CHAPTER 14 TRAFFIC AND TRANSPORT

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14 TRAFFIC AND TRANSPORT

This chapter provides an assessment of impacts of the Project on traffic and transport, including off-site rail impacts. Measures are included to manage identified potential impacts.

14.1 INTRODUCTION

The Project will generate light vehicle traffic on the local road network associated with movements of employees, visitors and contractors to and from the site and some heavy vehicles for service and maintenance activities and deliveries of construction materials, reagents for processing, fuel and explosives. All dispatch of zinc and lead concentrates will be by rail which will minimise traffic generation on the road network.

Ore crushed during the construction stage will be transported off-site for mineral processing. The crushed ore will be transported by road to the CBH Endeavor Mine near Cobar.

The traffic and transport investigation and assessment, including this chapter, was completed by ERM.

14.2 METHODOLOGY

Data supplied by BHOP regarding traffic generation, timing and haulage routes for the construction and operations phases of the Project were used in conjunction with data on existing traffic and transport conditions to assess impacts of the Project on traffic and transport. Data on existing traffic and transport conditions was derived from:

- review of traffic assessments conducted for Rasp Mine, sourced from ERM (ERM 2001), ERM (ERM 2006) and ERM (ERM 2007). This included peak hour traffic counts and results of a traffic analysis (using the INTANAL traffic analysis programme) of traffic conditions and levels of service for key intersections;

- review of baseline traffic volume and heavy vehicle percentage data for the nearby road network, obtained from the BHCC and the RTA;

- one hour AM peak hour traffic survey conducted by ERM on 26 April 2007 at the key intersection to be affected by the Project (Eyre St/ Bonanza St intersection) and at Eyre St in the vicinity of the site access; and

- review of ARTC schedules for Broken Hill – Port Pirie, to gain an indication of existing freight train movements along this line.

14.3 EXISTING ENVIRONMENT

14.3.1 Internal roads and car parking

The internal road network comprises a series of unsealed roads which provide access to key areas, including offices, open pits, site buildings and the proposed processing area (refer *Figure 2-3*). The main internal roads which will be used for the Project are the site access road off Eyre Street, the proposed road through the site (which provides access to Kintore Pit) and the haul road in Kintore Pit which provides access to the decline. These roads are sufficiently wide, have areas to accommodate passing vehicles and are well formed and graded with good visibility.

In 2006, some resurfacing and drainage work was undertaken on the Kintore Pit haul road to cater for traffic generated for the decline development and resource assessment programme.

In 2007 a sealed car parking area was established to the northwest of the administration BHOP offices, accommodating 40 vehicles. In addition there are dedicated parking bays adjacent to the BHOP offices and there is car parking areas distributed around the site. Employee and contractor vehicles that are not required to enter the site will be required to park in the sealed car park. There is sufficient designated parking bays to accommodate required vehicles around the site. Parking on Eyre Street will not be required and will be discouraged.

14.3.2 Site access

There are four main existing vehicle access points to the site. These are located off Eyre Street, MacGillivray Drive, South Road, and near to Thompson Shaft.

The sealed site entry from Eyre Street (refer *Figure 14-1)* is the main site access and will be used by the majority of mine-related traffic. Sight distances from this access point are approximately 150 m to the west and over 300 m to the east. Taking into account the speed limit of 50 km/hr along Eyre Street at this location, these site distances are adequate, as assessed against AUSTROADS (2005), which specifies a required entering sight distance of 125 m.

The configuration of the current entry and exit at Eyre Street requires large trucks such as B-doubles turning left into the site or exiting the site to the left to do so by crossing the road centreline. A condition of the recently approved DA264/2009 requires that modifications to this access point be undertaken to allow trucks to enter and exit without the need to cross the centreline. Plans are currently underway for these modifications.

The site access off South Road has poor lines of sight in both directions due to a hill and a bend in the road. Some oversized delivery trucks will utilise the South Road access, mainly during construction. This will require the use of a safe entry procedure which will form part of the traffic management plan, including spotters, and may require the temporary stoppage of traffic to allow trucks to safely enter and exit the site

The site access off MacGillivray Drive (via Iodide Street and Crystal Street) which provides access to Delprat Shaft and Visitor Centre and the access to Thompson Shaft will not be used by mine-related traffic and has not been assessed as part of this EAR.

