



# Report

## Woodlawn Bioreactor Environmental Assessment, Transport Impact Assessment

26 JULY 2010

Prepared for  
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NSW 2009  
  
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## Executive Summary

URS Australia Pty Ltd has been commissioned by Veolia Environmental Services (Australia) Pty Ltd (Veolia) to conduct a Transport Impact Assessment (TIA) to support a Major Project Application to increase the tonnage of waste received at the Woodlawn Bioreactor.

Specifically, Veolia is seeking approval to expand the Woodlawn Bioreactor from its existing assessed maximum input rate of 500,000 tonnes per annum to 1.13 million tonnes per annum (tpa). This total includes additional waste by rail from Sydney as well as 130,000 tpa of waste sourced from regional areas by road of which 50,000 tpa is now approved under DA 31-12-09.

Simultaneously, Veolia is also seeking to increase the maximum throughput rate at the Crisps Creek Intermodal Facility (IMF) to 1.18 million tpa. The Crisps Creek IMF has previously been assessed to accept up to 500,000 tpa of waste to service the Bioreactor, and to also accept up to 280,000 tpa of waste to service the approved Woodlawn Alternative Waste Technology (AWT) Facility.

The application also seeks to extend the operating hours of the Bioreactor and Crisps Creek IMF to between 0600 and 2200 hours to facilitate an additional train at the Crisps Creek IMF.

The Bioreactor is a key facility within Veolia's 6,000ha Eco-Precinct which is located approximately 250km south west of Sydney. The Eco-Precinct also includes a number of approved waste management and renewable energy facilities (including the approved Alternative Waste Technology (AWT) facility and the Woodlawn Wind Farm) which have been factored into the assessment so as to determine overall cumulative impacts.

Based on existing Annual Average Daily Traffic volumes and estimates for existing local traffic volumes, the additional traffic volumes resulting from the proposal are not expected to significantly alter the Level of Service from the existing acceptable Level of Service along the transportation route between the Crisps Creek IMF and the Bioreactor, and along roads that will be used to transport regional waste.

The existing access arrangements for the Woodlawn Bioreactor and Crisps Creek Intermodal Facility are adequate to support this proposal. Existing parking provisions at both sites have sufficient capacity to accommodate the additional vehicles.



## Introduction

### 1.1 Background

URS Australia Pty Ltd (URS) has been commissioned by Veolia Environmental Services (Australia) Pty Ltd (Veolia) to undertake a Transport Impact Assessment to support the Environmental Assessment for the proposed Woodlawn Expansion Project. The Woodlawn Bioreactor is a major facility within Veolia's Woodlawn Eco-Precinct. The Eco-Precinct consists of approximately 6,000ha of land located approximately 250km south west of Sydney, and includes a variety of approved waste management and renewable energy facilities including, the approved Alternative Waste Technology (AWT) facility and the Woodlawn Wind Farm.

The Woodlawn Bioreactor and Crisps Creek Intermodal Facility (IMF) are owned and operated by Veolia. The Woodlawn Bioreactor was assessed to receive up to 500,000 tonnes per annum (tpa) of general solid waste (putrescible) by rail from the Sydney region via the Crisps Creek IMF. However, the Conditions of Development Consent issued by the Department of Planning in November 2000 limited the input rate at Woodlawn to 400,000 tpa, which would then reduce by ten percent every five years.

Veolia is now seeking approval to expand the Woodlawn Bioreactor from its existing approved maximum input rate to 1.13 million tpa. This total includes additional waste by rail from Sydney as well as 130,000 tpa of waste sourced from regional areas by road, of which 50,000 tpa is now approved under DA 31-12-09.

Simultaneously, Veolia is also seeking to obtain consent to increase the maximum throughput rate at the Crisps Creek IMF to a total of 1.18 million tpa. The Crisps Creek IMF has been assessed to accept up to 500,000 tpa of waste delivered by train from Sydney to service the Bioreactor, and to also accept up to 280,000 tpa of waste to service the approved Woodlawn Alternative Waste Technology Facility (AWT), resulting in a total throughput at the IMF of 780,000 tpa.

### 1.2 Site Location

The Woodlawn Bioreactor and the Crisps Creek IMF (referred to herein as the 'Major Project Application') are located approximately 250 kilometres south-west of Sydney, approximately 40 kilometres south of Goulburn. The Bioreactor and the IMF are located approximately 10 kilometres and 3km south-west of Tarago respectively.

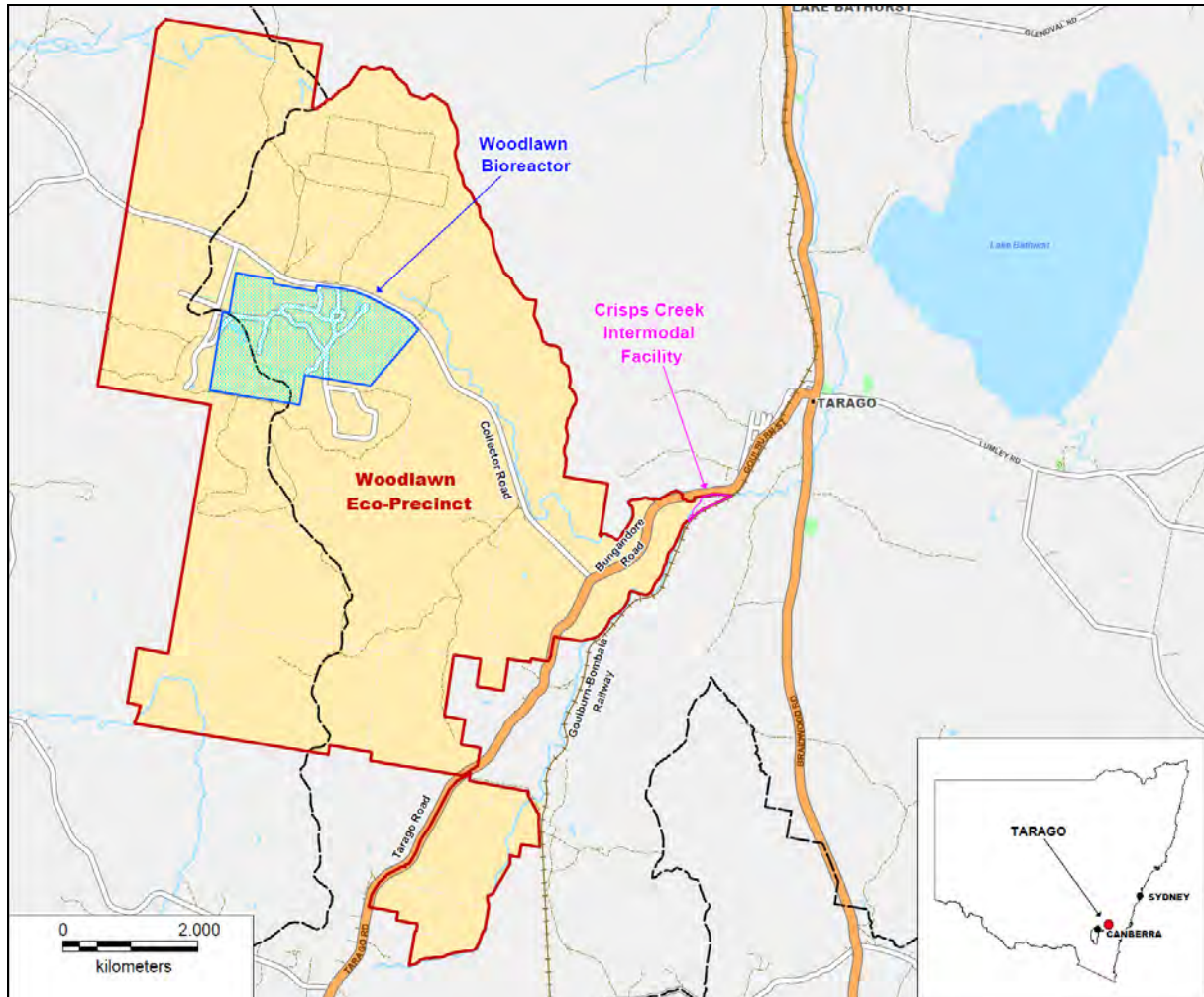
Access to the Woodlawn Bioreactor is via Collector Road, which runs in an east-west direction from its intersections with Bungendore Road to the east and Federal Highway to the west. The Woodlawn Bioreactor is located approximately 500 metres south of Collector Road.

Crisps Creek IMF is located on Bungendore Road, approximately 3 km south-west of Tarago. The intersection of Bungendore Road and Collector Road is a further 1.5 km south-west of the IMF.

Figure 1-1 illustrates the location of the site.

