wagons were picked up / dropped off by any passing scheduled Up / Down pickup goods train.

Loads and empties were 'staged' through Thirroul:-

Northbound loads from any colliery south of Thirroul were worked by any pickup train to Thirroul only, for forward working by another northbound pickup train from Thirroul. Similarly, southbound empties for any colliery south of Thirroul were worked by any pickup train from Thirroul only, the wagons being forwarded from any southbound pickup train terminating at Thirroul.

Southbound loads from any colliery north of Thirroul were worked by any pickup train to Thirroul only, for forward working by another southbound pickup train from Thirroul. Similarly, northbound empties for any colliery north of Thirroul were worked by any pickup train from Thirroul only, the wagons being forwarded from any northbound pickup train terminating at Thirroul.

Loads and empties from any local colliery to / from AIS or Lysaghts, were worked to / from AIS Cringila exchange sidings – specifically, see later comments about Lysaghts workings.

Note, the term 'Operational Timeframe' refers only to the 1950-1960 era depicted by this route.

Metropolitan Colliery, near Helensburgh

Operational Timeframe: 1950-1960

Output sent to: Sydney – some departmental coal sent to NSWGR Enfield, output also sent to Newcastle, and NSWGR Broadmeadow and Port Waratah – also some output to the Sydney Tramways Department (Wolli Creek??). The colliery was bought by AIS in 1965, and large quantities of coking coal were sent to the BHP Newcastle steelworks.

Types of wagons: NSWGR 4-w hoppers LCH and CCH, NSWGR bogie hoppers BCH – departmental coal in NSWGR S-trucks and K-trucks

Types of Locomotives: NSWGR 'Standard Goods'

Method of Working: Coal trains were 'staged' between the Colliery and Waterfall sidings. Empties – typical No 61b – worked from Waterfall sidings to Metropolitan Colliery Junction, where the train diverged onto the colliery loop line, stopped on the colliery loop line, loco uncoupled and run round to the back of the train, train then propelled up to the colliery – empties left in empty siding, the brake van propelled to the tail shunt. Loads – typical No 62a or No 24 - the loco coupled to the full rake, the brake van was gravitated onto the rear of the loaded train, then drew forward to the loop line near the junction, and waited for its appointed time over the main line to Waterfall sidings.

MSTS Paths – Metropolitan Colliery - Waterfall Gds.pat & Waterfall Gds - Metropolitan Colliery.pat

MSTS Consists – D50-5236-CoalLD-22mix+PHG.con, D50-5236-CoalMT-22mix+PHG.con

Coal Cliff Colliery, Coal Cliff

Operational Timeframe: 1950-1960

Output sent to: Illawarra Cokeworks via overhead conveyor – output also sent to Sydney? and Port Kembla?

Types of wagons: NSWGR 4-w S and K-trucks, NSWGR bogie hoppers BCH

Types of Locomotives: NSWGR 'Standard Goods'

Method of Working: Northbound loaded trains and southbound empty trains had direct access to and from the sidings via the cross-overs immediately south of Coal Cliff station. Southbound loaded trains had direct access from the sidings via the cross-over adjacent to the Cokeworks. Northbound empty trains did not have direct access, and had to run-through and stop in the Coal Cliff Up platform road, then reverse over the cross-overs into the sidings. There were no scheduled 'dedicated' trains for this traffic, all loaded and empties, either northbound or southbound were picked up / dropped off by passing Up or Down pickup goods trains – traffic for AIS was worked to / from the AIS Cringila exchange sidings. Typical Down pickup goods – No 61b – Up No 244. Export traffic – see comments about Inner Harbour Coal Loader as shown below.

MSTs Paths – Coal Cliff X Sidings - AIS Port Kembla.pat & AIS Port Kembla - Coal Cliff X Sidings.pat

MSTs Consists - create loose wagon Consists to suit pickup goods trains.

Clifton Tunnel Colliery, near Scarborough

Operational Timeframe: 1950-1960

Output sent to: Sydney? and Port Kembla?

Types of wagons: NSWGR 4-w hoppers LCH and CCH, NSWGR bogie hoppers BCH

Types of Locomotives: NSWGR 'Standard Goods'

Method of Working: Local shunting between the colliery and the local exchange sidings adjacent to Scarborough station was performed by NSWGR locos. Northbound loaded trains and southbound empty trains had direct access to and from the sidings via the cross-overs immediately south of Scarborough station. Southbound loaded trains would reverse out of the sidings onto the Down Main clear of the points, and then proceed south. Northbound empty trains would run-through and stop in Scarborough Up platform road, and then reverse into the sidings. There was one 'dedicated' train from Scarborough to AIS Cringila exchange sidings – Down No 361. Otherwise, all loaded and empties, either northbound or southbound were picked up / dropped off by passing Up or Down pickup goods trains - typical Up No 56, No 360 & No 244

MSTs Paths – Scarborough Gds - AIS Port Kembla.pat & AIS Port Kembla - Scarborough Gds.pat

MSTs Consists – For Down No 361, use D50-5236-CoalLD-22mix+PHG.con, otherwise create loose wagon Consists to suit pickup goods trains.

North Bulli Colliery, Coledale

Operational Timeframe: This colliery closed in the late 30's – in the Route it is shown as an abandoned site purely for scenic completeness – however, the track is still fully operational for MSTs, so if you wish to 'bend' history and operate trains to/from this colliery, you are free to do so!!!

Excelsior Colliery, Thirroul

Operational Timeframe: This colliery closed in the late 40's, early 50's, the derelict plant was not removed until the mid to late 1960's – in the Route it is shown as an abandoned site purely for scenic completeness – however, the track is still fully operational for

MSTs, so if you wish to 'bend' history and operate trains to/from this colliery, you are free to do so!!!

Old Bulli Colliery, Bulli

Operational Timeframe: 1950-1960

Output sent to: Colliery bought by AIS in 1937, all output sent to AIS steelworks.

Types of wagons: private 60ton bogie hoppers – branded A.I.S.

Types of Locomotives: ex-NSWGR locomotives on hire (19 class) from the exchange sidings to the colliery loading sidings. NSWGR 'Standard Goods' from the exchange sidings to the AIS steelworks

Method of Working: Local private workings between the colliery and the exchange sidings were always worked with the loco at the eastern end – empties propelled up to the colliery, loads drawn down to the exchange sidings. Northbound empties and southbound loads had direct access to and from the exchange sidings via cross-overs just north of Bulli station. Mostly worked by 'dedicated' trains – typical Down No 327a & No 327b – Up No 328a & No 328b. However, some Down traffic was picked up by pickup goods No 327 or 327c

MSTs Paths – Old Bulli X Sidings - Old Bulli Colliery.pat & Old Bulli Colliery - Old Bulli X Sidings.pat + Old Bulli X Sidings - AIS Port Kembla.pat & AIS Port Kembla - Old Bulli X Sidings.pat

MSTs Consists – Z19-1916-AIS-60t-Hop-Coal.con & Z19-1916-AIS-60t-Hop-Empty.con + D50-5133-AIS-60t-Hop-Coal.con & D50-5133-AIS-60t-Hop-Empty.con

South Bulli Colliery, Bellambi

Operational Timeframe: 1950-1960 Bellambi jetty abandoned in 1952, the line crossing the Main Illawarra line to the jetty fell into disuse.