14.3.3 Regional road network

The Broken Hill locality is serviced by the following regional roads and State Highways, as shown on *Figure 14-1*:

- Silver City Highway (State Highway (SH) 22), the major north south road link for western NSW and part of the route between Broken Hill and Melbourne;
- Barrier Highway (SH 8), a major east-west road link that connects to the Cobb Highway, Cobar and Sydney to the east and Adelaide to the southwest;
- Menindee Road (Main Road (MR) 66), which provides connectivity to other regional roads to the southeast and to Menindee; and
- Silverton Road (MR 81), which extends northwest to Silverton.

14.3.4 Local road network

The public road network in the vicinity of the site is illustrated in *Figure 14-1*. A description of surrounding roads to be utilised by mine related traffic is given below. These roads are currently utilised by traffic associated with the exploration decline development at Rasp Mine.

Eyre Street/ Holten Drive

The site has direct access to Eyre Street, which is a line-marked local road that extends from Bonanza Street in the west and becomes Holten Drive to the east. Eyre Street distributes mine site traffic to major roads connecting to other parts of Broken Hill. It provides connection to the Silver City Highway via Bonanza Street and to Menindee Road via Holten Drive. It is generally posted at 50 kilometres per hour (kph), with the stretch of road east of Whittaker Street to immediately west of the railway crossing posted at 60 kph. It has a sealed width of approximately 15 m at Eyre Street and 8 m at Holten Drive. The carriageway has a straight alignment and flat grade, with a generally good surface profile.

Eyre Street and Holten Drive have historically been subject to relatively high heavy vehicle flows related to mining within the Project Area the Blue Metal Quarry and grain silos which were formerly located near its eastern end.

Eyre Street and Holten Drive are part of the designated heavy vehicle route through Broken Hill, with the exception of the section between Comstock Street and Bonanza Street. This exception is due to the Eyre Street / Bonanza Street roundabout, located approximately 250 m west of the site access. This roundabout cannot be easily negotiated by large heavy vehicles such as road trains or semi-trailers. To access Eyre Street from Bonanza Street, these vehicles must use the bypass route along Patton Street and Comstock Street.

A railway level crossing (Orange – Broken Hill Line) is located approximately 3 km east of the access point, near to the intersection with Menindee Road, with flashing lights present.

In 2007 RTA, ARTC and BHCC recently completed a major safety upgrade to the Holten Drive/ Menindee Road intersection. This involved construction of a new concrete traffic median, improvements to traffic signage, road delineation, safety barriers and road lighting and upgrades to the flashing lights and associated infrastructure at the level crossing. The road priority has been reversed at the intersection, to minimise the risk of a road train blocking the crossing while giving way to the Menindee road traffic, or blocking Menindee Road while giving way to a train.

Bonanza Street / South Road

Bonanza Street and South Road form part of the Silver City Highway route between Broken Hill and Mildura and part of the designated heavy vehicle route through Broken Hill. They are two lanes wide, with a short four-lane section adjacent to the site, north of Eyre Street. These roads are posted alternatively at 50 kph and 60 kph, with generally good road surface condition.

The Eyre Street/Bonanza Street roundabout cannot be easily negotiated by large heavy vehicles, as discussed above. In addition, the small roundabout at Bonanza Street/Patton Street is difficult for large heavy vehicles to negotiate. Where possible, heavy vehicles travelling through Broken Hill use the sign posted bypass route via Kanandah Road, Ryan, Creedon and Gaftney Streets, to avoid these roundabouts.

Menindee Road / Argent Street

Menindee Road is a two lane rural road that widens to a 15 m urban road in the vicinity of the Project Area. Argent Street is a wide urban road that forms part of the Barrier City Highway route through Broken Hill. It effectively provides two traffic lanes plus kerbside parking in each direction.

