# Gurecon ARUP Riverstone Water Resource Recovery Facility / Rouse Hill Water Resource Recovery Facility Growth Package ADDENDUM TRAFFIC AND TRANSPORT TECHNICAL



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# **Content and chapter structure**

The chapter structure and associated content is outlined in Table 1.

#### Table 1: Content and chapter structure

Chapter		Content		
1.	Introduction	Outlines the project description, purpose of this document and relevant legislation and policy.		
2.	Methodology	Sets out the methodology used to assess the transport impacts of the project on the surrounding environment during construction and operation.		
3.	Existing environment	Details the existing transport and traffic environment surrounding the project. This chapter also highlights any future infrastructure schemes that need to be considered as part of this study.		
4.	Transport impact assessment	The impact assessment uses the methodology outlined in Chapter 2 to assess any impacts of the project during construction and operation. This chapter assesses the impacts upon all modes, including private vehicles, public transport, cycling and walking. Key impacts are defined at the end of this chapter.		
5.	Proposed mitigation measures	Following the identification of any key issues, mitigation measures during construction and operation are presented. These mitigation measures are proposed to reduce the impacts of the construction and operational phases on the surrounding transport network.		

# **Glossary of terms and abbreviations**

Term	Meaning	
CTMP	Construction Traffic Management Plan	
DCP	Development Control Plan	
DPHI	Department of Planning, Housing and Infrastructure	
EPL	Environment Protection Licence	
HV	Heavy Vehicle	
LGA	Local Government Area	
LV	Light Vehicle	
NHVR	National Heavy Vehicle Regulator	
NSW	New South Wales	
NWGA	North West Growth Area	
NWTH	North West Treatment Hub	
NWURC	North West Urban Renewal Corridor	
REF	Review of Environmental Factors	
RMS	Roads and Maritime Services	
ROL	Road Occupancy Licence	
RTA	Roads & Traffic Authority	
SCATS	Sydney Coordinated Adaptive Traffic System	
SSCTMP	Site Specific Construction Traffic Management Plan	
STS	Sludge Transfer System	
TfNSW	Transport for New South Wales	
The project	Riverstone Water Resource Recovery Facility and Rouse Hill Water Resource Recovery Facility (Growth Package)	
WRP	Water Recycling Plant	
WRRF	Water Resource Recovery Facility	
WWTP	Waste Water Treatment Plant	

# 1 Introduction

# 1.1 Project description

Sydney Water's North West Treatment Hub (NWTH) comprises of the Castle Hill Wastewater Treatment Plant (WWTP), Rouse Hill WWTP and Riverstone Wastewater WWTP. The NWTH provides wastewater servicing to Sydney's north west including the North West Growth Area (NWGA) and North West Urban Renewal Corridor along the new Metro North West Line.

In 2022, Sydney Water proposed the NWTH upgrades to address rapid growth, meet future regulatory requirements and provide a solution that minimises impacts to the community and the environment. The proposed works included:

- Upgrading at Rouse Hill WWTP and Riverstone WWTP
- Constructing a new sludge transfer system between the three WWTPs to centralise solid treatment at Riverstone.

The potential environmental impacts and mitigation measures for these works were assessed under the NWTH Upgrades and Sludge Transfer System – Growth Package, July 2022 (approved REF).

Following this, Sydney Water identified an opportunity to diversify our methods for solids processing. A review of technology available for advanced processing of biosolids to reduce contaminants of concern found that carbonisation with upstream digestion, dewatering and drying was the preferred technology for the NWTH upgrade project.

The proposed changes from the approved Review of Environmental Factors (REF) include the following:

- Riverstone Water Resource Recovery Facility (WRRF)
- A new carbonisation plant and associated infrastructure including drying, heating and carbonisation systems, this will result in production of biochar rather than biosolids
- No expansion of existing anaerobic digestion and no upgrade to waste gas burners
- Deletion of cogeneration unit
- Rouse Hill WRRF
- New dewatering and outloading building to cater for sludge treatment
- Expansion of the construction footprint to include a compound site in 7 Money Close, Rouse Hill (5/-/DP1158760) and new access roads into the facility.
- Ongoing use of part of existing biological nutrient removal (BNR) treatment and existing aerobic digester
- Sludge transfer systems
- Deletion of both sludge transfer pipelines (Rouse Hill WRRF to Riverstone WRRF, and Castle Hill WRRF to Rouse Hill WRRF).

