



PART B

Ophir Road Resource Recovery Centre

B.1 Existing Infrastructure and Operations

B.1.1 Existing facilities and services

As mentioned in Section A.3, the Proponent currently operates a domestic waste collection service and kerbside recyclables collection service covering Orange City, and the villages of Spring Hill and Lucknow. The Ophir Road RRC receives recyclables for sorting, not only from Orange, but from five surrounding LGAs. Self-hauled garden waste is also received, processed and sold as a mulched product.

The landfill on site (Photo B.1-1) provides for disposal of municipal, commercial and industrial (C&I), and construction and demolition (C&D) waste. An active recovery resource shop at the Ophir Road RRC sells used and salvaged products and materials, usually delivered to the shop for recycling.



Photo B.1-1 Existing landfilling operations at Ophir Road RRC

Recent waste and resource recovery activities have resulted in resource recovery levels of around 18% - 20%. These include fortnightly kerbside recyclables collections and on-site facilities at the Ophir Road RRC for recycling drop-offs, self-hauled garden waste processing at Ophir Road RRC and other facilities at the Ophir Road RRC for scrap steel, furniture and white goods, DrumMUSTER, household hazardous waste, used oil collection and E Waste.

As part of its commitment to regional cooperation, the Proponent also provides waste disposal and resource recovery services for five surrounding regional councils, including use of the existing MRF at

the Ophir Road RRC for sorting of kerbside collected recyclables (Cabonne, Forbes, Parkes, Blayney, and Bathurst). Process residuals of around 3,200 t/yr are currently sent to the landfill at the Ophir Road RRC. The regional contract also envisages kerbside collection of food/garden organics which may be triggered by each council if the opportunity to treat such waste is available.



Photo B.1-2 Existing truck storage building and MRF

Waste for direct disposal to landfill is routinely received at the Ophir Road RRC from other regional areas. Cabonne Council is an important client, with a waste disposal service provided for rural subdivisions in Cabonne northeast of Orange. Waste is also received from other regional Councils and commercial waste contractors, including Bathurst and Blayney, from which waste is received on special contract. This amounts to around 1,500 t/yr.

B.1.2 Current Licences and Approvals

Environment Protection Licence (EPL) No. 5956 is held by the Proponent for its Ophir Road RRC, under the *Protection of the Environment Operations Act, 1997*. This licence, which is renewed in July each year, is due for its next review on 26 Nov 2013,

The licence covers two scheduled activities - Contaminated Soil Treatment and Waste Disposal (application to land), and also applies to other activities carried out on the site, including Waste Processing (non-thermal treatment) and Waste Storage. The licence would be modified as a result of this application, as the current landfill would continue to receive low quantities of specific wastes even throughout the operation of the new facilities described in this Environmental Assessment.

There is also a Landfill Environmental Management Plan (LEMP) for the Ophir Road site. This is a working document that outlines how the site will function on a day-to-day basis, and specifies environmental management measures and monitoring requirements for the site operations. These reflect those specified in the licence.

B.1.3 Site Description

The existing Ophir Road RRC is located approximately 5 km to the north east of Orange CBD as illustrated in Figure B.1-2. It comprises a number of allotments as outlined below and shown in Figure B.1-1. This area is referred to throughout this Environmental Assessment as the 'Ophir Road Site'.

- ▶ Lots 22 and 23 DP 229513;
- ▶ Lots 2, 3, 4, 5, 7 and 8 DP 221529;
- ▶ Lots 102 and 103 DP 1113653; and
- ▶ Part of Lot 61 DP 790515 to the left of the western side boundary.

The existing site layout is shown in Figure B.1-3.

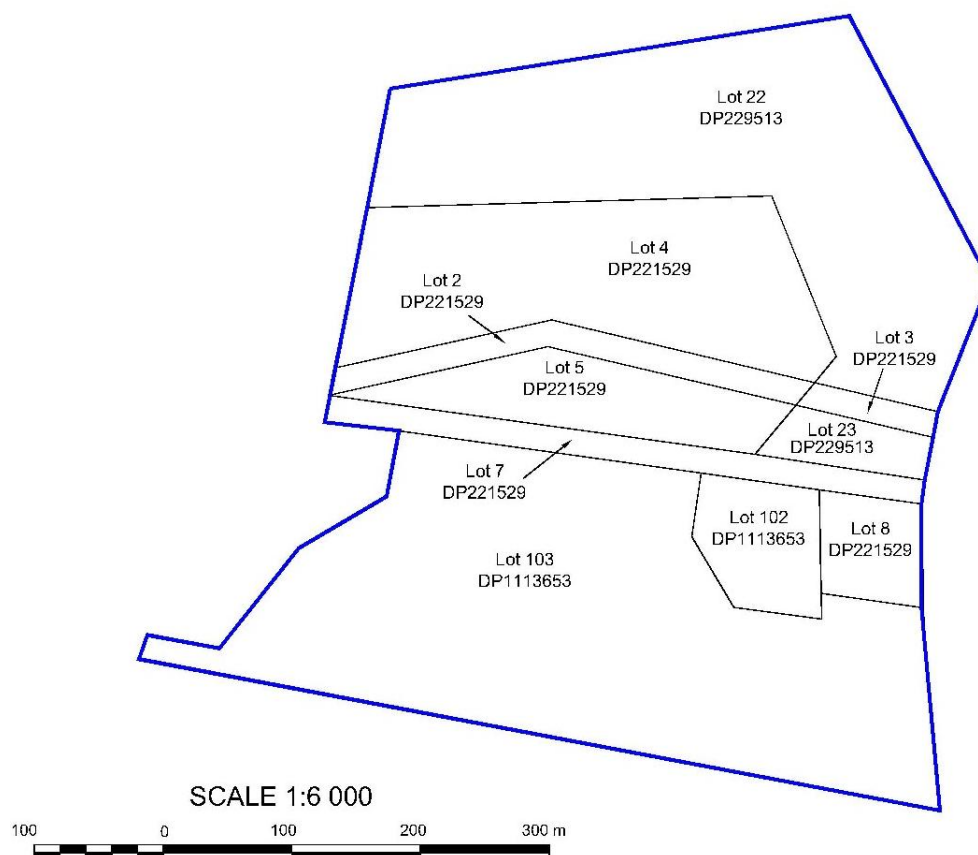
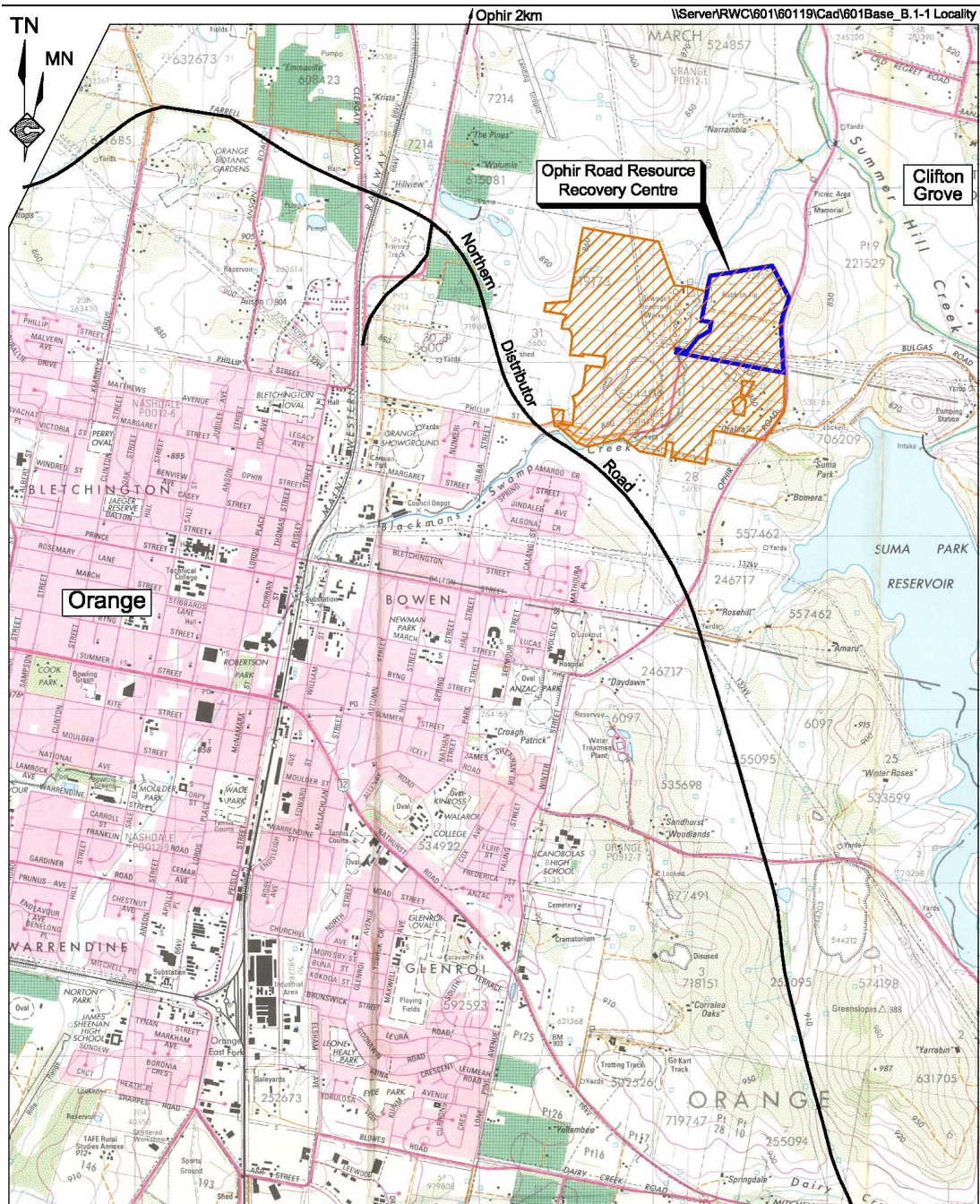


Figure B.1-1 The Ophir Road Site



REFERENCE

- Boundary of Ophir Road Resource Recovery Centre
- Orange City Council Land

SCALE 1:35 000

500 0 500 1000 1500m

Base Map Source: Orange 1:25 000 Topographic Map

Prepared by R.W. Corkery & Co. Pty. Limited

Figure B.1-2 Ophir Road Site location

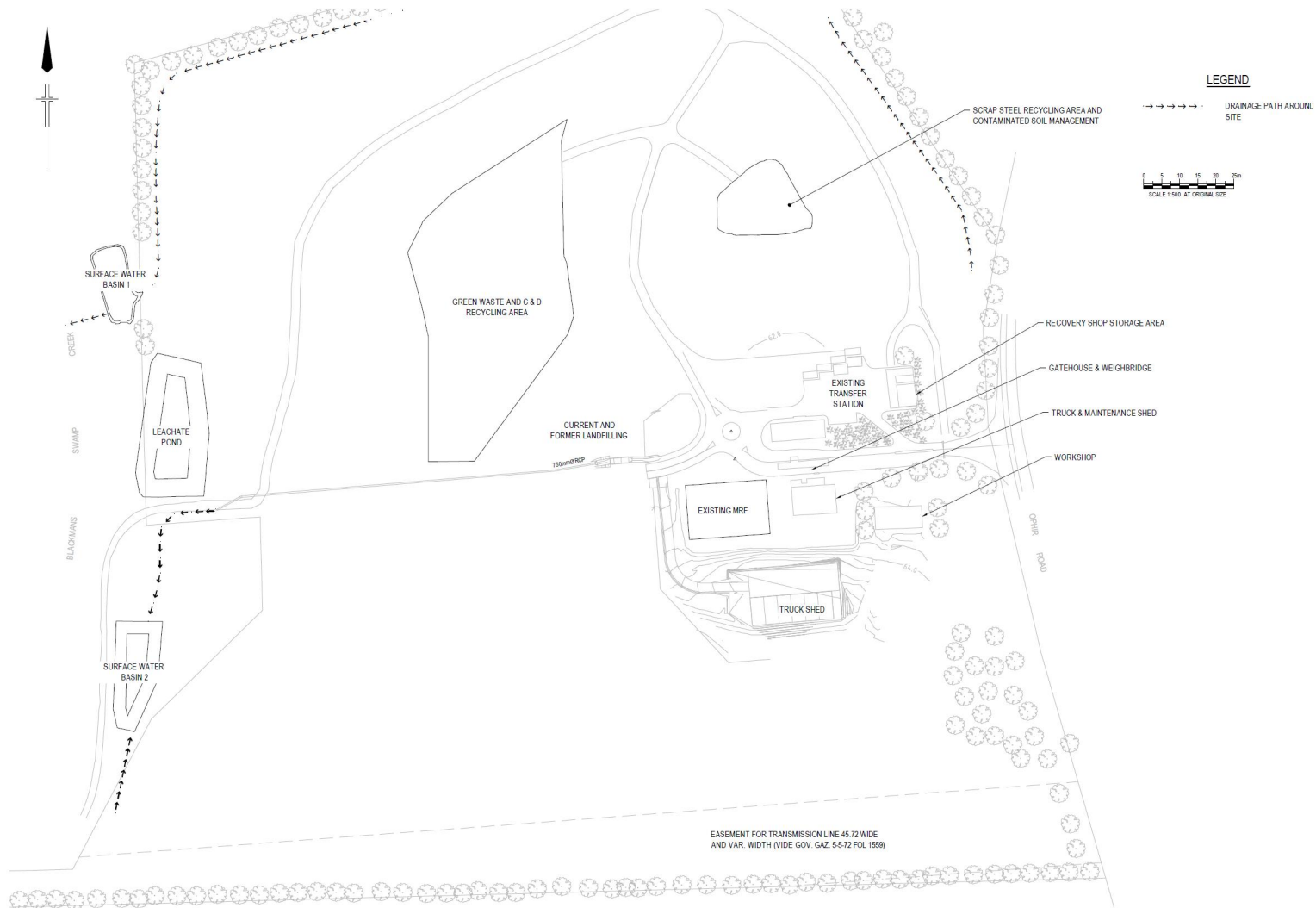


Figure B.1-3 Existing Ophir Road Site layout



B.1.4 Rehabilitation and Ongoing Use (Not Part of this Application)

B.1.4.1 Final landform

The general landfilling operation at the Ophir Road RRC is nearing capacity and will effectively cease around 2013. It is currently planned that all but two of the existing landfill cells would be capped by the commencement of the operation of the Euchareena Road RRC. These cells would be used for small quantities of waste that it is not practicable to transfer to Euchareena Road RRC.

B.1.4.2 Ongoing use

The Ophir Road RRC would continue to be the principal waste collection and processing facility for the Orange City LGA as described in Sections B.2.3 and B.2.4. Those areas not required for ongoing waste-related activities would be used for nature conservation.

A large scale sculpture park would be the final use on sections of the outer slopes of the rehabilitated landfill. Directly to the north west of the public waste transfer station are a series of community sculptures that are already positioned which depict a story about the history of the City of Orange.

B.2 Project Description – Ophir Road RRC

B.2.1 Introduction

This Section describes the existing facilities proposed for continued use and operation, and the proposed new or modified facilities for the site. The Ophir Road RRC will continue to receive municipal waste and recyclables as well as business waste and recyclables generated in the C&I and C&D sectors. The main activities undertaken at the Ophir Road Site would be:

- ▶ Receipt and baling of mixed residual waste with putrescibles content generated in the municipal sector and the C&I sector for transport to the Euchareena Road RRC;
- ▶ Receipt, MRF sorting, and consolidation of municipal kerbside recyclables, and dry recyclable materials generated in the C&I and C&D sectors, principally for transfer to external processors or (in the case of VENM, for use on site);
- ▶ Receipt and processing of self-hauled garden organics for production of mulch;
- ▶ Receipt, sorting of self-hauled recyclables and waste materials for transfer to external processors or to Euchareena Road RRC;
- ▶ Receipt and consolidation of C&I and C&D dry mixed waste for transfer to the Euchareena Road RRC following opportunistic sorting to recover targeted materials;
- ▶ Progressive closure and remediation of the landfill site.

