

28 June 2018

P1258 Ramboll Hydro Kurri Kurri Remediation

Ramboll Australia Pty Ltd
Level 2, Suite 18
50 Glebe Road
The Junction NSW 2291

Attn: Shaun Taylor

Dear Shaun,

Traffic Assessment for EIS at Hydro Aluminium site, Kurri Kurri

Further to your recent email we have now completed our site work and review of the documentation provided for the proposed remediation works at the project site. A traffic impact assessment has been previously completed by Hyder Consulting Pty Ltd (dated July 2016) for the demolition and remediation works at the Hydro Kurri Kurri Aluminium Smelter. The Department of Planning and Environment has subsequently requested further remediation works to be undertaken in conjunction with those previously reported including:

- Import approximately 20,000 tonnes of gypsum to add to material prior to placement within the Containment Cell
- Transportation of leachate off site for treatment

The following assessment reviews the traffic impacts associated with these additional movements, and is provided as an addendum to the previous traffic impact assessment prepared by Hyder Consulting Pty Ltd.

The Hydro Kurri Kurri Aluminium Smelter is located off Hart Road, north of the Hunter Expressway as shown in Figure 1.

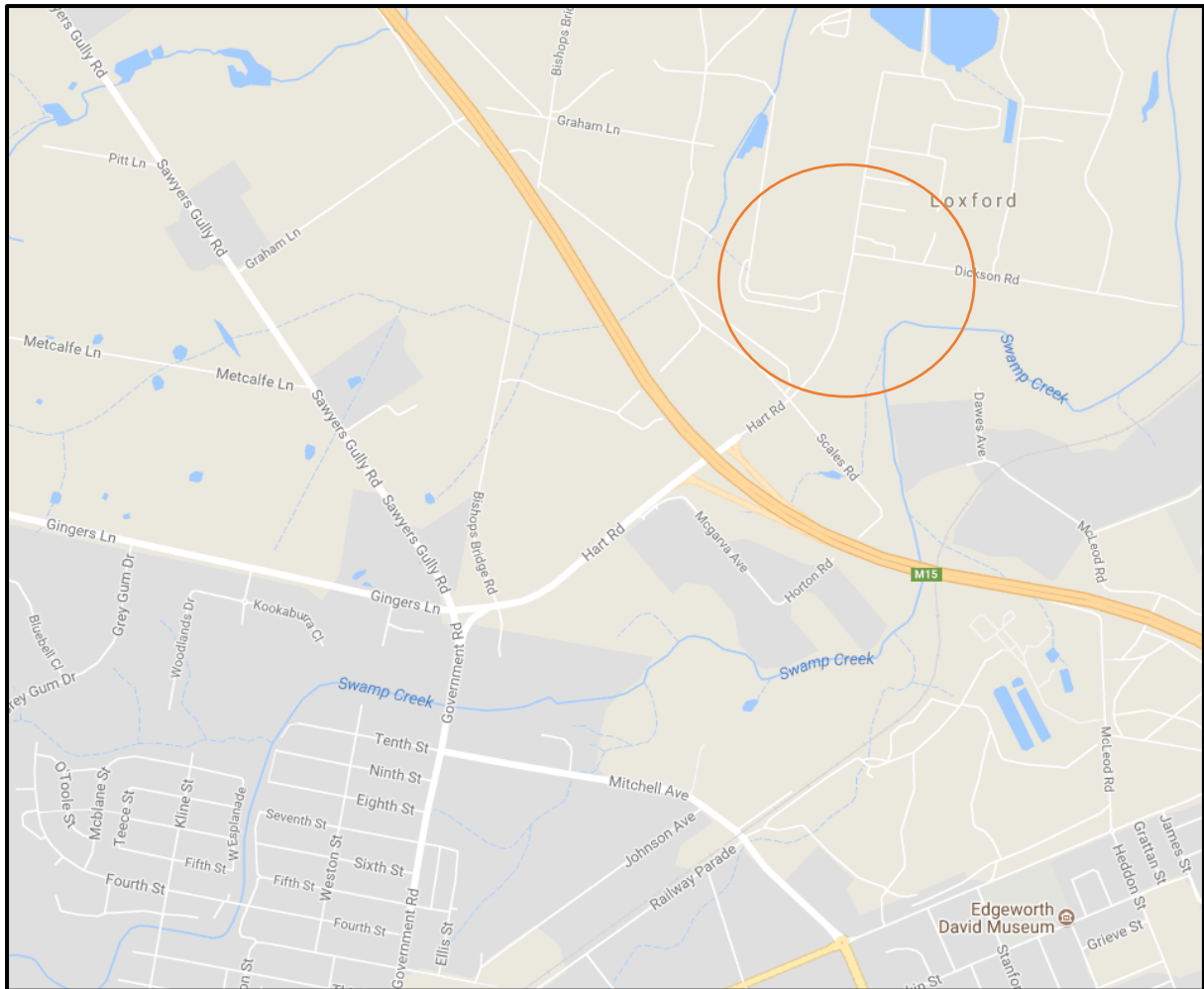


Figure 1 – General location of the site in the context of the local road network.

Updated Traffic Volumes

As part of the project work, traffic surveys were completed at the grade separated interchange at Hart Road and the Hunter Expressway to determine the current traffic volumes in this location. These surveys were completed on a typical weekday morning (7am to 9:30am) and afternoon (2:30pm to 5:30pm) on Thursday 14th June 2018. Peak hour traffic volumes were then determined from the survey data and are summarised in Figure 1 below.

Compared with the 2015 traffic surveys completed by Hyder Consulting, there has been significant growth on Hart Road (south of the Hunter Expressway) with peak traffic volumes increasing by 30-50% over this period.

