ARUP

Technical Note

Project title	Bromelton Energy and Resource Centre
Job number	293683-69
File reference	293683-69-ARU-00CIPA-TNE-000001
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Date	26 June2026
Subject	Pavement Impact Assessment Technical Note Rev B

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1. Introduction

1.1 Overview of Study

Cleanaway Operations Pty Ltd (Cleanaway) is an Australian waste management, recycling, and industrial services company. Cleanaway is developing an Energy from Waste (EfW) facility in Queensland known as the Bromelton Energy and Resource Centre (Lot 1 Beaudesert Boonah Road, Bromelton, Queensland, 4285). The facility is located within the Bromelton State Development Area (SDA), west of Beaudesert within the Scenic Rim Regional Council local government area.

The facility has been designed to thermally treat approximately 760,000 tonnes per annum (tpa) of waste feedstock, consisting of residual Municipal Solid Waste (MSW) and residual Commercial and Industrial (C&I) waste. Residual waste refers to material remaining after recycling and resource recovery processes, which would otherwise be sent to landfill for disposal.

If approved, and upon commencement of operations in 2032, Cleanaway will provide waste management services to councils across South East Queensland. This will involve the transport of fully loaded waste vehicles to the BERC facility via B-double approved routes. The BERC facility will also transport by-products to various locations. As the final waste contracts are yet to be confirmed, the assumptions in this Preliminary Pavement Impact Assessment are indicative only and should be reviewed during the next design stage and once waste source locations are finalised.

1.2 Purpose of this Technical Note:

The purpose of this technical note is to:

- Assess the impact of traffic generated by the Bromelton Energy and Waste Facility on Queensland Department of Transport and Main Roads (TMR) owned roads within Greater Brisbane and surrounding local government areas.
- Outline proposed routes taken throughout different Local Government Areas (LGA).
- Provide an overview of the estimated cost projections for 20 years after the opening year (in 2032).
- Summarise the estimated total amount owed to TMR.

This Pavement Impact Assessment will demonstrate compliance with the following planning and regulatory requirements:

- Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment (PIA) December 2018.

This Technical Note (TN) should be read in conjunction with the Arup Traffic Impact Assessment (TIA) and Ramboll Traffic Memo (Appendix F of the TIA), which provide information relevant of the anticipated traffic operations of the BERC.

2. Pavement Impact Assessment

2.1 Design inputs

The following design inputs have been adopted as part of the Pavement Impact Assessment (PIA):

- In accordance with Traffic Impact Assessment Practice Note (December 2018) the following loaded and unloaded Standard Axle Repetitions (SARs) values have been adopted as shown in Table 1.
- All roads under assessment are either granular pavement (GN) corresponding to SAR_4, asphaltic concrete pavement (AC) corresponding to SAR_5 or cement stabilised pavement (CS) corresponding to SAR_{12} based on the data provided by TMR.
- The average Marginal Cost (MC) in cents has been provided by TMR for every 0.1 km of road, where; (MC/100) *SAR-km was calculated and converted to Australian dollars ($).
- Table 1 states the adopted unloaded and loaded SAR values for the respected vehicle classes derived from the Ramboll traffic technical note.

Table 1: SAR values per Vehicle Classification

	Class 5	Class 9	Class 10
Unloaded SAR_4	0.46	0.51	0.53
Unloaded SAR_5	0.37	0.41	0.42
Unloaded SAR_{12}	0.9	0.11	0.11
Loaded SAR_4	4.09	4.93	6.3
Loaded SAR_5	4.89	5.61	7.09
Loaded SAR_{12}	17.07	14.63	17.17

2.2 Key assumptions

Key assumptions used for the estimation of truck arrivals are as follows:

- All operational traffic movements and their respective days of operation are detailed in Table 2.

Table 2 – Daily vehicle arrival numbers for worst case scenario

Vehicle Movement Description	Vehicles/year	Comments
Waste Delivery Vehicles		
Type 1A - A-Double Rear-Eject	0	**Monday to Sunday,** Portion of feedstock, 0%
Type 1B - B-Double Side-Tipping	16,121	**Monday to Sunday,** Portion of feedstock,70%
Type 2 - Rear-Eject Semi-Trailers	7,600	**Monday to Sunday,** Portion of feedstock, 20%
Type 3 - Compactor Trucks	8,444	**Monday to Sunday,** Portion of feedstock, 10%
Sub-Total Waste Delivery	**32,165**	
Consumable Delivery Vehicles		**Monday to Friday**
Quicklime (B-Double)	307	Peak delivery frequency e.g. after a long weekend
PAC (Pneumatic 12m3 tanker truck)	58	Every 4 days
40% Urea solution (B-Double tanker)	138	Trucks to fill storage tank
Cement (for APCr stabilisation) (B-Double)	444	Trucks to fill storage silo
Sub-Total Consumables	**947**	
By Product Dispatch Vehicles		**Monday to Saturday**
IBAA (B Double)	5,514	A-Double trucks to dispatch 1.5 months IBAA storage in a 28 day campaign
Scrap Metals (Semi-trailer)	876	
Stabilised APCr concrete (B-Double)	2,600	Monday to Friday
Sub-Total By-Products	**8,990**	
Total Trucks	**42,102**	

- Figure 1 shows the delivery days adopted for the waste delivery and by product vehicles, allowing for two weeks facility outages per year.