## 1 Introduction

**Figure 1-1 Regional Site Location**



## Existing Transport Conditions

### 2.1 Levels of Service

In accordance with the *Guide to Traffic Generating Developments*, version 2.2 (RTA, October 2002), the Levels of Service relevant to rural local roads are summarised in Table 2-1. The threshold volumes for the peak hour flow (veh/h) on two-lane rural roads associated with each Level of Service are based on the combined counts for both directions. These traffic volumes account for total vehicle movements. For the purposes of this study, the proportion of heavy vehicles has an assumed conservative estimate of 10 percent.

**Table 2-1 Levels of Service, Rural Two-Lane Two-Way Roads**

Level of Service	Traffic Volume Threshold (Level Terrain)	Traffic Volume Threshold (Rolling Terrain)	Definition
A	N/A	N/A	Free-flow conditions with a high degree of freedom for motorists to select speed and manoeuvre within traffic flow
B	610 veh/h	470 veh/h	Stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow
C	960 veh/h	750 veh/h	Stable flow conditions, restricted freedom to select speed and manoeuvre within traffic flow
D	1,450 veh/h	1,110 veh/h	Approaching unstable flow conditions, severely restricted to select speed and manoeuvre within traffic flow
E	2,270 veh/h	1,730 veh/h	Close to capacity, virtually no freedom to select speed and manoeuvre within traffic flow. Small increases in traffic volume would generally cause operational problems.

Notes:

1. Volumes rounded up to nearest 10 vehicles.
2. Source: Guide to Traffic Generating Developments, Version 2.2, 2002.

Roads operating at a Level of Service of C or better are generally considered to have acceptable flow conditions.

### 2.2 Road Network

The Woodlawn Bioreactor is accessed via Collector Road from Bungendore Road. The Crisps Creek IMF is located on Bungendore Road approximately three kilometres from the township of Tarago.

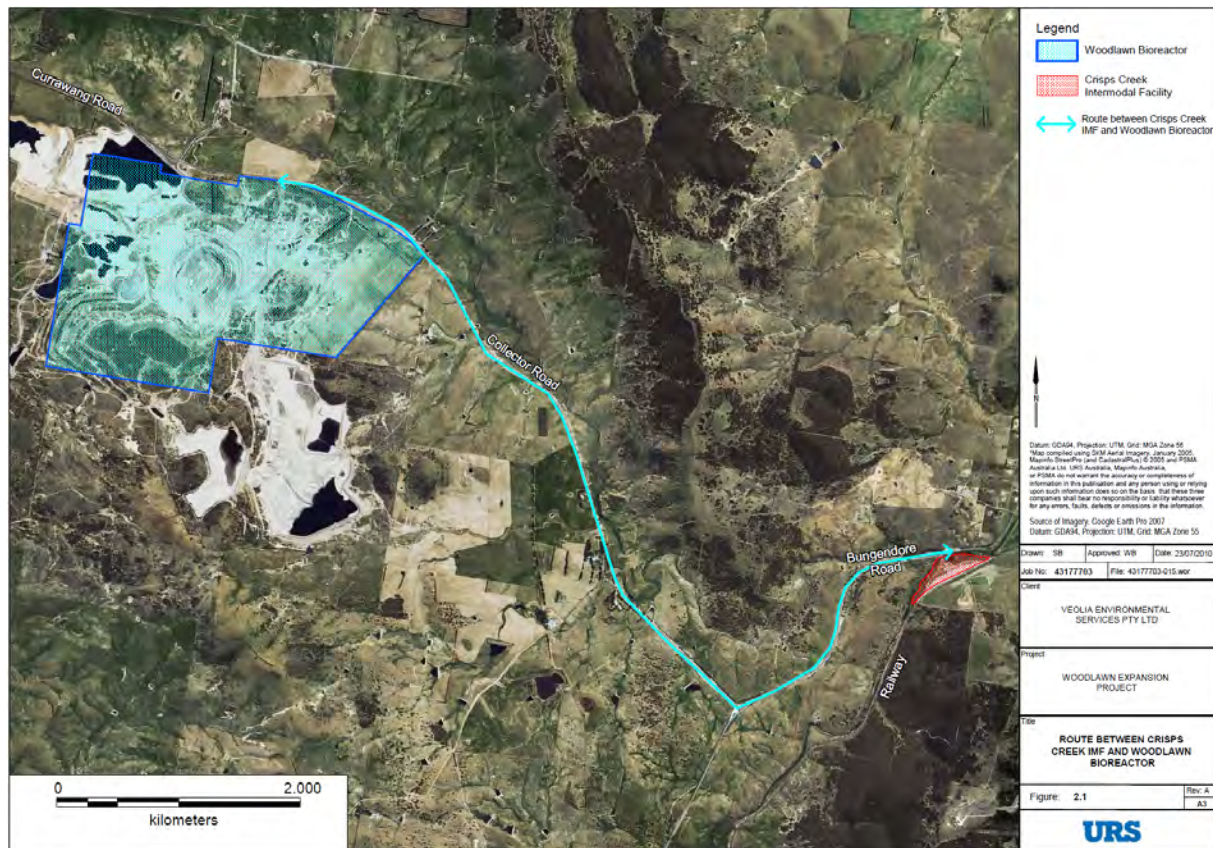
Containerised waste is transported from the Crisps Creek IMF to the Bioreactor along Bungendore and Collector Roads.

Figure 2-1 illustrates the route between the Crisps Creek IMF and Woodlawn Bioreactor.



## 2 Existing Transport Conditions

**Figure 2-1 Route between Crisps Creek IMF and Woodlawn Bioreactor**



### **Braidwood Road (MR79)**

Braidwood Road is a classified road comprising a two-lane, two-way configuration. There is a shoulder on both sides of the road generally with a width of approximately one metre. Braidwood Road has a posted speed limit of 100 kilometres per hour for the majority of its length with 50 or 60 kilometres per hour through towns.

The nearest RTA count station (94.142) is in Bungendore, east of Bungendore Road.

### **Bungendore Road (MR268)**

Bungendore Road is a classified road and comprises a two-lane two-way configuration for the majority of its length, with a shoulder of approximately one metre on each side. The posted speed limit is 100 kilometres per hour with a 60-kilometre per hour speed limit through the town of Tarago. The existing pavement along Bungendore Road appears to be in good condition.

At the Crisps Creek Intermodal Facility, Bungendore Road has a right-turn bay for a length of approximately 100 metres to provide access to the facility for eastbound vehicles. Additionally, there is an acceleration lane for vehicles turning left out of the facility, for a length of approximately 100 metres. The existing intersection configuration is a Give-Way controlled t-intersection.

The nearest RTA count station (94.143) is in Bungendore, north of Braidwood Road.

## 2 Existing Transport Conditions

### ***Collector Road***

Collector Road comprises a two-lane, two-way configuration for the majority of its length, with a shoulder of approximately one metre on each side. The posted speed limit is 100 kilometres per hour. The existing pavement along Collector Road appears to be in good condition for the length between Bungendore Road and the Bioreactor access. Plate 2-1 illustrates the general configuration and condition of Collector Road.

**Plate 2-1**      **Collector Road, Towards East, East of Woodlawn Bioreactor Access**



**Plate 2-2**      **Collector Road, Towards East, East of Woodlawn Bioreactor Access**



Source: URS, 4 February 2010.

### **2.3 Existing Traffic**

Traffic count data for relevant locations along the classified roads was obtained from the RTA database. The Annual Average Daily Traffic (AADT) for these roads has been summarised in Table 2-2.

## 2 Existing Transport Conditions

**Table 2-2 Summary of Historical AADT for Surrounding Road Network**

Station	Location	2000 AADT	2003 AADT	Average Annual Growth	2010 AADT Estimate <sup>1</sup>	Peak Hour Volume Estimate <sup>2</sup>
94.143	<b>MR268 Bungendore Road</b> , north of MR51 Braidwood Road, Bungendore	2,085	2,577	+8%	4,420	440
94.142	<b>MR79 Braidwood Road</b> , east of MR268 Bungendore Road, Bungendore	4,444	4,536	<+1%	4,540	450
94.470	<b>MR268 Bungendore Road</b> , at Yarralumla Shire Boundary	684	663	-1%	618	54
94.804	<b>MR79 Braidwood Road</b> , 1.5 km south of Currawong Road, Goulburn	1,309	1,458	+3%	1,794	311

Source: RTA Traffic Volume Data Southern Region 2006.

