MUSWELLBROOK COAL COMPANY LIMITED

TRANSPORT IMPACT ASSESSMENT OF PROPOSED EXTENSION TO MUSWELLBROOK NO.2 COAL MINE

AUGUST 1996

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JOB:9543

CONTENTS

1.0 INTRODUCTION

Muswellbrook Coal Company Limited (MCC) currently operate an open-cut and an underground mine within the one colliery holding. The No.2 Open Cut is a truck and shovel mine producing approximately 1.7 million tonnes per annum (mtpa), while the No.2 underground currently produces approximately 300,000 tpa. MCC has operated coal mines in this vicinity for over 90 years.

All coal is currently hauled by road, using a private haul road between the site and Muscle Creek Road, and thence to the New England Highway, for transport primarily to Port Newcastle, and to a lesser extent to Bayswater Power Station.

The proposal is to extend the area covered by the underground mine, to increase the coal resource available. No additional workforce will be involved. The company is investigating the economic viability of constructing a rail loop off the Main North Railway. This would be used for the transport of all coal being delivered to Port Newcastle. If the rail loop is not economically viable, the company will persue the option of the development and use of one of the proposed multi-user faciities in the Ravensworth district (multi-user option), to load coal onto rail. If the multi-user options are not viable, the company proposes to continue its existing transport arrangements, that is, by road to Port Newcastle. Local deliveries within the Hunter Valley will be unaffected by either scenario.

HLA Envirosciences Pty Ltd were commissioned by MCC to prepare an environmental impact study of the proposed mine extension. This firm commissioned Christopher Hallam & Associates Pty Ltd to undertake a transport impact assessment of the proposed extension and transport works, as part of the environmental study.

The Roads & Traffic Authority of NSW (RTA) have stated that the study will need to address the impact of the proposal on the efficiency and safety of the existing road system:

> "Appropriate traffic studies to determine possible traffic volumes and composition generated by the proposal, peak flows, travel desire corridors, accident rates and possible effects on intersection arrangements should be undertaken to ensure minimal impact on the major roads in the study area.
>
> Consideration should be given to the possibility of using existing and proposed rail loading facilities in the vicinity in an effort to minimise the haulage of coal by road and the result of this consideration reported in the study."

This transport impact assessment is set out in the following Sections:

* Section 2 reviews the current situation in regard to the road network, traffic flows and the operation of the mine;
* Section 3 assesses the relative change in transport movements and their impact on the road network, and
* Section 4 summarises conclusions.

2.0 CURRENT SITUATION

2.1 Road Network

The coal transport proposal would substantially reduce the volume of coal truck traffic travelling from the mine to Port Newcastle. A rail loop adjacent to the mine would reduce truck traffic along Muscle Creek Road and the New England Highway. There would be a revised traffic distribution in the vicinity of the multi-user facilities, should this be the adopted option, for the current operation. Should the proposal, with its rail transport component, not be developed, and the multi-user facilities not be viable, transport for the current operation would remain as at present. No additional mine staff are proposed to be employed. This review of the road network concentrates on the roads used for coal haulage at present.