Assumptions for routes are as follows:

Type	Austroad Vehicle Class	SAR Loaded	SAR UnLoaded	Number 100% (arrivals)	Days of Operation	LOADED SAR per year	UNLOADED SAR per year
Waste Delivery Vehicles							
Type 1A - A-Double Rear-Eject		0	0	0	**7 days**		
Type 1B - B-Double Side-Tipping	10	6.3	0.53	16121	**7 days**	101,562	8,544
Type 2 - Rear-Eject Semi-Trailers	**9**	**4.93**	**0.51**	7600	**7 days**	37,468	3,876
Type 3 - Compactor Trucks	5	4.09	0.46	8444	**5 days**	34,536	3,884
Sub-Total Waste Delivery				**32165**		**173,566**	**16,304**
Sub-Total Waste Delivery (loaded + unloaded)							
Consumable Delivery Vehicles							
B Doubles	10	6.3	0.53	307	**5 days**	1,934	163
Tanker	**5**	4.09	0.46	58	**Every 4 days**	237	27
B-Double tanker	10	6.3	0.53	138	**5 days**	869	73
B-Double	10	6.3	0.53	444	**5 days**	2,797	235
Sub-Total				**947**		**5,838**	**498**
Sub-Total Consumable Delivery (loaded + unloaded)							
By Product							
IBAA - B Double	10	6.3	0.53	5514	**5 days**	34,738	2,922
Scrap Metals - semi trailer	**9**	**4.93**	**0.51**	876	**5 days**	4,319	447
B Double Stablised APCr	10	6.3	0.53	2600	**5 days**	16,380	1,378
Sub-Total				**8990**		**55,437**	**4,747**
Sub-Total By Product Delivery (loaded + unloaded)							**60,184**
TOTAL				**42,102**		**234,841**	**21,549**