Kerbside recyclables from regional councils that currently utilise the Orange MRF would continue to be delivered to the site. A defined quantity of general waste from regional councils that wish to use the baling plant/Euchareena Road landfill would also be received at the Ophir Road RRC.

B.2.2 Existing Consents and Licences

Development Application 1/97 (Amended) was approved by the Orange City Council on 11 June 1997. This covers operation of all activities on site, but relates mainly to the landfilling activities at the Ophir Road RRC. It requires the site to be operated and monitored in accordance with the 1994 Operational plan prepared by Camp Scott Furphy Pty Ltd.

Environmental Protection Licence (EPL) no. 5956 was issued to Orange City Council for its Ophir Road RRC, under the Protection of the Environment Operations Act, 1997. This licence, which is renewed in July each year, is due for its next review on 26 Nov 2013. A copy of the Licence is included in Appendix E.

The licence covers two scheduled activities - Contaminated Soil Treatment and Waste Disposal (application to land), and also applies to other activities carried out on the site, including Waste Processing (non-thermal treatment) and Waste Storage. The licence would be modified as a result of this application, as the current landfill would continue to receive low quantities of specific wastes, even throughout the operation of the new facilities described in this Environmental Assessment.

A Landfill Environmental Management Plan (LEMP) for the Ophir Road site was prepared by Geolyse Pty Ltd. This is a working document that outlines how the site should function on a day to day basis, and specifies environmental management measures and monitoring requirements for site operations to meet licence conditions.

B.2.3 Existing Facilities to Continue Operation under Existing Consent

B.2.3.1 Site access and weighbridge

The existing weighbridge and site entry road would be used for the new facilities, which would be located inside the existing Ophir Road Site.

B.2.3.2 Existing public waste transfer station and receival centre

The existing public waste transfer station and receival centre on the site would continue to function as it does currently, servicing the needs of local residents and small contractors. These customers would deliver materials in utilities, trailers and small vans and trucks. The existing transfer facility (see Photo B.2-1) is not designed to accommodate commercial sized loads of waste, which would be diverted to either the baling building (if the material is comprised of baleable material), or if they are already segregated into different materials, to a specially designated area of the landfill, where they can be unloaded for resource recovery to take place.

The transfer station would be progressively upgraded to improve public recycling opportunities once the other new facilities become operational. Recyclables would continue to be removed periodically from the transfer station for recycling, in accordance with current practices.

Scrap metal and garden organics currently collected in bulk skips would be transferred to stockpile areas on top of the closed landfill (in the materials stockpile and processing area) as required, utilising an on-site service vehicle. The service vehicle would access the skip bins for collection via a service road located at the base of the drop-off platform. The service area would be closed off to the general public for small deliveries, as is the case now. Residents who bring in trailers of scrap steel and garden waste would continue to take their load direct to the stockpile and processing area.



Photo B.2-1 Existing transfer station at Ophir Road RRC



Figure B.2-1 Existing recycling facilities



Mixed waste deposited in the transfer station is likely to contain some bulky and uncompactable materials that are unsuitable for baling. Where possible, bulky items suitable for recovery (such as timber and scrap metal) would be extracted from the mixed waste bin by site staff. Bulky waste would be taken to the baling building for resource recovery purposes. Any non recoverable materials would be emptied into a 60 m³ waste skip for covered transport to the Euchareena Road RRC.

B.2.3.3 Landfill

Two small dedicated cells of the landfill at Ophir Road RRC would remain open for continuing the current arrangements for disposal of asbestos materials and animal carcasses respectively. The animal carcasses would be from the Orange area including local veterinary clinics. Technology to treat animal carcasses at the Euchareena Road RRC would also be investigated in future. This would eventually eliminate the need to landfill them at the Ophir Road Site.

Landfilling of general waste may also occur during short periods when the waste baler is being maintained (estimated at approximately 1 week per year). In the medium term (or in a major emergency) Euchareena Road RRC would receive animal carcasses to be immediately covered in accordance with current practice at the Ophir Road RRC.

B.2.3.4 Resource recovery shop

The existing Resource Recovery Shop would continue to operate as is, being run by a community group. Items such as computers and second hand goods including clothes, glassware, jars and furniture are diverted from the waste stream and sold at the shop. Items discarded, due to not being sold within a certain period, or due to being unsuitable for sale, would be put into the existing recycling or mixed waste skips in the transfer station area.

B.2.3.5 Contractor facilities

The existing contractor facilities, which encompass the truck garage, maintenance shed, and office would be retained on site and used in the same manner as they are currently. The garage is used to store the garbage collection trucks when they are not in use. The maintenance shed is used for maintenance and washing of the vehicles.

B.2.3.6 Other facilities / activities

Virgin excavated natural materials (VENM)

Limited quantities of VENM would continue to be accepted at the Ophir Road RRC, with a new charging VENM policy implemented to encourage source reuse, alternative uses, or source separation, and discourage landfill disposal. Only VENM received from projects and sites within Orange would be received at Ophir Road, due to limited applications for its onsite use. Waste plans attached to Orange City Council consents would need to demonstrate reuse or disposal plans for VENM. VENM received would be used for landfill capping and remediation over the next five years, but would be increasingly used for compost product development, as the site is progressively rehabilitated.

Garden organics

Receipt and processing of self-hauled garden organics would continue at the Ophir Road Site in much the same way as currently practised (see Photo B.2-2). The reduced quantity of garden organics

expected following introduction of the kerbside organics collection service would be shredded and provided to residents as mulch, as is current practice. Any unused mulch would be transported to the Euchareena Road RRC and used to produce compost.



Photo B.2-2 Existing garden organics drop-off area and stockpile

Other materials

The following streamed materials would be collected and processed or consolidated at the Ophir Road RRC:

- ▶ Steel;
- ▶ Timber;
- ▶ Paper/cardboard;
- ▶ Glass and plastic containers;
- ▶ Waste oil; and
- ▶ Tyres.

Other resource recovery initiatives would continue to operate as they do currently, such as:

- ▶ drumMUSTER;
- ▶ e-waste recycling;

- ▶ Household hazardous materials;
- ▶ Concrete crushing; and
- ▶ Sharps collection (external to Ophir Road RRC).

B.2.4 Proposed New or Modified Facilities

Future modification of the Ophir Road RRC would facilitate increased recovery of reusable and recyclable materials and hence increase waste diversion from landfill. The centre would improve current facilities for recovery of domestic and commercial recyclables (for example glass and plastic containers, certain plastics, paper and cardboard, gas cylinders, waste oil and batteries). The current MRF operation is shown at Photo B.2-3. Facilities are also proposed for receipt, sorting and consolidation of garden organics, C&D materials, C&I materials, and household items such as furniture and white goods, and tyres. The proposed facilities and site layout are shown at Figure B.2-2.

B.2.4.1 New materials recovery facility (MRF) – including adaptive reuse infrastructure

The proposal is to locate the baling plant in the existing MRF building, and to build a new MRF building on the southern area of the Ophir Road Site (an image of the proposed new MRF behind the existing building is shown in Photo B.2-4).



Photo B.2-3 Existing MRF equipment at the Ophir Road Site

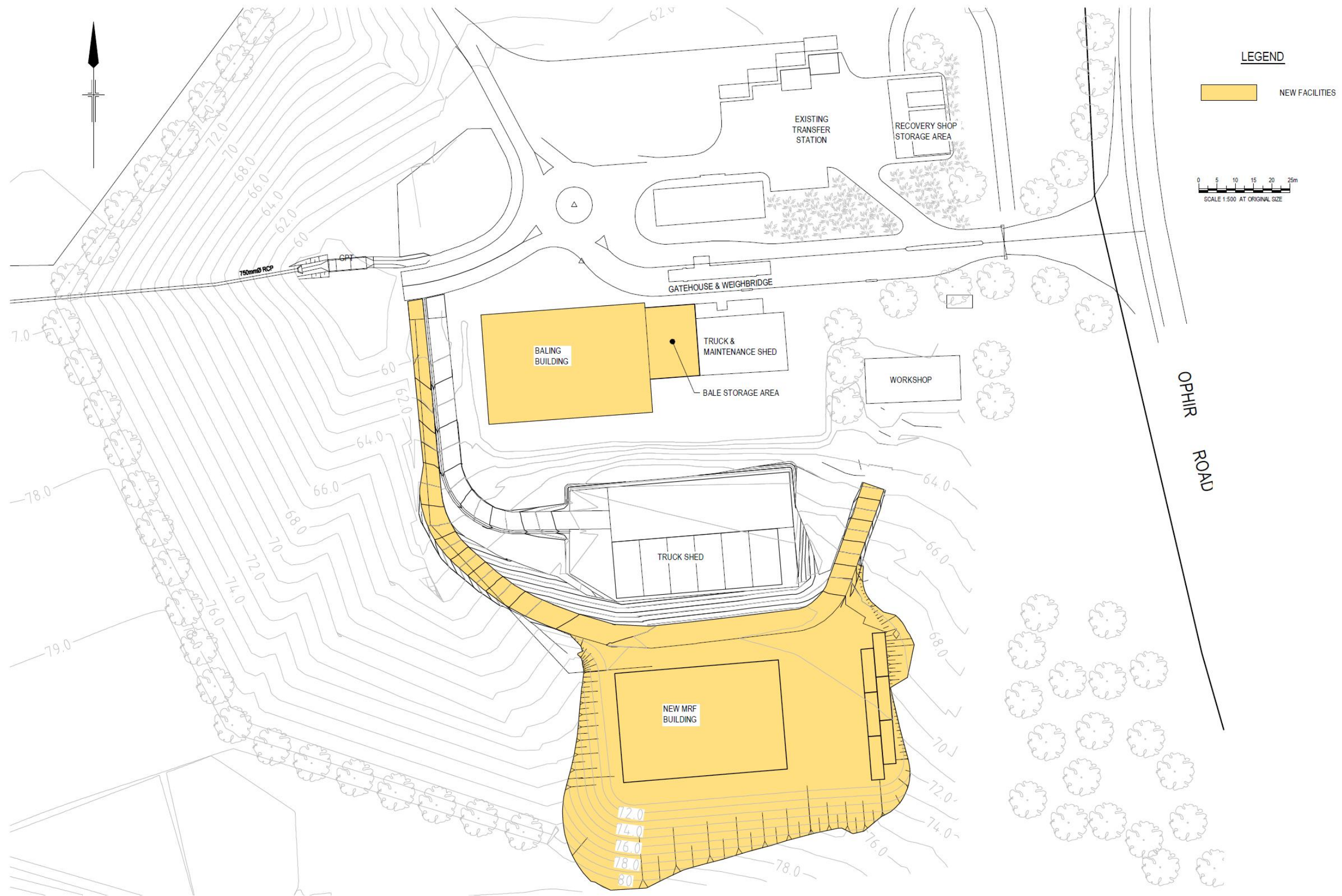


Figure B.2-2 Proposed Ophir Road RRC facilities

Development of the new MRF building would involve the following:

- ▮ Levelling an area approximately the size of the existing MRF building, with a footprint of approximately 60 m by 40 m to accommodate the new MRF and surrounding roadways;
- ▮ Building retaining walls, foundations, roads, building footings, and constructing diversion drains from the hill above, and constructing the building itself;
- ▮ Decommissioning the existing MRF; and
- ▮ Installing reconditioned and new MRF equipment and commissioning the new MRF.

During periods of construction some recycling will be stockpiled and some quantities may have to be disposed of to landfill.



Photo B.2-4 Proposed new MRF at Ophir Road RRC

B.2.4.2 Baling and resource recovery

The preferred technology for residual waste management is the use of compaction and baling technology to process residual waste into highly compacted bales of waste suitable for transport off site and bale filling. Development of the baling and resource recovery building would involve the following:

- ▮ Modifying the existing MRF building to accommodate the baling plant; and
- ▮ Installing the new baling plant and commissioning the new resource recovery and baling operation.

The baling plant would be a commercial sized two-ram waste baler, in which the waste bales are tied with plastic straps. An integrated bale wrapping line would also be used for wrapping the bales after compaction and tying. The estimated throughput for the baler is 15-20 tonnes of waste per hour, and it would generally operate for approximately 6-8 hours per day, during normal working hours. However, if

there is an equipment breakdown during the day, and repairs need to be carried out, the baling plant may operate at night until it processes all the waste material that was stockpiled during the down-time period.

The baler would produce up to 80 bales of waste daily, each weighing approximately 1 tonne, and having a density of approximately $0.75 - 1.0 \text{ t/m}^3$ (subject to final machine selected). Since the supply of the baler would be tendered after the project approval is received, final equipment details are not known at this stage.

Waste would be unloaded from incoming compactor trucks or skips onto the floor of the baling building (see Photo B.2-5), into one of two stockpiles. The first stockpile would comprise municipal residual wastes collected in the Council garbage collection from residential areas, and commercial wastes collected from wheelie bin based commercial waste collections. This material is expected to be relatively free of food/garden organics (due to the proposed residential and commercial food/garden organics collection service) and to contain very few recyclables, due to the effectiveness of the kerbside recycling system. A visual inspection to identify and remove bulky items unsuitable for baling would be made of this material before it is loaded onto the conveyor leading to the baling machine.



Photo B.2-5 Waste drop-off area at Ballina baling plant

The second stockpile would be comprised of mixed waste from the transfer station, unsorted commercial wastes from skip bin operators and commercial waste bulk bins. This material has the potential to contain recyclables such as steel, plastics and cardboard, some of which could potentially be recovered for recycling whilst the material is stockpiled on the floor (see Photo B.2-6 and Photo B.2-7).

Once all reasonable resource recovery efforts have ceased, the lighter commercial material that is suitable for baling would be removed from the top of the stockpile and placed in the baling stockpile. The remaining non baleable material would be disposed of in a 60 m^3 bulk bin located inside the building, for later transport and landfill disposal at the Euchareena Road RRC.



Photo B.2-6 Specialised equipment for removing bulky objects from waste (example)

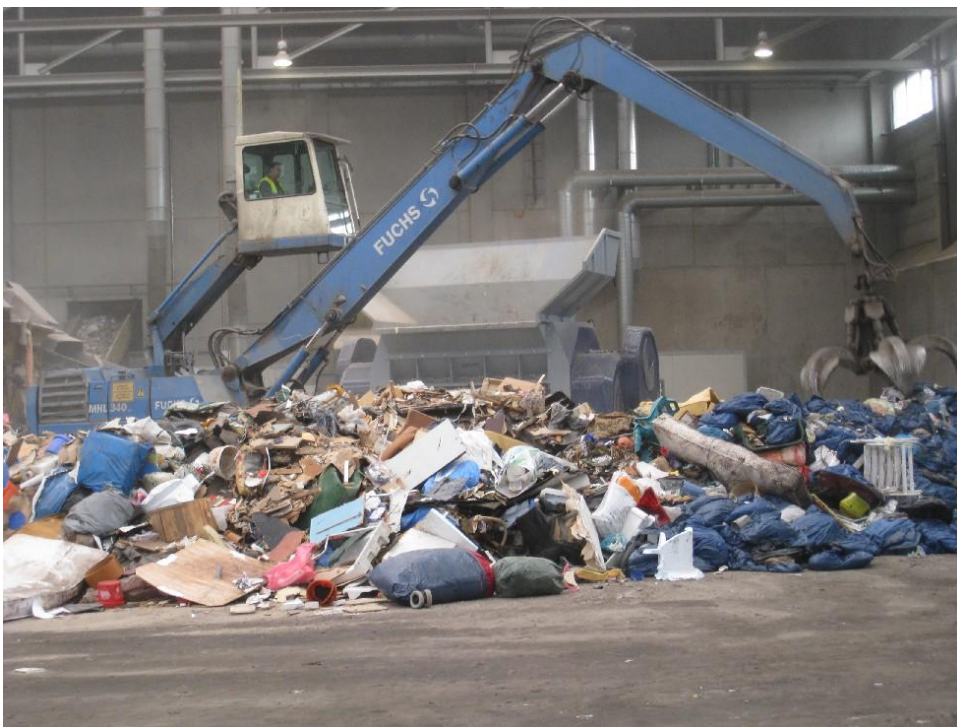


Photo B.2-7 Resource recovery from commercial wastes (example)

A front-end loader would load the waste into a receival hopper. A horizontal conveyor located in the reception hopper would transport it to an ascending conveyor that would deposit the waste into the hopper of the baler (see Photo B.2-8).