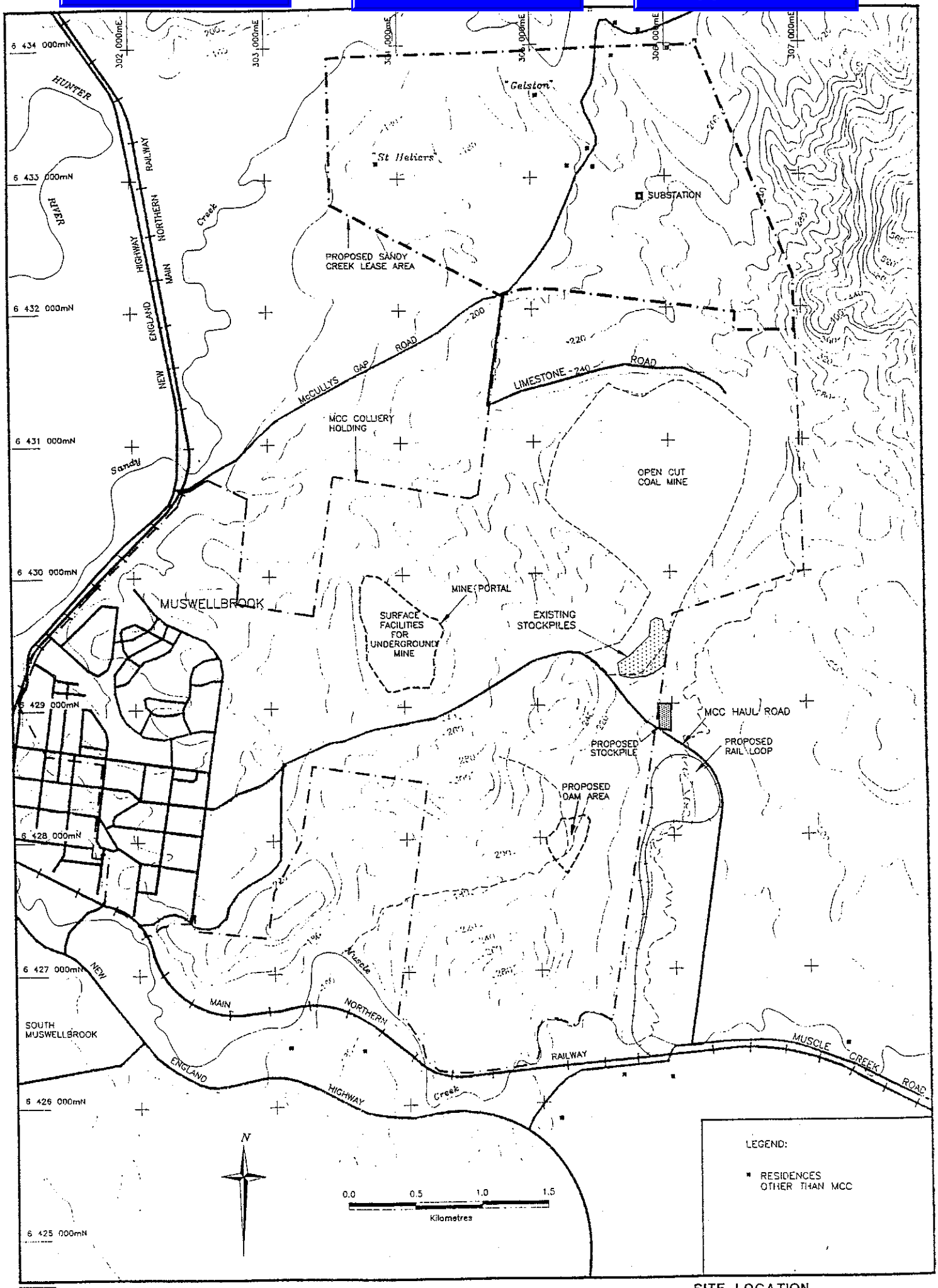
Coal trucks are loaded from either of the two mines and travel on the private haul road on the site to the junction with Muscle Creek Road. The haul road at this point has a sealed carriageway width of 8.2 metres. The Muscle Creek junction is constructed to an AUSTROADS Type B form, with some widening of the westbound carriageway of Muscle Creek Road, to assist vehicles passing other vehicles making a right hand turn into the haul road. To the East, Muscle Creek Road has a sealed carriageway width of just 5.2 metres, widening at the intersection to 8.5 metres, plus the additional sealed shoulder for passing vehicles. West of the haul road, Muscle Creek Road generally has a sealed carriageway width of about 8.2 metres. The road network adjacent to the site is shown on Figure 1, with Figure 2 showing the Muscle Creek Road intersections.

There is a railway line to the immediate south of Muscle Creek Road, near the haul road junction. The road passes over this railway line further to the West, with Muscle Creek Road first sweeping left, and then right, to return to its east-west alignment.

Between the haul road and the New England Highway, Muscle Creek Road passes two dwellings, with a third dwelling some distance away. At its junction with the New England Highway, Muscle Creek Road widens to a sealed carriageway width of 9.8 metres, in addition to a left turn slip lane for the movement to the Highway southbound. The Highway has a left turn deceleration and turning lane for the movement into Muscle Creek Road, and an AUSTROADS Type C treatment for the right turn movement into Muscle Creek Road, providing a sheltered right turn lane and a separate northbound lane on the Highway. The speed limit on both roads at this point is 100 km/hr. The sight distance for traffic in Muscle Creek Road to traffic on the Highway is good.

South of Muscle Creek Road, the New England Highway narrows to a two lane undivided road standard. In the vicinity of the Bayswater and Liddell Power Stations, the Highway widens out, with high standard grade-separated access ramps for movements to and from these power stations. This provides for coal trucks from the MCC site hauling coal to Bayswater Power Station.

Further to the South, the Highway passes through a number of towns and cities, on the