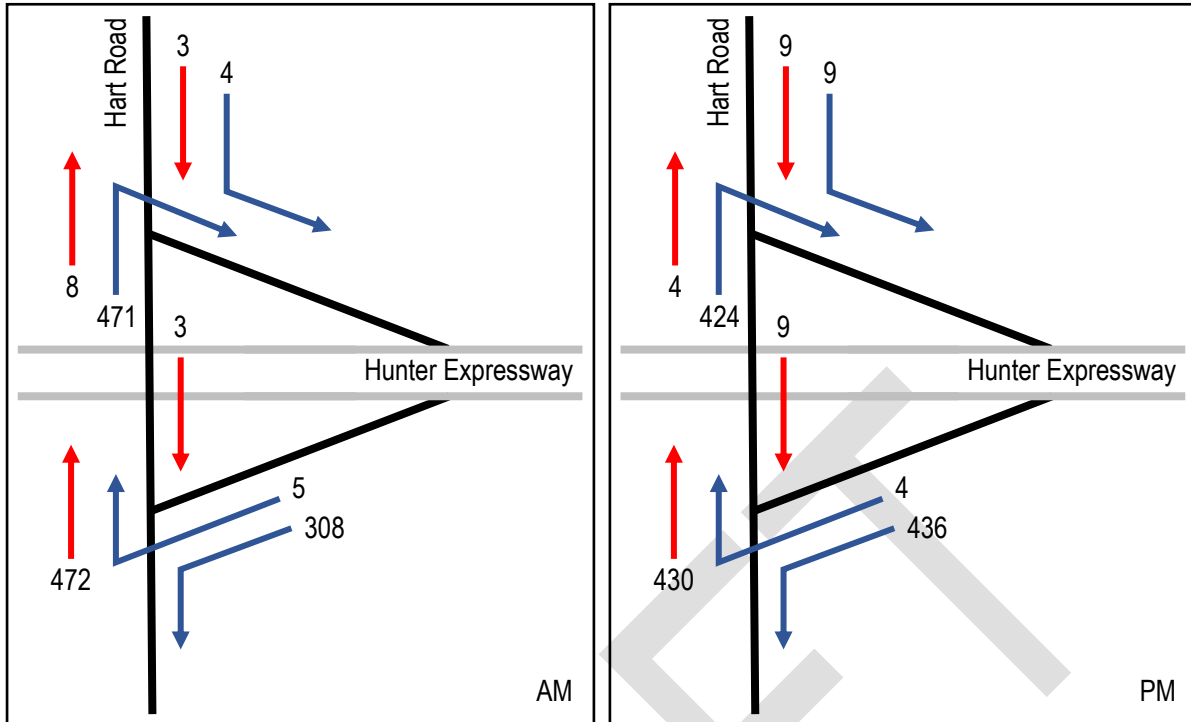


Figure 2 - 2018 peak hour traffic volumes

Construction Traffic

Advice from the study team has indicated the following additional movements associated with the transportation of gypsum and leachate.

Transportation of Gypsum

Allowing for 40 tonnes per truck, this shall require 900 trucks over five months (1,800 movements), with deliveries occurring continuously over this period. This equates to 41 trucks per week on average (82 movements).

Construction truck movements are permitted to occur between 7am and 5pm on weekdays only and are evenly distributed over this period. Allowing for this, the transportation of gypsum could see on average 8-9 trucks per day accessing the site (16-18 truck movements), of which, 2 trips could occur during the morning or afternoon peak (1 inbound, 1 outbound).

The transportation of gypsum will occur concurrently with the construction activities associated with the 'Cell Base Liner' or 'Cell Material Acceptance and Placement'.

Transportation of Leachate

It is estimated that approximately 12.7 ML of leachate will require treatment off-site, which would be completed over a period of 79 weeks. Trucks will transport an average of 20 kL, requiring 636 trucks (1,272 movements) occurring consistently over this period. This equates to 8-9 trucks accessing the site per week, giving 1-2 trucks per day (2-4 truck movements).

These movements could occur at various times throughout the day, however to ensure a robust assessment of the traffic impacts, it is assumed that 2 trips (1 inbound, 1 outbound) would occur in each of the morning and afternoon peak periods.

The transportation of leachate will occur concurrently with the construction activities associated with 'Cell Material Acceptance and Placement' or 'Containment Cell Cap Construction'.

Truck movements associated with the transportation of leachate may therefore also occur concurrently with the transportation of gypsum.