Photo B.2-8 Loading conveyor at Ballina NSW baling plant

Residual waste would be pushed into the loading hopper mechanically where it would then be fed via a conveyor through a compactor to the baling equipment (refer Photo B.2-9 and Photo B.2-10). The baling equipment would produce highly compressed waste bales. A small quantity volume of moisture would be squeezed from waste materials during compaction. This liquid would be collected in a tank below the baler and disposed at the nearby Orange Wastewater Treatment Plant which is operated by the Proponent. Estimated quantities of this liquid are less than 500 L/d.

The bales would also be wrapped or enclosed prior to transfer to the Euchareena Road RRC during periods when beehives are located in the vicinity of the Euchareena Road Site (as discussed in Section C.2.5.3). The bales would be strapped at all times, regardless of whether they were subsequently wrapped or bagged. To ensure that baled waste is wrapped or enclosed during these times, a protocol would be developed and implemented in close consultation with apiarists near the Euchareena Road Site. The protocol would establish mechanisms for ongoing communication about when beehives would be located in the area and when wrapping / enclosure of bales would be required.



Photo B.2-9 Baling plant at Ballina NSW being used to bale recyclables



Photo B.2-10 Direct unload onto tipping floor for transfer by conveyor to baling system (example)

Baling of the waste would assist in controlling leachate, litter, and odour during transport and subsequent landfilling and prevent unlikely access to the waste by bees from areas in the vicinity of the landfill.

The baling process results in increasing waste density from typically less than 0.2 t/m^3 up to $0.75 - 1.0 \text{ t/m}^3$.

Baled waste may be temporarily stored inside the baling building overnight or outside under cover, if immediate transfer off site is not possible. The baled waste would be transported off site on either conventional flat-bed semitrailers or smaller trucks or in truck and dog trailers (all curtain sided). Approximately 20 bales would fit onto each semi-trailer.

It is anticipated that it would take 1.5 to 2 hrs to produce enough bales to fill a semi-trailer. The semi-trailers would leave the Ophir Road RRC at times that would avoid the school bus pickup and drop-off times on Euchareena Road, That is, they would arrive in Molong no earlier than 9 am, and no later than 2.30 pm or after 4.30 pm if necessary. There would be no deliveries of waste bales to the Euchareena Road RRC on weekends, except in emergencies. Waste bales would be stockpiled overnight, if necessary to avoid this.

Photo B.2-11 gives an example of baled waste that has been bagged. Photo B.2-12 shows an example of baled and bagged waste that has been loaded onto a truck.



Photo B.2-11 **Baled waste after bagging (example)**



Photo B.2-12 Baled and bagged waste loaded onto a truck (example)

Initially, if the Proponent is the only LGA utilising the baling facility, approximately 60 bales (3 semi-trailer loads) would be produced per day. If other regional councils were to also utilise this facility, this would rise to approximately 80 bales per day (4 semi-trailer loads).

A 60 m³ capacity roll-on roll-off bin would be located in the baling building to receive non-baleable/non recyclable materials extracted from the incoming wastes. This would hold approximately 18 t of waste material. Therefore on most days, only one truck would be needed to transfer this material to Euchareena Road RRC for landfill disposal. On some days there would be two trucks per day.

B.2.4.3 C&D waste and resource recovery

All C&D wastes and streamered recyclable materials would continue to be received at the Ophir Road RRC. This would avoid the need for builders and other commercial operators to travel to the Euchareena Road RRC, reducing truck movements in Molong and along Euchareena Road. It would also allow some additional opportunities for sorting and recovery of recyclable materials, such as steel and timber, from delivered mixed loads. To encourage source separation and resource streaming, it is planned that higher charges would apply for mixed loads than for streamered materials such as steel, timber, VENM, and concrete.

Some skip bin loads would be diverted to the baling building, if they are comprised mainly of light baleable material, or if they contain putrescible wastes.

A dedicated area would be established at the Ophir Road RRC to receive loads of streamered C&D resource and mixed C&D waste. This would be an open area on the finished landfill area, adjacent to the scrap steel area. Loads would be discharged and either consolidated by material type or, opportunistically sorted using a bob cat (or similar) to recover recyclables, such as steel, timber and

brick/rubble. Residual C&D waste would be loaded into a 60 m³ skip bin or trailer and packed down using an excavator or similar. One 60 m³ skip would be filled on average per weekday. Therefore one large truck would need to travel to the Euchareena Road RRC each day. Some days may require two trucks to avoid stockpiling on site.

B.2.4.4 C&I waste and resource recovery

All C&I waste and dry streamed recyclable materials would also be received at Ophir Road RRC. Streaming of recoverable resources would be encouraged through application of a gate price incentive with a focus on recovering paper/cardboard, timber, steel and beverage containers. A dedicated area, adjacent to the proposed C&D area would be established for receipt and consolidation of streamer loads. Mixed C&I loads would be directed to the Baling Facility and opportunistic sorting of mixed dry C&I loads would be undertaken.

B.2.5 Transport and Traffic

An estimated 35 trucks per day would deliver waste and recyclables to the Ophir Road RRC, with 9 trucks per day, transporting baled and non-baled waste to the Euchareena Road RRC, and to transport recyclables and chipped green waste to markets. This equates to 44 trucks per day or 88 vehicle movements per day (44 in / 44 out). This is illustrated in Table B.2-1.

Current truck movements on Ophir Road associated with the Ophir Road RRC are estimated to be approximately 80 movements per day or (40 in / 40 out). The total truck movements associated with the Project would be similar in quantity to existing movements.

Recent traffic counts (Northern Transport Planning and Engineering 2009) show that existing average traffic flows at Ophir Road, north of Dalton Street are in the order of 1,400 to 1,700 vehicles per day in both directions.

Table B.2-1 Estimated future truck movements at Ophir Road RRC

Waste Stream	Truck movements/ year	Truck movements/ day	Assumed truck capacity
Asbestos	30	0 to 2	4.5 t
C&D waste large loads	334	2	18 t
VENM	1,340	4	18 t
C&I recycling	1,094	6	4.5 t
Domestic kerbside recycling	1,716	8	4.5 t
Regional kerbside recycling	2,778	12	4.5 t
C&I mixed waste	3,152	10	4.5 t
MSW mixed waste	3,934	16	4.5 t
Regional mixed waste (non-baled)	2,224	10	4.5 t
Subtotal – trucks delivering to Ophir Road Site	16,602	70	

Waste Stream	Truck movements/ year	Truck movements/ day	Assumed truck capacity
Recyclables to market	662	2	30 t
Chipped garden organics to market	232	2	30 t
C&D recycling	206	2	30 t
Mixed waste (mostly C&D) transfer to Euchareena Road	544	4	18 t
Baled waste transfer to Euchareena Road	1,560	6	30 t
Non-baled waste transfer to Euchareena Road	220	2	18 t
Subtotal – trucks transporting material from Ophir Road Site	3,424	18	
TOTAL	20,026	88	

In addition, there would be some small vehicle movements and truck movements associated with delivery and transport off site of non-kerbside collected recyclables such as scrap metal and green waste, fuel for mobile equipment, baling materials and other miscellaneous items. This is further discussed in Section B.5.7.

B.2.6 Utilities and Services

B.2.6.1 Power

The site is currently serviced by mains electricity. The internal supply would be augmented to supply the new MRF building. The new baling plant would require approximately 160 kW of additional power. It is anticipated that the new MRF would require a similar amount of power as the existing MRF. Sufficient capacity exists within the system to provide this additional power for the new site facilities.

B.2.6.2 Water

A 150 mm water main is located adjacent to Ophir Road. A connection from the main is provided to the Ophir Road Site. The water requirements for the new MRF and baling plant are minimal.

The new MRF would require water supply for dust suppression provided through a misting system and for regular (daily) wash down of floors. As an existing MRF is already operating on site, there would be negligible change to water demand for the new facility. The new baling building would require a water supply for regular (daily) wash down of floors. This would be provided as part of the current service to the site, as water quantities required for washing would not be significant.

The existing internal water supply network would be augmented to supply the new MRF building. Existing connections would remain for the building that would be converted for use as the baling building.

Water supply for fire fighting would also be required for the new MRF building. The existing hydrant system would be augmented to service the new MRF building with one to two additional hydrants being installed, subject to detail design.

Overall, the Project would see only a small increase in the overall demand for water at the Ophir Road RRC.

B.2.6.3 Wastewater

A sewer main traverses the site from east to west. It extends to the pump station adjacent to one of the site leachate ponds. From there, sewage is pumped to the adjacent Orange Wastewater Treatment Plant.

The baling equipment would produce highly compressed waste bales. A small quantity volume of moisture (estimated at less than 500 L per day) would be squeezed from waste materials during compaction. This liquid would be collected and transported to the Orange Wastewater Treatment Plant.

Furthermore, both the baling building and the MRF would be connected to the sewerage system for disposal of wash down effluent. Trade waste agreements would be entered into where required.

The existing sewerage system would have sufficient capacity to support the wastewater generated from the Project.

B.2.6.4 Communications

Communications facilities are available to the site providing telephone, facsimile and email services.

B.2.7 Hours of Operation

The Ophir Road RRC would continue to receive waste between 7 am and 6 pm, seven days a week. The centre would be open to the public between 8 am and 5 pm, seven days a week.

If there is an equipment breakdown during the day, and repairs need to be carried out, the baling plant may operate at night until it has processed all the waste materials stockpiled during the down-time. This scenario has been analysed as part of the noise assessment in Section B.5.8.4.

B.2.8 Construction at the Ophir Road Site

B.2.8.1 Construction activities

A progressive construction program over a 12 month period is envisaged, involving site preparation, building the new MRF building, modifying the existing building and installing new equipment.

Construction activities at the Ophir Road RRC would involve the following:

- ▶ Establishment of permanent and temporary fencing, work compounds and access;
- ▶ Construction and marking of construction roads and installation of traffic controls;
- ▶ Installation of temporary erosion, sediment and water quality controls;
- ▶ Levelling an area approximately the size of the existing MRF, with a footprint of approximately 60 m by 40 m to accommodate the new MRF and surrounding roadways;

- ▶ Building retaining walls, foundations, roads, building footings, and constructing diversion drains from the hill above, and constructing the building itself;
- ▶ Decommissioning the existing MRF;
- ▶ Installing reconditioned and new MRF equipment and commissioning the new MRF;
- ▶ Modifying the existing building to accommodate the baling plant, including leachate collection; and
- ▶ Installing the new baling plant and commissioning the new resource recovery and baling operation.

In parallel with installation and commissioning of the new MRF and baling plant, other site works would be undertaken including:

- ▶ Improvements to the existing public waste transfer station (covering bins and improving access);
- ▶ Amendments to signage; and
- ▶ Finishing works.

The exact construction methods would be determined by a contractor at the time of construction, but would generally include the above listed activities. All works would be undertaken in accordance with the environmental controls presented in this Environmental Assessment and the contractor's endorsed environmental management plan.

B.2.8.2 Construction equipment

An indicative list of construction equipment that would be used at the Ophir Road Site is shown in Table B.2-2.

Table B.2-2 Proposed construction equipment (Ophir Road Site)

Equipment	Indicative make / model (or equivalent)	Construction use
1 Excavator	Volvo EG210	Continuous during initial earthworks (approx 1-2 months)
1 Grader	CAT 140H	Periodic during initial earthworks (approx 1-2 months)
1 Dozer	CAT D7	Continuous during initial earthworks (approx 1-2 months)
1 Roller	Case SV216 & Bomag BW214	Continuous during initial earthworks (approx 1-2 months)
2 Trucks	25 t	Continuous during initial earthworks (approx 1-2 months)
1 Scraper	CAT 637	Continuous during initial earthworks (approx 1-2 months)
Mobile crane		Periodic
Concrete delivery truck		Periodic
Water truck		Periodic

Note: Continuous – refers to during most periods 8 hrs/day.



B.2.8.3 Construction hours

Construction activities would be restricted to between 7 am and 6 pm Mondays to Fridays and 7 am to 1 pm on Saturdays. No construction work would be undertaken on Sundays or public holidays.

Construction work may be permitted outside of the hours specified above (particular work that would not be audible at surrounding residences), however, this would be subject to consultation with DECCW.

B.2.8.4 Construction workforce

It is anticipated that the average construction workforce at the Ophir Road Site would be approximately 20 people.

B.3 Environmental Setting

B.3.1 Locality Description

The Ophir Road RRC is located within a substantial precinct owned by the Proponent on the northeastern outskirts of Orange (see Figure B.1-2 on page B.1-4) for sewage treatment, waste management and supply of road construction materials.

Access to the Ophir Road RRC is from Ophir Road, a regional road servicing properties between Orange and Ophir and a number of rural-residential lifestyle blocks and subdivisions to the northeast of Orange. It is noted that land to the east and north of the Proponent's land is currently held in substantial landholdings currently used for grazing.

Approvals have been issued or are being considered by the Proponent to subdivide parts of this land for rural residential/lifestyle blocks and accommodation facilities for Charles Sturt University.

Notwithstanding these subdivisions, the Proponent has or intends to retain buffers around its facilities in this precinct to avoid adverse impacts of those facilities on the planned new developments. This would likely preclude the establishment of any composting facilities or new landfills in this area, hence the selection of Euchareena Road Site for this purpose.

B.3.2 Topography

B.3.2.1 Local topography

The Ophir Road Site is located immediately north of a locally prominent hill (up to 905 m AHD) and lies between Ophir Road to the east and Blackmans Swamp Creek to the west. Most runoff from the site flows towards Blackmans Swamp Creek with a small area of the eastern part of the site draining to the east towards Summer Hill Creek, downstream from Suma Park Reservoir.

B.3.2.2 Site topography

Previous and current landfilling practices have altered the local topography significantly, creating numerous rises, such that the current landfill area no longer retains the natural topography.

The southern section of the site is currently used for landfilling. This area will be filled to an elevation of approximately RL 80 m (local datum).

B.3.3 Geology

The site is underlain by Angullong Tuff - Ordovician age volcanoclastic rocks interbedded with argillaceous sedimentary rocks and some lava. The area is intruded by pegmatite dykes, and local fracturing is present. To the east of the facility is a major fault system which downthrows Silurian-age Mullions Creek volcanics against Angullong Tuff.

Test pit information indicates that bedrock is generally present at shallow depth (ranging from less than one metre to over 2.4 m). Superficial deposits comprise up to one metre of red clay, overlying gravelly clays and clayey gravels which are assumed to be residual or colluvial soils.

Two field surveys, involving excavation of a series of test pits, were undertaken for the Ophir Road Landfill Environmental Assessment Report. The results of the 1997 survey indicate three soil types over the Ophir Road Site.

Type A: Red Clay ranging from 500 mm to 1,300 mm, brown/grey gravel with some mix of soft shales.

Type B: Red Clay ranging from 400 mm to 1,700 mm, greyish shale hard/soft.

Type C: Red Clay to 250 mm, blue stone.