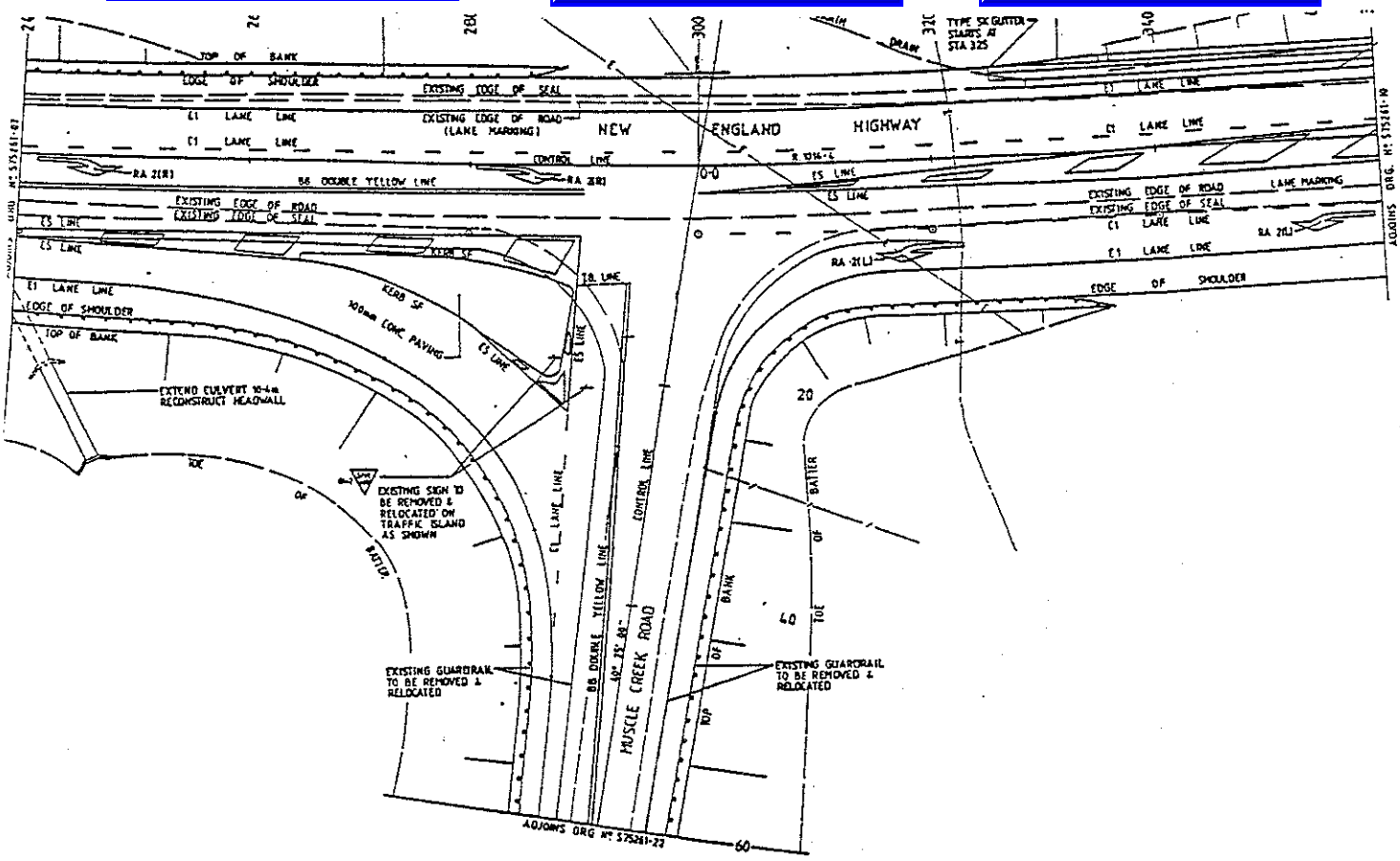


HLA-ENVIROSCIENCES PTY LIMITED

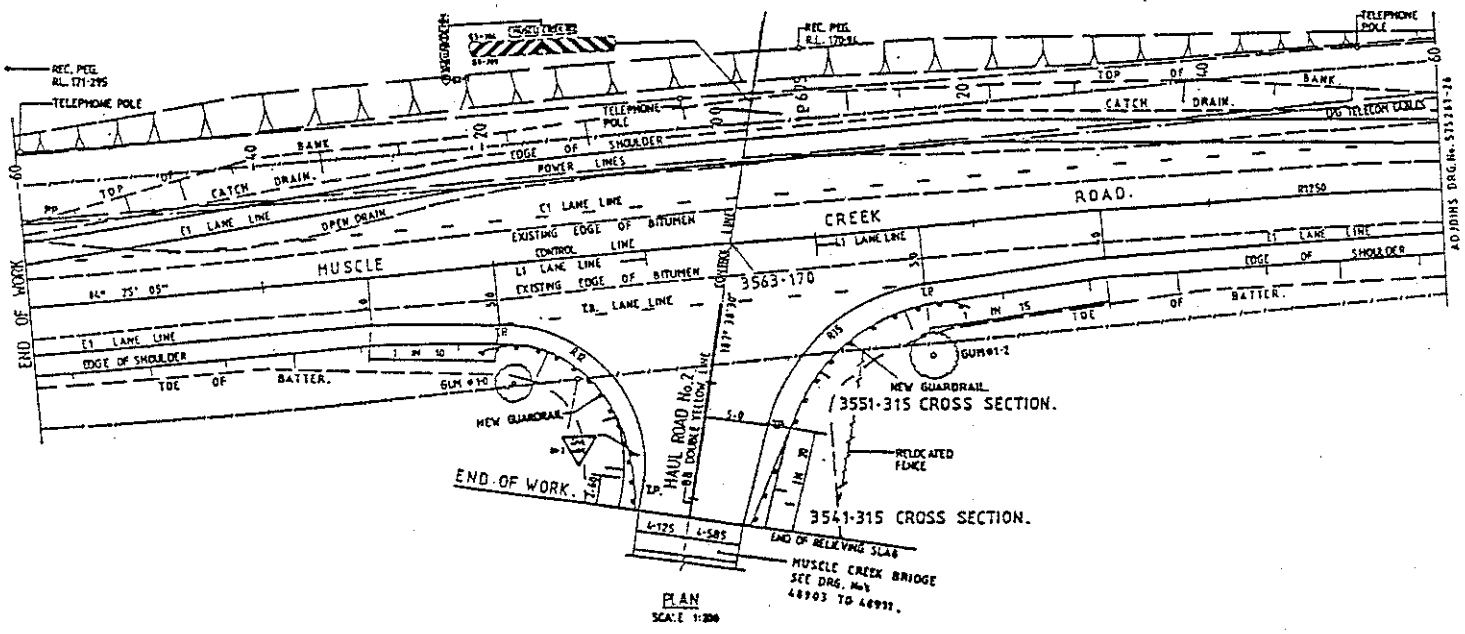
PROJECT No.: U182

SITE LOCATION PLAN

FIGURE 1



New England Highway-Muscle Creek Road intersection



Muscle Creek Road-Haul Road intersection

way to Newcastle. At Hexham the route to Newcastle becomes the Pacific Highway. Coal hauled by road uses the Highway from Muscle Creek Road into Mayfield West, where it uses Industrial Drive to access Port Newcastle, and in particular, Port Waratah.

2.2 Traffic Flows

Table 2.1 summarises daily traffic counts undertaken on Muscle Creek Road in the week beginning 31st July 1995, both east and west of its junction with the MCC haul road. These counts were undertaken by Muswellbrook Shire Council. Note that the figures for Monday 31st July do not cover a full 24 hour period. The difference in the two sets of flows is the traffic on the MCC haul road. The MCC truck loads per weekday are also given. On the Saturday and Sunday, there were no coal truck loads to/from the mine.

TABLE 2.1 Current Daily Traffic Flows on Muscle Creek Road 31 July - 4 August 1995

Day of Week	Daily Flow East of Haul Road	Daily Flow West of Haul Road	MCC Flow	MCC Truck Loads
Monday	167	368	201	117
Tuesday	147	576	429	65
Wednesday	154	600	446	241
Thursday	129	641	512	201
Friday	133	308	175	231

Table 2.1 indicates that MCC traffic dominates the weekday traffic on Muscle Creek Road. In absolute terms the daily flows west of the haul road are highest Tuesday to Thursday. For reference, the Saturday had the lowest flow, with 156 veh/day. East of the haul road, there is not a great deal of difference in the daily flows.

In theory, if the only MCC traffic using the haul road is the laden trucks, the "MCC Flow" should be twice the "MCC Truck Loads". There are some inconsistencies in this regard. In our opinion, the data for "MCC Truck Loads" is more accurate than the automatic count data, given the nature of the weighbridge operation and records. As further discussed, the automatic counts had inconsistencies in the "Other" vehicle classifications. These figures nevertheless provide general information on relative traffic flows in Muscle Creek Road.