## 1.2 Document purpose

This report is one of a number of technical reports that have been developed to support the Addendum REF for the project. This report outlines the traffic and transport impacts associated with the project and any mitigation measures to be implemented during construction and operation to address the impacts identified.

## 1.3 Legislative and Policy context

The legislation and policy included in Table 2 has been considered as part of this Traffic and Transport technical report.

#### Table 2: Legislation and policy

Legislation and policy relevant to the Traffic and Transport technical report					
Legislation/Policy	Description	Relevance			
Guide to Traffic Generating Development (Roads & Traffic Authority, 2002) (RTA)	The Guide examines how to assess traffic generating developments and identify impacts upon the wider transport network. The level of assessment can vary depending on the type of development.	This project will generate traffic relating to construction and operation works. Therefore, this Guide has been used as it provides the appropriate methodology for assessing all types of traffic generating developments.			
Guide to Traffic Management Part 12: Traffic Impacts of Developments (Austroads, 2009)	The document guides planners and engineers who design, develop and manage a variety of land use developments in identifying and managing the impacts on the transport network arising from these developments.	This project is a traffic generating development. Therefore, this Guide has been used as it provides the appropriate methodology for assessing all types of traffic generating developments.			

# 2 Methodology

## 2.1 Methodology structure

To assess the impact of the project on the transport and traffic network, the following methodology has been used:

- Review available data and documentation to understand the transport requirements of the project in construction and operation.
- Review other infrastructure schemes that overlap with the programme for the project and their likely cumulative impact on the surrounding road network.
- Liaise with the Sydney Water project team to derive robust assumptions for the traffic generation of the project in construction and operation.
- Identify key routes to be used by construction and operational vehicles and compare the potential traffic impacts with these assessed in the approved REF.
- Identify any impacts to public transport, walking and cycling and compare with these assessed in the approved REF.
- Classify the significance of all identified impacts.
- Develop mitigation measures to manage the identified impacts.

## 2.2 Project location

The Riverstone WRRF is located at 108 Bandon Road, Vineyard. The Rouse Hill WRRF is located on Mile End Road, Rouse Hill.

The site locations are shown in Figure 1 and Figure 2.



Figure 1 Project location – Riverstone WRRF Source: SIX Maps



Figure 2 Project location – Rouse Hill WRRF Source: SIX Maps

# 3 Existing environment

# 3.1 Riverstone Water Resource Recovery Facility

## 3.1.1 Existing road network

The Riverstone WRRF is connected to the wider road network via a primary and secondary access road from Bandon Road (shown in Figure 3). The primary access road connects to the northern section of the Riverstone WRRF and the secondary access road links to the southern section.



The secondary access road is shown in Photograph 1 and Photograph 2.

Figure 3 Local access roads to the Riverstone WRRF Source: SIX Maps



Photograph 1 Riverstone WRRF secondary access road Source: Site visit (July 2021)



Photograph 2 Riverstone WRRF secondary access road intersection with Bandon Road Source: Site visit (July 2021)

Bandon Road is a sub-arterial road that links Windsor Road with Vineyard Station and nearby lowdensity and undeveloped land uses. Unrestricted 90-degree parking is provided on Bandon Road near Vineyard train station.



The wider road network surrounding the Riverstone WRRF is shown in Figure 4.

Figure 4 Road network surrounding the Riverstone WRRF

## 3.1.2 Public transport

Vineyard train station is located approximately 500 metres east of the Riverstone WRRF and is served by T1 North Shore & Western Line and T5 Cumberland Line services. The T1 North Shore & Western Line runs at a frequency of up to two services per hour at peak times and provides direct connections to Richmond, Blacktown, Parramatta and the Sydney CBD. The T5 Cumberland Line runs at a frequency of up to two services per hour at peak times and provides direct connections to Richmond, Blacktown, Parramatta, Liverpool and Leppington.

Bus stops are located near Vineyard Station on Wallace Road (approximately 600 metres east of the site) and Windsor Road (approximately 1.3 kilometres east of the site). These bus stops service seven bus routes and a summary of these routes is shown in Table 3.

The public transport network surrounding the Riverstone WRRF is shown graphically in Figure 5.