The road pavement surface at the intersection of Menindee Road and Argent Street is concrete to provide additional surface durability for turning traffic. These roads both have speed limits of 50 kph. They distribute traffic to and from the north-eastern parts of Broken Hill and onto the Barrier Highway to the east.

Traffic flows

There is limited available traffic flow data for roads surrounding the Project Area. A review of 1996, 1999 and 2002 AADT for the Barrier Highway, Silver City Highway/ Bonanza Street, Menindee Road and Silverton Road as contained in RTA (2003), indicated that traffic volumes in the local area generally declined or remained stable between 1996 and 2002. Traffic volumes on both main and local roads in Broken Hill are generally lower than recorded during the 1980s (RTA, 2003). This is most likely due to several mine closures during this period and as discussed in *Section 16.3.1*, Broken Hill has experienced a population decline over the past 15 years, which would result in a decline in traffic movements. Traffic volumes on roads immediately surrounding the site that are to be used for mine-related traffic are presented in *Table 14-1*. This data shows that peak hour traffic flows in the immediate vicinity of the Project Area are similar to or marginally lower than those recorded in 2001.

Table 14-1 Traffic volumes

Location	Daily traffic				Peak 1 hour flow	
	1997 (Council)	1999 (RTA)	2002 (RTA)	2005 (Council)	2001 (ERM)	2007 (ERM)
Eyre St east of Bonanza St	1864	-	-	-	191	173 (4.0)
Eyre St east of Comstock St	2009	-	-	2232(1.6-4.6)	-	153 (13.7)
South Rd north of Eyre St	-	-	-	-	775	659 (3.6)
Bonanza St south of Eyre St	-	8273	8254	-	657	571 (4.4)
Menindee Rd north of Holten Dr	-	2656	-	-	195	-

1. Bracketed figures are heavy vehicle percentage.

Table 14-1 shows that heavy vehicle flows on Eyre Street, Holten Drive, South Road and Bonanza Street generally vary from 1.6 to 4.6% of total traffic flows. The relative proportion of heavy vehicles on Eyre Street in the vicinity of the site access (13.7% of total peak hour flow) is higher than at its intersection with Eyre Street due to use of Comstock Street to bypass this roundabout.

14.3.5 Rail network

The remains of a rail siding approximately 600 m in length runs across the western end of the Project Area (refer *Figure 14-2*), and across the access road from South Road. This siding, used for previous operations at the site, has been partially removed and will be reinstated to cater for rail transportation of concentrate for the Project. It connects to the main Sydney to Perth railway line at a point approximately 1.7 km west of Broken Hill railway station. This main railway line runs through the Project Area and extends east (Orange – Broken Hill Line) and south (Peterborough – Broken Hill Line), providing connectivity with the east and south/ west Australian coastlines respectively.

Figure 14-1 Road network within Broken Hill

Legend

CML 7 Boundary

Project Area

The Peterborough – Broken Hill Railway line provides a rail link between Broken Hill and Port Pirie, located 395 km to the south. All except 25 km of this track is single track rail line. Freight trains run at varying frequencies along this line. In addition, the Indian Pacific passenger service between Perth and Sydney and the Countrylink service between Broken Hill and Sydney use the line through Broken Hill. The frequency of train movements through Broken Hill along this line are indicated in *Table 14-2*.

Table 14-2 Rail movements through Broken Hill

	Number of trips through Broken Hill	
	per week	**per day**
Passenger train	6	0-2
Freight train	37	3-7
Total	**43**	**3-9**

1. Freight train movements are for the Peterborough – Broken Hill Line for July 2006 and are sourced from ARTC's website. Some additional freight trains may operate only along the Orange – Broken Hill Line.

Products can also be dispatched to Newcastle via the Orange - Broken Hill line, Port Pirie via the intercontinental line and by national rail to Port Adelaide.

14.4 IMPACT ASSESSMENT

14.4.1 Internal roadways and parking

The Kintore Pit haul road will be used by nominally 50 t trucks to transport ore to the ROM stockpile, returning via the same route for reloading. Some light vehicle traffic will also use this road for access to the pit and decline. For ore haulage, it is predicted that there will be a maximum 94 movements (47 loads) per day during underground operations. To mitigate potential noise and dust issues, the haul road will be relocated around the northern side of the Kintore Pit and sealed from the Kintore Pit to the ROM pad.