Table 2.2 provides a breakdown of the vehicle types on Muscle Creek Road west of the haul road intersection, for the same survey period, by direction.

TABLE 2.2 Current Traffic Composition on Muscle Creek Road - July,August 1995

Day	Car		Rigid Truck		Articulated Truck		Other *	
	Eastb	Westb	Eastb	Westb	Eastb	Westb	Eastb	Westb
Mon	93	59	15	25	56	8	25	87
Tues	80	62	14	18	142	15	57	188
Wed	86	55	6	17	133	20	75	208
Thurs	64	61	3	16	148	16	115	218
Fri	76	40	6	22	39	8	36	81
Weekd	80	55	9	20	104	13	62	156

Note that the final vehicle type - other - includes vehicles not classified under other categories. Looking at the final row totals, for average weekday flows, it would appear that the "Other" category is probably articulated trucks, but where their speed over the counting tubes confused the readings. If the last two categories are added, the eastbound and westbound figures make more sense. In general, for the coal truck movements, the directional flows should be the same, with laden westbound trucks and unladen eastbound trucks. Over this average weekday, the percentages of vehicle types was:

* Cars (AUSTROADS categories 1,2): 27.0%

* Rigid trucks (AUSTROADS categories 3-5): 5.8%

* Articulated, other (AUSTROADS categories 6-13): 67.2%

The articulated vehicles dominate the total flow, representing the coal transport from MCC. For the average weekday, Types 6-13 combined totalled 166 eastbound and 169 westbound. For the weekdays of the survey, MCC weighbridge records indicated that the average daily number of loads leaving the mine was 171. This closely tallies with the count.

A vehicle classification survey was undertaken on the New England Highway covering the week Saturday 4th November to Friday 10th November 1995. Table 2.3 summarises the daily flows, broken down into vehicle type. The AUSTROADS vehicle type categories are given in brackets. The survey was undertaken just south of the Muscle Creek Road intersection.