#### Table 3: Bus routes near Riverstone WRRF

Route number	Route name	Nearest bus stop	Peak hour frequency (buses/hour)
608	Windsor to Rouse Hill	Windsor Road at Bandon Road	1
671	Riverstone to Windsor via McGraths Hill & Vineyard	Wallace Road at Bandon Road	1
741	Oakville to Riverstone via Maraylya & Box Hill	Windsor Road at Bandon Road	2

#### Source: Transport for NSW (2024)



Figure 5 Public transport network surrounding Riverstone WRRF Source: Transport for NSW (2024)

#### 3.1.3 Active transport

Given the low-density and undeveloped land uses surrounding the site, pedestrian volumes are generally very low on surrounding streets. Footpaths are not provided near the site with the exception of the southern side of Bandon Road, east of Wallace Road. As a result, pedestrians are required to walk on the carriageway or road shoulders.

The lack of footpaths on Bandon Road near Riverstone WRRF is shown in Photograph 3.



Photograph 3 No footpaths provided on Bandon Road near Riverstone WRRF

#### Source: Site visit (July 2021)

The cycling network surrounding the site is shown in Figure 6. An off-road shared path is provided on Windsor Road to the east of the site, which links to the wider regional cycling network.



Figure 6 Cycling network around the Riverstone WRRF Source: Cycleway Finder (Transport for NSW, 2024)

# 3.2 Rouse Hill Water Resource Recovery Facility

#### 3.2.1 Existing road network

All operational vehicles and staff currently access the Rouse Hill WRRF using Mile End Road. The main entrance gate road provides a link from Mile End Road to the south east corner of the site (shown in Figure 7). A secondary access road for construction vehicles runs adjacent to Second Ponds Creek and connects to Withers Road. This is an unsealed road with varying widths that narrows along certain sections, meaning large vehicles travelling in opposing directions may struggle to pass safely (shown in Photograph 4). Sight distances for vehicles exiting onto Withers Road are reduced due to the gradient of Withers Road and vegetation bordering the road (shown in Photograph 5).



Figure 7 Local access roads to the Rouse Hill WRRF Source: SIX Maps



Photograph 4 Unsealed secondary access road Source: Site visit (July 2021)



Photograph 5 Reduced sight line for vehicles exiting the secondary access road onto Withers Road Source: Site visit (July 2021)

Mile End Road is a connector road that links to residential land uses and the wider arterial road network via Windsor Road at its southwestern end. Withers Road is also a connector road that provides access to a range of uses between North Kellyville and Rouse Hill.

The wider road network surrounding the Rouse Hill WRRF is shown in Figure 8.



Figure 8 Road network surrounding the Rouse Hill WRRF

## 3.2.2 Public transport

The Rouse Hill metro station is located approximately 2.5 kilometres south of the Rouse Hill WRRF and is served by the Metro North West Line. Several bus stops are located near the Rouse Hill WRRF on Mile End Road (approximately 400 metres east) and Milford Drive (approximately 600 metres east). These bus stops service four bus routes and a summary of these routes and frequencies is shown in Table 4.

The public transport network surrounding the Rouse Hill WRRF is shown graphically in Figure 9.

#### Table 4: Bus routes near Rouse Hill WRRF

Route number	Route name	Nearest bus stop	Peak hour frequency (buses/hour)
617	Rouse Hill to Kellyville Station	Mile End Road near Money Close	2
633	Rouse Hill to Pennant Hills via Kellyville & Castle Hill	Mile End Road near Money Close	2
735	Rouse Hill Station to Blacktown	Milford Drive near Mile End Road	2
746	Riverstone to Rouse Hill	Milford Drive near Mile End Road	2

#### Source: Transport for NSW (2024)



Figure 9 Public transport network surrounding Rouse Hill WRRF Source: Transport for NSW (2024)

#### 3.2.3 Active transport

Pedestrian activity around the Rouse Hill WRRF is low given the site is predominately bordered by open space with an industrial estate on its southeastern side. Footpaths are provided on one or both sides of Mile End Road and Money Close but not on either side of Withers Road. It was observed on site that pedestrians occasionally walk using the secondary access road as it is directly adjacent to Russell Reserve. Furthermore, members of the Walking Volunteers community group use the secondary access road.

The cycling network is shown in Figure 10 and several off-road shared paths are located around the Rouse Hill WRRF. A shared path is provided on the western side of Mile End Road, north of the Rouse Hill WRRF main entrance gate road. A shared path is also provided along the eastern side of Second Ponds Creek south of Withers Road, which connects to the wider regional cycling network via Windsor Road (shown in Photograph 6).



Figure 10 Cycling network around the Rouse Hill WRRF Source: Cycleway Finder (Transport for NSW, 2024)



Photograph 6 Shared path south of Withers Road Source: Site visit (July 2021)

# 3.3 Other infrastructure schemes

Several infrastructure schemes are planned or ongoing in the vicinity of the sites. Where publicly available information was available on the expected transport impact of these schemes, impacts have been considered within this assessment.