Notes:

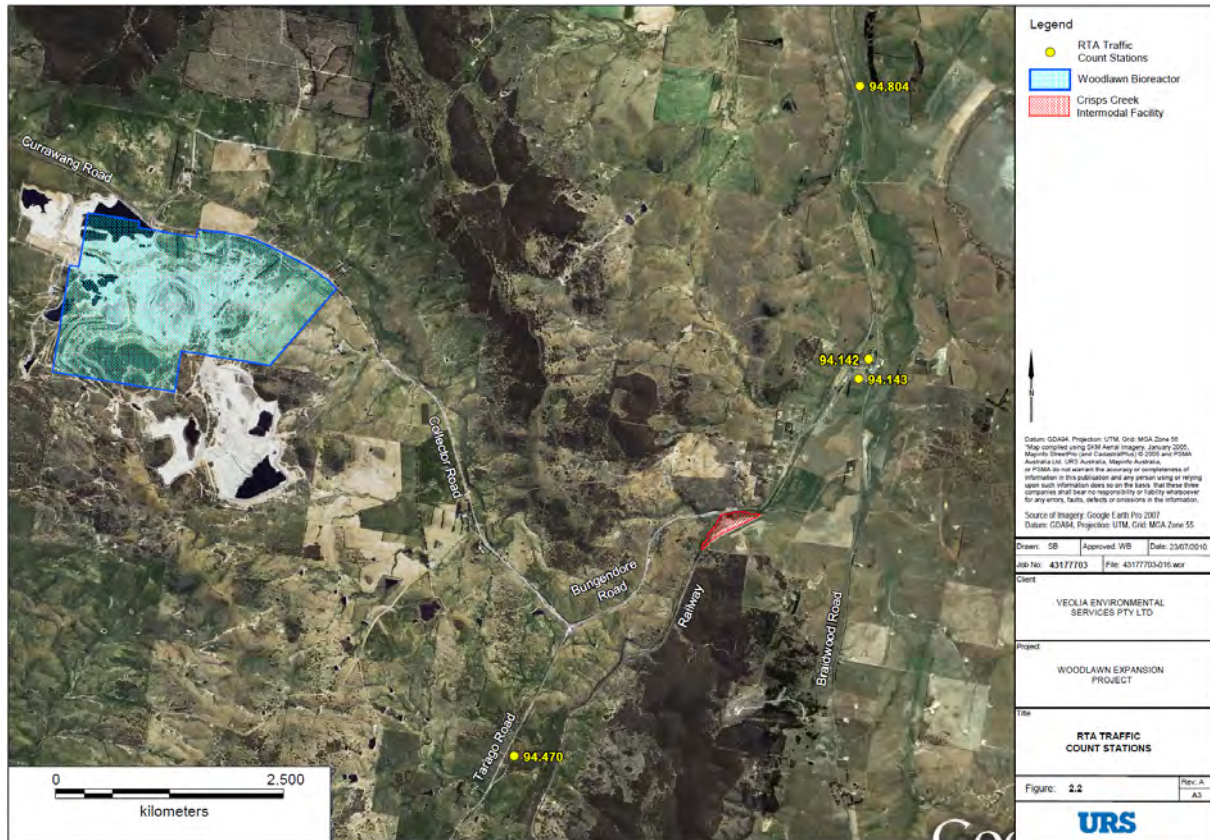
1. Based on linear average annual growth between 2000 and 2003 AADT data.
2. Based on the assumption that approximately ten percent of the AADT represents the peak traffic volume.

The Levels of Service thresholds in Table 2-1 indicate that Bungendore Road and Braidwood Road currently operate at Level of Service A.



## 2 Existing Transport Conditions

**Figure 2-2 RTA Traffic Count Stations**



Site observations on Collector Road suggest that the average daily traffic volume is less than 1,500 vehicles per day, which equates to up to 150 vehicles in the peak hour, assuming the peak hour volume represents ten percent of the average daily volume. Based on the Levels of Service specified in Table 2-1, Collector Road is currently operating at Level of Service A.

### 2.4 Other State and Regional Roads

As discussed in Section 1.1, part of this Major Project Application includes the receipt of up to 130,000 tpa of waste from regional areas by road, of which 50,000 tpa was assessed separately and is now approved under the existing consent. (AECOM, 22 January 2010). Therefore, while taking account the previous assessment of 50,000 tpa, this TIA also addresses the impacts of the transportation of the remaining 80,000 tpa of regional waste.

Since the exact sources and volumes of waste arriving from each regional area is unknown at this stage, it is assumed that waste would be transported via the three key highways before travelling along Bungendore Road and Collector Road to access the Bioreactor site. The key highways (including a sample RTA AADT) are:

- Hume Highway – 21,071 (2003 AADT, Yarra, 1.5 km east of SH3);
- Federal Highway – 11,240 (2003 AADT, Yarra, 1.5 km south of SH2); and
- Kings Highway – 3,705 (2006 AADT, approximately 30km east of Bungendore).

## 2 Existing Transport Conditions

### 2.5 Existing Operational Traffic

The road haulage between the Crisps Creek IMF and Woodlawn takes approximately seven hours. This time accounts for a 56-container train set to arrive and be unloaded, transported to the Bioreactor, the unloading of containerised waste into the void and to make the return trip to the Crisps Creek IMF, equating to an average of 10 trips per hours or 20 vehicle movements (accounting for return trip). The original Bioreactor EIS considered traffic impacts for an average of 11 vehicles per hour, which equates to 22 movements per hour (accounting for a return trip).

#### 2.5.1 Approved Operational Traffic

The Bioreactor facility is not the only development generating traffic within the Eco-Precinct. There are three approved facilities within the Eco-Precinct that will generate traffic concurrent with the proposed increases in vehicle activity at the Bioreactor site. The traffic generated by these facilities has been taken into account in this TIA to obtain an understanding of overall cumulative traffic impacts.

A summary of these other approved, but not operational activities, in the Eco-Precinct include:

- The AWT facility is approved to accept up to 280,000 tpa of waste from the Crisps Creek IMF;
- The Woodlawn windfarm development is an approved wind energy facility on Collector Road (east of the Bioreactor site) consent was given for approximately 200 vehicle trips generated per day during its construction phase only; and
- 50,000 tpa of regional waste to be received at the Bioreactor from the regional municipalities of Goulburn-Mulwaree, Queanbeyan, Bega Valley and Palerang Council's.

### 2.6 Access Arrangements

#### 2.6.1 Crisps Creek IMF

The Crisps Creek Intermodal Facility access is located on Bungendore Road, approximately eight kilometres from the Woodlawn Bioreactor site. The access comprises a right-turn bay for eastbound movements on Bungendore Road, which is approximately 100 metres long and an acceleration lane for vehicles turning out of the Crisps Creek Intermodal Facility travelling southwest towards the Bioreactor site. The sealed access road consists of a single lane of approximately seven metres width. The left and right turns into the Crisps Creek Intermodal Facility access have large radii, which allow for heavy vehicle turning movements. The existing pavement adjacent to the access and along the access road is in good condition. The access location provides good sight distance in both directions.

#### 2.6.2 Woodlawn Bioreactor

The Woodlawn Bioreactor access is on Collector Road and is a t-intersection incorporating a stop control. The access is approximately 30 metres wide with sufficient site distance to oncoming traffic in both directions. Plates 2-3 and 2-4 illustrate the width and stop-control of the access to the Woodlawn Bioreactor. The access road is sealed with a width of approximately eight metres. The existing pavement on Collector Road adjacent to the access and the access road itself is in good condition. The left turn into the Bioreactor access has a large radius, which allows for heavy vehicle turning movements.

## 2 Existing Transport Conditions

**Plate 2-3** Woodlawn Bioreactor Access,  
Towards West



**Plate 2-4** Woodlawn Bioreactor Access,  
Towards East



Source: URS, 4 February 2010.

### 2.7 Parking

There is visitor and employee parking located on the Bioreactor site. The occupancy rate of the visitor car park during the site visit was observed to be approximately ten percent. Car parking for at least 50 vehicles is provided on site.

There are an additional five parking spaces available for light vehicles at the entrance to the IMF site.

### 2.8 Public Transport, Pedestrians and Cyclists

During the site visit there were no public transport, pedestrian or cyclist facilities identified along key road corridors surrounding the Crisps Creek Intermodal Facility and the Bioreactor site.

### 2.9 Existing Rail Operations

Current operations involve one train set comprising of 56 containers, being transported from the Clyde Transfer Terminal to the Crisps Creek IMF on a daily basis.

The rail operations are summarised below:

- The train departs Clyde at approximately 1.30am with a laden set of containers
- Arrive at Crisps Creek IMF at 6.30am.
- Unloading operations using a container handler commence at approximately 7 am.
- Containers are placed on prime movers to be transported to the Bioreactor.
- Prime movers return empty containers to the IMF and are reloaded onto the train.
- Train departs the IMF at approximately 4.30pm.