Figure 1 – Operations and SAR Values per Truck

- Figure 2 shows the routes to and from each waste facility

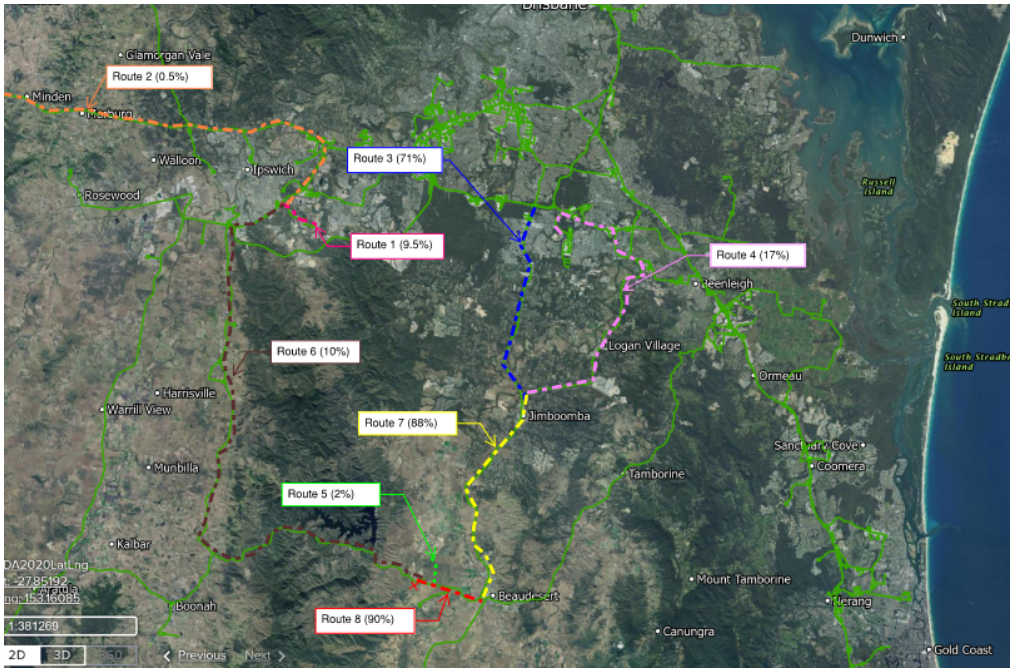

Figure 2 - Route Location and Percentage of BERC Traffic

- The final contractual arrangements for the facility are yet to be confirmed. At this stage, the proposed transport routes have been planned to enable the acceptance of waste from the identified target councils. The specific collection points for waste are also yet to be determined. For the purposes of the PIA, it has been assumed that waste will be collected from existing transfer stations located within each LGA.
- In the case of Brisbane, it has been modelled to terminate at chainage 0 of 12A Pacific Motorway as a reference point only due to multiple locations potentially being used within this council.
- The traffic has been calculated for all roads within the road asset request forms provided by TMR on the 14/08/2025 and 30/10/2025 based on traffic data available in the TMR database (generally from 2024). Traffic growth rate was calculated based on historic growth rate from previous data points. Where the calculated growth rate was negative, a presumptive 1% growth rate was adopted. This allows a cutoff year to be determined in the event the 5% traffic increase threshold from the BERC is not reached.
- An opening year of 2032 was assumed for the facility. There is currently no proposal to stage the development; therefore, it is assumed that 100% of the facility's throughput will be achieved in the first year of operation.
- All routes follow roads approved for B-double vehicles.
- Waste deliveries and consumables both arrive at the facility loaded and depart unloaded.
- By-products vehicles arrive at the facility unloaded and depart loaded.
- All consumables come from Brisbane, and all by products go to Brisbane.
- Table 3Table 3 presents the route numbers, associated councils, and the corresponding percentages of BERC traffic. The percentages have been derived from the estimated volumes of waste generated within each respective council area.
- Where a section of the network is shared by multiple routes, a unique route name has been assigned to ensure accurate calculation of combined traffic volumes (Route 8 through to Route 11).

Table 3- Route locations and percentage of BERC traffic

Route Number	Council	Percentage of BERC traffic
Route 1	Ipswich (Swanbank Landfill and Transfer Station)	9.5%
Route 2	Lockyer Valley (Gatton Transfer Station and Landfill)	0.5%
Route 3	Brisbane (via Mt Lindsey Highway)	71.0%
Route 4	Logan (Browns Plains landfill)	17.0%
Route 5	Scenic Rim (Gatton Recycle Plant)	2.0%
Route 6 (Route 1 + Route 2)	Ipswich & Lockyer	10.0%
Route 7 (Route 3 + Route 4)	Brisbane (Mt Lindsey Highway) & Logan	88.0%
Route 8 (Route 3+Route 4 + Route 5)	Brisbane, Logan & Scenic Rim	90.00%

Note: Non-TMR owned roads along the route and roads with no data in the TMR database were considered but could not be evaluated in this assessment.

2.3 Pavement Impact Assessment Evaluation and Costing

From the PIA, road links where BERC traffic caused a significant traffic increases (≥ 5%) was evaluated for the subsequent 20 years from the opening year. Roads that trigger this threshold are shown in Table 4 below.

Table 4- Roads where traffic loading exceed threshold in first year 2032

Route Number	Traffic loading ≥5% in first year 2032
Route 3	Beaudesert Boonah Road
Route 7 (Route 3 + Route 4)	Mt Lindesay Highway (Brisbane – Beaudesert)
Route 8 (Route 3 + Route 4 +Route 5)	Beaudesert Boonah Road

The total contributions owed are shown below in Table 5 in 5-year blocks:

Table 5- Total Contributions

Years	Contributions	Total Number of Trucks	Contribution Per Truck	Total Volume of Waste (tonnes)[1]	Contribution per Tonne of Waste
1 - 5	$1,416,036.90	210,510	$6.73	3,800,000	$0.37
6 - 10	$1,416,036.90	210,510	$6.73	3,800,000	$0.37
11 - 15	$1,215,918.98	210,510	$5.78	3,800,000	$0.32
16 - 20	$1,071,131.67	210,510	$5.09	3,800,000	$0.28
Total	**$5,119,124.46**	**842,040**	**$6.08 (average)**	**15,200,000**	$0.34

[1] The assumed tonnage based on full operating capacity of 760,000 tonnes per annum. In practice, throughput may be lower during the early stages of operation. This approach allows for flexibility, with charges applied based on actual tonnes processed in each year.

Pavement Contribution Summary

The pavement contributions from the impacted roads are estimated to be a total of **$5,119,124.46** from 2032-2051 (20 years). This overall contribution is an estimate based on data provided by TMR and the assumptions outlined in Section 2.1. The estimate should be used as a guide only.

There are several factors that may materially influence the final pavement contribution value, including:

- Confirmation of waste contracts and transport routes to the BERC site;
- The potential for Cleanaway to utilise A-double vehicles, which would reduce the total number of truck movements to the facility; and

- The assumption that the facility reaches full operational capacity from Day 1, which represents a conservative scenario.

Cleanaway therefore seeks to retain flexibility in any conditions relating to contributions, noting that further information on waste contracts, vehicle fleet composition and the facility ramp-up period will become available as the project progresses.

DOCUMENT CHECKING

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