## 3.3.1 Riverstone Water Resource Recovery Facility

The following additional scheme is located near the Riverstone WRRF:

- Bandon Road corridor

The location of this scheme is shown in Figure 11.



Figure 11 Other infrastructure schemes near Riverstone WRRF

#### 3.3.1.1 Bandon Road corridor

Transport for NSW is currently planning an extension of the Bandon Road corridor to link Richmond Road, Marsden Park and Windsor Road, Vineyard as part of the North West Growth Centre Road Network Strategy. The Bandon Road corridor would deliver an additional road connection between Richmond Road and Windsor Road, providing an alternative access across the North West Growth Area and reducing traffic within Riverstone.

Near Vineyard train station, Bandon Road would be realigned slightly north of the existing Bandon Road and then travel southwest to intersect with Richmond Road. A grade-separated rail crossing would be provided across the existing railway line near Vineyard Station. Access to the Riverstone WRRF would be maintained via the existing Bandon Road.

As of July 2019, the corridor alignment has been finalised. However, as of April 2024, the corridor has not commenced further planning or design phases and construction is not expected to overlap with the project. As no information on construction traffic associated with the scheme is publicly available, this scheme has not been considered within this assessment.

No other infrastructure schemes were identified that would impact the transport network surrounding the Riverstone WRRF during construction.

## 3.3.2 Rouse Hill Water Resource Recovery Facility

The following additional schemes are located near the Rouse Hill WRRF:

- 330-334 Annangrove Road
- Sydney Water Compliance Upgrades

The location of these schemes is shown in Figure 12.



Figure 12 Other infrastructure schemes near Rouse Hill WRRF

#### 3.3.2.1 330-334 Annangrove Road

A mixed-use development application and modification application at 330-334 Annangrove Road, approximately 500 metres southwest of the site, was approved in 2023 by The Hills Shire Council (development consent 1180/2020/HC). The development comprises of a mixed-use building with 14,960m<sup>2</sup> of gross floor area including bulky good premises, food and drink premises, childcare centre, neighbourhood shops, offices, gym and play centre. Primary access to the site would be left-in left-out via Withers Road.

The Traffic Impact Assessment for the development identified that operation of the development will not have a significant impact on Annangrove Road or the road network assuming signalisation of the Annangrove Road/Withers Road/The Water Lane intersection. Information on construction traffic associated with the scheme is not publicly available.

Any overlap in construction planning for this scheme will be coordinated with adjoining developer works.

#### 3.3.2.2 Sydney Water Compliance Upgrades

The Sydney Water Compliance Upgrades includes upgrades to ensure licence conditions are met at the Rouse Hill WRRF, including conditions for wet weather overflows. The need to upgrade treatment processes at Castle Hill WRRF and Rouse Hill WRRF is on the critical path with completion to meet compliance requirements set for 2025. Construction traffic is expected to use Mile End Road and access the Rouse Hill WRRF via the secondary access from Withers Road.

A separate REF was undertaken to assess the traffic associated with the compliance upgrades, which identified that peak construction periods would generate 50 inbound light vehicle movements and 20 heavy vehicle movements in the AM peak hour. Impacts to the surrounding road network were expected to be minimal. There is a potential overlap between the end of construction of this scheme and the beginning of construction of the project.

# 4 Transport impact assessment

Construction and operational impacts on road network performance, parking and access, public transport and active transport are detailed below. All impacts have been classified as outlined in Table 5.

#### **Table 5 Impact classifications**

Impact classification	Description
Low	Minimal impact with low frequency
Moderate	Likely impacts to the transport network; however, generally more localised. Recommended that these impacts be monitored prior to the implementation of mitigation measures
High	Frequent impacts which may cover larger areas of the transport network. Will require further mitigation measures

## 4.1 Construction hours

Construction activities would be undertaken during the following hours:

- Monday to Friday: 7 am to 6 pm
- Saturday: 8 am to 1 pm
- No work on Sundays or public holidays

Some out of hours works would also be required. However, these works are expected to generate negligible volumes of additional traffic on the surrounding road network.

## 4.2 Indicative construction vehicle access routes

For both sites, potential routes have been developed for construction traffic from the nearest arterial route. This exercise considered the vehicle types, suitability of surrounding roads and access points to each site.