Concurrent Construction Activities

Traffic generation associated with concurrent construction activities have been reported by Hyder Consulting Pty Ltd with the following estimated traffic demands:

Cell Base Liner Construction

- 48 passenger vehicle trips per day including 16 trips inbound during the morning peak and 16 outbound during the afternoon peak associated with staff arriving / departing.
- An average of 17 truck movements per day, occurring consistently throughout the construction hours. This equates to 1 truck inbound and 1 outbound per hour.

Cell Material Acceptance and Placement

- 36 passenger vehicle trips per day including 12 trips inbound during the morning peak and 12 outbound during the afternoon peak associated with staff arriving / departing.
- An average of 5 truck movements per day, occurring throughout the day. This gives a worst case of 1 truck inbound and 1 truck outbound during the peak periods.

Containment Cell Cap Construction

- 42 passenger vehicle trips per day including 14 trips inbound during the morning peak and 14 outbound during the afternoon peak associated with staff arriving / departing.
- An average of 17 truck movements per day, occurring consistently throughout the construction hours. This equates to 1 truck inbound and 1 outbound per hour.

Stage 1 Works

The traffic impact assessment prepared by Hyder Consulting Pty Ltd also notes that these works could occur concurrently with Stage 1 works, creating additional demand for two truck movements (1 inbound, 1 outbound) during the peak periods.

Summary of Construction Traffic

Based on the above, there are three potential traffic generating scenarios which each require consideration:

1. Transportation of gypsum occurring concurrently with cell base liner construction
2. Transportation of gypsum and leachate occurring concurrently with cell material acceptance and placement
3. Transportation of leachate occurring concurrently with containment cell cap construction.