Output sent to: Sydney? and Port Kembla for Lysaghts & AIS, and from time to time, for export.

Types of wagons: private 4-w hoppers – branded SB, Sydney traffic in NSWGR 4-w hoppers LCH and CCH

Types of Locomotives: Avonside 0-6-0T's No1, No4 and No5 Other locos on hire at various times. NSWGR 'Standard Goods' from the exchange sidings to Port Kembla.

Method of Working: Local private workings between the colliery and the exchange sidings were always worked with the loco at the eastern end – empties propelled up to the colliery, loads drawn down to the exchange sidings. Northbound empties and southbound loads had direct access to and from the exchange sidings via cross-overs just north of Bellambi station. There was one scheduled 'dedicated' return trip between Bellambi and Mt. Pleasant cokeworks – Down No 379 and Up No 380, worked by South Bulli private locomotive No 5, using a South Bulli CHG type brake van at the rear.

Otherwise, all loaded and empties, either northbound or southbound were picked up / dropped off by passing Up or Down pickup goods trains – traffic for AIS and Lysaghts was worked to / from the AIS Cringila exchange sidings. Typical Down pickup goods – No 317, Up pickup goods - No 364, or No 324c. Export traffic – see comments about Inner Harbour Coal Loader as shown below.

MSTs Paths – South Bulli Colliery - Bellambi Jetty.pat & South Bulli Colliery - Bellambi X Sidings.pat & Bellambi X Sidings - South Bulli Colliery.pat & Bellambi Jetty - South Bulli Colliery.pat + Bellambi X Sidings – AIS Port Kembla.pat & Bellambi X Sidings - Figtree Cokeworks.pat & Figtree Cokeworks - Bellambi X Sidings.pat & AIS Port Kembla - Bellambi X Sidings.pat

MSTs Consists – SBC-4-10hop-LD & SBC-4-10hop-MT & SBC-5R-10hop-LD & SBC-5R-10hop-MT + For No 379 & No 380 use, SBC-0-6-0T-5-10hop-LD+CHG.con & SBC-

0-6-0T-5R-10hop-MT+CHG.con, otherwise create SBC and NSWGR loose wagon Consists to suit pickup goods trains [Note – coal for Lysaghts was carried in ex-Hunter Valley 'JK' non-air wood hoppers].

Corrimal Colliery, Corrimal

Operational Timeframe: 1950-1960

Output sent to: Sydney? and Port Kembla for Lysaghts & AIS, and from time to time, for export.

Types of wagons: private 4-w hoppers – branded CCC (some early CBC), Sydney traffic in NSWGR 4-w hoppers LCH and CCH

Types of Locomotives: Yorkshire Engine Co. 0-6-0T's No1 and No2, ex-NSWGR 0-6-0 No18. Other locos on hire at various times. NSWGR 'Standard Goods' from the exchange sidings to the AIS steelworks

Method of Working: Local private workings between the colliery and the exchange sidings were always worked with the loco at the eastern end – empties propelled up to the colliery, loads drawn down to the exchange sidings. Northbound and southbound loads and empties had direct access to and from the exchange sidings via cross-overs just south of Corrimal station. There were no scheduled 'dedicated' trains for this traffic, all loaded and empties, either northbound or southbound were picked up / dropped off by passing Up or Down pickup goods trains – traffic for AIS and Lysaghts was worked to / from the AIS Cringila exchange sidings. Typical Down pickup goods – No 325. Export traffic – see comments about Inner Harbour Coal Loader as shown below.

MSTS Paths – Corrimal Colliery - Corrimal X Sidings.pat & Corrimal X Sidings - Corrimal Colliery.pat + Corrimal X Sidings - Inner Harbour Coal Loader.pat & Inner Harbour Coal Loader - Corrimal X Sidings.pat

MSTS Consists – CCC-1-10hop-LD & CCC-1-10hop-MT & CCC-2R-10hop-LD & CCC-2R-10hop-MT + create CCC and NSWGR loose wagon Consists to suit pickup goods trains [Note – coal for Lysaghts was carried in ex-Hunter Valley 'JK' non-air wood hoppers].

Mt. Pleasant Colliery, North Wollongong

Operational Timeframe: This colliery closed in the late 30's, early 40's – in the Route it is shown as an abandoned site purely for scenic completeness – however, the track is still fully operational for MSTS, so if you wish to 'bend' history and operate trains to/from this colliery, you are free to do so!!!

Mt. Keira Colliery, North Wollongong

Operational Timeframe: 1950-1954 – branch line to Wollongong Harbour closed just after AIS purchase in 1937 – all output sent via underground cross-connection with Mt. Kembla Colliery (Kemira Colliery) in 1954 – Mt. Keira railway closed 1954

Output sent to: Colliery bought by AIS in 1937, output sent to AIS steelworks – coal slack sent to Federal Cokeworks

Types of wagons: private 4-w hoppers – branding unknown – for coal supply to the Federal Cokeworks – NSWGR LCH and CCH 4-w hoppers for supply to AIS steelworks

Types of Locomotives: Nasmyth, Wilson 0-6-0T's No1 and No2, Kerr Stuart 0-6-0T No3 'Lithgow'. NSWGR 25 class 2-6-0 and NSWGR 19 class 0-6-0 on hire at various times prior to 1950. NSWGR 'Standard Goods' from the exchange sidings to the AIS steelworks

Method of Working: Southbound loads would back out onto the Up Main clear of the points, and then draw forward over the cross-over onto the Down Main and then

proceed south. Northbound empties would run-through clear of Gipps St level crossing and stop, and then reverse into the exchange sidings.

MSTs Paths – N/A

MSTs Consists – N/A

A.I.S. Mt. Kembla Colliery, Mt. Kembla

Operational Timeframe: 1950-1960

Output sent to: A.I.S. Steelworks Port Kembla over A.I.S. owned private railway

Types of wagons: private 60ton bogie hoppers – branded A.I.S.

Types of Locomotives: Private A.I.S. owned locomotives, both steam (none yet available for MSTs) or Bo-Bo diesel-electric locos.

Method of Working: Empties – loco draws empties (AIS brake van?) from any road 1-6 at the AIS Coalstack, and runs via the AIS Circle Line to Mt. Kembla Colliery – draws into Road No3, loco uncouples and uses the Runaround road to swap ends, draws the empty rake back out and propels it under the loading roads 1 or 2, uncouples the brake van and propels to the Tailshunt, van gravitated onto rear of train. Loads – loco draws empties through the loader, and when full, returns to any road 1-6 at the AIS Coalstack, loco uncouples ready for next duty.

MSTs Paths – AIS Coal Stack - AIS Mt.Kembla Coll.pat & AIS Mt.Kembla Coll - AIS Coal Stack.pat

MSTs Consists - AIS Bo-Bo DE1 60t Hop Coal.con & AIS Bo-Bo DE1R 60t Hop Empty.con – Consists could be modified to include / exclude AIS brake van.