B.3.4 Meteorology

B.3.4.1 Temperature

Temperature data collected from the Orange Agricultural Institute is presented in Table B.3-1. The mean daily temperature ranges from 1.4°C lowest minimum to 26.5°C highest maximum in the months of July and January respectively.

Table B.3-1 Monthly Temperature and Relative Humidity (Ophir Road Site)

Month	Mean Daily Temperature (°C)		Mean Relative Humidity (%)	
	Maximum	Minimum	9:00 am	3:00 pm
January	26.5	13.2	67	N/A
February	25.8	13.1	71	N/A
March	22.8	10.6	69	N/A
April	18.5	7.2	70	N/A
May	14.2	4.7	79	N/A
June	10.5	2.5	83	N/A
July	9.3	1.4	82	N/A
August	10.9	2.1	75	N/A
September	14.0	4.1	70	N/A
October	17.6	6.6	66	N/A
November	20.9	9.0	68	N/A
December	24.4	11.3	65	N/A
Annual	18.0	7.1	72	N/A

Source: BOM Website

B.3.4.2 Rainfall

Rainfall recorded at the NSW Agriculture's Orange Research Centre since 1966 is summarised in Table B.3-2.

Table B.3-2 Monthly Mean Rainfall (Ophir Road Site)

Month	Rainfall (mm)
January	88.7
February	74.8
March	56.8
April	52.0
May	69.6
June	70.3
July	90.5
August	98.3
September	79.3
October	85.9
November	77.9
December	77.4
Annual	921.3

Source: BOM Website

B.3.4.3 Wind

Wind speed and direction data from the Orange Sewage Treatment Plant for 2007 is illustrated in Figure B.3-1. The annual wind rose shows that winds are predominantly light to moderate (between 1.5 m/s and 8 m/s) from the northwest, southeast and east-northeast. The seasonal wind roses indicate that in spring, the prevailing wind directions are from the north and southwest, in summer from the north and northeast, in autumn, from the southwest and in winter from the south-southwest.

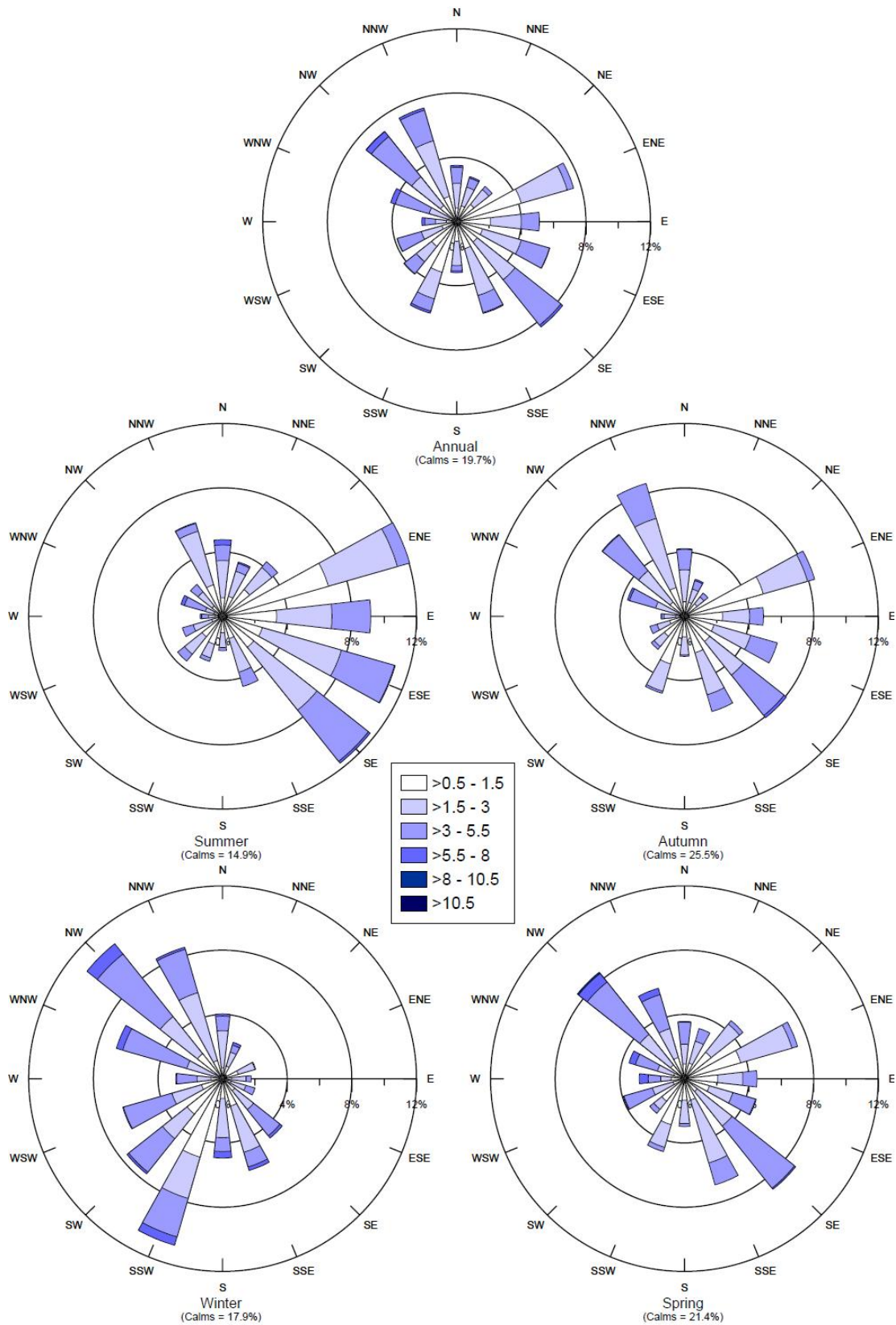


Figure B.3-1 Ophir Road Site wind roses

B.3.5 Land Ownership and Land Use

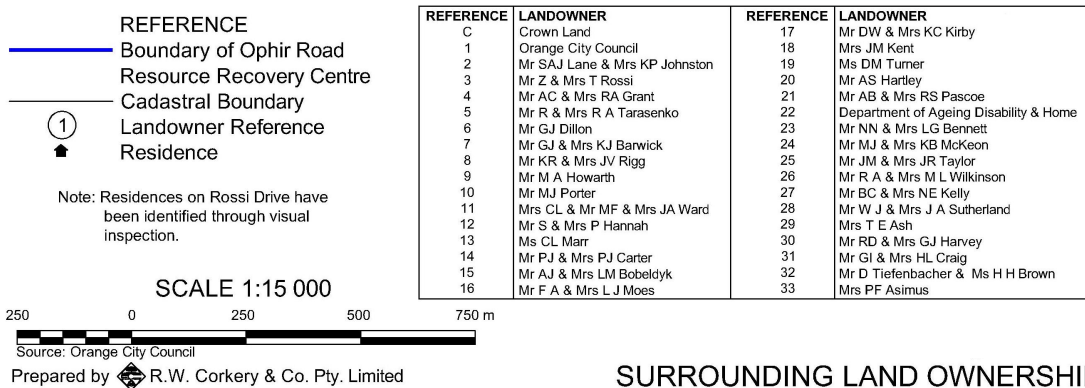
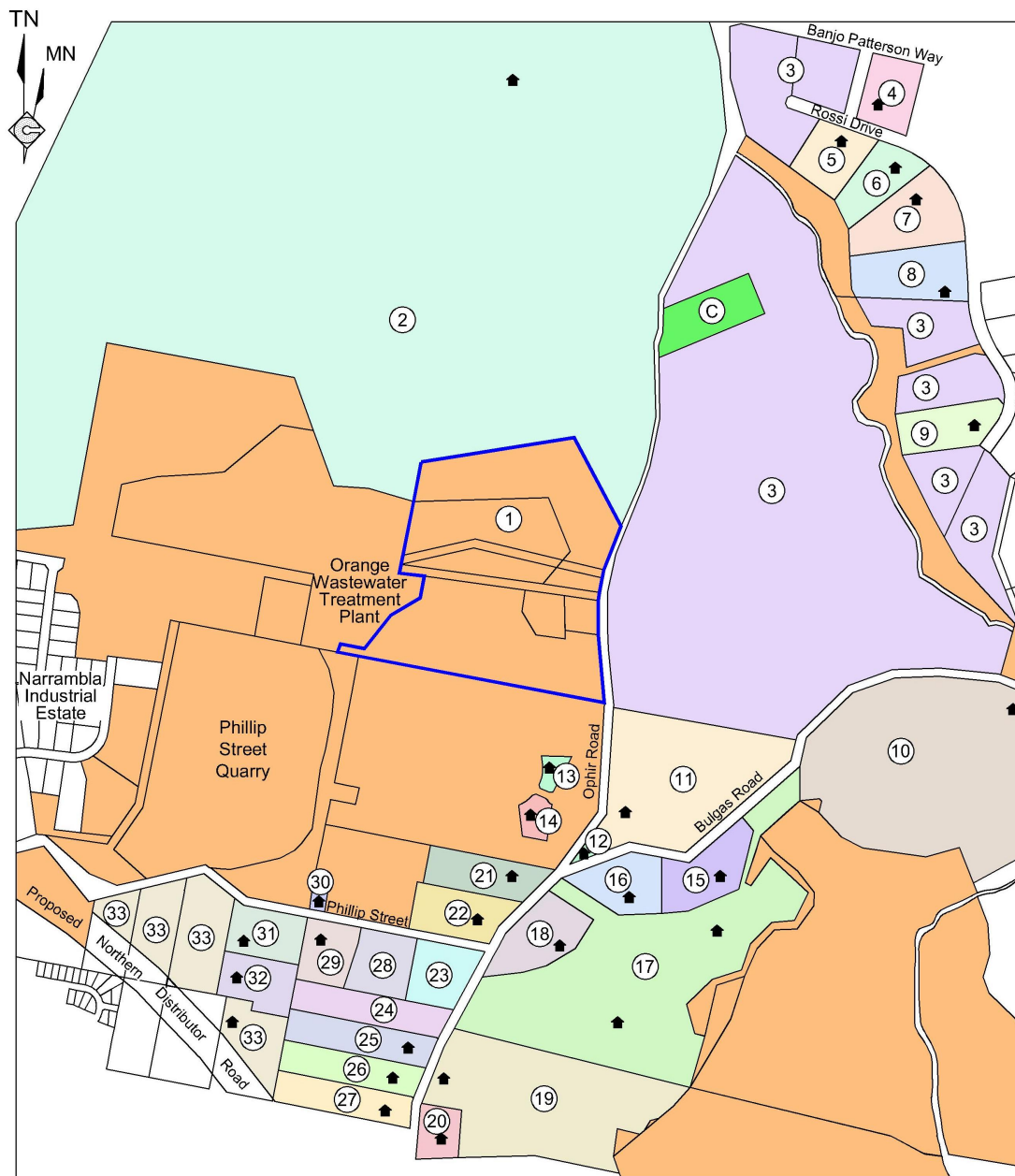
B.3.5.1 Land ownership

Figure B.3-2 displays the land ownership and residences around the Ophir Road RRC. As can be seen from this figure, the Proponent has a substantial land ownership based around the Ophir Road Site and also including the adjacent Orange Wastewater Treatment Plant, Phillip Street Quarry, and the eastern part of the Narrambla Industrial Estate. It also owns the land surrounding and on which Suma Park Reservoir is sited and the corridor along the northern side of Summer Hill Creek, both further to the east of the Ophir Road Site.

There are two other large private land holdings located directly to the north and east of the Ophir Road Site. The remainder of the surrounding land comprises smaller remnants of agricultural land and areas of rural residential/lifestyle allotments.

B.3.5.2 Surrounding residences

There are 29 existing residences within a 1 km radius of the Ophir Road Site, as illustrated in Figure B.3-2. Apart from a few isolated rural dwellings, the majority are clustered in the Clifton Grove rural residential area and the large lot residential land between Ophir Road and Phillip Street. The closest residential property (shown as no. 13 on Figure B.3-2) is approximately 300 m to the south of the proposed relocated MRF building.



SURROUNDING LAND OWNERSHIP

Figure B.3-2 Ophir Road Site surrounding land ownership

B.3.5.3 Site existing land use

The Ophir Road Site has an overall area of 25.36 ha and is bounded to the east by Ophir Road, the south by rural-residential land, the west by Blackmans Swamp Creek, beyond which is the Orange Wastewater Treatment Plant, and the north by Charles Sturt University land. The site is owned by the Proponent and the Ophir Road RRC has been in operation since the 1960s with a number of alterations occurring to the facility over time.

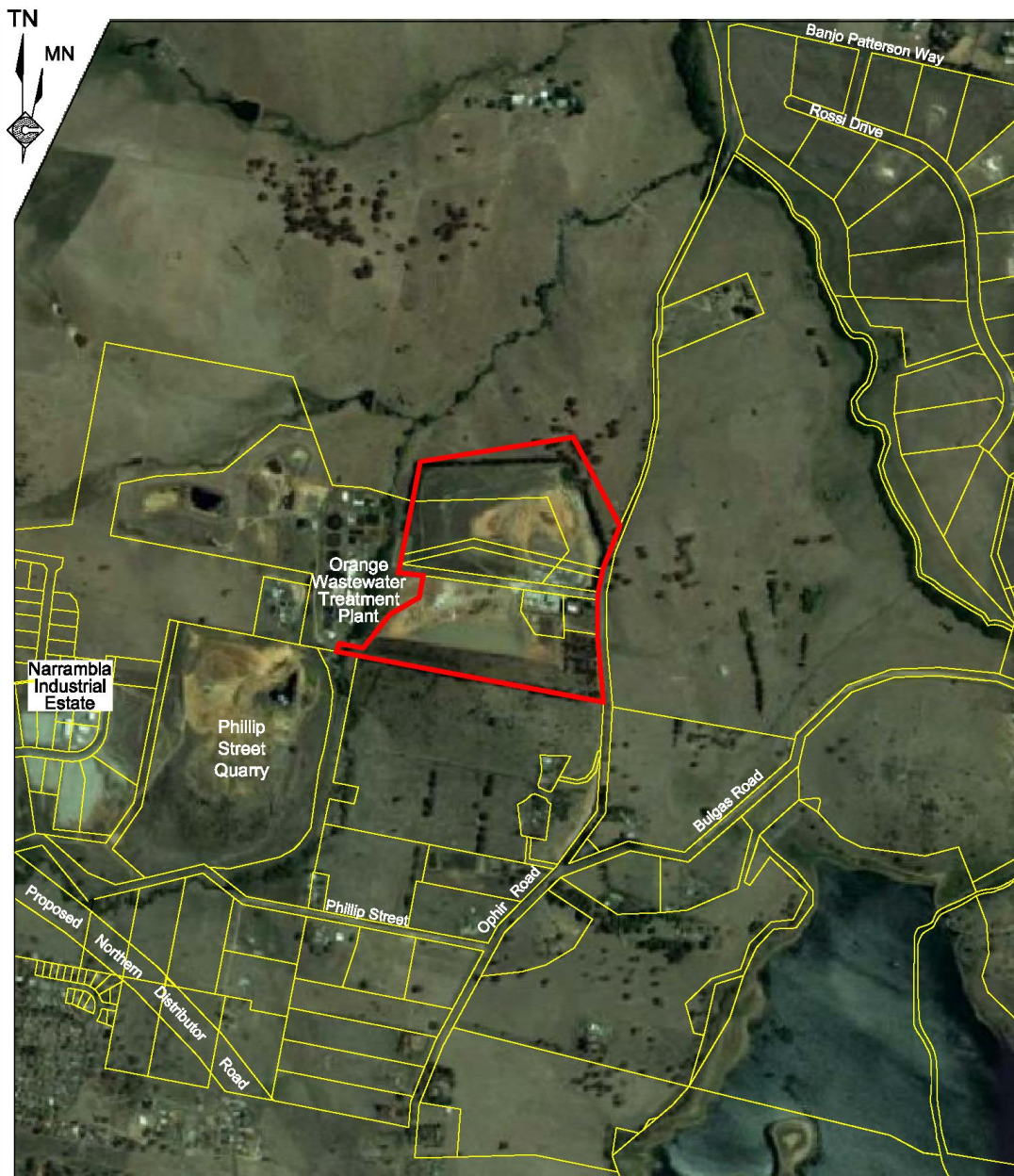
The following outlines the existing improvements on site, with Figure B.1-3 providing an illustration of such.