Other internal roads may be utilised by light vehicles for staff, visitors and deliveries; a small number of heavy vehicles will also use these roads for deliveries. This will require existing roads to be upgraded and the construction of new roads.

Frequently used roads will be sealed; these are primarily to the processing and workshop areas.

Roads with a low frequency of use will be left unsealed and will be compacted road base material with high moisture content. A chemical dust suppressant will be used as a standard dust control measure on these roads. Static water sprays have already been installed on a portion of these service roads and will be maintained as a backup interim measure.

Existing roads are generally well formed and are constructed so that vehicles can pass; however some upgrades and resurfacing will be required. Internal roads will be subject to regular watering to minimise dust generation and will be regularly maintained. The main site access from Eyre Street has been sealed to the vehicle wash facility.

All new roads will be constructed of compacted road base, have appropriately designed drainage and have sufficient width to allow vehicles to pass safely. The gradient for internal roads, including the Kintore Pit haul road will not exceed 1 in 7.

The access off South Road, which will be used temporarily, will have suitable safety controls at the rail spur (refer to *Section 14.5*) and at the intersection with South Road (refer to *Section 14.4.2*). A safety procedure will be implemented for its use.

The sealed car parks immediately inside the Eyre Street entrance, adjacent to the site offices (16 spaces around the main site office and 10 spaces around Radford House), will be used for administration staff and site visitors. The 40 space car park constructed to the west of the main site office will be used for employee car parking.

Council's Development Control Plan for Industrial Development specifies that '*car parking space shall be provided on-site for employees, visitors and company vehicles and shall be calculated at the rate of one space per three employees'*.

The predicted number of employees for full-scale underground mining is 143, permanent contractors will number 10 and short term contractors and site visitors are conservatively estimated to be 12 per day. As such, 55 on-site car parking spaces would be required to meet Council requirements. The existing car parks will provide adequate parking spaces to meet this requirement.

Potential air quality and noise impacts from internal site traffic are discussed in *Chapters 7* and 8.

14.4.2 Site access

The existing access off Eyre St will be the primary access point during the life of the Project. As discussed in *Section 14.3.2*, it provides sufficient sight distances and pending approval of a no parking zone in Eyre Street, it will accommodate the path of a turning B-double without the need to cross the Eyre Street centreline.

The internal road from the Eyre Street entrance to the proposed processing area cannot be easily negotiated by oversized vehicles. Site access off South Road will be temporarily utilised for deliveries of heavy and/or wide loads during construction, and possibly on occasion during operations. The restricted sight distances at this entrance are not expected to increase risks as a site access permit, outlining traffic control measures, will be required to use this entrance. This will provide for safe entry to and exit from the site as well as maintain the safety of the public using South Road.

14.4.3 Traffic generation on external roads

Construction

During the construction period, variable volumes of construction traffic will use the local and regional road network. Average truck deliveries during construction are predicted at two loads (four movements) per day with the majority (80%) of trucks using the Eyre Street entrance.

Two buses and up to eight light vehicles will be used to transport construction staff between their accommodation and the site, with most trips occurring at shift changeover periods. In addition, it is predicted that two courier deliveries (light vehicles) will occur per day.

Due to the following factors, impacts from construction traffic are anticipated to be minimal and are not expected to affect the capacity of the surrounding road network:

- small volume of construction traffic to be generated (estimated at 28 vehicle movements per day);
- heavy vehicles will be generally be restricted to the approved B-double route through Broken Hill;

- the impact would be short-term, as the construction period is only anticipated to last for twelve months; and
- construction traffic will generally be restricted to day shift hours between 7am and 7pm.