A.I.S. Wongawilli Colliery, Wongawilli

Operational Timeframe: 1950-1960

Output sent to: A.I.S. Steelworks Port Kembla, partly over A.I.S. owned private railways, and partly over NSWGR metals between Dapto and Unanderra (required NSWGR brake van on rear – LHG, PHG or MHG).

Types of wagons: private 60ton bogie hoppers – branded A.I.S.

Types of Locomotives: Private A.I.S. owned locomotives, both steam (none yet available for MSTs) or Bo-Bo diesel-electric locos.

Method of Working: Empties – loco draws empties (plus brake van) from any road 1-6 at the AIS Coalstack, and runs via the AIS Circle Line to the Unanderra AIS Exchange Sidings - after clearance given, proceeds south on the Main Illawarra line, through Kembla Grange, to the turnout at Brownsville and runs to Wongawilli Colliery - draws into Road No3, loco uncouples and uses the Runaround road to swap ends, draws the empty rake back out and propels it under the loading roads 1 or 2, uncouples the brake van and propels to the Tailshunt, van gravitated onto rear of train. Loads – loco draws empties through the loader, and when full, returns to wait clear of the Brownsville turnout – after clearance given, proceeds north through Kembla grange to the Unanderra AIS Exchange Sidings, and returns to any road 1-6 at the AIS Coalstack, loco uncouples ready for next duty.

MSTs Paths – AIS Coal Stack - AIS Wongawilli Coll.pat & AIS Wongawilli Coll - AIS Coal Stack.pat

MSTs Consists - AIS Bo-Bo DE1 60t Hop Coal.con & AIS Bo-Bo DE1R 60t Hop Empty.con

Inner Harbour Coal Loader (1963)

The only Working Timetable that I have access to, is dated 1956 – the Inner harbour Coal Loader was not built until 1963. Therefore I do not have any details of specific workings to / from any colliery to the coal loader.

Export Contracts could be won by any of the collieries within the local Illawarra region, so it is feasible that 'dedicated' coal trains, extra to the normal scheduled trains in the Working Timetable, could be run between the relevant colliery and the coal loader, and return. Therefore, I have not provided any specific Consists or Paths. For the occasional simulation of this type of working, it is suggested that you run the train in 'Explore' mode using any available suitable loaded or empty Consist headed by a suitable NSWGR locomotive. Suitable Consists could include: D50-5236-CoalLD-22mix+PHG.con, D50-5236-CoalMT-22mix+PHG.con

Cokeworks Traffic

Cokeworks – Coal Cliff

Operational Timeframe: 1950-1960

Output sent to: Sydney? and Port Kembla

Types of wagons: NSWGR CCH 4-w hoppers

Types of Locomotives: NSWGR 'Standard Goods'

Method of Working: Northbound loads had direct access via the points immediately south of Coal Cliff station. Southbound empties from Enfield marshalling yards did not have direct access, and would run-through into the Down Relief siding opposite the Cokeworks, clear of the points, and then reverse into the sidings. Northbound empties did not have direct access, and would run-through and stop in Coal Cliff Up platform, and then reverse into the sidings. Southbound loads had direct access via the cross-overs at the south end of Coal Cliff yard area. There were no scheduled 'dedicated' trains for this traffic, all loaded and empties, either northbound or southbound were picked up / dropped off by passing Up or Down pickup goods trains – traffic for AIS and Lysaghts was worked to / from the AIS Cringila exchange sidings. Typical Down pickup goods – No 61b – Up No 244. Export traffic – see comments about Inner Harbour Coal Loader as shown above.

MSTS Paths – N/A

MSTS Consists - create loose wagon Consists to suit pickup goods trains.

Cokeworks – Coledale

Operational Timeframe: This cokeworks closed in the late 30's – in the Route it is shown as an abandoned site purely for scenic completeness – however, the track is still fully operational for MSTS, so if you wish to 'bend' history and operate trains to/from this cokeworks, you are free to do so!!!

Cokeworks – Bellambi

Operational Timeframe: This cokeworks closed in the late 30's – in the Route it is shown as an abandoned site purely for scenic completeness – however, the track is still fully operational for MSTS, so if you wish to 'bend' history and operate trains to/from this cokeworks, you are free to do so!!!

Cokeworks – Corrimal

Operational Timeframe: 1950-1960

Output sent to: Sydney? and Port Kembla?

Types of wagons: NSWGR CCH 4-w hoppers and S-trucks

Types of Locomotives: NSWGR 'Standard Goods'

Method of Working: Northbound loads had direct access via the cross-overs south of Corrimal station. Southbound empties did not have direct access, and would run-

through and stop, clear of the cross-overs at the south end of Corrimal, and then reverse into the sidings. Southbound loads and northbound empties had direct access via the cross-overs at the south end of Corrimal. There were no scheduled 'dedicated' trains for this traffic, all loaded and empties, either northbound or southbound were picked up / dropped off by passing Up or Down pickup goods trains – traffic for AIS and Lysaghts was worked to / from the AIS Cringila exchange sidings. Typical Down pickup goods – No 325. Export traffic – see comments about Inner Harbour Coal Loader as shown above.

MSTs Paths – N/A

MSTs Consists - create loose wagon Consists to suit pickup goods trains.

Cokeworks – Mt. Pleasant (Robshaw's and Figtree Coke Works)

Operational Timeframe: 1950-1960 – Figtree Cokeworks sold to Federal Coke Company in 1920

Output sent to: Input coal slack originally from Mt. Pleasant Colliery in narrow-gauge private hoppers and private locos - output originally sent to Dapto Smelting Works and to small foundries in Sydney. Input coal slack later obtained from South Bulli Colliery at Bellambi. Coke output later sent to AIS steelworks

Types of wagons: South Bulli 4-w hoppers and NSWGR CCH 4-w hoppers

Types of Locomotives: NSWGR 'Standard Goods' – South Bulli locomotive No 5 had permission to work over NSWGR metals between Bellambi exchange sidings and Mt. Pleasant cokeworks

Method of Working: During the later days, private loaded coal trains would be worked down from Bellambi, by Bellambi locomotive No 5 and Bellambi CHG brake van and the return empties worked back to Bellambi. The loaded coke wagons would be worked down to the AIS Port Kembla exchange sidings, by passing Down pickup goods trains and the return empties worked back to Mt. Pleasant, by passing Up pickup goods trains

MSTs Paths – see notes for South Bulli Colliery

MSTs Consists - see notes for South Bulli Colliery

At present I have no exact details of how these sidings were worked – as there was only one siding with a single parallel loop siding, to allow running-around and changeover from loaded and empty wagons, I am presuming it would mean having to temporarily 'shunt and hold' wagons on the Up and Down Main lines.

Cokeworks – Mt. Keira (Federal Cokeworks)

Operational Timeframe: 1950-1954 – Mt. Keira railway closed 1954

Output sent to: Input coal slack from Mt. Keira Colliery via private locos and private hoppers, coke output to AIS steelworks

Types of wagons: NSWGR CCH 4-w hoppers for supply to AIS steelworks.