## Description of Proposal

### 3.1 Proposed Operations

The Major Project Application seeks to increase the maximum input rate at the Woodlawn Bioreactor to 1.13 million tpa. This total includes additional waste by rail from Sydney as well as 130,000 tpa of waste sourced from regional areas by road of which 50,000 tpa is already approved.

Simultaneously, Veolia is also seeking to obtain consent to increase the maximum throughput rate at the Crisps Creek IMF to a total of 1.18 million tpa. Additionally, the Major Project Application seeks to extend the hours of operation at the Crisps Creek IMF and Woodlawn Bioreactor to facilitate an additional train each day.

To facilitate the increased input rates, some additional equipment and personnel may be required at both the Crisps Creek IMF and Woodlawn Bioreactor. The following additions would cover the proposed operating conditions as well as any additional contingency requirements:

- 11 employees between the two facilities;
- One container handler;
- One bulldozer;
- One landfill compactor; and
- One container tripper.

### 3.2 Traffic Generation Estimates

#### 3.2.1 Construction Traffic Generation

There is limited construction work associated with the Project as Veolia is not proposing to increase the project footprint of either the Bioreactor or the IMF. If required, any construction traffic would consist of short-term deliveries to install additional mobile and permanent lighting infrastructure at the Woodlawn Bioreactor to facilitate evening operations. Given the one off nature of these operations, any delivery and installation traffic is considered to have a negligible impact on the transportation network.

#### 3.2.2 Operational Traffic Generation

The proposed increase in tonnage would require an increase to the hours of operation to unload and transport the additional containers received at Crisps Creek.

Table 3-1 summarises the average hourly vehicles required for the proposal in comparison to the original Bioreactor proposal.



### 3 Description of Proposal

**Table 3-1 Average Hourly Heavy Vehicle Movements from Crisps Creek IMF, Waste Haulage**

	Existing Operations	Proposed Operations	Change
Truck operation hours	0700 to 1800 (11 hours)	0600 to 2200 (16 hours)	+5 hours
Number of Vehicles to Bioreactor	10	15	+5 Vehicles
Number of Vehicles to AWT	0	6	+6 Vehicles
Total Number of Vehicles <sup>1</sup>	10	21	+11 Vehicles
<b>Total Number of Vehicle Movements<sup>2</sup></b>	<b>20</b>	<b>42</b>	<b>+22 Vehicle Movements</b>

Source: Veolia, January 2010.

Notes:

1. Considers one-way vehicle movements (to/from Crisps Creek IMF)
2. Considers two-way vehicle movements (to/from Crisps Creek IMF)

The Major Project Application would require an increase in equipment and personnel at the Woodlawn Bioreactor and the Crisps Creek IMF. This includes an additional 11 employees, one forklift, one bulldozer, one landfill compactor and one container tipper. The delivery of the additional equipment is a one-off impact and is considered to have an insignificant impact on the surrounding transport network. For the purpose of this proposal it is assumed that the additional 11 employees would travel to the Bioreactor site in separate cars during the AM peak hour and leave the site in the PM peak hour.

The proposal also includes the receipt of up to 130,000 tpa of waste from regional areas, of which 50,000 tpa is already approved to be received from the regional municipalities of Goulburn-Mulwaree, Queanbeyan, Bega Valley and Palerang. Appendix H of the *Environmental Assessment – Modification to DA 31-02-99 to Receive Regional Council Waste at the Woodlawn Bioreactor* (AECOM/Veolia, February 2010) outlines the estimated traffic volumes and haulage routes between these Councils and the Bioreactor site and are summarised in Table 3-2.

Although the exact sources and volumes of the additional 80,000 tpa of regional waste have not been confirmed, estimates of the traffic generated by the additional regional waste are outlined in Table 3-2.

**Table 3-2 Regional Vehicle Movement Impact Considerations**

Council	Waste (tpa)	Annual Trucks	Daily Trucks One Way (Two-Way)
<b>Approved Regional Waste (50,000 tpa) <sup>1</sup></b>			
Goulburn Mulwaree	20,000	1,053	4 (8)
Palerang	10,000	526	4 (8)
Queanbeyan	8,000	421	2 (4)
Bega Valley	12,000	632	2 (4)
Total	50,000	2,632	10 (20)
<b>Additional 80,000 tpa proposed under this Environmental Assessment</b>			
Upper Lachlan	3,000	158	1 (2)
Yass Valley	3,000	158	1 (2)
Eurobodalla	21,000	1,105	4 (8)
ACT <sup>2</sup>	53,000	2,789	9 (18)
Total	80,000	4,210	15 (30)

### 3 Description of Proposal

1. *Environmental Assessment – Modification to DA 31-02-99 to Receive Regional Council Waste at the Woodlawn Bioreactor (Aecom/Veolia, February 2010) – Appendix H*
2. *ACT figures based on 50% of total Commercial, Industrial and Private Waste Volumes, (ACT SoE Report, 2006/7)*

Based on a conservative approach, it is assumed that all the truck trips associated with the transportation of the 130,000 tpa of waste from regional areas would take the route via Bungendore Road and Collector Road only. A conservative truck capacity figure was used i.e. 19 tonnes. In addition, it was assumed that all daily truck movements outlined in Table 3-2 (i.e from surrounding areas) will occur during the peak periods. Although this may not actually occur during the operational phase, this will produce the conservative approach for the traffic impact analysis conducted in section 4 of this document.

Based on the figures contained in Table 3-2, the following regional traffic is expected to be generated

- 130,000 tpa of regional waste equates to approximately 6,842 vehicle trips to the Woodlawn Bioreactor per year, assuming each truck transports 19 tonnes of waste;
- Although waste can be transported six days per week for 52 weeks of the year, totalling 312 days per year; all has been assumed to occur during the modelled period and will produce the 'worst-case' scenario.

### 3.3 Other Developments in Area

The Woodlawn Bioreactor is located on Collector Road which is subject to two more additional developments that may be in their construction and/or operational phase at the same time of the increased traffic generation rates described in section 3.2. The first of these developments is the Woodlawn Windfarm Project and is a proposed wind energy facility incorporating twenty wind turbines. The site access to this windfarm for construction vehicles will be on Collector Road at the entrance to Pylara Farm and is located east of the Bioreactor access road. Over-dimensional and construction vehicles accessing the windfarm site will be originating in Port Kembla and/or Goulburn and travel along Bungendore Road via Tarago.

The second development along Collector Road is the Woodlawn Alternate Waste Technology Facility which is located west of the Bioreactor access road. Additional vehicles generated by this Project will be travelling between the AWT facility and the Crisps Creek IMF.

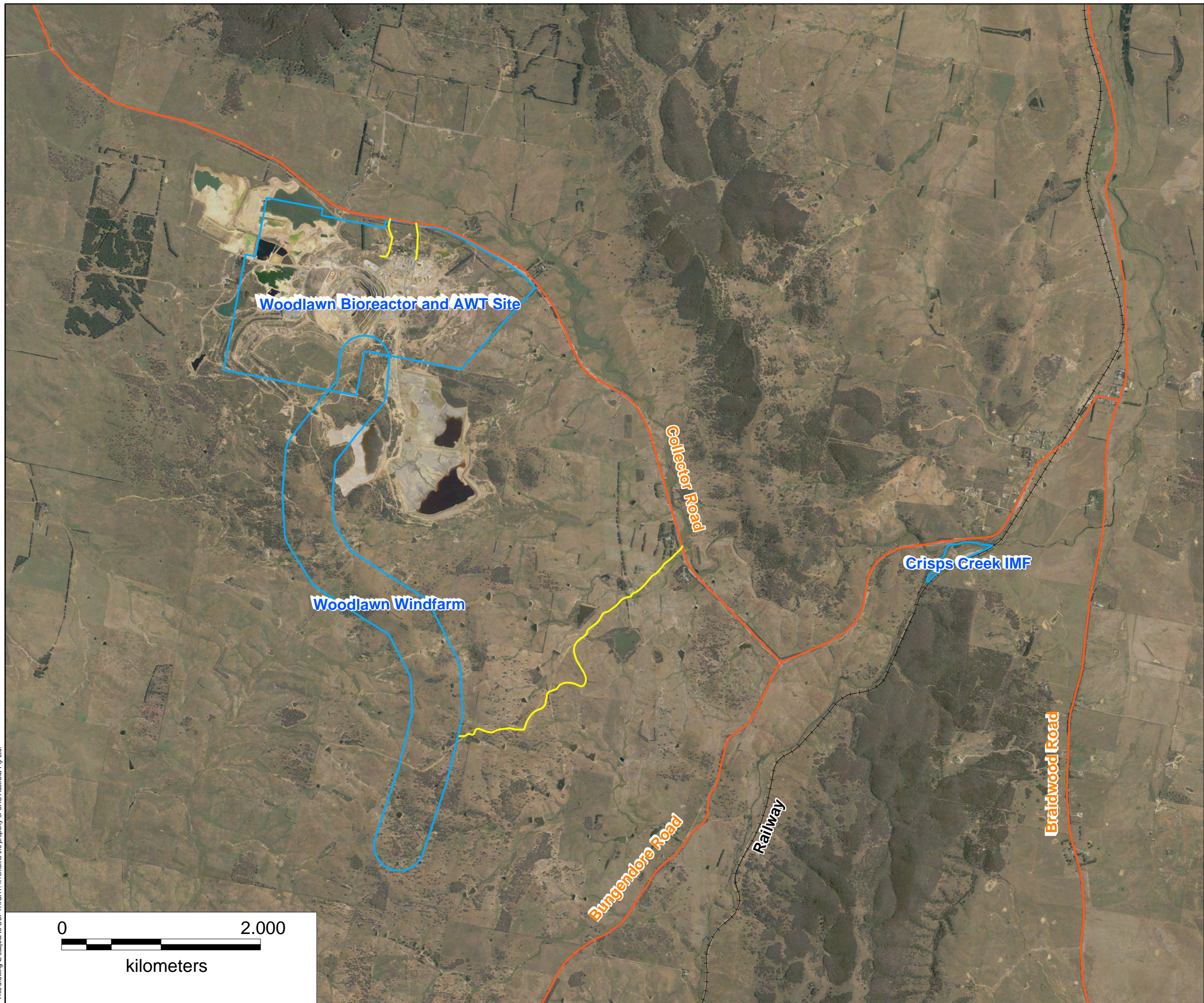
Details of the vehicle generation assumed for each site is provided in Table 4-1 and have been adopted in the traffic impact analysis in section 4.