Table 14-3 Traffic generated on internal and external roads – construction activities

Activity	Vehicle type	Vehicle movements	
		Weekly	Delivery Location
Fuel	Semi or Double B	0.5	Fuel storage tank
Explosives	Semi or Double B	1	Surface explosives magazines (BHP Pit)
Workshop Spares	Flattop or utility	6	Workshop
Underground Stores	Semi or Double B	2	Kintore Pit
General Deliveries	Car or utility	4	Workshop
Service Trucks	Flattop or utility	4	Kintore Pit
Construction vehicles	Semi	14	Processing plant area

Temporary ancillary surface mining activities

The proposed activities will generate light vehicle traffic on the local road network associated with movements of employees, visitors and contractors to and from the site, some truck movements from deliveries and heavy vehicle traffic transporting crushed ore from the site.

Table 14-4 Traffic generated on internal and external roads – ancillary surface mining activities

Activity	Vehicle type	Vehicle movements	
		Daily	Peak hour
Mine trucks (Kintore Pit to temporary ROM stockpile)	50 t trucks	14	NA[1]
Road trucks (transport of crushed ore off site)	50 t B-doubles	21	2
Maintenance and delivery vehicles	Light vehicles and light trucks	11	1

1. Mine trucks will not travel off-site.

It is predicted that an additional 2 B-double trucks carrying crushed ore and returning empty trucks will use the heavy vehicle route through Broken Hill, Eyre Street – Holten Drive – Menindee Road / Argent Street – Barrier Highway, per hour or 21 vehicles per day. An additional 2 trucks per hour on average or 11 vehicle movements will occur as a result of maintenance activities per day.

There will also be increased light vehicle traffic from employees and contractors attending the site. It is anticipated that this traffic (35 vehicle movements) will peak around 7 am and 7 pm at shift change over.

The potential impacts of traffic noise resulting from operational related traffic on public roads are assessed have been assessed by EMGA who have predicted that road traffic noise limits will be met (refer *Section 7.2* and EMGA report *Annexure G(B)*).

Given the volume of additional traffic and the compliance with noise traffic limits, the additional movements are considered unlikely to have any adverse impact either on traffic movements in the locality or the local community.

Due to the short time frame for these activities they are not included in the discussions below.

Operation

During mine operations, traffic generated on the surrounding road network will be predominately light vehicles for movement of employees, visitors and contractors. There will also be some heavy vehicles for deliveries of reagents, fuel and explosives, and supplies for the workshop, underground and administration activities. Contractor vehicles for service and maintenance will also use the local road network. Deliveries will occur between the hours of 7am and 7pm and will generally be from Monday to Friday.

It is not anticipated the Project will generate significant heavy vehicle movements in the local area. Most additional traffic movements are associated with waste rock transfer and concentrate transport both of which will not impact local roads as the waste rock will be retained on-site and concentrate will be transported from the site by rail. Other than site deliveries, heavy vehicle movements will be within the boundaries of the Project Area.

The expected peak volumes of traffic to be generated by the Project are summarised in *Table 14-5*. In summary, the Project is anticipated to generated 202 daily vehicle movements on the surrounding road network, of which a maximum of 30 are predicted to be heavy vehicle movements.

A conservative approach has been taken, with calculations of peak hour vehicle movements based on the following assumptions:

- all predicted daily heavy vehicle deliveries, service vehicles, administrative employees and almost half of the light delivery vehicles are assumed to enter the site over a one hour period, coincide with the shift changeover (6.30am to 7.30am and 6.30pm to 7.30pm);
- traffic generation for employee movements has been conservatively assessed on the basis that employees will drive to the site, at a nominal rate of 1.5 employees per vehicle. Up to an estimated 15% of employees could potentially walk, cycle or travel by bus to the site; and
- traffic generated by current operations at the Rasp Mine have not been subtracted.

Heavy vehicle traffic generation has been conservatively assessed on the basis that reagent, fuel and explosive deliveries all occur on the same day. In reality, these deliveries will not all occur daily. For lime, grinding ball, fuel and explosive there will be a total of approximately six deliveries (12 movements) per week, for copper sulphate and depressant there will be two deliveries (four trips) per month and for flocculant and xanthate, only six deliveries (12 movements) per year.