Types of Locomotives: NSWGR 'Standard Goods'

Method of Working: Southbound loads would back out onto the Up Main clear of the points, and then draw forward over the cross-over onto the Down Main and then proceed south. Northbound empties would run-through clear of Gipps St level crossing and stop, and then reverse into the exchange sidings.

MSTs Paths – N/A

MSTs Consists – N/A

Port Kembla – AIS Steelworks and other local Industrial Traffic

I have included a substantial amount of the private railways within the Port Kembla industrial areas, as shown from a trackwork drawing published by BHP in 1955-56. I have provided generally simplified trackwork, but sufficient enough to be able to simulate the essential rail services, in an authentic manner, for the steelworks and related industries in the area.

Australian Iron and Steel – Port Kembla Steelworks

The giant 'Australian Iron and Steel' steelworks was an ever-changing and evolving industrial complex. When Charles Hoskins moved his steelworks from Lithgow to Port Kembla, the first blast furnaces were built just south-west of where Cringila station is today. As the steelworks expanded to include blast furnaces Nos 1, 2 and 3 (and its associated infrastructures), it was realised that there was no more space for expansion available in this area. So, in conjunction with the Port Kembla port authorities (which owned and operated the area now known as Outer Harbour), it was decided to build an 'Inner Harbour' to cater for not only expanded steelworks facilities, but to expand the total capacity of the port itself. One major feature of the new Inner harbour was a long wharf complex, on the south-west side, to allow vast quantities of iron ore and limestone to be shipped in for unloading direct into huge raw material stockpiles adjacent to the steelworks. In 1963, the Inner Harbour was extended on the north-east side adjacent to the ocean, and a massive export Coal Loader was built with several dedicated coal berths in the new section of the Inner Harbour.

This new Inner Harbour was built over the area known as Tom Thumb Lagoon, a relatively large swamp and tidal lagoon area adjacent to the port. Allans Creek meandered through this area and was diverted into a straight outfall direct into the new Inner harbour Stage 1 works. Slag, and other waste fill, was progressively dumped in the area, the lagoon dredged out and the reclaimed land prepared for the expansion of the port and the AIS steelworks. The original area around blast furnaces Nos 1, 2 and 3 was designated AIS Steelworks No1, and the new area to be developed, designated as AIS Steelworks No2. During the era depicted in this route, blast furnace No 4 and its associated infrastructures (ie No 2 open hearth furnaces, etc.) were in place by 1955-1956.

AIS decided to 'future proof' its new No 2 Steelworks by separating the steelmaking processes from the rolling and finishing processes and dividing it into two separate areas. Whilst the steelmaking facilities were built on the south side of Allens Creek just behind the new AIS wharf complex, AIS built a new 'Flat Products Division' north of Allens Creek on the eastern side of the NSWGR Port Kembla branch line (opposite the Lysaghts works). This comprised the primary rolling mills and all the secondary rolling mills and finishing processes, where the end product was ready for shipment to steel merchants and manufacturing industries. The only disadvantage of this two part separation process was the hot ingots had to be transported over a much greater distance from the open hearth to the primary rolling mill soaking pits.

Transport of any steel products internally within the steelworks complex was done using AIS rolling stock and locomotives, but finished product from all the mills was loaded onto NSWGR wagons, and taken by AIS locomotives to the AIS Cringila exchange sidings, where it was left for pickup and forwarding by NSWGR trains.

BHP took over control of the entire AIS steelworks in 1935, but retained the name AIS to differentiate it from the BHP Newcastle steelworks. In 1999, BHP closed the giant BHP Steelworks in Newcastle, which was subsequently demolished. In 2002, BHP divested itself of all remaining steel manufacturing interests (including AIS and Lysaghts) which were sold to Bluescope Steel, and today, the Bluescope steelworks only operates modern high-capacity blast furnaces No 5 & 6, the original four furnaces being long demolished. Today's Bluescope Steelworks is very different in layout, appearance, operation and manufacturing methods from the AIS steelworks of old.

Prior to the mid-1960's the conversion process from molten iron to molten steel was done in large Open Hearth furnaces – this required the transport of hot metal from the blast furnace to the open hearth furnaces in open-topped Hot Metal cars. The transfer of molten steel from the open hearth furnaces to the first stage of manufacture, the Bloom Mills, was done with trains of 'ingot buggies', where molten steel was poured (a process known as 'teeming') into Casting Moulds (placed on the buggies) to create Ingots. On arrival at the bloom mills, the molten steel was allowed to solidify, the moulds were stripped-off for re-use, and the ingots were craned into below-ground covered Soaking Pits, where they were heated to a constant temperature throughout. Once heated to the required temperatures, they were lifted out and rolled into Blooms, which were subsequently processed by other types of mills into the finished steel products.

Both primary stages of steelmaking, iron from the blast furnaces and steel from the open hearths, created a huge amount of molten waste material called Slag. This was transported in open Slag Pots to be dumped on waste ground adjacent to the steelworks – in some sections it was used to fill other areas for expansion for the No2 Steelworks. In later years, crushing plants were established to crush the solidified slag into small granules, to be used for road-making, and other industrial processes.

From the mid-1960's on, the whole process of steelmaking was transformed; the Basic Oxygen Steelmaking process replaced the Open Hearth method, and transfer of molten iron to the BOS plant was now done in large ceramic-lined Torpedo Cars (capable of moving 230 tons of molten iron at a time). The ingot buggies were replaced by a new system of Continuous Casting, where the molten steel from the BOS was poured by crane-lifted ladle direct into the top of a new continuous casting machine, where the molten steel was guided and cooled through a series of rollers and presses. The now semi-molten steel emerged as a continuous length of semi-solidified steel which was cut by specially designed oxygen lance gas cutters into sections (similar to the blooms created in the old steelmaking processes) for further reduction and processing into finished steel products.

All bulk material handling was by AIS owned rolling stock – incoming coal from the AIS owned mines by 60T bogie hopper wagons, all other internal bulk traffic by general purpose 50T bogie hopper wagons called 'trippers'. Internal rail traffic within the steelworks could be either drawn or propelled – when propelled, a shunter with flag would ride on the end wagon. Propelling movements were usually done at around half the General Plant 12 mph speed limits, as they were more dangerous to perform.

The track layouts included in the Main Illawarra V3 route are arranged to be able to simulate most of this steelworks internal traffic as further detailed below.

General Notes: - in the sections below, I describe the different production processes, and include custom MSTs Paths and Consists to represent this traffic. The custom Consists will be included in each Rolling Stock Pack applicable to those wagons, and will require to be copied over into the main MSTs Consists folder. I have provided Paths generally in a simple point A to point B format – in some traffic workings, due to the layout of the plant, Paths will require ‘Reversing Points’, watch the track indicator, slow down as you approach, stop when the reverse indicator clears, then reverse your train.