## 4.2.1 Riverstone Waste Water Resource Recovery Facility

From the arterial road network, vehicles accessing the Riverstone WRRF would travel via Windsor Road and Bandon Road to the secondary access road. The primary access road will be the main access for construction vehicles to access the main construction compound. During busy construction periods (such as large concrete pours), traffic control would be in operation to manage heavy vehicle movements in and out of the Riverstone WRRF. The secondary access road may also be occasionally used by vehicles during busy construction periods.

The proposed construction vehicle route to and from the Riverstone WRRF is shown in Figure 13. The proposed access route would travel near Vineyard Public School, which is located on Bandon Road.



Figure 13 Indicative construction vehicle routes to and from the Riverstone WRRF

#### 4.2.2 Rouse Hill Water Resource Recovery Facility

From the arterial road network, vehicles accessing the Rouse Hill WRRF would travel via Windsor Road and Mile End Road to either:

- Primary access via 7 Money Close main construction access route including deliveries, construction material and equipment and worker vehicles.
- Secondary access via Withers Road (directly west of the Rouse Hill Rural Fire Brigade) construction truck and heavy vehicle access during peak traffic periods.
- Alternative access via main entrance gate to be used in the event that the primary and secondary
  accesses are not available.

The proposed construction vehicle route to and from the Rouse Hill WRRF is shown in Figure 14. The proposed access route would travel near Rouse Hill Public School, which is located on Mile End Road.

Due to the poor sight distances for vehicles exiting the secondary access road onto Withers Road, it is recommended that vehicles only turn left onto Withers Road to reduce the safety risk. Consideration may also be given to left-in only access via Annangrove Road for vehicles entering the Rouse Hill WRRF via the secondary access road to minimise potential conflicts with other vehicles.



Figure 14 Indicative construction vehicle routes to and from the Rouse Hill WRRF

## 4.3 Construction workers and vehicles

#### 4.3.1 Vehicle types

A range of construction vehicle types are expected to be used throughout the construction phase and the vehicles to be used by the contractor are not limited to those listed in this section:

- Light vehicles and utility vehicles
- Truck and Dog
- Concrete trucks
- Excavators
- Small rigid vehicles
- Heavy rigid vehicles
- Franna cranes
- Oversize cranes

## 4.3.2 Traffic generation

#### 4.3.2.1 Riverstone Water Resource Recovery Facility

#### 4.3.2.1.1 Riverstone Water Resource Recovery Facility Upgrade

Typical construction would involve up to 85 workers per day. This may increase to up to 105 workers during peak construction periods.

A comparison of the forecast number of peak construction traffic movements between the approved REF and addendum REF is summarised in Table 6.

Vehicle type		Time period	Peak hour movements (inbound and outbound) <sup>1</sup>		
			Approved REF	Addendum REF	
Light	AM peak	6:45 am to 7:45 am (one hour)	50 movements per hour (inbound only)	105 movements per hour (inbound only)	
vehicle	PM peak	4:30 pm to 6:30 pm (two hours)	25 movements per hour (outbound only)	53 movements per hour (outbound only)	
Heavy vehicleAM peak7 am to 12 pm20 movements per hour (to		tal inbound and outbound)			

Table 6: Summary of peak construction traffic generation – Riverstone WRRF

<sup>1</sup>Inbound movements correspond to vehicles entering the site. Outbound movements correspond to vehicles leaving the site.

The peak period of construction traffic is expected to occur in the AM peak hour. When compared to the approved REF, the addendum REF is expected to generate an additional 55 light vehicle movements in the AM peak hour and 28 light vehicle movements in the PM peak hour (an average of less than one additional movement per minute). Light vehicle movements are predominately driven by the number of workers on site.

It should be noted these are peak values and vehicle movements are expected to be lower than these values for large periods of the construction phase.

#### 4.3.2.2 Rouse Hill Water Resource Recovery Facility

Typical construction would involve up to 30 workers per day. This may increase to up to 105 workers during peak construction periods (6 to 8 months).

A comparison of the forecast number of peak construction traffic movements between the approved REF and addendum REF is summarised in Table 7.

#### Table 7: Summary of peak construction traffic generation – Rouse Hill WRRF

Vehicle type		Time period	Peak hour movements (inbound and outbound) <sup>1</sup>		
			Approved REF	Addendum REF	
Light	AM peak	6:45 am to 7:45 am (one hour)	30 movements per hour (inbound only)	150 movements per hour (inbound only)	
vehicle	PM peak	4:30 pm to 6:30 pm (two hours)	25 movements per hour (outbound only)	75 movements per hour (outbound only)	
Heavy vehicle	AM peak	7 am to 12 pm	Four movements per hour (total inbound and outbound)	30 movements per hour (total inbound and outbound)	

<sup>1</sup>Inbound movements correspond to vehicles entering the site. Outbound movements correspond to vehicles leaving the site.