TABLE 2.3 Current Traffic Composition on The New England Highway - Nov.1995

Day	Car (1,2) #1	Small Truck (3)	Rigid Truck (4,5)	Articulated (6-10)	B-Double, Other (11-13)	Total (1-13)
Sat	5266	239	47	481	50	6083
Sun	5835	151	23	531	65	6605
Mon	6077	379	94	1860 (332) #2	150	8560
Tues	5679	355	81	1441 (320)	129	7685
Wed	5671	318	118	1412 (326)	134	7653
Thurs	5899	336	113	1383 (294)	129	7860
Fri	6847	324	94	1229 (320)	138	8632
Week day	6035 (76%)	342 (4%)	100 (1%)	1348 (318) (17%)	136 (2%)	7961 (100%)

Notes:

#1: AUSTROADS vehicle categories
#2: MCC truck movements

Table 2.3 indicates that the average weekday two-way traffic flow on the New England Highway south of the Muscle Creek Road intersection is some 7,961 veh/day, with 17% of this traffic articulated trucks, plus 2% larger combinations such as B-Doubles. The medium-large rigid truck category only had 1% of the total vehicles, with small trucks accounting for 4% of the total. Of the weekday average of 1348 articulated truck movements, MCC haul trucks averaged 318 movements, or 24% of the total articulated trucks. If larger trucks were included in these totals - Types 11-13) - the MCC proportion is 21%. Over all vehicle movements, the MCC trucks accounted for 4% of movements. It is thus seen that the MCC haul trucks are not the predominant heavy vehicle on the road at this point, being between one every four and one every five heavy vehicles. The balance would probably be long distance freight vehicles.

The traffic survey also provided information on the hourly distribution of flows. Table 2.4 summarises the information for two-way average weekday flows, per vehicle type.

TABLE 2.4 Weekday Traffic Flow Distribution on New England Highway - Nov.95

Hour	Car	Small Truck	Rigid Truck	Articulated	B-Double, Other	Total
0-1am	31	5	1	37	4	78
1-2	17	3	1	29	3	53
2-3	17	3	1	24	4	49
3-4	17	10	1	27	2	57
4-5	27	7	2	36	3	75
5-6	93	7	3	46	5	154
6-7	434	16	5	51	6	512
7-8	381	17	7	90	9	514
8-9	357	20	7	87	8	479
9-10	342	19	6	86	10	463
10-11	342	24	7	99	9	481
11-12n	370	30	6	109	11	526
12-1pm	379	26	8	98	9	520
1-2	356	22	8	89	9	484
2-3	484	28	7	57	5	581
3-4	541	21	7	41	3	613
4-5	459	21	5	39	5	529
5-6	363	12	3	40	5	423
6-7	274	12	2	46	3	337
7-8	186	10	2	37	3	238
8-9	136	10	2	38	4	190
9-10	131	7	1	45	3	187
10-11	159	6	4	57	5	231
11-12	130	5	2	41	5	183
24 hour	6036	341	98	1349	133	7957

Note that the total flow in this table is slightly different to the 7961 veh/day in Table 2.3, due to round off variations. Table 2.4 indicates that the peak periods for total flow are 7.00-8.00am and 3.00-4.00pm, with the latter flows being higher than the morning flows. With the Type 6-10 vehicles, including the MCC trucks, the hourly flows plateau in the period 7.00am to 2.00pm, while still maintaining constant throughput throughout the day and night. The plateauing in the day is probably partly the result of the MCC trucks topping up the base truck load on the Highway. Impacts due to heavy vehicles continue throughout the evening and early morning, beyond the times that MCC transport coal.

2.3 Operation of Mine

The current extraction of coal at the mine occurs in the No.2 Underground, producing approximately 300,000 tpa, and in the No.2 Open Cut, a truck and shovel operation producing approximately 1.7 mtpa. The total company workforce is 209, of which 53 are employed in the underground operation.

The open cut operation has approximately 10 years of production left. The underground mine will cease development during 1997, unless the extraction area is increased.

All coal is transported by road, using contract trucks. Each mine has an automatic weighbridge, allowing the drivers to check their loads, and ensure that they are not overloaded. The Boral Freightliners currently in use have loads of about 27 tonnes. Some B-Doubles are also used. These would typicaly have loads of 34 tonnes. After leaving the weighbridges, drivers can pull over beside the haul road to securely fix their tarpaulins, before joining the public road network.

The usual transport hours are 7.00am to 10.30pm. There are no specific controls on these hours, in the current consent for the mine operation.

Weighbridge data from both mines for the period January 1994 to June 1996 was reviewed to determine the number of loads per day, and the destinations of those loads. This data provides a very accurate picture of truck movements from the current mine operation. The results are summarised on Table 2.5.

TABLE 2.5 Current Monthly Truck Loads of Coal from Muswellbrook Coal Co.