Iron Ore

Iron ore was brought in by sea, rather than rail. It was bulk stockpiled adjacent to the Inner harbour wharves. The iron ore was transported from the wharf area bulk stockpile to the blast furnaces by 50t trippers – AIS locomotives either drew or propelled a train of loaded ore hoppers to the blast furnace ‘high lines’ No 1 and No2 where the ore was bottom-discharged into storage bins for transport to the top of the blast furnaces by conveyor. After discharge, the locomotive would return the empty hoppers to the wharf loading road for the next loading cycle.

MSTs Paths – AIS Ore Wharf - AIS No1 Highline.pat, AIS Ore Wharf - AIS No2 Highline.pat, AIS No1 Highline - AIS Ore Wharf.pat & AIS No2 Highline - AIS Ore Wharf.pat

MSTs Consists - AIS Bo-Bo DE5 50t Hop IOre.con & AIS Bo-Bo DE3 50t Hop Empty REV.con

Coal and Coke

The AIS owned several nearby coal mines exclusively for its own coal supply – Old Bulli, Mt. Kembla and Wongawilli. Coal was railed from these mines in AIS 60T hoppers; the Mt. Kembla and Wongawilli traffic by AIS locomotives direct to the AIS ‘coal stack’, the Old Bulli traffic by NSWGR locomotives to the AIS Cringila exchange sidings. At times of peak demand, additional coal was sourced from any northern Illawarra colliery, particularly from South Bulli and Corrimal collieries, but Coal Cliff colliery and South Clifton Tunnel colliery were other common sources - this was generally railed to the AIS Cringila exchange sidings by NSWGR pickup goods trains. Transfer from the AIS Cringila exchange sidings to the AIS coal stack was done internally by AIS locomotives.

AIS established several large batteries of coke ovens adjacent to the AIS coal stack – coal was moved by conveyor from the coal stack to the coke ovens. At times of peak demand, additional coke was sourced from any northern Illawarra cokeworks, particularly from Figtree and Corrimal cokeworks, but Coal Cliff cokeworks and Federal cokeworks (up to 1954) were other common sources - this was generally railed to the AIS Cringila exchange sidings by NSWGR pickup goods trains. Transfer from the AIS Cringila exchange sidings to the AIS coke oven distribution area was done internally by AIS locomotives.

The coke was transported from the coke ovens distribution area to the blast furnaces by 50t trippers – AIS locomotives either drew or propelled a train of loaded coke hoppers to the blast furnace ‘high lines’ No 1 and No2 where the coke was bottom-discharged into storage bins for transport to the top of the blast furnaces by conveyor. After discharge, the locomotive would return the empty hoppers to the coke ovens distribution area for the next loading cycle.

The production of coke resulted in two by-products, tar and benzol, which were piped to the tar distillery and the benzol plant. The tar was then sent for further processing at the

Koppers plant in Newcastle, in Koppers tank wagons. The benzol was railed out in NSWGR tanks and taken to inter-state customers.

MSTS Paths – AIS Coke Ovens - AIS No1 Highline.pat, AIS Coke Ovens - AIS No2 Highline.pat, AIS No1 Highline - AIS Coke Ovens.pat & AIS No2 Highline - AIS Coke Ovens.pat

MSTS Consists - AIS Bo-Bo DE5 50t Hop Coke.con & AIS Bo-Bo DE3 50t Hop Empty REV.con

Limestone and sinter

Limestone was brought in by sea, rather than rail. It was bulk stockpiled adjacent to the Inner harbour wharves. The limestone was transported from the wharf area bulk stockpile to the blast furnaces by 50t trippers – AIS locomotives either drew or propelled a train of loaded hoppers to the blast furnace ‘high lines’ No 1 and No2 where the limestone was bottom-discharged into storage bins for transport to the top of the blast furnaces by conveyor. After discharge, the locomotive would return the empty hoppers to the wharf loading road for the next loading cycle.

In later years, at times of peak demand, additional supplies of limestone were railed down the Moss Vale line, from Medway quarry on the Southern Highlands.

Sinter was a ‘recovery’ process where fine particles of iron ore, coke and limestone (which would otherwise be lost by screening or overspill, etc) was mixed together and ‘roasted’ into ‘briquette’ like chunks, for supplementary feedstock to the blast furnaces. The sinter was transported from the Sinter Plant to the blast furnaces by 50t trippers – AIS locomotives either drew or propelled a train of loaded hoppers to the blast furnace ‘high lines’ No 1 and No2 where the sinter was bottom-discharged into storage bins for transport to the top of the blast furnaces by conveyor. After discharge, the locomotive would return the empty hoppers to the Sinter Plant for the next loading cycle.

MSTS Paths – AIS Ore Wharf - AIS No1 Highline.pat, AIS Ore Wharf - AIS No2 Highline.pat, AIS No1 Highline - AIS Ore Wharf.pat & AIS No2 Highline - AIS Ore Wharf.pat + AIS Sinter Plant - AIS No1 Highline.pat, AIS Sinter Plant - AIS No2 Highline.pat, AIS No1 Highline - AIS Sinter Plant.pat & AIS No2 Highline - AIS Sinter Plant.pat

MSTS Consists - AIS Bo-Bo DE3 50t Hop Agreg.con & AIS Bo-Bo DE3 50t Hop Empty REV.con

Hot Metal

Blast furnaces produce huge quantities of molten iron, which requires a second process to convert it to molten steel in the Open-Hearth Steelmaking Plant. The molten iron was transported from the blast furnaces to the open hearth furnaces in open-topped Hot Metal cars – these comprised an open-topped ladle, holding around 35 tons, which sat in a cradle on the wagon. At the open-hearth plant the ladles were lifted off the wagons by crane and poured into the open-hearth furnaces. The empty ladles were craned back onto the wagons and the wagons returned to the blast furnaces for the next loading cycle.

In later years the Open-Hearth steelmaking process was replaced by the Basic Oxygen Steelmaking (BOS) process – this change also required a change of transport type – molten iron is now tapped from the blast furnaces into huge ‘Torpedo’ ladle cars which are lined internally with ceramic bricks, holding around 230 tons. At the BOS plant, the torpedo cars are placed on a special transfer siding, the car plugged into an electricity

supply, and the ladle rotated by electric motor to pour the molten iron into a 'transfer' ladle in a deep pit beside the siding. These transfer ladles are in turn craned and poured direct into the BOS vessel. The empty Torpedo cars are returned to the blast furnaces for the next loading cycle.

Open ladles were never filled or emptied while the locomotive was attached – the loco would place the empty cars, uncouple and draw back to a 'clearance' position – once the open ladles were filled, the loco would draw forward, and re-couple to the cars for transport – a similar process applied when emptying the ladles.

In the Main Illawarra V3 route, I have made the 'steelmaking' plant relatively 'generic' – although it is labelled as an Open-Hearth plant, it could just as easily represent a BOS plant. In this way you, as the user, can choose either, to use open Hot Metal cars, or to use Torpedo cars. However, I have not attempted to replicate the Continuous Caster steelmaking process.