The 130,000 tpa of waste received by the Bioreactor facility from regional LGAs (detailed in section 3.2) also needs to be taken into consideration when assessing the traffic impacts of the proposed increases in activities of the Bioreactor facility, of which 50,000 tpa is already approved.

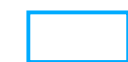
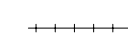


Figure 3-1 illustrates the Bioreactor site with the nearby developments in the area.



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## Legend

-  Site Boundaries
-  Rail
-  Road
-  Access to Sites



\*Map compiled using Mapinfo StreetPro 2010  
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Source: Aerial Imagery from ©Land & Property Management Authority (LPMA) [2009]  
Datum: GDA94, Projection: UTM, Grid: MGA Zone 55

Drawn: SB	Approved: WB	Date: 09/08/2010
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Job No: 43177703	File: 43177703-022.wor
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Client
VEOLIA ENVIRONMENTAL SERVICES PTY LTD

Project
WOODLAWN EXPANSION PROJECT

Title
VEHICLE ROUTES OF DEVELOPMENTS IN ECO-PRECINCT

Figure: 3-1	Rev: A
	A3

**URS**

0 2.000  
kilometers







## Impact of Traffic Generation

This section provides the degree of traffic impact created by the increase in the proposed vehicle movements and extended operational hours of the Bioreactor site. The AM Peak Hour is the chosen period to be assessed as this will produce the 'worst-case' scenario. The assumptions used in determining the traffic impact is outlined in section 4.2.2.

### 4.1 Impact on Midblocks

The impact on key roads surrounding the Crisps Creek Intermodal Facility and the Bioreactor Site with respect to increased traffic volumes is presented in Table 4-1.

**Table 4-1 Impact Assessment of AM Peak Hour Vehicle Movements (two-way) for the Project**

Activity	Collector Road	Bungendore Road	Braidwood Road
<b>No Development</b>			
Traffic Flow	150	440	450
Existing Operational Traffic, Woodlawn Bioreactor	10	10	0
Total Traffic Flow – Existing	160	450	450
Level of Service	A	A	A
<b>With Proposal</b>			
Proposed Operational Traffic (additional IMF deliveries) <sup>1</sup>	30	30	0
Proposed Operational Traffic, Regional waste deliveries <sup>2</sup>	50	50	8
Estimated Operational Traffic, Woodlawn AWT <sup>3</sup>	12	12	0
Additional Staff Required at IMF and AWT facilities <sup>4</sup>	11	10	9
Estimated Construction Traffic, Woodlawn Windfarm <sup>5</sup>	70	65	58
Total Traffic Flow – with Proposal	333	617	525
Percentage Change (from No Development)	108%	37%	17%
Midblock Level of Service	A	B	A / B <sup>7</sup>

Source: URS, February 2010.

**Notes:**

1. Represents two-way movements between Bioreactor and IMF.
2. Refer Table 3-2 for values – assumed all two-way movements occur during AM Peak Hour for 'worst-case scenario'.
3. Represents a total of twelve two-way truck movements between AWT site and IMF.
4. Represents one-way movements to site during AM Peak Hour. Assume employee distribution of 75% from Goulburn/Tarago, 15% from Bungendore and 10% from Collector.
5. Total construction volumes have been based on the *Woodlawn Wind Farm Modifications – Statement of Environmental Effects* (Aurecon, Jan 2010). Total of 50 one-way personnel movements and 20 return truck trips during AM Peak Hour. Assume employee distribution of 75% from Goulburn/Tarago, 15% from Bungendore and 10% from Collector for turning movement split for site access.
6. A level of service 'B' is still considered to have reasonable freedom of congestion and is not of any concern.
7. A level of service 'A' applies to Braidwood Road if the majority of its length is considered level terrain or is otherwise 'B' if considered rolling terrain. The site inspection indicated that the road topography is somewhere in between and therefore both levels of service have been provided. Nonetheless, a level of service 'B' is still considered to have reasonable freedom and is not of any concern.

Analysis of Table 4-1 for the Major Project Application indicates the following key elements:

- AM Peak Hour traffic on Collector Road would be approximately 108 percent higher than the existing traffic volumes. Despite this significant increase in peak hour traffic volumes, the Level of Service for Collector Road remains unchanged at Level of Service A.

## 4 Impact of Traffic Generation

- AM Peak Hour traffic on Bungendore Road and Braidwood Road would increase by 37 and 17 percent respectively and would have negligible impact on the operation of the roads.

As outlined earlier, it is expected that up to 130,000 tpa of waste may be transported from regional areas to the Bioreactor site for disposal. An assessment of the proposed delivery of waste to the Bioreactor from these areas, including sources, transportation arrangements, haulage routes and associated impacts has been incorporated into Table 4-1 and turning movements are outlined under the assumptions in section 4.2.2. As addressed in Section 2 of this report, it is assumed that the route taken by road is likely to be via the state highway network then Bungendore Road and Collector Road to access the Bioreactor site. Based on the existing high traffic volumes on the state highway network and the likelihood that these vehicular movements would be spread over a wide transport network, it is anticipated that traffic generated by this proposal on other road midblocks would be negligible and would be dissipated within normal traffic growth.

The cumulative effect of nearby developments proposed to be developed or operating simultaneously has also been considered in Table 4-1.

### 4.2 Impact at Intersections

The SIDRA modelling package was used to analyse the performance of the existing road network to identify the current traffic characteristics (in 2010 estimates) at three key intersections between the Crisps Creek IMF and Woodlawn Bioreactor sites:

- Crisps Creek IMF site access / Bungendore Road intersection;
- Bungendore Road / Collector Road intersection; and
- Woodlawn Bioreactor site access / Collector Road intersection.

There are a number of other intersections in the surrounding area (such as in Goulburn, Collector and Bungendore), however the impact of operational vehicles at these intersections will be negligible (i.e. the only vehicles during the operational phase of the development will be from regional areas and will amount to only a handful of vehicles per hour).

The 'degree of saturation' and '95% queue length' are used to compare the affect that operational vehicles will have on the operation of the intersections.

The Degree of Saturation refers to the ratio of an intersection between the traffic demand at the intersection compared to its total capacity. An intersection with a Degree of Saturation approaching 0.90 to 0.95 is considered to be at capacity.

The 95% queue length value is used as an indication of the length whereby the probability of exceeding it is only 5% - often referred to as the design queue length.

## 4 Impact of Traffic Generation

### 4.2.1 SIDRA Analysis

Table 4-2 provides the SIDRA analysis outputs for the three nominated intersections.