Month/Year	Transport Days	Destination Bayswater Power Stn	Port Newcastle	Liddell Coal Loader	Total
January 1994	20	1713	2814	0	4527
February	21	680	4845	84	5609
March	21	1925	2779	0	4704
April	16	901	919	0	1820
May	25	1454	6173	0	7627
June	23	981	4270	0	5251
July	23	997	2629	0	3626
August	25	1463	3741	1143	6347
September	24	1037	3300	0	4337
October	20	982	2440	0	3422
November	23	1604	3518	0	5122
December 1994	18	889	5130	0	6019
Monthly Avg.	21.6	1219	3546	102	4867
January 1995	21	1498	1934	0	3432
February	19	1306	3049	0	4355
March	22	1722	377	1114	3213
April	19	491	3644	1307	5442
May	24	1454	2614	0	4068
June	22	596	5389	0	5985
July	23	1219	3878	0	5097
August	20	1562	1963	0	3525
September	21	1365	2410	0	3775
October	20	1045	3139	0	4184
November	10	959	911	0 (2 other)	1872
December 1995	21	1109	3041	0	4150
Monthly Avg.	20.2	1194	2696	202	4092
January 1996	24	812	5543	0	6355
February	23	1093	3908	0	5001
March	24	1299	4483	0	5782
April	19	1999	2771	0 (4 other)	4774
May	26	1835	5743	0	7578
June 1996	23	164	5985	0	6149
6 Month Avg.	23.2	1200	4739	(1)	5940
30 Month Avg.	21.4	1205	3445	121	4771
		25.3%	72.2%	2.5%	100.0%

With an average load of about 30 tonnes, with the mix of articulated and B-Double trucks, the 4,771 truck loads per month would represent 143,130 tonnes/month, or 1,717,560 tpa. This is slightly less than the nominal production of 2.0 mtpa, due to annual variations in sales.

With the 1205 loads per month to Bayswater Power Station, the annual load, at 30 tonnes per load, would be 433,800 tpa. This is consistent with the contract requirement for Bayswater Power Station, of about 500,000 tpa. The volume of coal transported by road to Port Newcastle - to Port Waratah and to Kooragang coal loaders - averages 72% of the total.

With an average of 21.4 days per month and 4,771 loads per month, there is an average of 223 loads per average day. As the monthly data indicates, and as indicated in more detail in the daily data, there is substantial variation in the number of loads per day and per month. The average of 223 loads per day equates to 446 truck movements per day, including the empty return trips, with about 320 of these movements being to Port Newcastle.

3.0 TRANSPORT IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 Description

The proposed development is the extension of the area mined underground. The existing underground mine will cease development in 1997. Unless an additional area is made available for mining, the closure of this mine will result in the loss of jobs. It will also result in the waste of existing coal reserves. These reserves can be efficiently extracted using the existing underground mine infrastructure and staff. With this same staff but with improved extraction techniques, the current rate of extraction of 300,000 tpa can be increased to 500,000 tpa.

In summary, without the mine extension, the current total company output of 2.0 mtpa will reduce to 1.7 mtpa in 1997. With the mine extension, the company output will be increased to 2.2 mtpa, and be maintained at this level for about 10 years. The transport impact is the impact resulting from the 200,000 tpa increase in annual production. With no change in staff numbers, there would be no additional commuter movements to the site.

Revised transport arrangements are currently being reviewed by the company. If it is economically viable, the company may construct a rail loop into the mine site. A new spur line may be constructed from the Main North Railway at a point generally adjacent and easterly to the alignment of a previous rail spur. This rail loop would be used to transport all coal destined for Port Newcastle. Existing road transport arrangements would be retained for the approximately 500,000 tonnes per annum transported to power stations in the Hunter Valley.

Should the rail loop not be viable, the company propose to persue the development of a multi-user coal loading facility such as the Ravensworth Coal Terminal. Under this scenario, coal would be road transported to a terminal, for transferral to rail.

If a multi-user facility is not economically viable, the company propose to maintain their existing approved coal haulage by road.

3.2 Traffic Generation and Distribution

With the proposed new mine and the rail loop into the mine site, the overall coal truck movements from the mine would significantly reduce, as indicated below. Truck movements have also been estimated for the situation with the mining extension but without the rail loop.

Based on the 30 month data for current transport operations from the mine, coal would be

transported for an average of 21.4 days per month, or 257 days per year. The additional output of 200,000 tpa would thus be an additional 778 tonnes per day. Without the rail loop, at an average load of 30 tonnes, this would be about 26 loads per day, or 52 truck movements. Allowing for some variation, the daily truck movement increase used for the assessment is 60 trucks per day. Thus, the average total movements would increase from 446/day to 506/day.

Based on the current load destinations, the relative flows would be:

Destination	**Current Movements/Day**	**Movements/Day No Rail Facility**	**Future Movements/Day with Rail Facility**
Port Newcastle-road	322	366	0
Bayswater Power S	112	128	128
Liddell coal loader	12	12	0
Total	446	506	128

The coal sold to Bayswater power station could not feasibly be transported by rail. There is an on-going contract to supply Bayswater power station with coal for the short to medium term. Thus, some 72% of the coal is currently transported by road to Newcastle. From the point of view of the environmental implications of this road haulage through the towns and cities along the New England Highway, it would be ideal if this coal could be transported by rail. However this ideal would depend on the practical aspects of such transport, and on the relative cost implications. The additional coal that would be road-transported to Newcastle would amount to 144,400 tpa, which equates to just under 20 truck loads per day. It should be noted that the current consent allows for the road haulage of the existing output of the mine.