The peak period of construction traffic is expected to occur in the AM peak hour. When compared to the approved REF, the addendum REF is expected to generate an additional 120 light vehicle movements and 26 heavy vehicle movements in the AM peak hour and 50 light vehicle movements in the PM peak hour (an average of up to three additional movements per minute). Light vehicle movements are predominately driven by the number of workers on site.

It should be noted these are peak values and vehicle movements are expected to be lower than these values for large periods of the construction phase.

#### 4.3.2.3 Oversize overmass vehicles

Oversize overmass (OSOM) vehicles would be required to transport the gasifier and dryer system, membrane and large plant. Up to 12 and 10 OSOM vehicles are expected to travel to the Riverstone WRRF and Rouse Hill WRRF respectively over the construction phase. These OSOM vehicles are expected to travel from nearby ports, which would be confirmed during detailed design.

The NSW Oversize Overmass Load Carrying Vehicles Network map displays the network for eligible vehicles operating under the following Heavy Vehicle National Law notices:

- Multi-State Class 1 Load Carrying Vehicles Mass Exemption Notice 2020, which authorises the use of class 1 load carrying vehicles that are up to 5.5 m wide, 35 m long and 5 m high.
- Multi-State Class 1 Load Carrying Vehicles Dimension Exemption Notice 2020, which authorises the use of class 1 load carrying vehicles that are up to 115 tonnes.

The OSOM network near the Riverstone WRRF and Rouse Hill WRRF is shown in Figure 15. Windsor Road is the key arterial road on the OSOM network near the sites.



Figure 15 OSOM network near the Riverstone WRRF and Rouse Hill WRRF

## 4.4 Construction worker parking

## 4.4.1 Riverstone Water Resource Recovery Facility

Within the Riverstone WRRF, all construction worker parking would be accommodated on-site, minimising impacts to surrounding local streets.

#### 4.4.2 Rouse Hill Water Resource Recovery Facility

Within the Rouse Hill WRRF, all construction worker parking would be accommodated on-site, minimising impacts to surrounding local streets.

# 4.5 Riverstone Water Resource Recovery Facility construction impact assessment

#### 4.5.1 Impacts on road network performance

As discussed in Section 4.3.2, the peak period of construction traffic is expected to occur in the AM peak hour. Peak construction periods are expected to generate 105 inbound light vehicle movements and 20 heavy vehicle movements in the AM peak hour.

Therefore, the addendum REF is expected to generate an additional 55 light vehicle movements in the AM peak hour (an average of less than one additional movement per minute) when compared to the approved REF. It should be noted these are peak values and vehicle movements are expected to be lower than these values for large periods of the construction phase.

Construction traffic generation is expected to have a negligible impact on Bandon Road given the low existing traffic volumes. Impacts on Windsor Road are also expected to be low given the relatively low increase in traffic generation.

#### 4.5.1.1 Impacts of OSOM vehicles

To manage OSOM vehicles, a permit will be sought from the National Heavy Vehicle Regulator (NHVR). This permit will undergo a separate approval process and a suitable contractor will be engaged for transportation. As part of the permit, the subcontractor would develop a traffic management plan and undertake a detailed route survey to assess physical constraints. A suitable route would be determined based on the required OSOM vehicle dimensions and mass in consultation with the NHVR. These traffic movements would be undertaken at night under police escort and in accordance with any OSOM permit conditions.

The traffic management plan for the movement of these OSOM vehicles would be undertaken to identify risks and minimise impacts to the wider road network.

The plan would cover:

- Identification of route
- Measures to provide an escort for the loads
- Times of transporting to minimise impacts on the road network
- Communication strategy and liaising with emergency services and police.

Due to the low number of OSOM vehicle movements, combined with the fact that these OSOM vehicles would travel outside of peak periods, it is expected that the traffic impact of OSOM vehicles on the road network would be minimal.

#### 4.5.2 Impacts on parking and access

Impacts of the addendum REF on parking and access are expected to be similar to these assessed in the approved REF. As discussed in Section 4.4, all construction worker parking at the Riverstone WRRF would be accommodated on-site. Therefore, no impacts to parking on surrounding roads are expected.