Table 14-5 Traffic generated on external road network during mine operations

Activity	Vehicle type	Peak traffic generation (vehicle movements)	
		Daily	Peak hour
Reagent delivery	20 t truck	12	6
Fuel/ explosive delivery	Semi or B-double	4	2
Workshop/ underground/ admin/ other general delivery	Semi/ B-double/flattop	12	6
	Light vehicle	16	3
Service and maintenance activities	Flattop truck	2	1
	Light vehicle	2	1

Activity	Vehicle type	Peak traffic generation (vehicle movements)	
		Daily	Peak hour
Staff movements	Light vehicle	134	67
Site visitors	Light vehicle	20	-
TOTAL	**Heavy**	30	15
	Heavy + Light	202	86

1. One site visit is equivalent to two vehicle movements i.e. access and egress from the site.
2. Peak hour is assessed as 6.30am-7.30am and 6.30pm-7.30pm, to coincide with shift changeover times of 7am and 7pm.
3. Vehicle movements are for a worst case scenario, whereby all predicted daily heavy vehicle deliveries, service vehicles, administrative staff and almost half (3) of the light delivery vehicles enter the site over a one hour period, coincident with the shift changeover.
4. Staff movements are assumed to occur at a rate of 1.5 employees per vehicle.
5. Flattop trucks are conservatively assumed to be heavy vehicles.

Typical light vehicle traffic distribution for employee movements, site visitors and some deliveries is anticipated to be:

- 60% north west via Eyre Street and South Road;
- 10% north east via Holten Drive and Menindee Road;
- 22% south via Eyre Street into local Streets including Comstock Street; and
- 8% south via Eyre Street and Bonanza Street.

Typical heavy vehicle traffic distribution for deliveries and service activities is estimated to be:

- 40% via Eyre Street and South Road;
- 20% via Holten Drive and Menindee Road;
- 30% via Eyre Street and Comstock Street; and
- 10% via Eyre Street and Bonanza Street.

Broad assessments of the peak hour and daily traffic increases on the road network associated with the Project are presented respectively in *Tables 14-4* and *14-5*, based on the predicted distributions outlined above. 'Peak hour' for the Rasp Mine (6.30am-7.30am and 6.30pm-7.30pm) is conservatively assumed to coincide with the Broken Hill road system peak hour, which would in reality occur later of a morning and earlier of an evening.

Table 14-6 Peak 1 – hour traffic flows – existing and predicted

Road	Heavy vehicles – peak 1- hour flow			Total Peak 1-hour flow			
	Existing	Project	Total with project	Existing	Project	Total with project	Increase
Eyre St (west Comstock St)[1]	7	+7	14	173	+56	229	32%
Comstock St	N/A	+5	N/A	N/A	+13	N/A	N/A
Holten Dr[1]	21	+3	24	153	+10	163	6.5%
South Rd[1]	24	+6	30	659	+49	708	7.4%

Road	Heavy vehicles – peak 1- hour flow			Total Peak 1-hour flow			
	Existing	Project	Total with project	Existing	Project	Total with project	Increase
Bonanza St (south Eyre St)[1]	25	+1	26	571	+7	577	1.2%
Menindee Rd[2]	-	+3	-	195	+10	205	5.1%

1. Existing Peak 1-Hr flows sourced from 1- hour AM peak hour traffic surveys conducted by ERM on 26 April 2007.
2. Existing peak 1-hour flows sourced from ERM (ERM 2001) peak hour traffic counts (which are comparable to 2007 volumes (refer *Table 14-1*)).
3. N/A – not available

The Project will increase peak hour traffic volumes on the local road network, particularly along Eyre Street between the site access and Bonanza Street (refer *Table 14-6*). However, volume increases are less than 7.5% for other roads and the total peak 1-hr flows will remain low. These conservative predictions indicate that the impact of traffic generation for the Project upon peak hour flows will not be significant

Table 14-7 Daily traffic– existing and predicted with project

Road	Existing AADT	Daily traffic generation for project	Future AADT (existing + project)	% Increase from existing
Eyre St (west Comstock St)	2471	+132	2603	5.3%
Comstock St	N/A	+28	N/A	N/A
Holten Dr	2186	+23	2209	1.1%
South Rd	9414	+115	9529	1.2%
Bonanza St (south Eyre St)	8157	+17	8174	0.2%
Menindee Rd	2786	+23	2809	0.8%