The rail terminal options that have been addressed are:

1. Drayton coal loader
2. Liddell coal loader
3. Proposed Bayswater coal loader
4. Proposed Ravensworth coal loader

The Drayton coal loader is currently in operation, exclusively serving Drayton colliery. The problem with using it is in having a separate stockpile for MCC coal. Discussions are being held with Drayton in this regard.

The Liddell coal loader is currently used by MCC for less than 4% of the output. This facility, used by Cumnock and Bayswater mines, has the major disadvantage of not having stockpiling facilities for an external party, in this case, MCC. While the

opportunity to use it is made when it is convenient, this is only occasionally. It was used on 48 days in the period January 1994 to October 1995.

The proposed Bayswater coal loader at Ravensworth would be an opportunity. It will not provide stockpiling for external parties in the short term, although this could change. Discussions are being held with Bayswater.

The proposed Ravensworth coal loader - Upper Hunter Coal Terminal Pty Ltd (Messrs Marheine and Horseman) is proposed to be a multi-use coal loading terminal, to be constructed at Ravensworth, on a site bounded by the Old New England Highway, the Mount Owen overland conveyor, Bayswater Creek and the Liddell rail loop. Trucks would access the facility via the Old New England Highway. Discrete stockpiles for each participating coal company would be established, and served by a rapid reclaim conveyor/train loading facility. Development consent was previously given for the operation of the Mount Owen open cut coal mine plus a single user coal terminal at the Ravensworth site. In 1995 BHP Australia Coal purchased the Mount Owen mine and the terminal site. Upper Hunter Terminal Pty Ltd has since acquired the proposed terminal site from BHP. An environmental impact statement is being prepared for this proposed multi-user coal loading facility.

In summary, we recommend that all options be persued to transfer the MCC coal with a Port Newcastle destination onto the rail network. It would be desirable to transfer all the coal currently transferred by road to Newcastle, in addition to the additional coal from the underground mine extension. However it should be pointed out that existing coal transport is covered by existing consents. The mine extension would produce 0.5 mtpa, some 0.2 mtpa more than the current operation. On current distribution patterns, this increment amounts to just under 20 truck loads per day to Port Newcastle. The 0.5 mtpa amounts to about 46 truck loads per day to Port Newcastle.

3.3 Transport Impact

Muscle Creek Road

As indicated on Figure 1, Muscle Creek Road provides the link from the MCC haul road to the New England Highway. Figure 2 reproduces the layout of the intersections of Muscle Creek Road with the haul road and with the Highway.

Looking first at the haul road intersection, the current traffic flows are very low. West of the haul road, the highest daily traffic flow on Muscle Creek Road in the survey discussed in Section 2.2 was 641 veh/hr, on a Thursday. On the same day the two-way flow east of the haul road was 129 veh/day. The balance of 512 veh/day would be haul road traffic. Assuming all haul road traffic travels to/from the West, and assuming that in the worst hour the flows are 20% of the daily flows - a higher percentage than normally occurs - the current operation of this intersection can be reviewed. Using the INTANAL program, as used by the RTA, the current level of service in this assumed peak hour is A, the highest level, with an average delay of less than 5 seconds.

Adding traffic caused by the additional 200,000 tpa would result in an additional 30 loads per day. Over a transport period of 10 hours, this would be 3 loads per hour. Thus, an additional 6 truck movements were added to the base traffic flows. The level of service would remain at A, the highest level, with the delay levels not changing. As a sensitivity test, all traffic flows at this intersection were doubled. The INTANAL analysis indicates that the level of service would remain at A, the highest level, with the average delay increasing from an estimated 4.2 seconds, to 4.5 seconds. We conclude that this intersection has ample capacity to handle the projected traffic flows, and ample capacity for more than a doubling in traffic flows. No works would be required at this intersection.

West of the haul road intersection, Muscle Creek Road currently carries an average weekday flow of 499 veh/day, with the highest weekly flow being 641 veh/day. The additional 200,000 tpa would result in these flows increasing by about 60 veh/day, two-way, giving an average weekday flow of about 560 veh/day and a maximum daily flow of 700 veh/day. These increases are of no consequence. AUSTROADS guidelines - "Guide to Traffic Engineering Practice - Part 2: Roadway Capacity (1988)", suggest maximum annual average daily traffic flows for two lane, two-way rural roads. Based on an average of 14% trucks - lower than the subject case - the resulting flows would be well within the limit for level of service A, the highest level, for level terrain.

There is a proposed rural residential subdivision of some 94 lots, with access onto Muscle Creek Road. At an estimated daily traffic generation of 9.0 veh/day, this subdivision would add about 850 veh/day to Muscle Creek Road. This would take the new average weekday flow to about 1400 veh/day, or the peak daily flow to about 1550 veh/day. These flows are still within the limit for level of service A, for level terrain, so the situation would remain very satisfactory.