**Table 4-2 SIDRA Analysis Results**

Intersection		2010 Existing Conditions	2010 Estimated Values <sup>1</sup>	Critical Movement
Crisps Creek IMF site access / Bungendore Road intersection	Degree of Saturation	0.13	0.19	Eastbound Bungendore Road right turn into IMF site
	95% Queue Length	Less than one vehicle <sup>2</sup>	12m	
Bungendore Road / Collector Road intersection	Degree of Saturation	0.18	0.55	Eastbound Collector Road left and right turn movements into Bungendore Road
	95% Queue Length	7m	42m	
Woodlawn Bioreactor site access / Collector Road intersection	Degree of Saturation	0.05	0.23	Northbound Bioreactor site access right turn into Collector Road
	95% Queue Length	6m	15m	

Notes:

1. Includes impacts of proposed increase in Bioreactor volumes and cumulative effects of adjacent developments and regional LGA deliveries.
2. Queue Lengths of 'less than one vehicle' refer to a distance less than 6m.

The analysis summary provided in Table 4-2 during the AM Peak Hour indicates that there will no significant traffic impacts of the additional truck movements associated with the proposed increase in activities at the Woodlawn Bioreactor site. The Degree of Saturation outputs for all three intersections are well below the 0.90-0.95 threshold and the longest queue length is expected to be 42m (i.e approx 7 cars). As such, there is no indication that intersection improvements will be required even after taking into account the additional cumulative impact of the adjacent developments on the existing traffic.

### 4.2.2 Assumptions

Turning movements and heavy vehicle volumes must be known or estimated in order for intersections performance to be analysed in SIDRA. Midblock volumes, supplied by RTA counts, are the only known data and as such a number of assumptions have been made for the purposes of SIDRA modelling, and includes:

- Existing Traffic Conditions
  - Existing traffic directional split along Bungendore Road and Collector Road is assumed to be 50/50 (eg. 50% northbound, 50% southbound);
  - A conservative estimate of existing heavy vehicle proportion of 10% has been applied to all road sections;
  - The AM Peak Hour has been modelled and is estimated to represent 10% of total daily volumes; and
  - Collector Road attracts 10% of northbound traffic and 10% of southbound traffic on Bungendore Road.

## 4 Impact of Traffic Generation

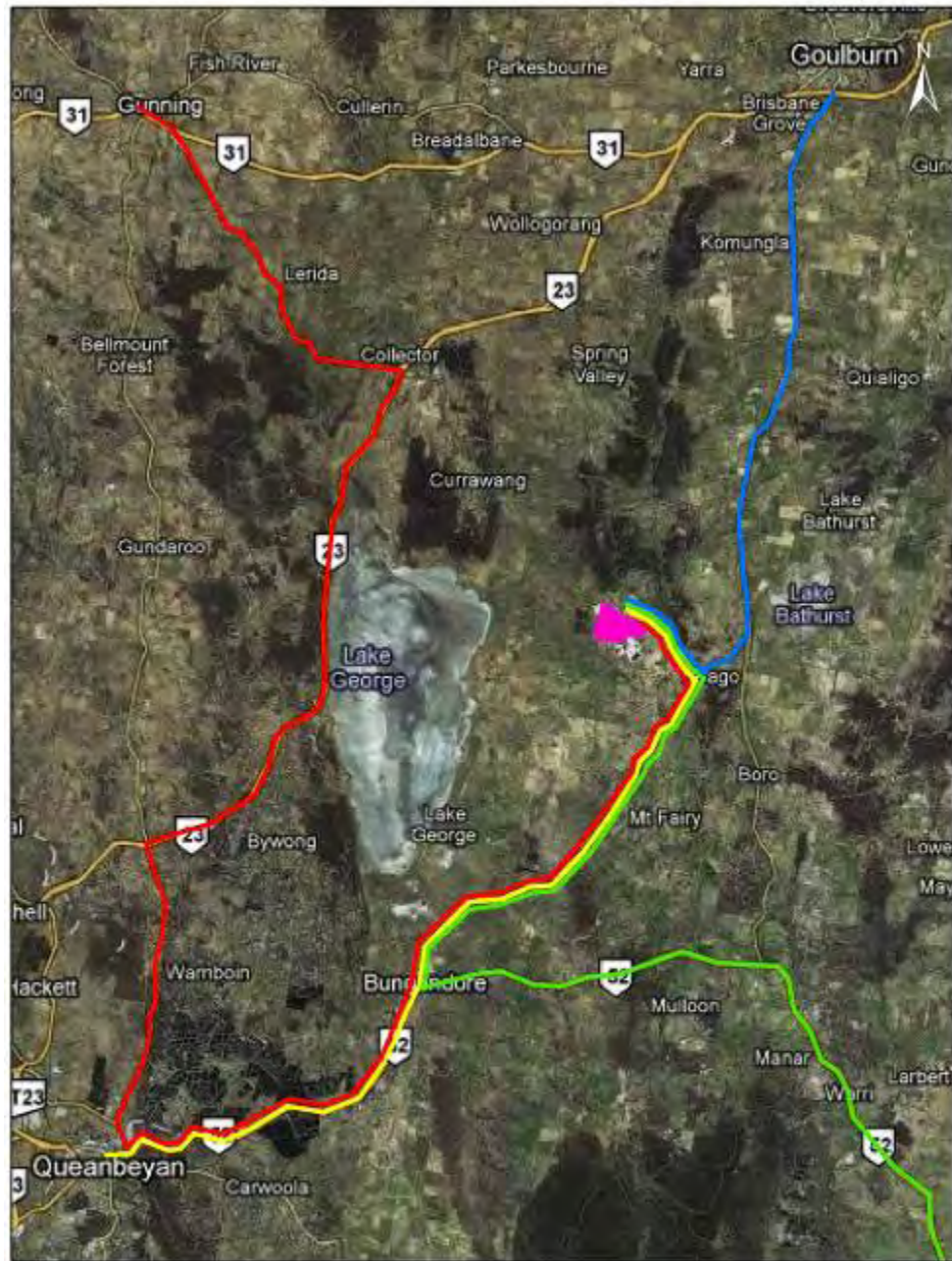
- Additional Bioreactor Vehicles
  - The public road network is assumed to have 100km/h posted speed limits while the Bioreactor and IMF site accesses will apply a 50km/h speed limit;
  - All additional truck movements from regional areas will occur in the AM Peak Hour;
  - All truck movements from regional areas will arrive to the site on Collector Road from the east with all deliveries following the route defined in Figure 4-1;
  - All personnel vehicle movements will occur during the AM Peak Hour and will be inbound to the site; and
  - Daily truck vehicle volumes are assumed to occur evenly over the proposed 16-hour working day.

These assumptions may be conservative when being applied to the AM Peak Hour however will provide a 'worst-case scenario' of the traffic impacts of the increased operations of the Woodlawn Bioreactor as well as taking into account the cumulative impacts of surrounding developments.

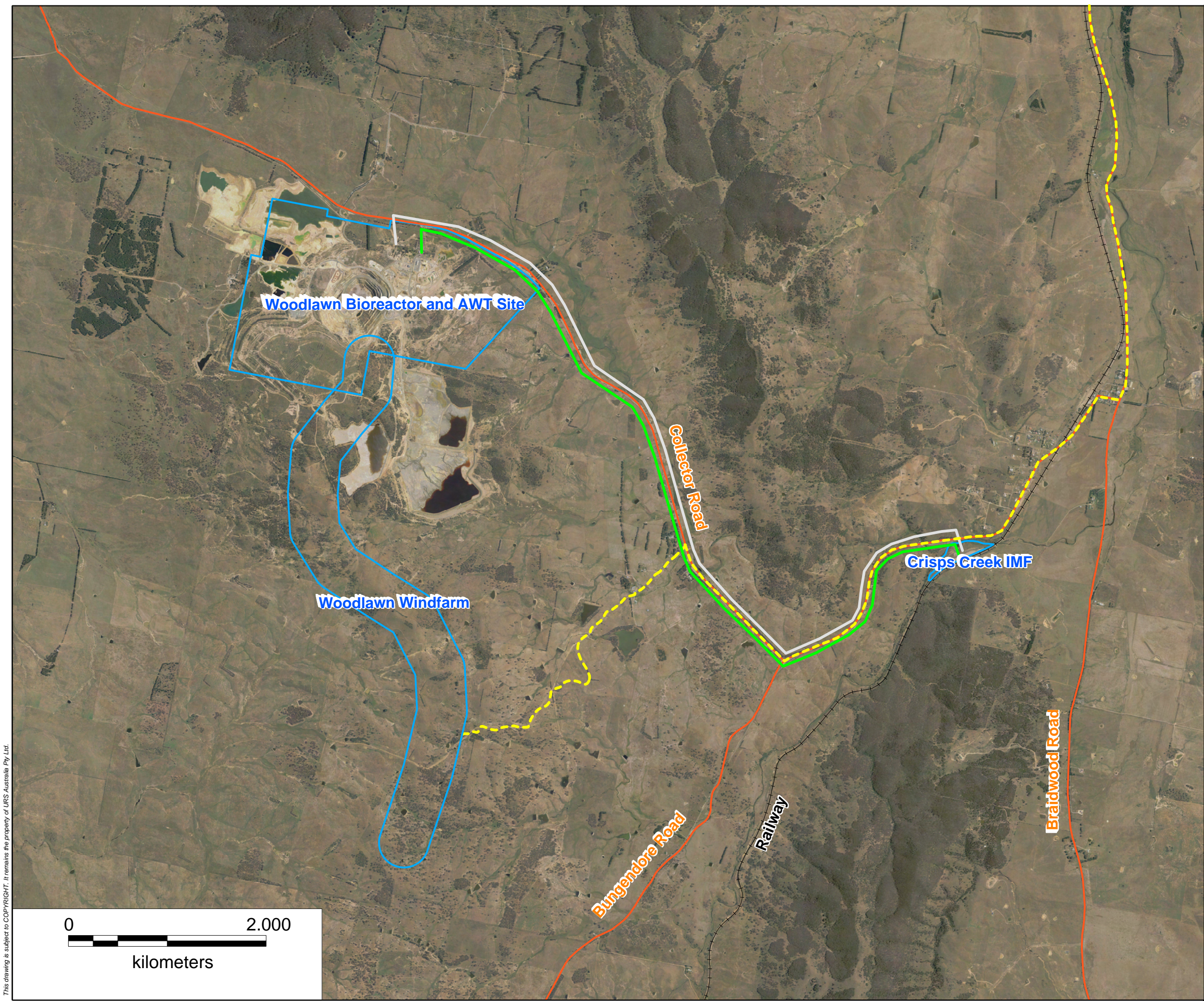
A diagram of the delivery routes used for the various developments along Collector Road, and assumed in developing the cumulative impact of the construction and/or operation of these sites, is provided in Figure 4-2.