#### 4.5.3 Impacts on the public transport network

Impacts of the addendum REF on the public transport network are expected to be similar to these assessed in the approved REF. Windsor Road and Bandon Road are used by buses and also form part of the proposed construction vehicle route. Minimal impacts on bus services are expected given the relatively low volumes of traffic being generated. No impacts are anticipated on the operation of bus stops.

#### 4.5.4 Impacts on the active transport network

Impacts of the addendum REF on the active transport network are expected to be similar to these assessed in the approved REF. No impacts to pedestrians or cyclists are expected given that no footpath or cycleway closures are proposed during construction. However, up to 20 heavy vehicle movements would be generated during the morning school drop-off period between 8 am and 9:30 am. These vehicles are proposed to travel near Vineyard Public School, which is located on Bandon Road. Where practical, the finalised heavy vehicle routes would aim to avoid overlapping with the school drop-off period.

# 4.6 Rouse Hill Water Resource Recovery Facility construction impact assessment

#### 4.6.1 Impacts on road network performance

As discussed in Section 4.3.2, the peak period of construction traffic will occur in the AM peak hour. Peak construction periods are expected to generate 150 inbound light vehicle movements and 30 heavy vehicle movements in the AM peak hour.

Therefore, the addendum REF is expected to generate an additional 120 light vehicle movements and 26 heavy vehicle movements in the AM peak hour (an average of up to three additional movements per minute) when compared to the approved REF. It should be noted these are peak values and vehicle movements are expected to be lower than these values for the large periods of the construction phase.

As discussed in Section 3.3.2, traffic generated by nearby infrastructure schemes is expected to be relatively minor.

Construction traffic generation is expected to have a negligible impact on Withers Road and Mile End Road given the low existing traffic volumes. Impacts on Windsor Road are expected to be moderate during peak construction periods given the moderate increase in traffic generation. Windsor Road also carries higher volumes of traffic near the Rouse Hill WRRF, noting that construction traffic generation is expected to only form a small percentage of overall traffic on Windsor Road.

#### 4.6.1.1 Impacts of OSOM vehicles

As with the Riverstone WRRF, to manage OSOM vehicles, a permit will be sought from the NHVR and a traffic management plan would be developed.

Due to the low number of OSOM vehicle movements, combined with the fact that these OSOM vehicles would travel outside of peak periods, it is expected that the traffic impact of OSOM vehicles on the road network would be minimal.

#### 4.6.1.2 Impacts on safety

As with the approved REF, poor sight distances for vehicles exiting the secondary access road onto Withers Road poses a safety risk, particularly for heavy vehicles with slower acceleration speeds.

#### 4.6.2 Impacts on parking and access

Impacts of the addendum REF on parking and access are expected to be similar to these assessed in the approved REF. As discussed in Section 4.4, all construction worker parking at the Rouse Hill WRRF would be accommodated on-site. Therefore, no impacts to parking on surrounding roads are expected.

#### 4.6.3 Impacts on the public transport network

Impacts of the addendum REF on the public transport network are expected to be similar to these assessed in the approved REF. Windsor Road, Withers Road and Mile End Road are used by buses and also form part of the proposed construction vehicle route. Minimal impacts on bus services are expected given the low volumes of traffic being generated. No impacts are anticipated on the operation of bus stops.

#### 4.6.4 Impacts on the active transport network

Impacts of the addendum REF on the active transport network are expected to be similar to these assessed in the approved REF. It was observed on site that pedestrians occasionally walk using the secondary access road as it is directly adjacent to Russell Reserve. Furthermore, members of the Walking Volunteers community group use the secondary access road. Therefore, additional construction vehicles would be travelling near pedestrians wanting to use the secondary access road. Given low existing pedestrian volumes on this walking track, impacts are expected to be moderate.

Furthermore, up to 30 heavy vehicle movements would be generated during the morning school drop-off period between 8 am and 9:30 am. These vehicles are proposed to travel near Rouse Hill Public School, which is located on Mile End Road. Where practical, the finalised heavy vehicle routes would aim to avoid overlapping with the school drop-off period.

## 4.7 Operational impacts

During operation, traffic generation would include light vehicle movements for staff travelling to and from the Riverstone WRRF and Rouse Hill WRRF and heavy vehicle movements to transport chemicals and materials. Operational vehicles would use the vehicle access routes described in Section 4.2.