- ▶ Weighbridge (installed in 1998);
- ▶ Truck maintenance facility, including a truck wash down bay;
- ▶ Truck garages (used by the contractors for storage of the garbage collection trucks when not in use);
- ▶ Materials recovery facility (MRF) (installed in 2005);
- ▶ Green waste chipping area, with material to either be sold to the public or reused on site;
- ▶ Scrap metal storage area for collection;
- ▶ Public Waste Transfer Station (established in 1998);
- ▶ Recovery Shop which is managed by a community group and sells second hand goods such as clothes, glassware, jars, furniture and computers which are diverted from the waste stream;
- ▶ Visitor / learning program and tourist facility which includes community sculptures. These sculptures depict the story of the history of Orange and are proposed to be added to over time in order to achieve the final use of the site, being a large-scale sculpture park.
- ▶ Landfill area, including both the active tipping site and the completed, capped and rehabilitated areas; and
- ▶ Leachate collection system culminating in the leachate pond, which is discharged to the adjacent Orange Wastewater Treatment Plant.

B.3.5.4 Existing surrounding land uses

Figure B.3-3 illustrates the existing land uses surrounding the Ophir Road Site. To the north and directly east of the site is agricultural land which is currently used for grazing. Further to the north east is Clifton Grove which is a rural residential estate. Flanking Summer Hill Creek and extending south to include Suma Park Reservoir and its immediate surrounds is an area of open space. South of the site is some fragmented remnants of agricultural land.

Further south from this is an area of small agricultural/rural residential holdings which transitions to Orange's eastern suburb of Bowen. Immediately to the west of the Ophir Road Site is the Orange Wastewater Treatment Plant. Adjoining the south west of the wastewater treatment plant is Narrambla Industrial Area which also contains the Phillip Street Quarry owned by the Proponent. The Northern Distributor Road forms the western boundary of the industrial area and provides separation to the adjacent Narrambla residential area.



REFERENCE
 — Boundary of Ophir Road Resource Recovery Centre
 — Cadastral Boundary

SCALE 1:15 000
 250 0 250 500 750 m
 Source: Orange City Council LEP 2000
 Prepared by R.W. Corkery & Co. Pty. Limited

SURROUNDING LAND USE

Figure B.3-3 Existing surrounding land uses at the Ophir Road Site

B.4 Issue Identification and Risk Assessment

B.4.1 Risk Assessment Methodology

B.4.1.1 Evaluating likelihood

The likelihood of an impact occurring can be described in terms of probability. Overlaying this is the need to recognise the uncertainty that may be associated with the possible impacts, particularly during the initial risk assessment process. Where there is scientific uncertainty a cautious approach will identify a higher level of risk.

Each identifiable impact can be assigned a likelihood between remote and almost certain. In simplifying the possible impacts for the purpose of a risk assessment an element of subjectivity is introduced. The purpose of the risk assessment is not necessarily to agree on the probability of any particular impact, but to facilitate an understanding of the relative probability of different impacts.

Columns 2 to 4 in Table B.4-1 give descriptions that elaborate on the possible likelihood categories. These are presented to help view the impact from different perspectives.

Table B.4-1 Likelihood and probability of occurrence

Likelihood	Description	Probability	Community Attitude
Remote	May occur in exceptional circumstances	<1%	Few people interested
Unlikely	Not expected to occur in most circumstances	1-20%	Some people affected
Possible	May occur	21-49%	Many people affected
Likely	Probably will occur	50-85%	Most people affected
Almost Certain	Expected to occur	>85%	Almost everyone affected

B.4.1.2 Evaluating consequence

The consequences of an impact require a degree of subjective assessment as the likely consequences of an impact may consist of several elements.

The elements that have been considered in this risk assessment are described below. Table B.4-2 provides a guide to the elements considered when evaluating consequence.

Table B.4-2 Consequences of occurrence

Consequence		Minimal	Minor	Moderate	Major	Catastrophic
Magnitude	Spatial	A small isolated area	A part of the site	The whole Site	The Site and surrounding areas	Whole of Region
	Intensity	Chronic/	Acute impacts on some	Acute/	Lethal impacts on some	Lethal/

Consequence		Minimal	Minor	Moderate	Major	Catastrophic
		low Level. behavioural, lifespan or condition effect	species.	Moderate. Impact on growth, recruitment or survival rates	species.	extreme. For individuals or communities
Temporal	Duration	Single incident. transient event	Short term impact (single generation)	Medium term	Long term effect (multiple generations)	Permanent
	Timing (periodic events)	Occurs outside breeding times.	Occasional interruption of feeding or breeding.	Interrupts one life cycle.	Regularly interrupts life cycle.	Permanent interruption of ecosystem cycle.
Ecological	Values	Previously disturbed areas	Parkland	Native flora or fauna	Conservation area or listed Species	Wilderness or nationally threatened Species.
	Sensitivity	Will recover completely.	Will recover with some changes	Moderate change to ecosystem function	Significant change to ecosystem function	Will not recover.
Social	Number of People	Some people indirectly affected	Some people directly impacted, or several indirectly	Several people directly impacted, or many indirectly	Large number of people directly impacted.	Loss of life
	Heritage Considerat ions	Impact on place(s) or object(s) assessed below significance threshold	Impact on place(s) or object(s) with limited levels of significance, or, minor impact to significant place(s) or object(s)	Substantial degree of impact on significant place(s) or object(s)	Major degree of impact on significant place(s) or object(s) with a high level of significance	Major degree of impact on place(s) or object(s) with an exceptional level of significance
Economic	General	Minimal losses	Sever thousands of dollars in lost revenue or remediation costs	Half a million dollars in lost revenue or remediation costs	A million dollars in lost revenue or remediation costs	Several million dollars in lost revenue or remediation costs
	Financial/ Business Cost	No Loss	<\$100,000	<1,000,000	<\$10,000,000	>\$10,000,000

B.4.1.3 Risk assessment matrix

Based on the assessment of likelihood and consequence (as described above) any foreseeable impact can be assigned a risk rating. An Environmental Assessment is intended to focus on potentially significant environmental impacts.

The table below is to be read as a matrix, with increased consequence across the top and increased likelihood down the left side. Any potential impacts that fall in the bottom right are to be specifically addressed in the Environmental Assessment.

Table B.4-3 Risk assessment matrix

	Consequence				
Likelihood	Minimal	Minor	Moderate	Major	Catastrophic
Remote	Negligible	Negligible	Very Low	Low	Medium
Unlikely	Negligible	Very Low	Low	Medium	High
Possible	Very Low	Low	Medium	High	Very High
Likely	Low	Medium	High	Very High	Significant
Almost Certain	Medium	High	Very High	Significant	Significant

B.4.2 Potential Impacts

Table B.4-4 lists the potential impacts associated with the Ophir Road Site. A similar assessment for the Euchareena Road Site is provided in Table C.3-4.

Table B.4-4 Risk assessment – Ophir Road Site

Issue	Potential impacts	Likelihood	Consequence	Assessed risk level	Comment / response
Groundwater	Contamination of groundwater.	Remote	Minor	Negligible	This is not considered a key issue at the Ophir Road Site, and groundwater would not be affected by the Project. No leachate leakage is predicted to occur as baling would be undertaken inside the baling building and all leachate would be collected.
Transport	Increases in heavy vehicle traffic.	Remote	Minimal	Negligible	This is not considered a key issue at the Ophir Road Site, however the Director-General's requirements identify this as a key issue and it is therefore addressed in Section B.5.7. Changes in the traffic mix are predicted, but overall traffic levels are not expected to change noticeably.
Air quality and odour	Dust emissions from construction activities and ongoing operations, odour emissions during baling of waste.	Possible	Moderate	Medium	This is considered a key issue at the Ophir Road Site and was also identified in the Director-General's requirements as a key issue and therefore has been addressed in Section B.5.6. Normal construction practices would be followed to minimise dust and noise emissions during site works.
Biodiversity	Affects on threatened or vulnerable species.	Remote	Minimal	Negligible	This is not considered a key issue at the Ophir Road Site, however the Director-General's requirements identify this as a key issue and it is therefore addressed in Section B.5.3. No vegetation would be removed at the Ophir Road Site.
Soil and water	Disturbance of soils during construction to prepare new MRF building and hence potential for sediment movement.	Likely	Minor	Medium	This is considered a key issue at the Ophir Road Site and was also identified in the Director-General's requirements as a key issue and



Issue	Potential impacts	Likelihood	Consequence	Assessed risk level	Comment / response
	Surface water impacts from runoff from disturbed areas.				therefore has been addressed in Sections B.5.1 (Soils and Land Capability) and B.5.2 (Surface Water). Normal construction practices would be followed to minimise surface water impacts during site works.
Aboriginal heritage	Disturbance of Aboriginal heritage items during construction.	Remote	Minimal	Negligible	This is not considered a key issue at the Ophir Road Site, however the Director-General's requirements identify this as a key issue and it is therefore addressed in Section B.5.4. No items would be disturbed.
European heritage	Encounter and disturb items or European heritage during construction	Remote	Minimal	Negligible	This is not considered a key issue at the Ophir Road Site. No items would be disturbed.
Noise	Construction noise, operational noise emissions from plant and equipment.	Possible	Moderate	Medium	This is considered a key issue at the Ophir Road Site and was also identified in the Director-General's requirements as a key issue and therefore has been addressed in Section B.5.8. Normal construction practices would be followed to minimise noise impacts during site works. Occupational health and safety procedures would be followed when using noisy equipment.
Hazards	Leakage of hydrocarbons (fuel) and resulting impacts on surface or groundwater quality. Fire in the baling building or from fuel storage.	Remote	Moderate	Very low	This is not considered a key issue at the Ophir Road Site, however the Director-General's requirements identify hazards (generally) as a key issue and it is therefore addressed in Section B.5.5. Smoking would not be permitted in areas where combustible materials are being handled. No new fuel storage facilities are proposed.
Visual amenity	Visibility of the proposed new MRF building.	Unlikely	Minor	Negligible	This is not considered a key issue at the Ophir Road Site, however the Director-General's requirements identify this as a key issue and it is



Issue	Potential impacts	Likelihood	Consequence	Assessed risk level	Comment / response
					therefore addressed in Section B.5.9.
Greenhouse gas	Emissions from fuel use in construction equipment and electricity use, mobile equipment and transport contributing to global warming.	Almost certain	Minimal	Medium	This is considered a key issue at the Ophir Road Site and was also identified in the Director-General's requirements as a key issue and therefore this issue is addressed in Section D.2 and considers the Project as a whole. Baling of wastes would minimise fuel usage, through greater load densities, thereby minimising greenhouse gas emissions.
Socio-economic	Effects on employment and access to waste disposal facilities.	Remote	Minor	Negligible	This is not considered a key issue at the Ophir Road Site, however the Director-General's requirements identify this as a key issue and therefore is addressed in Section D.1 and considers the Project as a whole. Most staff from the current landfill would be transferred to the proposed baling plant, leading to no net loss of employment. Residents would still be able to deliver small loads of waste to the Ophir Road Site – no changes to current arrangements are envisaged.

B.5 Impact Assessment

B.5.1 Soils and Land Capability

B.5.1.1 Soil occurrences and characteristics

As outlined in Sections B.3.2 and B.3.3, the Ophir Road Site, due to its current land use, has experienced significant alterations to its landform and surface soil type.

B.5.1.2 Impact assessment

Construction

Construction works impacting on soils would include land shaping for the new MRF building and associated manoeuvring area and access road. Construction activities would only occur for a short time.

During operation

The proposed development would be a continuation of the existing landfilling land use on site and would therefore not have any adverse impacts on land capability.

The new internal access roads would be sealed and use of such would therefore not result in any adverse impacts on soils.

Use of the unsealed roads within the site to access the stockpile areas for scrap metal, green waste and contaminated soil/carcasses have the potential to create particulate and surface water pollution. The management measures outlined in the Landfill Environmental Management Plan (LEMP) would be adhered to for surface water and dust control. These measures are outlined in Sections B.5.2 and B.5.5.

The soils of the site are not considered to be restrictive to the Project in terms of exhibiting qualities that would be adversely impacted by the Project. In addition the Project would not adversely impact upon soils nor would it restrict land capability. Therefore no management or mitigation measures are deemed necessary beyond those referred to above.

B.5.2 Surface Water

B.5.2.1 Existing environment

There is negligible upstream stormwater runoff that drains onto the site. As with topography, natural drainage features have been significantly altered by landfilling operations. Figure B.5-1 illustrates the current drainage catchments and existing surface water management devices, which would not be altered as a result of the Project.



PRELIMINARY

Figure B.5-1 Surface water management

The small undeveloped portion of the eastern side of the facility drains to Summer Hill Creek, downstream from the Suma Park Reservoir.

The final landform of the site will incorporate a ridge that runs north/south through the centre of the site. The western slope of this ridge will drain directly to surface water pond on the western boundary. A drain runs along the north eastern boundary of the site intercepting all overland flow in that location and discharging to the surface water pond (SWP) in the north eastern corner of the site. This pond discharges to a drains that extends along the northern and western boundaries, discharging to Leachate Pond 1 (LP1).

The built form area of the site drains to a gross pollutant trap (GPT) located to the south west of the proposed bale storage area. The GPT drains via a 750 mm pipe discharging to the SWP.

Surface water management and monitoring of the existing facility is outlined in the LEMP and is summarised as follows:

- ▶ Daily inspection of the surface water collection and leachate collection ponds to ensure the ponds have a freeboard of at least one metre.
- ▶ Leachate pumps operated as necessary to discharge leachate to the wastewater treatment plant.
- ▶ Surface water and leachate quality is being monitored quarterly.
- ▶ If routine sampling detects exceedences of quality parameters, validation sampling would be undertaken.
- ▶ In the event that validation sampling confirms surface water pollution, a Surface Water Assessment Plan (SWAP) is to be prepared for approval by the DECCW.
- ▶ A Surface Water Contamination Remediation Plan would be prepared and implemented following the SWAP.

B.5.2.2 Impact assessment

The additional hardstand areas and new MRF building would create additional runoff. This additional runoff would be captured and piped to the existing GPT and disposed of as described above. There is sufficient capacity within the existing system to support the additional stormwater generated. The additional stormwater infrastructure is conceptually illustrated on Figure B.5-1.

B.5.2.3 Mitigation measures

Apart from the additional stormwater infrastructure described above, there would be no change to existing surface water management controls on site.

B.5.3 Biodiversity

B.5.3.1 Existing environment

Due to its use as a landfill for over 30 years, the Ophir Road Site is a highly modified site with no remnant vegetation remaining over those disturbed areas.

Flora

There is a pocket of mature vegetation in the south eastern corner of the site, with the remainder largely cleared. Vegetative screening works have been undertaken along the northern, eastern and western boundaries for the northern part of the site. Screening comprises a mixture of pine and native species. A single row of native trees has recently been planted along the ridge line on the southern boundary. The completed landfill cells have been capped and sown with native grass species. The earth mounds on top of stage 1 of the landfill (i.e. the northern part of the site) have also been planted with a mixture of native shrubs as part of the rehabilitation.

No threatened flora species or endangered ecological communities exist on site.