The traffic demands for each scenario are summarised below:

Table 1 - Estimated Trip Generation for Construction Traffic

Trip Generation	Scenario 1	Scenario 2	Scenario 3
Daily Trips	48 staff movements Up to 35 truck movements Equally split between inbound and outbound.	36 staff movements Up to 27 truck movements Equally split between inbound and outbound.	42 staff movements Up to 21 truck movements Equally split between inbound and outbound.
Morning Peak	16 staff inbound 3 trucks inbound 3 trucks outbound	12 staff inbound 4 trucks inbound 4 trucks outbound	14 staff inbound 3 trucks inbound 3 trucks outbound
Afternoon Peak	16 staff outbound 3 trucks inbound 3 trucks outbound	12 staff outbound 4 trucks inbound 4 trucks outbound	14 staff outbound 3 trucks inbound 3 trucks outbound

Scenario 1 provides the greatest increase in traffic on Hart Road and has therefore been applied throughout the following assessment.

Traffic Distribution

The distribution of construction traffic has been adopted as per the trip distributions stated within the traffic impact assessment prepared by Hyder Consulting Pty Ltd. This gave:

- 45% of staff traffic having an origin / destination south of the Hunter Expressway via Hart Road.
- 55% of staff traffic having an origin/destination east via the Hunter Expressway.
- 100% of heavy vehicle traffic has an origin/destination east of the site via the Hunter Expressway.

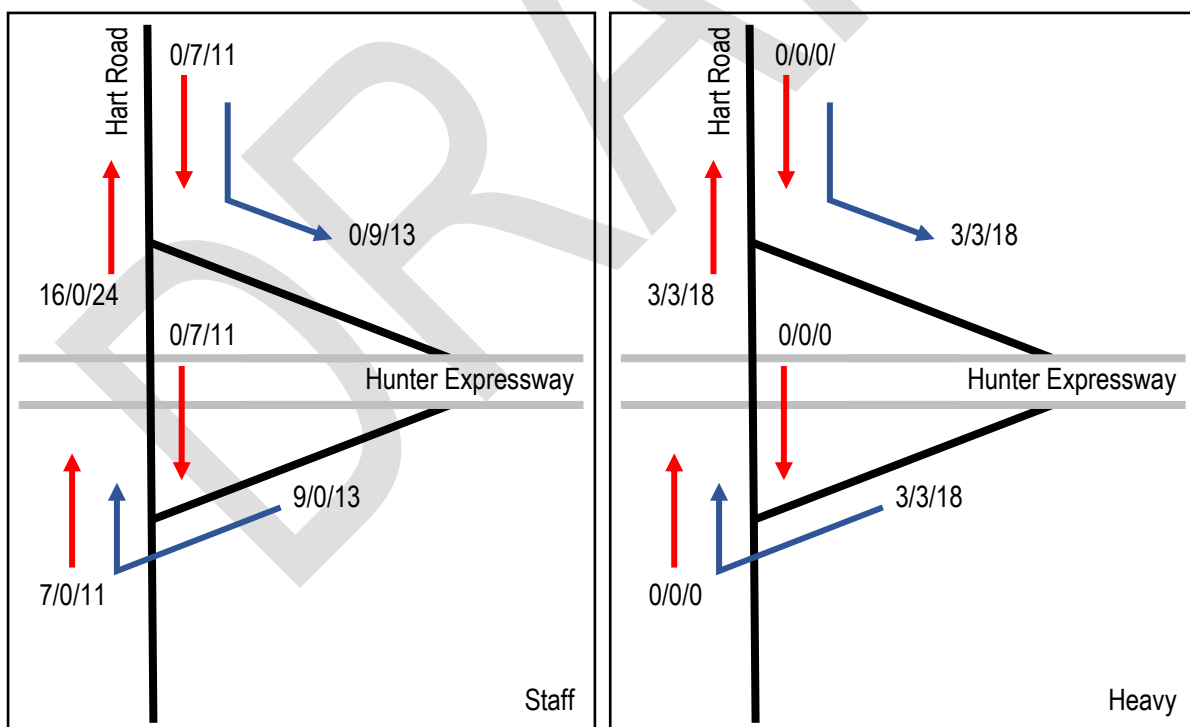


Figure 3 - Distribution of construction traffic (Scenario 1) on the local road network (AM/PM/Daily)