## 4 Impact of Traffic Generation

Figure 4-1 Haulage Routes for regional areas







### Legend

- Site Boundaries
- Rail
- Road
- Woodlawn Windfarm Construction Traffic
- Woodlawn Bioreactor (IMF - Bioreactor)
- Woodlawn AWT (IMF - AWT)

\*Map compiled using Mapinfo StreetPro 2010  
URS Australia and Mapinfo Australia do not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that these two companies shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

Source: Aerial Imagery from ©Land & Property Management Authority (LPMA) [2009]  
Datum: GDA94, Projection: UTM, Grid: MGA Zone 55

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WOODLAWN EXPANSION PROJECT		
Title		
VEHICLE ROUTES OF DEVELOPMENTS IN ECO-PRECINCT		
Figure: 4-2	Rev: A	
		A3

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## 4 Impact of Traffic Generation

### 4.3 Vehicle Size

The conservative capacity of vehicle proposed for transportation between the Crisps Creek IMF and the Woodlawn Bioreactor site is to be a 19-tonne truck. This vehicle size and mass is below that of the B-Double which has a defined road network capable of accommodating these size limits. Map 30 of the RTA's *Travel Restrictions Vehicle Routes* indicates that Collector Road (between the Bioreactor site and Bungendore Road) and Bungendore Road (between Collector Road and Braidwood Road) are declared to be suitable for B-Double vehicle movements. These road sections incorporate the full route between the IMF and Bioreactor sites and as such there are no limitations in the existing infrastructure for vehicle sizes up to and including the B-Double (which includes 19-tonne trucks). Consequently, road and intersection upgrades due to physical dimensions, weight and swept path of vehicles associated with the proposed increased activity of the Bioreactor site is not required as this is already accommodated along the required lengths of Collector Road and Bungendore Road.

Section 7.2.2 of the *Goulburn Mulwaree Development Control Plan 2009* identifies a Haulage Route Standard. This standard outlines typical requirements expected by Council for road sections that are being upgraded due to being utilised as a haulage route for a particular development. However, no road or intersection upgrades along any haulage routes are required as Collector Road and Bungendore Road (between the IMF and Bioreactor facilities) have already been constructed to permit the use of vehicles up to a B-Double. As a result, the Haulage Route Standards do not apply to the proposed increase in vehicle movements outlined in this traffic assessment.

### 4.4 Access Arrangements

The existing accesses at the Crisps Creek Intermodal Facility and the Bioreactor site are adequate for the additional vehicles expected to be generated by the proposal and allow for the heavy vehicle turning movements associated with the haulage of waste, including B-double access. The impact on the existing accesses is anticipated to be insignificant and the safety of the accesses would not be compromised with the additional traffic.

### 4.5 Parking Provision

There is currently parking provision for over 50 vehicles at the Bioreactor site with an observed utilisation of 10% during current operations. The additional employees generated by the proposed increase in activity at the site (total of 6) will be easily catered by the current spare capacity of the parking area.

Existing truck parking areas within the Crisps Creek Intermodal Facility and the Bioreactor site are adequate for the additional vehicles required for the haulage of waste.

### 4.6 Rail Based Operational Impacts

In November 2009, Veolia requested Pacific National, the rail operator, to undertake an assessment of existing rail capacity to enable the proposed increase in tonnage to be transported from the Clyde marshalling yards to the Crisps Creek IMF. This assessment was updated in June 2010 by the rail operator and a copy contained in Appendix A.

## 4 Impact of Traffic Generation

The findings of this assessment concluded that 1.18 million tpa rail capacity at the Crisps Creek IMF would be achievable. This is based on the Crisps Creek IMF receiving two train sets per day, six days a week, with 60 containers on each train and a payload of 32 net tonnes per container. It is important to note that under the existing EPL conditions, and under the conditions of the existing development consent for the operations of the Crisps Creek IMF, the facility is approved to receive and unload up to two trains per day 6 days a week.

### 4.6.1 Proposed Rail Scheduling

The transportation of 1.18 million tpa of containerised waste can be accommodated by the current rail system by running two train sets per day with 60 containers on each. Each train will fit within the Crisps Creek IMF as shown in table 4-3 below.

**Table 4-3 Crisps Creek Siding Capacity**

No. of Wagons	Total Length of Wagons (m)	Total length of train set incl. locomotive (m)	Length of Crisps Creek Siding 1 (m)	Length of Crisps Creek Siding 2 (m)	Total length of Crisps Creek Siding (m)	Variance (m)
60	876	940	557	580	1137	197

The proposed train would only be 29.2m longer than the one currently deployed by the rail operator and as such the proposed trains would still be within current rail specifications both in terms of infrastructure and operating / service conditions.

Train scheduling would be expected to work with the two trains arriving at two separate times during the day. Based on the current rail network constraints, the first train would be expected to remain on its current approved plan whereby it leaves Clyde at 01:42 and arrives at Crisps Creek at 06:30 and shunted into position. As is currently the case, the containers would be unloaded onto trucks and transported to Woodlawn. In order to accommodate a second train, the first train would leave Crisps Creek at approximately 13:15 arriving at Clyde by 19:30. Based on current operating conditions, the second train would be expected to leave Clyde at 09:30 after the morning commuter peak period, and arrive at Crisps Creek at 14:45. As with the first train it would then be unloaded and containers transported to Woodlawn on trucks. The second train would be scheduled to leave Crisps Creek at 20:00 and arrive at Clyde by 03:30. Table 4-4 shows the expected operating plan to support the increased capacity based on existing freight operating curfews, crossings loops and rail network scheduling.

**Table 4-4 Expected Future Rail Scheduling - Crisps Creek IMF**

Future Operations Train Schedule				
	Train 1		Train 2	
	Clyde	Crisps Creek	Clyde	Crisps Creek
<b>Depart</b>	01:42		09:30	
<b>Arrive</b>		06:30		14:45
<b>Depart</b>		13:15		20:00
<b>Arrive</b>	19:30		03:30	



## 4 Impact of Traffic Generation

### 4.6.2 Crisps Creek Operations

The current infrastructure and equipment at both Crisps Creek and Woodlawn would enable the two trains to be safely and effectively unloaded at Crisps Creek, transported to Woodlawn, emptied and returned to Crisps Creek within the windows provided by Pacific National (Table 4-4 or Appendix A). This is based on the current average turn around time for the road haulage of 40 minutes.

With a continuous flow of truck movements each train could be unloaded using a single container handler and a single container tipper within a 6 hour period. If a train is required to be unloaded and reloaded within a shorter period of time, a second container handler and container tipper could be utilised. This would effectively half the period of time needed to unload and load a train. Two container handlers and container tippers are already a part of the current operation and are only used in the event of any unforeseen issues arising due to maintenance, delays or emergency. This contingency measure would remain unchanged for the two train schedule.