MSTs Paths – AIS BF-No1 - AIS OH-No1.pat, AIS BF-No4 - AIS OH-No2.pat, AIS OH-No1 - AIS BF-No1.pat & AIS OH-No2 - AIS BF-No4.pat

MSTs Consists - AIS Bo-Bo DE1 HotMetl Empty.con, AIS Bo-Bo DE1 HotMetl Full.con, AIS Bo-Bo DE1 Torpedo Empty.con & AIS Bo-Bo DE1 Torpedo Full.con

Slag

Blast furnaces also produce significant quantities of Slag; a waste by-product of the iron-making process. Also the Open-Hearth (and later BOS) process produced significant quantities of Slag. The molten slag was transported from the blast furnaces and OH (or BOS) plants by open-topped Slag Pots – these were similar to the Hot Metal cars, except the ladle was semi-permanently fixed in the cradle on the wagon, and was arranged so that the ladle could be tipped to one side (through approximately 120 degrees rotation) to pour the slag into the various 'slag dumps' scattered around the site. Initially the slag pots required the use of steam locomotives only, as the ladle 'rotation' was steam-powered. Once the AIS disposed of its steam locomotive fleet, all the slag pots were converted to air-power so they could be used with diesel locomotives. The empty slag pots were returned for the next loading cycle.

Open ladles were never filled while the locomotive was attached – the loco would place the empty cars, uncouple and draw back to a 'clearance' position – once the open ladles were filled, the loco would draw forward, and re-couple to the cars for transport. However the loco remained coupled to the cars when emptying, to provide power for the tipping mechanisms.

MSTs Paths – AIS BF-No1 - AIS Slag Dump.pat, AIS BF-No4 - AIS Slag Dump.pat, AIS Slag Dump - AIS BF-No1.pat & AIS Slag Dump - AIS BF-No4.pat

MSTs Consists - AIS Bo-Bo DE5 Slag Empty .con & AIS Bo-Bo DE5 Slag Full.con

Ingot traffic

The molten steel output from the Open-Hearth furnaces was poured into a bottom-tap ladle, which was craned over a rake of empty ingot buggies, and each ingot mould was filled in turn. Ingot moulds were never filled while the locomotive was attached – the loco would place the empty buggies, uncouple and draw back to a 'clearance' position – once the ingot moulds were filled, the loco would draw forward, and re-couple to the buggies for transport to the Bloom mills. Because of the small size and short-wheelbase of the buggies, the variable quality trackwork, and the tall 'top-heavy' nature of the ingots, the hot ingot trains were moved only at walking pace.

In later years when the BOS plant and Continuous Caster were commissioned, the whole system of ingot casting and transport became redundant and was removed.

MSTs Paths – AIS OH-No2 - Bloom Mill No2.pat & AIS Bloom Mill No2 - AIS OH-No2.pat

Note – due to track complications and MSTs limitations it has not been possible to create Paths for OH-No1 to Bloom Mill No1 and return.

MSTs Consists - AIS Bo-Bo DE3 Ingots Empty.con & AIS Bo-Bo DE3 Ingots Full.con

Steel sections traffic – eg slabs, blooms, billets, bar, plate, coil, etc.

After the primary production process through the Bloom mills was completed, the blooms were then transported to whichever milling process was next required to turn the steel into finished products. The AIS had a large stock of internal flat and bolster wagons (coded R) for moving this semi-finished product between different production stages and bulk storage.

Once the finished (or in some cases, semi-finished) product was ready for delivery to the customer, it would be loaded onto NSWGR wagons and moved to the AIS Cringila exchange sidings for onward transport by NSWGR trains. In the case of export product shipped through Port Kembla, the loaded AIS wagons would be shunted down to the AIS exchange sidings adjacent to Port Kembla station, where they would be taken over and shunted within the port complex by Public Works Department locomotives. The PWD crews would place the wagons on the appropriate wharf for direct loading into the ships. Empty wagons were returned the same way.

MSTs Paths – as there are vast numbers of Paths possible, I have not included any.

MSTs Consists – as there are vast numbers of Consists possible, I have not included any - however, I would suggest creating loaded loose wagon Consists to suit NSWGR goods trains picking-up from AIS Cringila exchange sidings.

Scrap traffic

Scrap steel was a big by-product of the steelmaking process at Port Kembla, and its efficient recovery reduced the amount of direct waste to landfill. Scrap was sourced from three primary sources: 1 – steel off-cuts from any of the AIS rolling or shearing mills was recovered for reuse, 2 – steel off-cuts from any other local Port Kembla industry, Lysaghts in particular, was recovered for reuse, and 3 – scrap steel could be railed in from remote sites all over NSW (and beyond) by NSWGR train, and left at AIS Cringila exchange sidings, for internal transport by AIS locos. In all three cases, the recovered scrap steel was fed into the Open-Hearth furnaces (and later BOS plants) for mixing, re-melting and re-purifying into new steel.

MSTs Paths – as there are vast numbers of Paths possible, I have not included any.

MSTs Consists - as there are vast numbers of Consists possible, I have not included any.

Lysaghts Australia and Commonwealth Rolling Mills – Port Kembla

In 1935, following the BHP takeover of AIS, Lysaghts acquired the existing AIS Sheet and Galvanising Plant. This was seen only as a 'stop-gap' for the first few years, until new works were built, adjacent to Springhill Road, for production of high-quality flat and corrugated galvanised steel sheets. Lysaghts built their new sheet steel and galvanising plant at Springhill during 1936-7, some of the special mills and furnaces were transferred from the old AIS site to the new Springhill site, and the new plant was

commissioned during 1938. It was later expanded considerably, and manufacture commenced of specialised coated steel products, such as today's well-known, Galvabond ®, Zincalume ® and Colorbond ®.

In 1939, Lysaghts also entered into a joint partnership with American Rolling Mills Company, and the joint venture constructed the Commonwealth Rolling Mills (CRM) plant adjacent to Port Kembla station – this was to manufacture specialised high-finish steel suitable for production of motor car bodies, refrigerator and washing machine cases and other such high-finish flat or rolled steel products. By 1947, Lysaghts had purchased all the American Rolling Mills shares, and the CRM plant came totally under the ownership of Lysaghts, but the CRM plant retained its original name.

Lysaghts maintained a small locomotive fleet – initially two Andrew Barclay 0-4-0ST's – 'Alison' and 'Marian' – in 1955, two GE 44t Bo-Bo diesels were added to the fleet 'Primrose' and 'Ann', both built by Goninan's in Newcastle. As Lysaghts had a very close association with AIS, and had substantial transfer traffic with AIS, they secured running rights over the entire AIS track, and Lysaghts locomotives were regularly seen operating over many sections of the AIS network. After taking full ownership of CRM, Lysaghts also secured running rights over part of the NSWGR network between Allans Creek siding and Port Kembla North for transfer trips between the Springhill works and CRM works – these trains requiring the purchase of an ex-NWGR 'CHG' brake van to be used when running on the NSWGR sections. Note, however, that any Lysaghts to AIS transfer workings over the very short NSWGR section over Allans Creek from the Lysaghts entry points to the AIS Cringila entry points was under the direct control of the NSWGR Allans Creek Signal Box and did not require the use of a brake van.