Impact of Construction Traffic

The additional traffic demands associated with remediation of Hydro Kurri Kurri will see the daily flows on Hart Road increase by 22 light vehicles per day.

Whilst there are no limits on daily traffic flows, the RMS Guide to Traffic Generating Developments provides performance standards for assessing the capacity of a road, which depends upon its overall function and the volume of traffic carried during the peak hours. For Hart Road, which operates as a collector road between Weston and the Hunter Expressway, the maximum hourly capacity would be 900 vehicles per hour (vph) per direction.

The current peak traffic volumes together with the construction traffic will be less than 500 vehicles per hour and are therefore within the capacity of Hart Road.

Intersection of Hart Road and the Hunter Expressway

The grade separated interchange at the intersection of Hart Road and the Hunter Expressway has been modelled using *Sidra Intersection 8* to assess its current operation during the morning and afternoon peak and assess the impact of construction traffic associated with the proposed remediation works at Hydro Kurri Kurri. The results of this assessment are summarised below.

Table 2 - Sidra Results - 2018 Existing Situation - Hunter Expressway Off-Ramp (AM/PM)

Approach	Level of Service	Avg. Delay (s)	95% Queue (m)
Hart Road (S)	A / A	0.0 / 0.0	0 / 0
Hunter Expressway Off-Ramp	A / A	5.8 / 5.7	0.2 / 0.1
Hart Road (N)	A / A	0.0 / 0.0	0 / 0

Table 3 - Sidra Results - 2018 Existing Situation - Hunter Expressway On-Ramp (AM/PM)

Approach	Level of Service	Avg. Delay (s)	95% Queue (m)
Hart Road (S)	A / A	6.2 / 6.3	12.1 / 10.7
Hart Road (N)	A / A	4.0 / 3.3	0 / 0

The grade separated interchange at Hart Road and the Hunter Expressway currently operates to a high standard during the morning and afternoon peaks, with very minimal delays and queuing. All movements currently operate with an overall Level of Service A (LoS A).

Table 4 - Sidra Results - 2018 + Construction traffic - Hunter Expressway Off-Ramp (AM/PM)

Approach	Level of Service	Avg. Delay (s)	95% Queue (m)
Hart Road (S)	A / A	0.0 / 0.0	0 / 0
Hunter Expressway Off-Ramp	A / A	5.9 / 5.7	0.7 / 0.3
Hart Road (N)	A / A	0.0 / 0.0	0 / 0

Table 5 - Sidra Results - 2018 + Construction traffic - Hunter Expressway On-Ramp (AM/PM)

Approach	Level of Service	Avg. Delay (s)	95% Queue (m)
Hart Road (S)	A / A	6.0 / 6.3	12.1 / 10.8
Hart Road (N)	A / A	5.2 / 3.9	0 / 0

The above results demonstrate that the intersection currently provides adequate spare capacity to accommodate the additional traffic demands associated with proposed remediation works. With these additional vehicles, the intersection will continue to operate to a high standard, with no change to the overall level of service for any movement and negligible changes to delays and queuing.

Conclusion

Overall the additional construction traffic associated with the remediation works at the Hydro Kurri Kurri site will have a minimal and acceptable impact upon the surrounding road network. The grade separated interchange to the south of the site currently operates to a high standard and has ample spare capacity to accommodate these additional demands with negligible impact to its overall operation during the peak periods.

Please feel free to contact me on 4032, 7979, should you have any queries.

Yours sincerely,



Sean Morgan
Director

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