Fauna

The highly modified nature of the site does not provide suitable habitat for any threatened fauna species likely to occur in the area. Fauna occurring on site has been observed as mainly large scavenging bird species such as egrets and silver gulls, and other introduced species including cats, foxes and rabbits.

B.5.3.2 Impact assessment

The proposed Bale Storage Area shown on Figure B.2-2 is already a hardstand area and would therefore not require the removal of any vegetation. No vegetation would be required to be removed to facilitate the new MRF, adjacent manoeuvring area, access roads, or stockpile areas. In this regard there is unlikely to be any impact on the habitat for any fauna species.

The Project is not expected to have an impact on any threatened species or endangered ecological communities at the Ophir Road Site.

B.5.4 Aboriginal Heritage

B.5.4.1 Existing environment

As outlined throughout this Environmental Assessment, the Ophir Road Site is already highly disturbed. Throughout all activities previously undertaken on site there has been no items of Aboriginal heritage significance uncovered. In this regard, there are no known Aboriginal Heritage sites located on the Ophir Road Site.

B.5.4.2 Impact assessment

The Project is not expected to have an impact on Aboriginal heritage at the Ophir Road Site.

B.5.4.3 Mitigation measures

To avoid impact on any unknown items of heritage significance during construction, the following mitigation measures are proposed:

- ▶ If during construction any Aboriginal objects are discovered, work should be immediately ceased and advice should be sought from the Aboriginal Heritage Unit of the Department of Environment and Climate Change.

B.5.5 Hazards

B.5.5.1 SEPP 33 overview and risk framework

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development aims to ensure that appropriate measures are employed to minimise the impacts of developments that are deemed to be either 'hazardous' or 'offensive'.

Under SEPP 33, the Project is considered to be potentially offensive because waste related activities could potentially impact on the surrounding localities, even after measures are taken to reduce or minimise the potential impacts.

However, the Project is not considered hazardous, as environmental controls proposed for the Project would limit the potential health risk to workers and nearby residents and risk to the biophysical environment. Mitigation measures for these risks are outlined in the various sections of this Environmental Assessment.

SEPP 33 requires that potentially hazardous or offensive development are publicly advertised under the same requirements as for designated developments. Community consultation has been carried out as per these requirements and in accordance with the EP&A Act.

B.5.5.2 Hazard identification and potential impacts

A hazard is defined as a source of potential harm or a situation with a potential loss. Hazards can relate to situations with potential for human injury, damage to property, damage to the environment, or a combination of these factors.

Hazards typically associated with waste management facilities include:

- ▶ Health (biological) hazards;
- ▶ Occupational Health and Safety (OH&S) hazards;
- ▶ Operational hazards; and
- ▶ Hazards during excavation and construction works.

There would only be one new facility on the site, the baling plant. The existing MRF equipment would be relocated to a new building, or new MRF equipment would be purchased for use. All other site operations would remain as they are currently, other than the landfill tipping face would be closed to the public, and the majority of landfilling of waste from Orange City would cease on the site.

B.5.5.3 Impact assessment

Construction

Construction type activities at Ophir Road RRC would occur initially to establish the new MRF building.

General safety hazards

Safety hazards from proposed construction works include operation of heavy equipment for the construction of the new MRF building.



Noise

Earth moving equipment and other heavy equipment would be used during construction activities. Occupational health and safety procedures such as the use of earmuffs would be followed during use of this equipment.

Operations

Normal levels of hazard and risk associated with industrial sites would exist for site workers and visitors.

Fire

None of the wastes that would be baled are considered to be flammable, however being comprised mainly of paper and plastics, they are potentially combustible. Smoking would not be permitted within the building, and fixed fire hydrants and reels would be used to provide water for firefighting.

Dangerous goods

No new dangerous goods would be stored on site, other than small quantities of solvents used to clean the equipment. These would be stored in accordance with normal dangerous goods storage procedures.

General safety hazards

Safety hazards would exist from handling of wastes within the baling building, and from handling of large skips containing non-baleable materials and from the use of front end loaders and other equipment used to sort wastes prior to baling, load wastes into the baler, and load non baleable waste into large skips for transport to Euchareena Road RRC. These would be managed through occupational health and safety procedures. Semi-trailers would be used to transport the bales of waste to Euchareena Road RRC. A forklift would be used to load the bales onto the trailers. All of these operations would be managed through development and implementation of an operations plan for the baling plant. Occupational health and safety procedures would be followed during use of the baling equipment.

Hazards to visitors

With a public facility such as the Ophir Road RRC, there is already a potential of accidents between heavy vehicles and resident vehicles or pedestrians on the site or in the vicinity of the site. The proposed baling plant at Ophir Road would result in no net increase in the level of hazards that local residents would be exposed to. As residents would not be permitted to deliver waste and recyclables to any area other than the existing waste transfer station, or to bulk drop-off areas (garden organics or separated concrete) this would minimise the level of hazards associated with the new facilities.

As there would be a similar number of commercial vehicles delivering waste to the site to in the past, the level of hazard associated with heavy vehicles for local residents in the vicinity of the site, or using the site to drop off wastes or recyclables, would not change significantly.

B.5.6 Air Quality

The following section is based on the Ophir Road RRC Air Quality Assessment Report (Appendix F) prepared by Heggies (2009a). The air quality assessment report concluded that the proposed construction activities and operation of the new baling plant at the Ophir Road RRC would have a negligible impact on local air quality.

B.5.6.1 Existing environment

Dust

No site specific dust deposition data is available for the Ophir Road Site, however historical dust deposition monitoring data from four locations surrounding the Euchareena Road Site (30 km north west of the Ophir Road RRC) between May 2003 and May 2004 has been adopted for this assessment. The highest average dust deposition recorded was 1.8 g/m²/month. While a background level of ~ 2 g/m²/month may not account for localised sources of dust, according to Heggies (2009a), it is considered an appropriate level of ambient 'dustiness' for a rural location.

Particulate matter

No historical monitoring data is available for the locality to establish background concentrations of suspended particulate matter. However the historical data is available from the DECCW's Tapered Element Oscillating Microbalance (TEOM) monitoring location in the Central West at Bathurst. While it is recognised that the sources of PM₁₀ may differ between the township of Bathurst and the Ophir Road Site, the air quality assessment (Heggies 2009a) considered that the PM₁₀ concentrations recorded at the Bathurst location would be a reasonably good representation of the rural location in Orange. Hence the annual average PM₁₀ concentration of 14.6 µg/m³ (for 2007) has been adopted for this assessment.

In the absence of monitoring data for total suspended particulate (TSP), a conservatively high background concentration of annual TSP of 32 µg/m³ has been adopted. This reflects USEPA (2001) opinion that the PM₁₀ subset is typically 50% of the TSP in the ambient air of regions where road traffic is not the dominant particulate source, such as rural towns.

Odour

There are two sources of odour in the vicinity of the Ophir Road Site; the existing operations of the Ophir Road RRC and the adjacent wastewater treatment plant. To account for impacts from background sources of similar odour character in the vicinity of the Ophir Road RRC site, a cumulative odour impact assessment is conducted for all sources (as discussed in Section B.5.6.4).

B.5.6.2 Air quality and odour goals

Dust

Table B.5-1 presents the DECCW impact assessment goals for dust fallout, showing the allowable increase in dust deposition level over the ambient (background) level which would be acceptable so that dust nuisance could be avoided.

Table B.5-1 DECCW Goals for allowable dust deposition

Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level
Annual	2 g/m ² /month	4 g/m ² /month

Source: DEC 2005

As the ambient dust deposition level has been assumed to be $<2\text{g/m}^2/\text{month}$ (see Section B.5.6.1), the maximum increase in deposited dust level ($2\text{ g/m}^2/\text{month}$) would be the governing goal for the Project for deposited dust.

Particulate matter

The DECCW PM₁₀ impact assessment goals, as expressed in the document 'Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales', are:

- ▶ A 24-hour maximum of $50\text{ }\mu\text{g/m}^3$
- ▶ An annual average of $30\text{ }\mu\text{g/m}^3$

The 24-hour PM₁₀ reporting standard of $50\text{ }\mu\text{g/m}^3$ is numerically identical to the equivalent National Environment Protection Measure (or NEPM) reporting standard except that the NEPM reporting standard allows for five exceedances per year. These NEPM goals were developed by the National Environmental Protection Council (NEPC) in 1998 to be achieved within 10 years of commencement.

As the annual TSP goal is seen to be achieved if the annual PM₁₀ goal is satisfied, TSP has not been considered further in this report.

The Ambient Air Quality NEPM references the goals for PM_{2.5} as:

- ▶ A 24-hour maximum of $25\text{ }\mu\text{g/m}^3$
- ▶ An annual average of $8\text{ }\mu\text{g/m}^3$

Odour

A summary of DECCW odour performance goals for various population densities is shown in Table B.5-2.

Table B.5-2 DECCW impact assessment criteria for complex mixtures of odorous air pollutants

Population of Affected Community	Impact Assessment Criteria for Complex Mixtures of Odours (OU)
Urban area (≥ 2000)	2.0
500 – 2000	3.0
125 – 500	4.0
30 – 125	5.0
10 – 30	6.0
Single residence (≤ 2)	7.0

Source: DECC 2006

Due to the surrounding low density residences, the odour performance goal adopted for this assessment is a 99th percentile of 6 OU expressed as a nose response average (1-second) value.

The population most likely to be affected by odour from the Ophir Road Site (based on preliminary modelling) is located immediately to the south of the site, and limited to the closest four residences.

B.5.6.3 Methodology

A complete annual data set of hourly observations recorded by an Automatic Weather Station (AWS) at Orange Airport AWS and the Orange Wastewater Treatment Plant during 2007 has been used to create a meteorological input file for modelling purposes. A spatially and temporally varying gridded meteorological file centred over the Project Site was created using observations, TAPM and CALMET software.

Dispersion model predictions of fugitive emissions (PM₁₀, dust deposition and odour) from the Ophir Road Site were undertaken using the USEPA approved CALPUFF software to determine the resulting air quality impacts of the proposed construction and operation of the site.

A construction and operation scenario has been modelled, taking into consideration the location of the construction/operation activities, the internal haul route used to transport material to the MRF/landfill/stockpiles and the location of individual items of plant and equipment. For the odour scenario, the operation of the MRF, baling process (including odour emissions from current leachate ponds, the remaining landfill cell and the green waste stockpile are taken into account. The scenarios are thus considered representative of operating conditions during the life of the Ophir Road RRC.

B.5.6.4 Assessment of impacts

Dust

Table B.5-3 shows the results of the CALPUFF predictions for dust deposition. The results show the average deposition rates predicted at the assessment locations over a one-year time frame.

A contour plot of the modelled dust deposition values predicted around the Ophir Road RRC is presented in Figure B.5-2 for construction and in Figure B.5-3 for operation.

Table B.5-3 Background and predicted incremental dust deposition at the assessment locations

Receptor	Annual Average Dust Deposition Rate (g/m ² /month)	
	Increment	Project Goal
Construction Scenario		
'A'	0.0	2
'D'	0.0	2
'G'	0.0	2
'I'	0.3	2
Operation Scenario		
'A'	0.0	2
'D'	0.0	2
'G'	0.0	2
'I'	0.6	2

Source: Heggies 2009a

Table B.5-3 indicates that at all four assessment locations, the total mean monthly dust deposition rates (expressed as an annual average) associated with the proposed Ophir Road RRC are predicted to be well below the project goal of $2.0 \text{ g/m}^2/\text{month}$ for both during construction and operation.

Particulate matter

PM₁₀ – 24 hour average

The results of CALPUFF modelling indicate that at all four assessment locations, the maximum 24-hour average concentration of PM₁₀ (background plus increment, excluding days on which the background PM₁₀ concentration is greater than $50 \text{ }\mu\text{g/m}^3$) associated with the proposed Ophir Road RRC is predicted to be below the project goal of $50 \text{ }\mu\text{g/m}^3$ (24-hour average) both during construction and operation.

It is noted that the maximum predicted incremental increase is predicted to be 10 and $15 \text{ }\mu\text{g/m}^3$ at Residence 'I' for construction and operational respectively, which is between 20% and 30% of the project goals. Generally, the incremental concentrations of PM₁₀ attributable to construction and operation of the Project are an order of magnitude lower than the background concentration.

PM₁₀ – annual average

The results of CALPUFF modelling indicate that at all four assessment locations, the maximum annual average concentration of PM₁₀ (background plus increment) associated with the proposed Ophir Road RRC is predicted to be significantly below the project goal of $30 \text{ }\mu\text{g/m}^3$ for both construction and operation of the Project.

PM_{2.5}

Emissions of PM_{2.5} have not been explicitly modelled. Generalised particle size distributions are available in Appendix B.2 of the USEPA AP-42 document. Size distributions from industries covering material handling and the processing of aggregate and unprocessed ore (the closest approximation to activities at the Ophir Road Site) are quoted as the following:

- ▶ Approximately 30% of the PM₁₀ particle size fraction will constitute PM_{2.5}

A simple calculation based on the above assumption, combined with the highest predicted PM₁₀ concentration for the relevant averaging period, indicates that:

- ▶ Worst-case 24-hour average PM_{2.5} may be expected to be of the order of $20 \text{ }\mu\text{g/m}^3$; and
- ▶ Annual average PM_{2.5} may be expected to be of the order of $5 \text{ }\mu\text{g/m}^3$.

Therefore it is predicted that both the 24-hour average PM_{2.5} goal of $25 \text{ }\mu\text{g/m}^3$ and the annual average goal of $8 \text{ }\mu\text{g/m}^3$ PM_{2.5} will be achieved for all modelling scenarios.