Lysaghts had a large stock of internal flat and coil wagons (coded LR) for moving this semi-finished product between different production stages and bulk storage.

In 1979, BHP acquired all shares in Lysaghts and gained 100% ownership. In 1993, all workings by the Lysaghts Traffic Department passed to the BHP Steelworks Traffic Department, and from then on, were worked solely by BHP locomotives and rolling stock.

Coal and Coke

Lysaghts required a regular supply of coal (for the Crude Gas plant feeding the rolling mill furnaces) and coke (for the Clean Gas plant feeding the annealing furnaces and galvanising pots). A fleet of 68 second-hand ex-Hunter Valley wooden non-air hoppers was bought from John Kennaway, for this traffic.

[Note – use the JK wagons in the Hunter Valley LCH 4-wheel Coal Hoppers pack – found at

http://steam4me.railpage.org.au/trainsim/freight/files/AU_hv_LCH_MSTs1_Setup.exe]

Coal was purchased from either Corrimal or South Bulli collieries, and was railed to Lysaghts in the ex-JK hoppers to the AIS Cringila exchange sidings by NSWGR pickup goods trains – the transfer from the AIS Cringila sidings to Lysaghts, and internal shunting, being done by Lysaghts locos. Coke was purchased from AIS, and Lysaghts locos and hoppers were worked between the AIS Coke Ovens (via Cringila exchange sidings) and the Springhill plant. When the two Bo-Bo diesels were added to the fleet,

the hoppers were withdrawn from mainline service due to lack of air brakes and auto couplers, being relegated only to internal workings at Port Kembla.

MSTs Paths – LYS-Gas Plant - AIS Coke Ovens.pat, LYS-Gas Plant - AIS Port Kembla.pat, AIS Port Kembla - LYS-Gas Plant.pat & AIS Coke Ovens - LYS-Gas Plant.pat

MSTs Consists - x

Raw Coil Feed Stock

Lysaghts obtained its raw metal feedstock from AIS in the form of coils – this was collected by Lysaghts locos from Road 8 in the AIS Flat Products Division. To facilitate ease of transfer, Lysaghts negotiated with AIS and NSWGR and had a special turnout fitted in the NSWGR Down Main, just north of Allans Creek, to considerably shorten the distance to AIS Road 8. Once permission to work the train was given by the NSWGR Controller, the Lysaghts loco propelled a rake of empty flat coil wagons onto the Down Main, stopped clear of the 'Lysaghts Turnout', reversed and ran onto AIS metals clear of NSWGR. Then, in conjunction with the AIS Controller, the train ran around the Western Perimeter road of AIS to the northern end, stopped clear of the northern turnouts, reversed and propelled back into Road 8 'Coil Processing and Despatch'. After shunting and leaving the empties for future loading, the loaded coil wagons were attached, and the loco re-traced its path back to Springhill.

MSTs Paths – LYS SH Works - AIS Coil Despatch.pat & AIS Coil Despatch - LYS SH Works.pat

MSTs Consists - x

Transfer Trips – Springhill / CRM

Some Lysaghts products required processing at both the Springhill and the CRM works – this required internal transfer working, one morning trip and one afternoon trip, over a short section of the NSWGR mainline. Lysaghts locos would assemble the transfer train at Springhill yard (most loads were covered by tarpaulins) and the ex-NSWGR CHG brake van attached to the rear. After permission was given by the NSWGR Controller, the train ran out onto the Down Main, through Cringila and Port Kembla North stations, and turned off into the northern CRM Siding adjacent to Port Kembla South yard. The train proceeded down the CRM siding to the CRM exchange sidings, dropped off the wagons, collected any new wagons for Springhill, then proceeded out the southern end of CRM yard, around the Balloon Loop, through Port Kembla North yard and back onto the NSWGR mainline to Springhill.

MSTs Paths – LYS SH Works - LYS CRM Works.pat & LYS CRM Works - LYS SH Works.pat

MSTs Consists –

Finished Products – Springhill / CRM

The finished product output from either Springhill or CRM could be sent via NSWGR to the customer or exported from the Port Kembla wharves.

Product for export from Springhill was loaded onto Lysaghts internal wagons, and shunted by Lysaghts locos over the AIS lines via Cringila exchange sidings, the AIS Circle Line to Drews Exchange Siding adjacent to the No1 Steelworks Merchant Mills. AIS locos took over from here and shunted the Lysaghts wagons down to Port Kembla south, where they were left in the exchange sidings adjacent to Newbolds – PWD locos (ex-NSWGR 20 class) or NSWGR 26 class then picked up the Lysaghts wagons and shunted them to the relevant wharf for direct loading onto the waiting ships. Empty

Lysaghts wagons were worked back to Springhill the same way. Product for export from CRM was loaded onto Lysaghts Internal wagons, and collected by PWD or NSWGR from the south end of the CRM yard and taken to the wharves, return empties worked back the same way. Loads were usually tarpaulined to keep them clean and protect them from inclement weather.

Product from Springhill for outwards working by NSWGR was loaded onto suitable NSWGR wagons – the required empty wagons (usually bogie flats, bogie bolsters or bogie opens) were requested from NSWGR and left for Lysaghts collection in the AIS Cringila exchange sidings. The Lysaghts locos worked across to Cringila, collected the empties, and returned to Springhill – after loading, the Lysaghts locos returned the loaded wagons to AIS Cringila exchange sidings for collection and forwarding by NSWGR trains. Product from CRM for outwards working by NSWGR was loaded onto suitable wagons collected from Port Kembla South yard, taken to CRM for loading, and when loaded returned to Port Kembla South yard for collection and forwarding by NSWGR trains. Loads were usually tarpaulined to keep them clean and protect them from inclement weather.

MSTs Paths – LYS SH Works - AIS Drews X Siding.pat, LYS SH Works - AIS Port Kembla.pat, AIS Drews X Siding - LYS SH Works.pat & AIS Port Kembla - LYS SH Works.pat

MSTs Consists - x

Scrap Metal

All scrap metal off-cuts from Lysaghts Springhill and CRM processing was collected and loaded into a number of small 4-wheel wagons called 'scrap sets' – these were flat wagons fitted with metal bins. Because of only having hook type couplings and handbrakes, they were only worked by Lysaghts steam locos. Once ten to twelve wagons were loaded, they were worked to the AIS No1 Open Hearth furnaces scrap line, where the Lysaghts loco would wait until they were emptied and then worked them back to Lysaghts or CRM. From Springhill, the traffic path was to AIS Cringila exchange sidings, along the AIS Circle Line, past Drews Exchange Siding and shunted direct to the OH No1 Scrap Line. From CRM, the traffic path was from the south end of CRM yard, drawn out onto the Balloon Loop, reversed and shunted across the NSWGR Port Kembla main lines onto the AIS network adjacent to Port Kembla South Signal Box, then via the AIS lines under Five Islands Road direct to the OH No1 Scrap Line. Return workings of the empty scrap sets was via the same paths.