1. Existing AADT is calculated on the assumption that peak 1-hour flows provided in *Table 14-4* are 7% of AADT.

The Project is predicted to increase daily traffic on Eyre Street by approximately 5.3% and will result in an increase of 1.2% or less at other locations (*Table 14-7*). These traffic increases represent only minimal impact, particularly given that traffic volumes on the local road network are approximately 30% lower than they were in 1982 (ERM 2001). Existing traffic flow data was not available for Comstock Street so future flows were not able to be predicted. However, given the small volume of mine-related traffic to be generated on this road (13 vehicle movements during peak hour and 28 daily movements), adverse impacts are not expected.

Heavy vehicles travelling to and from the site will generally use the designated heavy vehicle route through Broken Hill which will minimise potential impacts. The Project is only predicted to generate a maximum of 30 additional heavy vehicle movements on the local network per day, which is not considered to be significant.

14.4.4 Transport of crushed ore

During construction and until the processing plant is operational it is proposed to crush mined ore on site and transport to the Endeavor Mine at Cobar for processing. This is a temporary activity as once the processing plant is commissioned all ore mined on CML7 will be processed on site.

Once crushed the material will be loaded into a truck with trailer (up to 50 t per load) using a FEL. The truck / trailer doubles will be fitted with covers and leave site via a truck wash facility to remove any material or dust build-up on the truck/trailers. The truck wash system uses sprays to clean both under and around the truck to remove material. The trucks will exit the wash station and the site via a sealed road.

Trucks transporting the material will use the existing road train route through Broken Hill to the Endeavor Mine depicted on Figure *14-2*.

14.4.5 Rail network

A rail siding will be reinstated at the site to enable rail dispatch of all product concentrate. Potential traffic and transport impacts associated with construction of the rail siding are addressed in the general discussion of construction impacts contained in *Section 14.4.3*.

During normal operations the Project will not require any additional trains to operate along the main line. It is possible that from time to time an additional train may operate to accommodate the increased freight. Therefore, the maximum net increase in train movements along this rail line will be one per week, from 43 to 44 trains, which is not considered to be significant.

14.4.6 Public transport, pedestrians, cyclists and emergency access

There are no existing or proposed facilities for public transport, pedestrians or cyclists to the Project Area. Some pedestrian and cyclist movements are likely to occur along the roads surrounding the Project Area and the Broken Hill bus service operates along South Road. The Project is not expected to impact on these activities. Emergency access is provided via the existing road network.