### 4.6.3 Rail / Road Interactions

At present, the train is required to temporarily park across Bungendore Road level crossing after leaving the Crisps Creek Intermodal Facility. This is to enable the train driver to activate the manual switching device to allow for travel through to Goulburn. The obstruction of the level crossing has the potential to impact on motorist travelling on this part of Bungendore Road.

Veolia has received correspondence from Australian Rail Track Corporation (ARTC) advising that work has commenced to alter the method of train operation on the Canberra line to an electronic switching system known as 'Train Working Order'. Under this working, trains will no longer be required to stop at the Tarago platform and block the Bungendore Roads level crossing. ARTC expects to finalise this work in 2011. A copy of this letters is included as Appendix B.

### 4.6.4 Contingency Planning

Existing contingency plans for Crisps Creek for late trains or truck transport issues include the ability to unload trains quickly by using the second container handler and tipper. This effectively allows for the train to be unloaded twice as quick as normally scheduled. Additional contingency measures include the ability to remove the last 6 to 8 containers from the train and place them on the IMF's hard stand then replacing them with spare empty containers thus allowing the train to leave earlier. The remaining containers can then be transported to Woodlawn for emptying without affecting the train schedule. These contingency measures would also apply in the case of two train sets.

Further to these operational contingency measures, the proposed scenario of two 60 container trains per day provides for a contingency of one container per train per day.



## Mitigation and Management Measures

The existing Traffic Management Plan for the IMF and Bioreactor operations would be updated to account for increased hours of operation and increased haulage of waste between Crisps Creek IMF and the Bioreactor site including the receipt of regional waste by road. As outlined in Table 3-2 and section 4, an assessment of the delivery of waste to the Woodlawn Bioreactor from regional areas has been included.

The pavement condition of the route between the Crisps Creek IMF and the Bioreactor site is to be monitored to assess damage caused by haulage vehicles. Financial contributions for repairs would be made as per existing arrangements under Goulburn Mulwaree Council's Section 94 Contributions Plan.



## Conclusion

Traffic generated by this proposal is not considered to have a significant impact on the existing transport network, with current operation anticipated to remain at an acceptable Level of Service for key roads. The Mitigation and Management measures recommended by the Traffic Impact Assessment are provided in Table 6-1.

**Table 6-1** Statement of Commitments

Mitigation Measure	Implementation		
	Design	Construction	Operation
Update the Traffic Management Plan for the existing operation activities to include the increased hours of operation and increased haulage activities			✓
Assess pavement condition and provide financial contributions to Council for repair of haulage routes			✓



## Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Veolia Environmental Services (Australia) Pty Ltd and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 4 December 2009.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between 1 February and 26 July 2010 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.





## Appendix A Rail Capacity Assessment



**25 June 2010**

Mr Justin Houghton  
 Site Manager  
 Woodlawn Bio-Reactor  
 Veolia Environmental Services  
 c/- email [justin.houghton@veolia.com.au](mailto:justin.houghton@veolia.com.au)

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POSTAL  
 Locked Bag 90  
 PARRAMATTA, 2124  
[peter\\_lew@pacificnational.com.au](mailto:peter_lew@pacificnational.com.au)

Dear Justin

**CRISPS CREEK TASK GROWTH – REVIEW OF SERVICE PLAN**

I refer to our recent review of the Veolia task growth projections against a service plan with a capability to support the transport of 1.18mtpa of product from the Clyde Marshalling Yards to the Crisps Creek Intermodal Terminal.

The following review has been conducted with current service information and operating conditions. The information and conditions may change in future therefore validation will be required as part of the detailed planning and implementation.

**1 Task Understanding**

The current task of 400ktpa has a future growth forecast at 1.18mtpa. The capacity required will be based on a 52 week / 6 day week. Service planning to increase capacity will be supported through train marshalling changes within the terminal operations at the Clyde Transfer Facility and Crisps Creek Intermodal Facility.

**2 Containers**

Veolia containers are specialised ISO forty foot equivalent units (FEU) for the loading of waste. A fleet of FEU containers are deployed to enable efficient loading, transit and unloading activities to occur.

FEU (existing) specifications are:

Tare:	4.8
Net:	27.5
Gross:	32.3

Replacement of the fleet of FEU containers is in progress. New FEU's have an increased payload capacity.

FEU (new) specifications are:

Tare:	4.8
Net:	32.0
Gross:	36.8

**3 Container Wagons**

Pacific National container wagons currently deployed are capable of carrying a 56 tonne payload. The existing and new FEU's will be loaded one per wagon which is within the wagon limits.

Future opportunities may exist with acquisition of new two-deck container wagons. These would have a gross limit of 114 tonnes providing a capability of carrying two FEU's.

**4 Service Plan**

The service plan to provide a rail capacity to meet the 1.18mtpa task is based on a weekly demand of 22,692 tonnes, equivalent to 720 FEU's per week. A 6 day / week operation would require the capacity to transport ~ 120 FEU's / day.

To meet this demand Pacific National would deploy two train sets with capacity for 60 FEU's each operating 1 cycle per day.

The operating plan to support the capacity would be based on the following schedule\*:

	Train 1	Train 2	Comments
Clyde – depart	01:42	09:30	
Crisps Creek –arrive	06:30	14:45	
Crisps Creek – depart	13:15	20:00	Train 1 crosses Train 2 at Goulburn and stages for return to Clyde
Clyde – arrive	19:30	03:30	

\* Note: the schedules are based on a conceptual operating plan derived from current operating information.

The operation has considered the current operating conditions:

- RailCorp freight operating curfews.
- Goulburn – yard sidings to stage and cross trains.
- Goulburn to Tarago section of the Canberra line – Tarago crossing loop ~ 520m.
- Tarago to Crisps Creek (intermediate section) to Bundgondore section of the Canberra line – no suitable crossing loops.

The conceptual schedule has taking into consideration the Countylink (passenger) services operating to and from Canberra. At present there is a total of six passenger (forward & return) services each day. The 4 Veolia (forward & return) services operating on the Canberra line are scheduled around the passenger services.

Configuration of the electric staff instrument (ESI) safe working system permits one train between Goulburn to Tarago and Tarago to Bundgondore sections. The Veolia service plan is permits the crossing of the passenger services at Goulburn and Crisps Creek.

Australian Rail Track Corporation (ARTC) manage the rail infrastructure and control the rail movements between Macarthur and Canberra. ARTC has indicated the intention to convert the ESI to a Train Order Working (TOW) safe working system as part of their upgrading. The TOW would permit the re-configuration of the line sections to improve the efficiency of rail movements on the Canberra line. This would remove the majority of constraints on the Canberra line and provide greater capacity to schedule windows for the Veolia Service arrival and departures.

## 5 Service Implementation

Pacific National would implement alterations to the service plan via its change management process which incorporates stakeholder consultation and risk assessments to manage the operation and interface between the Pacific National train crew and Veolia terminal operators.

I trust this proposal meets your requirements and I look forward to working with you to finalise the details. Please contact me if you require any additional information or if you would like to accept this proposal.

Yours sincerely



Peter Lew  
Contract Manager, Bulk Rail

## Appendix B Train Order Working Project







AUSTRALIAN RAIL TRACK CORPORATION LTD

ARTC Reference: Train Order Working Project Canberra Branch line

24<sup>th</sup> June 2010

**Mr Henry Gundry**  
**Environmental and Operations Manager - Woodlawn**  
**Veolia Environmental Services Pty Ltd**  
**619 Collector Road**  
**Tarago**  
**NSW 2580**

Dear Henry,

The Australian Rail Track Corporation as the contractor to the Rail Infrastructure Corporation intend to alter the method of train operations on the Canberra branch line from the current dated token working system which involves trains stopping at a "staff location" to collect a token and receive authority from the Network Controller to enable the train to move into the section ahead.


At some locations depending upon train length and the location of the equipment within the location, nearby level crossings are sometimes blocked whilst this takes place. The system that will replace the current token working is known as Train Order Working and involves the issue of an electronic authority by voice communication to a train crew to enable trains to progress through the network.

This will mean that trains coming from the Crisps Creek Siding towards Goulburn will receive an authority whilst still in the siding to traverse the section Tarago (which will include the Crisps Creek Siding) and Goulburn. Under this working these trains will no longer stop at the Tarago platform and obstruct the Bungendore Road level crossing.

Train Order Working is proposed to be introduced throughout many sections of the New South Wales country rail network including Tarago during 2011. This project includes some major technology innovations and accordingly we can only provide this indicative time frame.

We hope this assist Veolia and advise that if you have any further enquiries please continue to liaise with our CRN Operations Manager Mick Sanders.

Regards

  
**Tony Frazer**  
**General Manager**  
**CRN\Services**







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