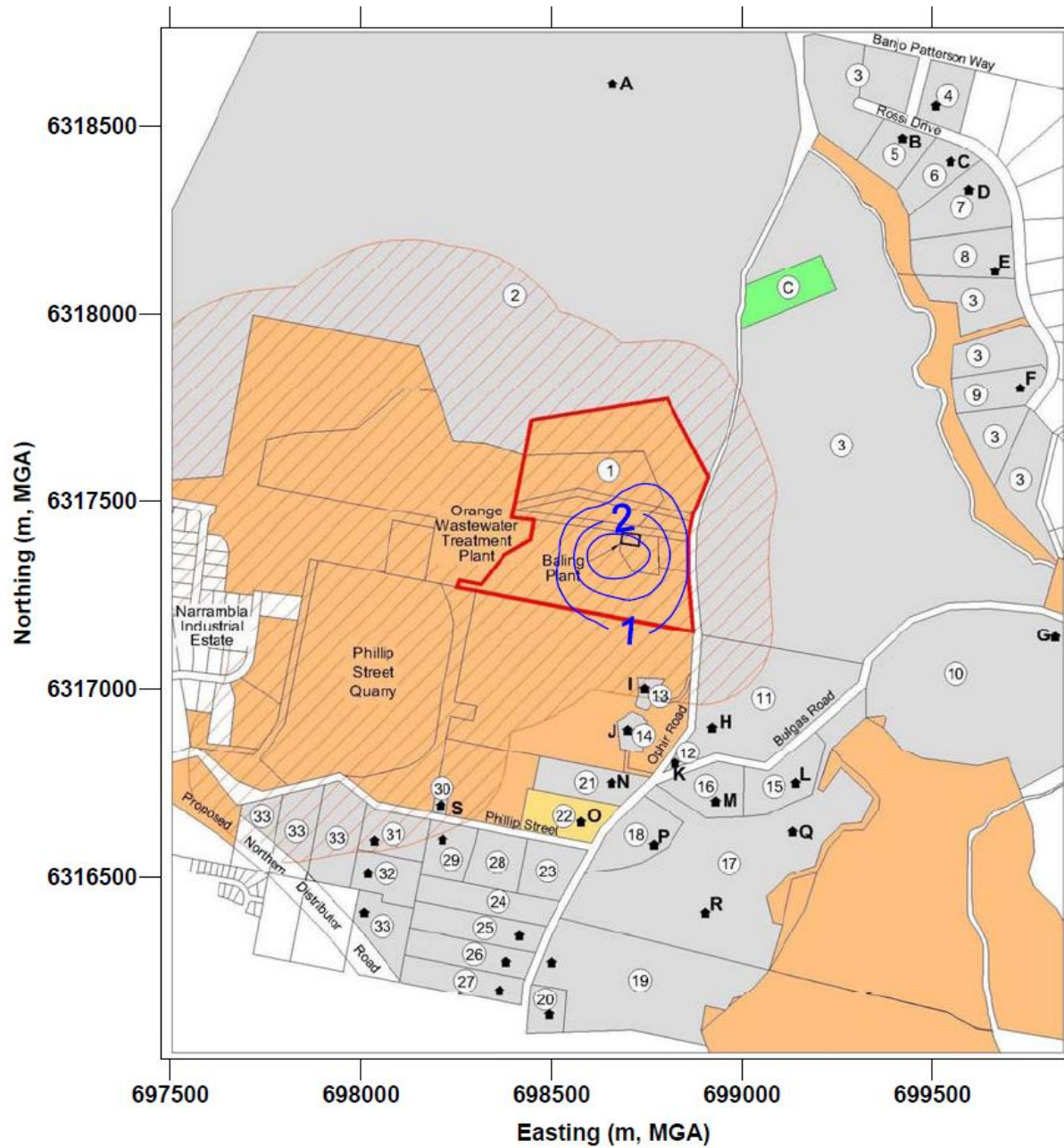


Figure B.5-2 Predicted incremental dust deposition rate during construction ($\text{g}/\text{m}^2/\text{month}$)

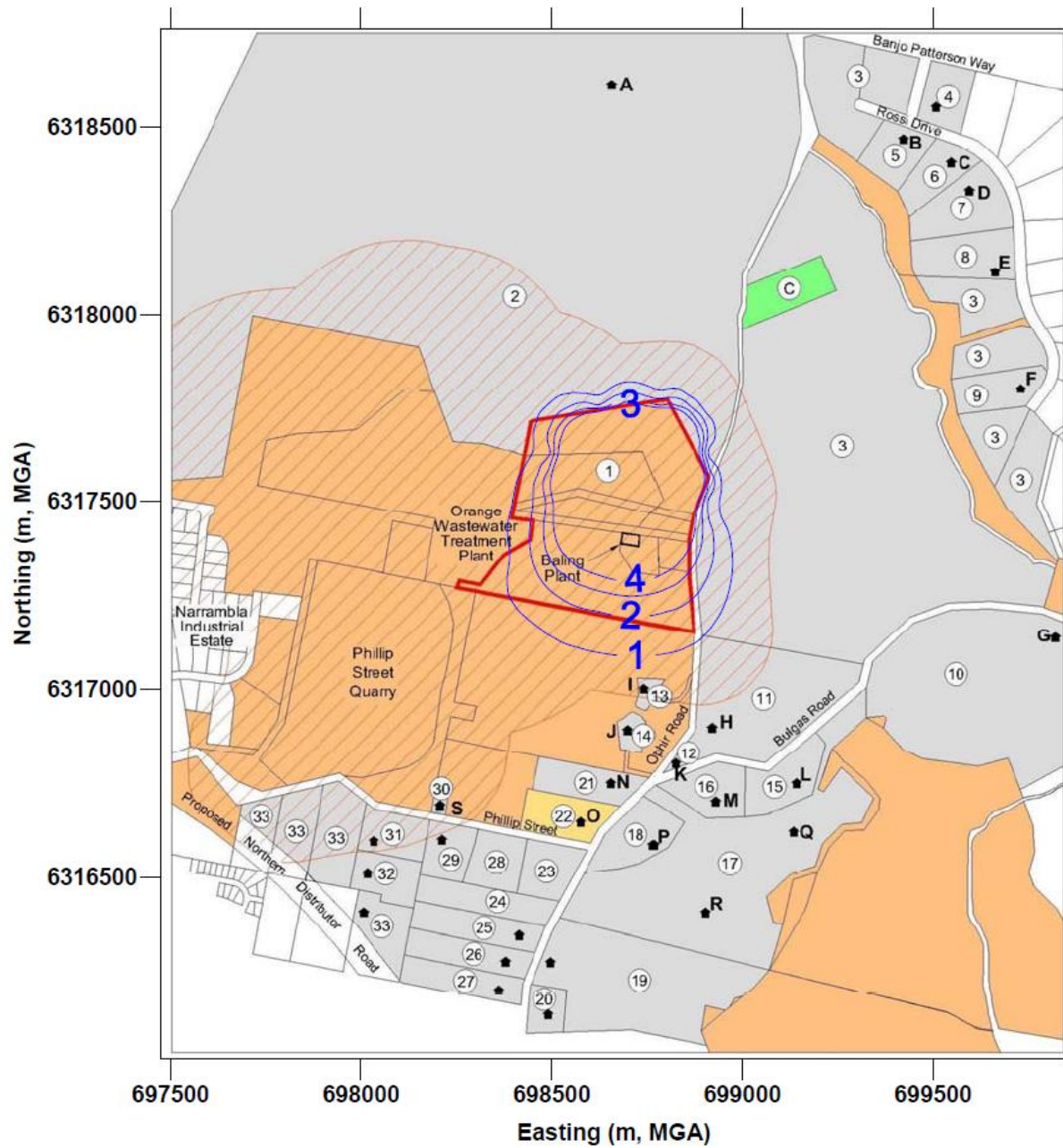


Figure B.5-3 Predicted incremental dust deposition rate during operation ($\text{g/m}^2/\text{month}$)

Odour

Table B.5-4 shows the results of the CALPUFF predictions for the predicted odour concentration for the Ophir Road RRC only. The results show the predicted odour concentration (expressed as a nose response average) predicted at the assessment locations surrounding the Ophir Road RRC over a one-year time frame.

A contour plot of the predicted peak odour concentrations obtained around the Ophir Road RRC is presented in Figure B.5-4. The contours indicate that the worst-case 6 OU (99th Percentile) contour resulting from operations at the Ophir Road Site is predicted to lie largely within the site boundary.

Under a worst-case modelling scenario, the 6 OU contour (99th percentile) would extend approximately 90 m past the southern site boundary, and approximately 10 m past the eastern site boundary with the remainder of this odour contained within the site. Thus, day-to-day odour impacts are predicted to be negligible.

Table B.5-4 Predicted odour concentrations at the assessment locations

Receptor	99 th Percentile Hourly Average Odour Concentration (OU)			
	Background	Increment	Background + Increment	Project Goal
Operation				
'A'	N/A	0.1	0.1	6
'D'	N/A	0.1	0.1	6
'G'	N/A	0.1	0.1	6
'I'	N/A	2.6	2.6	6
Note:	No odorous activities are predicted to occur during construction			
Source:	Heggies 2009a			

Table B.5-4 indicates that at all assessment locations, the odour concentration associated with the proposed operations at the Ophir Road RRC is predicted to be significantly below the project goal of 6 OU expressed as a nose response average (1-second). It is noted that no odour is assumed to be generated during construction.

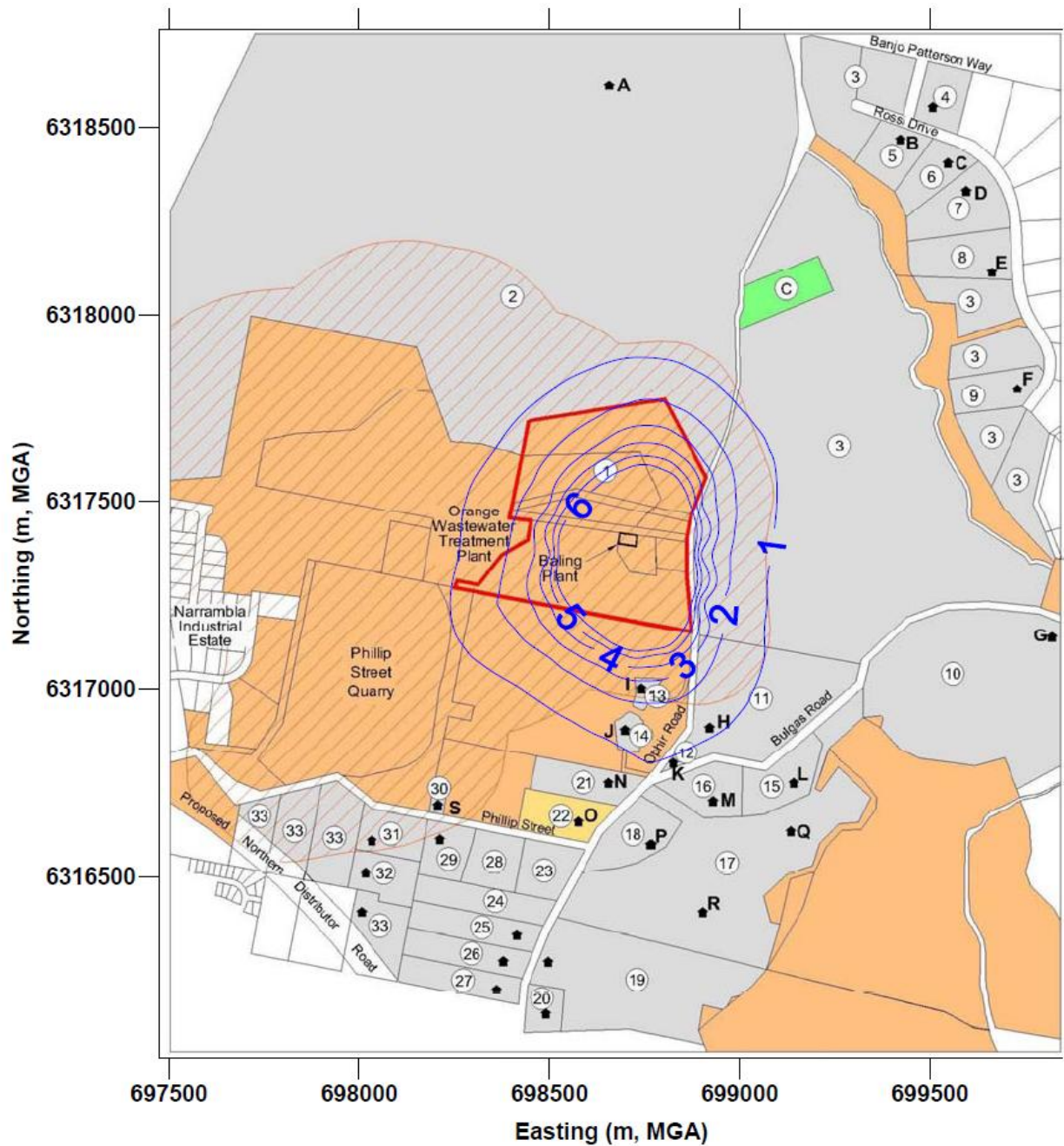


Figure B.5-4 Predicted odour concentrations at the assessment locations

Cumulative odour

Table B.5-5 shows the results of the CALPUFF predictions for the cumulative odour concentrations resulting from the wastewater treatment plant (derived from the Leeds Parade report) and the Ophir Road RRC.

The results show the predicted peak odour concentration (OU 99th percentile expressed as a nose response average) is influenced strongly by the odour emissions from the wastewater treatment plant.

A contour plot of the predicted peak odour concentrations obtained around the Ophir Road Site and the wastewater treatment plant is presented in Figure B.5-5. Cumulative odour impacts are predicted approximately 1.2 km from the wastewater treatment plant site, however these are driven by odour attributable to the wastewater treatment plant.

Table B.5-5 Predicted cumulative odour concentrations at the assessment locations

Receptor	99 th Percentile Hourly Average Odour Concentration (OU)				
	Background	Increment wastewater treatment plant + Ophir Road RRC	Increment Ophir Road RRC	Percentage Odour due to Ophir Road RRC (%)	Project Goal
'A'	N/A	1.3	0.1	7.7	6
'D'	N/A	0.5	0.1	20	6
'G'	N/A	0.3	0.1	33	6
'I'	N/A	8	2.6	32	6
Note:	No odorous activities are predicted to occur during construction				
Source	Heggies 2009a				

The Leeds Parade report predicted that exceedances of the 6 OU odour criterion were expected to be observed up to 600 m to the north of the wastewater treatment plant site boundary. The modelling presented here shows increased impacts (approximately 1.2 km). However, the emissions of odour from the modified Ophir Road RRC alone are predicted to be low at the closest Residence 'I' and negligible at other residences.

Vehicle emissions

It is estimated that a maximum of 88 heavy vehicle movements would be generated per day at the Ophir Road RRC. This is a marginal increase in existing average traffic flows (based on recent traffic counts on Ophir Road, north of Dalton Street), which show 1,400 to 1,700 vehicles per day in both directions.

Given this comparatively small increase in local traffic, it is not anticipated that the incremental increase in waste transportation would impact significantly on the local air shed's capability to achieve the air quality goals associated with vehicle emissions (principally NO₂, SO₂ and hydrocarbons).

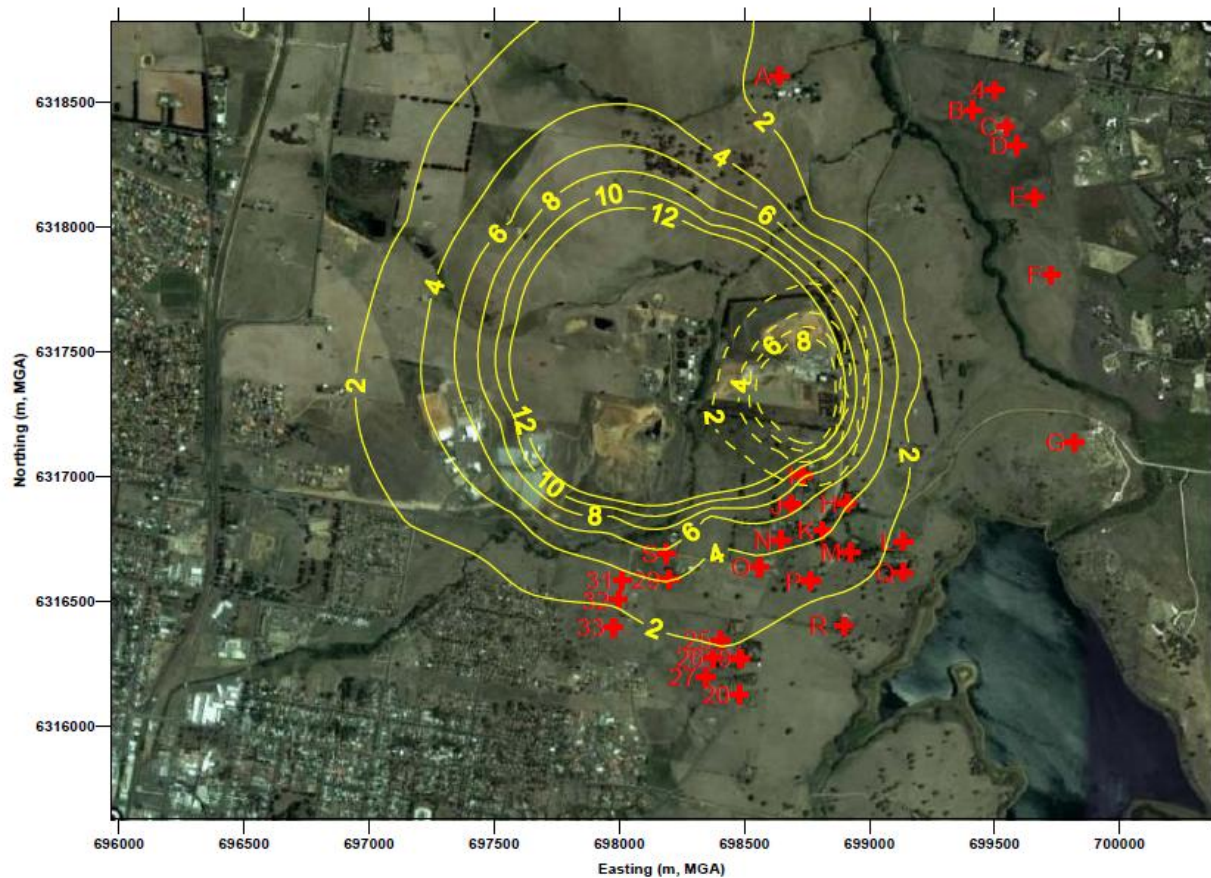


Figure B.5-5 Predicted cumulative odour concentrations at the assessment locations

B.5.6.5 Mitigation measures

A dust and odour control strategy would be implemented at the Ophir Road RRC to minimise potential particulate / odour emissions during adverse weather conditions or days when excessive amounts of dust or odour could be generated. This would ensure that fugitive emissions are acceptable for the proposed resource reprocessing operations at all times.