MSTs Paths – LYS SH Works - AIS-OH No1-Scrap.pat, LYS CRM Works - AIS OH-No1-Scrap.pat, AIS OH-No1-Scrap - LYS CRM Works.pat & AIS OH-No1-Scrap - LYS SH Works.pat

MSTs Consists - x

Additional notes on the CRM workings

Until 1955, all local CRM shunting and transfer workings to / from the NSWGR and /or Port Kembla wharves was performed by Public Works Department locomotives, on a hire basis. After 1955, these workings were performed by Lysaghts locomotives.

Australian Fertilisers, Metal Manufacturers and Electrolytic Refining & Smelting

Apart from the main AIS and Lysaghts works, there were a number of other large local industries within Port Kembla, served by rail sidings

Some of these industries, such as Australian Fertilisers, railed raw materials to their plant via NSWGR. The finished processed product was then either railed away from Port Kembla by NSWGR, or transferred directly to the adjacent wharves for export.

Other industries, such as Metal Manufacturers and E.R & S., also brought in raw materials and base metal ores for refining – these were principally non-ferrous metals, such as copper, bronze, aluminium, etc. Similarly, the finished product could be railed away by NSWGR or shipped out via the Port.

As these industries do not have sufficient sidings or traffic to justify it, I have not provided any specific MSTS Paths or Consists – any wagons working to or from these industries would be worked by the normal NSWGR goods trains serving Port Kembla – any local shunting being done by either NSWGR loco or PWD loco serving the wharves.

Ore Concentrates – Cobar to Port Kembla

There was a lesser known ore concentrate working; however this did not require a dedicated train like W44. A single-line branch extended out to the west of Cobar to the CSA mines. The local goods train locomotive would run out to the mines and attach a number of GP wagons loaded with ore (usually four or six in number - although I have one photo of a 32 class, and water gin, on the Cobar branch with around 10-12 loaded GP's in tow). These wagons would be worked via the normal scheduled goods trains along the line to Dubbo, where they were put into a main goods train going to Enfield. At Enfield the loaded GP's were shunted into a main goods train heading down the Illawarra line. At Thirroul they were shunted into a local goods train serving Port Kembla, where they were then shunted into the ERS sidings for unloading. The return empties were worked back to Cobar in a similar fashion.

Other Traffic Workings

General Goods Traffic

Specific details of general Goods Trains, the type of goods vehicles used and basic histories, as applied to MSTs, can be found in a supporting document, "NSWGR General Goods Traffic Workings", included with this route.

Ballast, Blue Metal and Minerals

The two main sources of ballast for track use on the NSWGR, were at Bombo on the Illawarra line, just north of Kiama, and at Martin's Creek, approximately half-way between Maitland and Dungog, on the North Coast line.

Prior to building the BBW bogie ballast hoppers, NSWGR used 16T MH 4-wheel hoppers; a total of 105 MH's were built in 1931 and 1938 (metal bodied equivalents to the typical wooden LCH wagons used by most coal mines), for transporting ballast.

Photos showing Ballast Trains in use on NSWGR, generally show a typical consist of six or nine bogie ballast hoppers and a bogie Ballast Plough Van, which would be within the typical 550 ton loading capacity for a Superheated Class D50 2-8-0.

Another common ballast train consist would comprise a set of six BBW bogie ballast hoppers, then a bogie plough van, following behind these would be a small number of S-Trucks (maybe 4 or 5) loaded with 'fines' for use on pathways and other paved areas around yards and stations, all this was then tailed by a normal LHG goods brake van.

The Bogie Ballast Plough Vans, as well as having normal accommodation for the train Guard, also had additional seating accommodation for the Ballast Train crew. The twin centre-mounted ploughs under the floor would be wound down to track level by a set of winding gear inside the van. The plough van had two sets of ploughs, so that track ballasting activities could be carried out in either direction to suit conditions at the work-site.

Normally loaded ballast trains would be worked over the Down (outbound) lines to all parts of the state, with the return empties being worked in Up (inbound) trains. However, ballast from Bombo was normally worked directly to Enfield Marshalling Yard, where it would be re-marshalled for required 'work trains' throughout the West and South regions. Local ballast services on the Illawarra line, and for working over the Unanderra-Moss Vale line, were normally worked to Wollongong yard for re-marshalling into the required work trains. Ballast trains in transit, not forming an STN scheduled 'work train,' would be trailed by a normal brake van, rather than a Ballast Plough Van.

Petroleum

The only two oil refineries in NSW were both in Sydney. Port Kembla had a couple of local oil distribution terminals in the southern part of the Port which were supplied by tanker ships from either Kurnell or from the Victorian oil refineries. Most oil and petrol distribution from these centres was by road, however, both had rail sidings adjacent, and some local and distant distribution was by rail. Within the Port Kembla port areas, there were dedicated sidings for Mobil, BP, Shell and Ampol. There was a Vacuum siding and a Shell siding on the Down line adjacent to North Wollongong station.

Details of other oil and petroleum traffic workings, as applicable to this route, can be found in the document "NSWGR General Goods Traffic Workings".

Milk

The south coast of NSW, between Kiama and Nowra, had a significant dairy produce industry. A daily dedicated Milk Train No. 120, ran from Nowra direct to the Dairy Farmers milk depot at Darling Harbour. This train picked up milk vans (MLK's and MLV's) and milk tanks (BMT's) at Nowra, Berry, Gerringong, Kiama and Albion Park, and then proceeded direct to Darling Harbour. Return empties were worked back to Albion Park, Kiama, Gerringong, Berry and Nowra, by either No.9 Mixed or the early morning pick-up goods trains.

Fruit and Vegetables

There was only a small local industry in the growing of fruit and vegetables, mostly for local area consumption. Significant quantities of fruit and vegetables grown in other parts of the state (or interstate) were railed to Wollongong for sale in the local markets, particularly tropical fruit from northern NSW and Queensland (ie bananas, pineapples, mangos, paw paws, etc.) and stone fruit and vegetables from the Riverina District and the Murrumbidgee Irrigation Area. This traffic was worked as a number of refrigerator vans or louvre vans in normal scheduled goods trains to Wollongong.

Other traffic – wheat, wool, livestock, timber

Wheat – there were no wheat farms within the Illawarra district - however a small flour mill and starch factory, in the industrial estate east of Bomaderry station, required regular small consignments of wheat, either bagged in tarpaulin covered open wagons or bulk in RU 4-w wheat hoppers, with the bagged output being distributed again by tarpaulin covered open wagons or in covered vans.

Wool – there was no woollen industry within the Illawarra, hence no rail traffic.

Livestock – there was only a small local requirement for livestock transport within the Illawarra, generally moved by road transport rather than rail. Rail livestock vehicles were rarely seen on the Illawarra lines.

Timber – some timber cutting and logging was carried out in the forestry areas on the far south coast of NSW – however most of this was only transported within local precincts and mostly by road. Some sawn timber was brought in by rail to Wollongong to supply the local timber yards, and any manufacturing and housing construction industries that required timber.