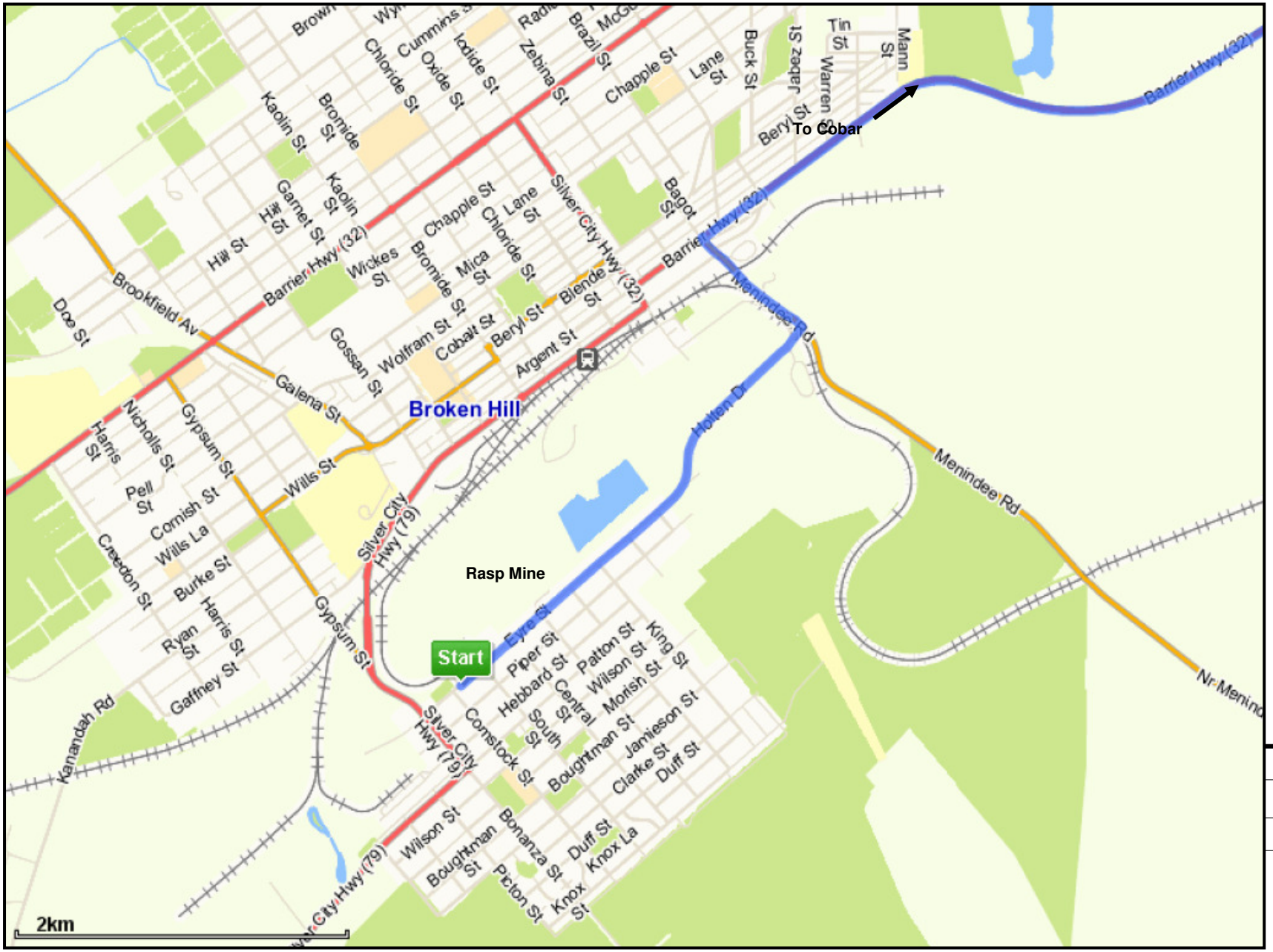
14.4.7 Road safety

The Project is not considered likely to have any significant impact on road safety as:

- there is sufficient sight distance at the site entrance on Eyre Street;
- the South Road entrance will only be subject to intermittent temporary use, with suitable traffic safety controls;
- the Holten Drive rail line level crossing, which will be subject to minor increases in traffic volumes, has recently been upgraded to ensure safety of road users and would be negotiated at relatively slow speeds due to the proximity of the Menindee Road intersection;
- the rail siding will not cross or impact the external road network;
- there is currently excess capacity in the road network; and
- heavy vehicles will generally utilise the designated heavy vehicle route through Broken Hill.

The proposed site circulation and parking layout allows for the efficient and safe movement of operational traffic around the facility.

Figure 14-2 Trucking route through Broken Hill



14.5 MANAGEMENT MEASURES

The following measures will be undertaken to maintain a safe road network and minimise any potential negative impacts:

- sealing the majority of the haul road and other primary internal site roads;
- all heavy vehicles associated with deliveries to the mine will use approved B-Double routes where possible;
- the level crossing on the access road from South Road to be fitted with gates, which can be used to either block vehicles from driving onto the rail line or to block trains;
- a minimum of 55 car parking spaces will be provided on-site;
- specification of on-site signage e.g. speed limits, parking areas; and
- safety procedures to be adhered to during temporary usage of the South Road access.

14.6 CONCLUSIONS

The Project will not significantly impact the external road or rail network. There is adequate spare capacity in the existing road system to accommodate the predicted additional traffic to be generated by the Project and this traffic is not expected to affect the level of service at key intersections near the site. Adequate car parking spaces are provided on-site and the proposed site circulation network allows for the efficient and safe movement of operational traffic around the site.