A comparison of the forecast number of peak traffic movements during operation between the approved REF and addendum REF is shown in Table 8 and Table 9. It should be noted that the values shown are conservative peak values assuming an overlap of traffic movements in the same hourly period. Typical heavy vehicle volumes are also expected to be lower due to the lower quantity of biochar to be transported (compared to biosolids).

Vehicle type	Peak hour movements (inbound and outbound) <sup>1</sup>			
venicie type	Approved REF	Addendum REF		
Light vehicle	Up to four movements per hour (inbound and outbound)			
Heavy vehicle	Up to four movements per hour (inbound and outbound)			

#### Table 8: Summary of peak operation traffic generation – Riverstone WRRF

#### Table 9: Summary of peak operation traffic generation – Rouse Hill WRRF

Vahielo typo	Peak hour movements (inbound and outbound) <sup>1</sup>			
	Approved REF	Addendum REF		
Light vehicle	Up to 15 movements per hour (inbound)			
Heavy vehicle	Up to two movements per hour (inbound and outbound)	Up to four movements per hour (inbound and outbound)		

<sup>1</sup>Inbound movements correspond to vehicles entering the site. Outbound movements correspond to vehicles leaving the site.

When considering the peak hour, the addendum REF is expected to generate similar peak hour vehicle movements when compared to the approved REF.

Therefore, in operation the upgraded plants are expected have a negligible impact on surrounding road network performance. Similarly, impacts on public transport and active transport are expected to be negligible during operation. No changes to parking or access are expected during operation as parking would be accommodated on-site.

# 5 **Proposed mitigation measures**

This section outlines potential mitigation measures required to minimise the impacts of the project throughout the construction and operational phases. All proposed mitigation measures should be developed further by the appointed contractor as part of their detailed Construction Management Plan.

# 5.1 Riverstone Water Resource Recovery Facility

The impacts and proposed mitigation measures relating to the Riverstone WRRF are summarised in Table 10.

Project specific mitigation measures – construction and operation							
Potential impact	Impact	Mitigation measure	Impact following mitigation				
Impacts of construction vehicles on surrounding road network performance	Low	Prepare and implement Traffic and Pedestrian Management Plan prior to construction.	Low				
		Encourage the use of carpooling and public transport, particularly during peak construction periods.					
		Where practical, consider commuter peak traffic congestion when finalising transport routes.					
Impacts of OSOM vehicles on surrounding road network performance	Moderate	Seek permit with NHVR. Engage contractor for OSOM transportation and develop traffic management plan.	Low				
Potential impact of heavy vehicles travelling near Vineyard Public School on Bandon Road	Moderate	Prepare and implement Traffic and Pedestrian Management Plan prior to construction, noting schools near vehicle access routes.	Low				
		Where practical, consider school zones when finalising transport routes.					

#### Table 10: Mitigation and effectiveness – Riverstone WRRF

# 5.2 Rouse Hill Water Resource Recovery Facility

The impacts and proposed mitigation measures relating to the Rouse Hill WRRF are summarised in Table 11.

#### Table 11: Mitigation and effectiveness – Rouse Hill WRRF

Project specific mitigation measures – construction and operation							
Potential impact	Impact	Mitigation measure	Impact following mitigation				
Impacts of construction vehicles on surrounding road network performance, particularly Windsor Road	Moderate	Prepare and implement Traffic and Pedestrian Management Plan prior to construction. Encourage the use of carpooling and public transport, particularly during peak construction periods. Where practical, consider commuter peak traffic congestion when finalising transport routes.	Low				
Impacts to safety due to poor sight distance for vehicles exiting the secondary access road onto Withers Road	Moderate	Left-out only for vehicles leaving the Rouse Hill WRRF via the secondary access road. Use signage to alert vehicles on Withers Road of the informal access. Consider left-in only access for vehicles entering the Rouse Hill WRRF via the secondary access road.	Low				
Impacts of OSOM vehicles on surrounding road network performance	Moderate	Seek permit with NHVR. Engage contractor for OSOM transportation and develop traffic management plan.	Low				
Potential impact of heavy vehicles travelling near pedestrians on secondary access road to Rouse Hill WRRF	Moderate	Use signage to alert pedestrians of heavy vehicle access. Manage secondary access road to permit shared vehicle and pedestrian movements or provide alternative connection. This would form part of a Traffic and Pedestrian Management Plan.	Low				
Potential impact of heavy vehicles travelling near Rouse Hill Public School on Mile End Road	Moderate	Prepare and implement Traffic and Pedestrian Management Plan prior to construction, noting schools near vehicle access routes. Where practical, consider school zones when finalising transport routes.	Low				