There would be very minor amenity impacts associated with the additional 60 truck movements in Muscle Creek Road. There are two houses in the vicinity of the road, plus a third further away. It is unlikely that the average increase from 446 to 506 truck movements per day would be noticed. The daily variations in truck movements are currently greater than this increase.

New England Highway

Looking first at the intersection of Muscle Creek Road with the Highway, this intersection is currently constructed to a good standard. Based on current average weekday hourly traffic flows on the Highway in the periods 7.00-8.00am and 3.00-4.00pm, the INTANAL intersection analysis program indicates that this intersection is currently operating at level of service A in both peak periods. The additional 60 truck movements per day resulitng from the 200,000 tpa production increase would see a minor increase of about 6 veh/hr in each peak period. The INTANAL analysis indicates that this increase would have an insignificant impact on intersection capacity, with the level of service remaining at A. The average delay would remain at less than 1 second.

The impact on this intersection of adding traffic from the proposed rural residential subdivision was also tested. This indicated that the average delay increased to about 2 seconds, with the delay to the right turn out of Muscle Creek Road increasing from 10 to 11 seconds, with the intersection remaining at level of service A, the highest level. As a sensitivity test, all turning flows were doubled. The resulting analysis indicated a slight further delay increase, but with the level of service remaining at A.

The intersection of New England Highway and Muscle Creek Road would thus have ample capacity to cater for the small increase in coal truck - and other projected - traffic, with a high level of service, with no intersection upgrading works required.

On New England Highway south of Muscle Creek Road, the current average weekday traffic flow of 7,961 veh/day would increase to about 8,021 veh/day, an increase of less than 1%. The number of large articulated trucks - AUSTROADS types 6-13 - would increase from 1484/day to 1544/day, a 4% increase. This is a small increase that would be less than daily variations. For reference, the number of large articulated trucks at present on weekdays varies from 1367 to 2010 veh/day - Table 2.3. Table 3.1 summarises this data.

TABLE 3.1 Comparison of Current and Future Weekday Traffic Flows on New England Highway south of Muscle Creek Road with Mine Expansion

Day	Total Flows		Articulated Truck Flows	
	Current	+ Expansion	Current	+ Expansion
Monday	8560	8620	2010	2070
Tuesday	7685	7745	1570	1630
Wednesday	7653	7713	1546	1606
Thursday	7860	7920	1512	1572
Friday	8632	8692	1367	1427
Avg.Weekd	7961	8021	1484	1544

In summary, the additional mine production would only have a minor impact on traffic flows on the New England Highway, as indicted by the figures in Table 3.1. If all haulage was by road, the additional truck traffic would be about 42 truck movements per day, with the balance of the additional 60 truck movements being deliveries to Bayswater Power Station.

4.0 CONCLUSIONS

1. The proposed extension of the Muswellbrook No.2 coal mine would result in the total mine output increasing from 2.0 mtpa to 2.2 mtpa. Without this extension, the No.2 underground mine would cease development during 1997. The mine extension would maintain the existing workforce at the mine, with no increase.

2. At present there are an average of 223 truck loads of coal per day, or 446 truck movements per day. The mine transports coal for about 257 days per year, with an average load of about 30 tonnes, using both articulated trucks and B-Doubles. The additional 200,000 tpa of coal production would increase this to 253 truck loads per day, or 506 truck movements.

3. Based on the destinations of coal transported in the period January 1994 to June 1996, some 72.2% of coal is transported by road to Port Newcastle, 25.3% by road to Bayswater Power Station and the balance to the Liddell rail coal loader and other local destinations. If this market split was maintained, as would be anticipated, the additional coal production would result in an additional 20 truck loads on the Highway to Port Newcastle, or 40 truck movements.

4. We recommend that all options be persued to transfer the MCC coal with a Port Newcastle destination onto the rail network. With the location of a proposed coal loader within the Singleton local government area, the full mine output may still be transported by road from the mine and southbound down the New England Highway, with some trucks diverting to Bayswater Power Station.

5. The traffic impact of the additional coal transport has been assessed in Muscle Creek Road and on the New England Highway. The intersection of Muscle Creek Road with the mine haul road is currently operating at a high level of service. When assessed with the INTANAL computer model, the additional truck flows were not indicated to have any adverse impact, with the level of service remaining at the highest level. The intersection of Muscle Creek Road and the Highway is also currently operating at a high level of service, which would remain when the extra truck traffic was added, even when traffic from the proposed rural residential subdivision on Muscle Creek Road is also added. No intersection improvement works would be required.

6. The additional 60 movements per day would increase the average weekday flow in Muscle Creek Road to about 560 veh/day. In traffic efficiency terms, this road would remain at a high level of service. There would be a minor amenity impact on two to three dwellings in Muscle Creek Road, although this increase would be less than typical daily variations in truck movements.

7. On the New England Highway south of Muscle Creek Road the additional mine output would see average weekday traffic flows increase from 7,960 to 8,020 veh/day, an increase of less than 1%. The number of large articulated trucks would increase from about 1480 to 1540 per day, a 4% increase. This small increase would be substantially less than current daily variations.

8. In summary, the proposed mine expansion would be expected to have an acceptable traffic impact.