The above modelling exercise indicates that the project air quality / odour goals should be met under both construction and operational scenarios.

However, general design and operational safeguards would include the following:

- ▶ Watering of exposed surfaces, including stockpiles unless revegetated or have a stable surface;
- ▶ Minimisation of exposed surfaces;
- ▶ Rapid rehabilitation of available areas of disturbance;
- ▶ Establishment and maintenance of visual amenity and perimeter bunds to limit emissions of particulate matter and odour beyond the site boundary;
- ▶ Covering of the active landfill area at the end of each day with approximately 150 mm of daily cover material or a landfill tarpaulin;
- ▶ Attending immediately to odorous waste loads to limit transfer of odour off-site;

- ▶ Recording any complaints with respect to odour, and correlating with weather conditions and deliveries of particularly odorous wastes;
- ▶ Minimisation of the drop heights of waste dumped to landfill and within the MRF and baling buildings; and
- ▶ Limiting of high dust-generating activities during adverse wind conditions, i.e. moderate to high winds from the north and south-west blowing directly towards the nearest residences.

B.5.7 Traffic and Transport

B.5.7.1 Existing conditions

Ophir Road

Ophir Road is a regional road and is the main access road to the Ophir Road RRC. It provides the main connection between Orange CBD and Ophir and a number of rural-residential/lifestyle blocks to the northeast of Orange.

Ophir Road is a divided two-lane rural highway with a sign-posted speed of 80 km/h.

Site accessibility

The site is mainly accessible at Ophir Road. Two road easements traverse the site from east to west providing legal access to the land on which the adjoining wastewater treatment plant is located within.

The existing site entry forms a give way T-intersection with Ophir Road. The road is upgraded to the required standard already.



Photo B.5-1 **Ophir Road Site entrance**

Traffic data

No historical traffic data is available for Ophir Road. However, in a recent study undertaken in April 2008 for the North Orange By-pass from Astill (North) to Chinaman's Bend (Northern Transport Planning and Engineering 2009), automatic vehicle counts were set out for the traffic assessment study which included a survey location on Ophir Road just north of Dalton Street.

Traffic volumes observed at that location showed that Ophir Road currently carries an average daily traffic of 3,281 vehicles (both directions) with average weekday traffic being slightly higher by 5.6% over weekly average at 3,466 vehicles for both directions. During weekdays, peak hour traffic in the morning was observed to occur between 11 am and 12 pm for the northbound direction and between 7 am and 8 am in the southbound direction. For the PM period, peak traffic was observed to occur between 5 pm and 6 pm, for the northbound direction and between 1 pm and 2 pm for the southbound direction.

Table B.5-6 Average daily traffic on Ophir Road, 2008

	Northbound	Southbound	Both Directions
ADT – Weekday	1,727	1,739	3,466
ADT – Weekend	1,420	1,401	2,821
ADT – 7 days	1,639	1,642	3,281
AM Peak	161	297	458
PM Peak	223	152	375

Note: North Orange By-pass from Astill (North) to Chinaman's Bend, April 2008.

Road capacity

For a Level of Service C, the maximum AADT values range from 3,500 to 7,900 depending on the design hour volume to AADT ratio. The peak hour volumes along Ophir Road were observed to be approximately 13% of the average daily traffic on a weekday. From the table above, a maximum AADT of 4,000 is assumed for a Level of Service C.

Comparing these values with the current ADT levels along Ophir Road indicates that the roadway has spare capacity to accommodate additional traffic.

Pedestrian and cycle network

There are no pedestrian or cycle facilities along Ophir Road adjacent to the site although a few cyclists ride along Ophir Road past the site.

B.5.7.2 Assessment of construction impacts

Traffic generation

Traffic generation as a result of construction would generally be limited to movements of construction workers and delivery of material and equipment. All vehicles would access the site via the existing access of Ophir Road.

It is estimated that approximately 20 construction workers would be travelling to and from the Ophir Road Site during the construction period. Using an estimated average of one vehicle per construction worker, this translates to 40 vehicle movements a day (20 in + 20 out).

It is assumed that up to 5 heavy vehicles would need to access the site per day during construction. This would result in the generation of 10 truck movements on a typical weekday.

The impact of the construction traffic on the road network surrounding the site would be temporary and would be limited to the estimated 12 month construction period.

B.5.7.3 Assessment of operational impacts

Traffic generation

Traffic generation for the Ophir Road Site has been estimated on the basis of current operations at the existing facilities and the proposed new facilities at the site. The vehicle movements anticipated for the improved facility would consist of employee/staff travel movements, resident vehicles delivering small quantities of waste and truck vehicle movements delivering various residential, commercial and industrial waste to and from the Site.

Staff/employee traffic

The baling facility would have approximately three staff per day, plus three drivers. Using an estimated average of one vehicle per staff member, this translates to 12 vehicle movements a day for staff/employee movements (6 in + 6 out).

Given the work hours, it is assumed that staff arrivals and departures in the morning hours would occur outside the morning peak hour traffic of Ophir Road. However, staff arrivals and departures in the afternoon and early evening hours may coincide with the peak hour traffic, depending on the shift hours.

Deliveries from residents

As the Ophir Road RRC would also be accepting small waste deliveries from the public, traffic associated with these deliveries from residents has been estimated at around 60 vehicle movements per day (30 vehicles to and from the site).

Truck movements

It is also expected that large and heavy vehicles associated with the operations of the Ophir Road RRC would be departing from and arriving at the site. The number of heavy vehicles expected to be operating at the depot on a weekday are shown in Table B.2-1 (page B.2-15).

From this table, it is estimated that a total of 88 truck movements per day would be generated by the facility (or 44 in + 44 out). This will be in addition to the 72 light vehicle trips per day from employee/staff and residents (60 trips for residents + 12 for staff), which would be similar to current levels. This translates to 44 truck trips and 36 light vehicle trips to and from the site, compared to an estimated 40 truck trips and 36 light vehicle trips currently.

Traffic distribution

In terms of distribution, it is assumed that the vehicle movements to and from the site are likely to be towards and from the Orange CBD. Majority of the vehicles approaching the site would travel from either Dalton Street or March Street. With the proposed North Orange Bypass Road, it is anticipated that this new road will serve as major diversion route to bypass the CBD.

Additional traffic on Ophir Road

In terms of additional traffic on Ophir Road due to the Project, the expected generation of the site would not increase the current traffic volumes significantly. Hence the current level of service of Ophir Road would remain at Level of Service C.

Access arrangements

The existing access intersection on Ophir Road would be utilised.

B.5.7.4 Conclusion

The Project would have no adverse traffic-related environmental implications on traffic amenity, safety or traffic service levels, provided the proposed mitigation measures are undertaken (refer Section B.5.7.5). Furthermore, the Project, including the proposed access provisions would meet the requirements and guidelines of the Roads and Traffic Authority in terms of road safety and network efficiency.

B.5.7.5 Mitigation measures

Prior to construction of the new project components, a construction traffic management plan would be prepared and would form part of the construction environmental management plan to ensure safe movement of vehicles into and around the site. A road safety audit would be undertaken to identify appropriate measure to enable reduction in vehicle speed on the approaches to the access intersection.

B.5.8 Noise

B.5.8.1 Existing environment

Background noise surveys were conducted in May 2009 to characterise and quantify the acoustic environment in the area surrounding the Ophir Road Site. Unattended noise loggers were positioned at two selected representative locations adjoining the Ophir Road Site for a period of 10 days, commencing Monday 4 May 2009:

- ▶ Location 3: 240 Ophir Road (approximately 120 m east of Ophir Road); and
- ▶ Location 13: 223 Ophir Road (Residence 'I').

The noise data was processed in accordance with the requirements of the INP in order to derive the Monday to Sunday background noise levels presented in Table B.5-7.

The Rating Background Levels (RBLs) adopted for assessment purposes are representative of the existing noise environment, with background noise levels ranging from 24 dB(A) to 34 dB(A) in the vicinity of the Ophir Road Site. In accordance with the INP, if the RBL is below 30 dB(A), then 30 dB(A) is the assumed RBL.

Table B.5-7 Background and industrial amenity noise environment May 2009 (dB(A) re 20 µPa)

Location	Rating background level ^{1,2} all noise sources			LAeq(period) ³ all noise sources			Estimated LAeq(period) ³ industrial noise amenity		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
3	34	30	30	47	39	37	<44	<39	<34
13	33	30	30	49	46	44	<44	<39	<34

Note 1: Measured noise levels less than 31 dB(A) may have a signal to noise ratio less than 5 dB(A).

Note 2: In accordance with the NSW INP, if the RBL is below 30 dB(A), then 30 dB(A) shall be the assumed RBL.

Note 3: Daytime 0700 hours to 1800 hours and Evening 1800 hours to 2200 hours.

Source: Heggies 2009b

In order to supplement the unattended logger measurements and to assist in identifying the character and duration of background noise sources, operator-attended daytime surveys were also conducted at one of those two noise logging locations. The operator-attended measurement results are summarised in Table B.5-8.

Table B.5-8 Operator-attended daytime background noise May 2009 (dB(A) re 20 µPa)

Location	LA90(15minute) background level	LAeq(15minute) background level	LAeq(15minute) industrial noise
3	37	41	<20

Source: Heggies 2009b

No significant industrial noise (i.e. non-transport related noise) from other developments in the locality was detected at the monitoring location. The Ophir Road Site was audible for one event (at 29 dB(A)) out of the 15 minutes measurements. The existing Ophir Road Site contribution to background noise environment is therefore negligible and would not have affected the background level measured by the loggers.

B.5.8.2 Noise goals

Project specific noise goals

The Industrial Noise Policy (INP) based intrusive and amenity noise assessment criteria in the vicinity of the Ophir Road Site are presented in Table B.5-9.

At all locations, the amenity criteria noise levels in Table B.5-9 are higher than the intrusiveness criteria noise levels. Compliance with the intrusiveness criteria, therefore, will also demonstrate compliance with the amenity criteria. Accordingly, the following assessment is based on the intrusiveness criteria being the controlling noise criteria. The Project Specific Noise Levels (PSNLs) for the Project are shaded in Table B.5-9.

Table B.5-9 INP Project specific noise assessment criteria (dB(A) re 20 µPa)

Location	Project specific assessment criteria					
	Intrusive LAeq(15minute)			Amenity LAeq(Period) ¹		
	Day	Evening	Night	Day	Evening	Night
13I	38	35	35	50	45	40
11 – in the field	39	35	35	50	45	40

Note 1: Intrusive LAeq at 13I is the more stringent and then considered appropriate to represent the receivers in the vicinity of Ophir Road Site.

Source: Heggies 2009b

Traffic assessment criteria

Ophir Road carries traffic from one region to another. Based on the DECCW's Environmental Criteria for Road Traffic Noise (ECRTN) Policy, Ophir Road is classified as an 'arterial/sub-arterial' road and the applicable noise criteria are presented in Table B.5-10.

Table B.5-10 ECRTN traffic noise assessment criteria (dB(A) re 20 µPa)

Road	Policy	Assessment criteria	
		Daytime LAeq(15hour)	Night-time LAeq(9hour)
Ophir Road	Land use developments with potential to create additional traffic on existing freeways / arterials	60 dB(A)	55 dB(A)

Source: Heggies 2009b

Note, in all cases where the nominated criteria are already exceeded, traffic associated with the development should not lead to an increase in the existing noise traffic levels of more than 2 dB(A).

B.5.8.3 Noise assessment methodology

The INP states that these criteria have been selected to protect at least 90% of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90% of the time. Provided that the criteria in the INP are achieved, it is unlikely that most people would consider the resultant noise levels excessive.

In those cases where the INP project specific assessment criteria are not achieved, it does not automatically follow that all people exposed to the noise would find the noise unacceptable. In subjective terms, exceedances of the INP project specific assessment criteria can generally be described as follows:

- ▶ Negligible noise level increase <1 dB(A) (not noticeable by all people).
- ▶ Marginal noise level increase 1 dB(A) to 2 dB(A) (not noticeable by most people).
- ▶ Moderate noise level increase 3 dB(A) to 5 dB(A) (not noticeable by some people but may be noticeable by others).

- Appreciable noise level increase >5 dB(A) (noticeable by most people).

Based on the foregoing, Table B.5-11 presents the methodology for assessing noise levels which may exceed the INP project specific noise assessment criteria.

Table B.5-11 Ophir Road RRC noise impact assessment methodology

Assessment criteria	Project specific criteria	Noise management zone		Noise affectation zone
		Marginal	Moderate	
Intrusive LAeq(15minute)	Rating Background Level plus 5 dB(A)	1 dB(A) to 2 dB(A) above project specific criteria	3 dB(A) to 5 dB(A) above project specific criteria	>5 dB(A) above project specific criteria
Amenity LAeq(period)	INP based on existing industrial level			

Source: Heggies 2009b

For the purposes of assessing the potential noise impacts, the management and affectation criteria are further defined as follows.

Noise Management Zone

Depending on the degree of exceedance of the project specific criteria (by 1 dB(A) to 5 dB(A)) noise impacts could range from negligible to moderate. It is recommended that management procedures be implemented including:

- Noise monitoring on-site and within the community.
- Prompt response to any community issues of concern.
- Refinement of on-site noise mitigation measures and operating procedures, where practicable.
- Discussions with relevant land owners to assess their concerns.
- Consideration of acoustical mitigation at receivers, where substantiated by monitoring results.
- Consideration of negotiated agreements with land owners.

Noise Affectation Zone

Exposure to noise levels corresponding to this zone may be considered unacceptable by some land owners (particularly at night) and the following is recommended:

- Discussions with relevant land owners to assess concerns and define responses.
- Implementation of acoustical mitigation at receivers.
- Negotiated agreements with land owners where required.

B.5.8.4 Impact assessment

Construction

Construction activities would occur during the daytime period only. It is understood that normal activities would continue at the Ophir Road Site while construction of the new MRF building is being undertaken.

The construction scenario modelled comprises the plant items denoted in Table B.5-12. The resulting noise contours for the construction scenario are presented in Figure B.5-6.

Table B.5-12 Construction plant items

Activity - location	Equipment	Number of equipment
Current operation - Old MRF building	Hopper	1
	Conveyors	1
	Trommel	1
	FEL	1
Transport	Cars	2 movements/15 minutes
	Trucks	2 movements/15 minutes
Landfilling - south	Compactor	1
	Dozer	1
Construction	Trucks	2 movements/15 minutes
	Water cart	1
	Excavator	1
	Dozer	1

The predicted LA_{10(15minute)} noise emissions at the nominated residences from noise modelling indicates that noise emissions from construction activities under calm daytime conditions would be below the Ophir Road Site specific criteria at the nominated residences.

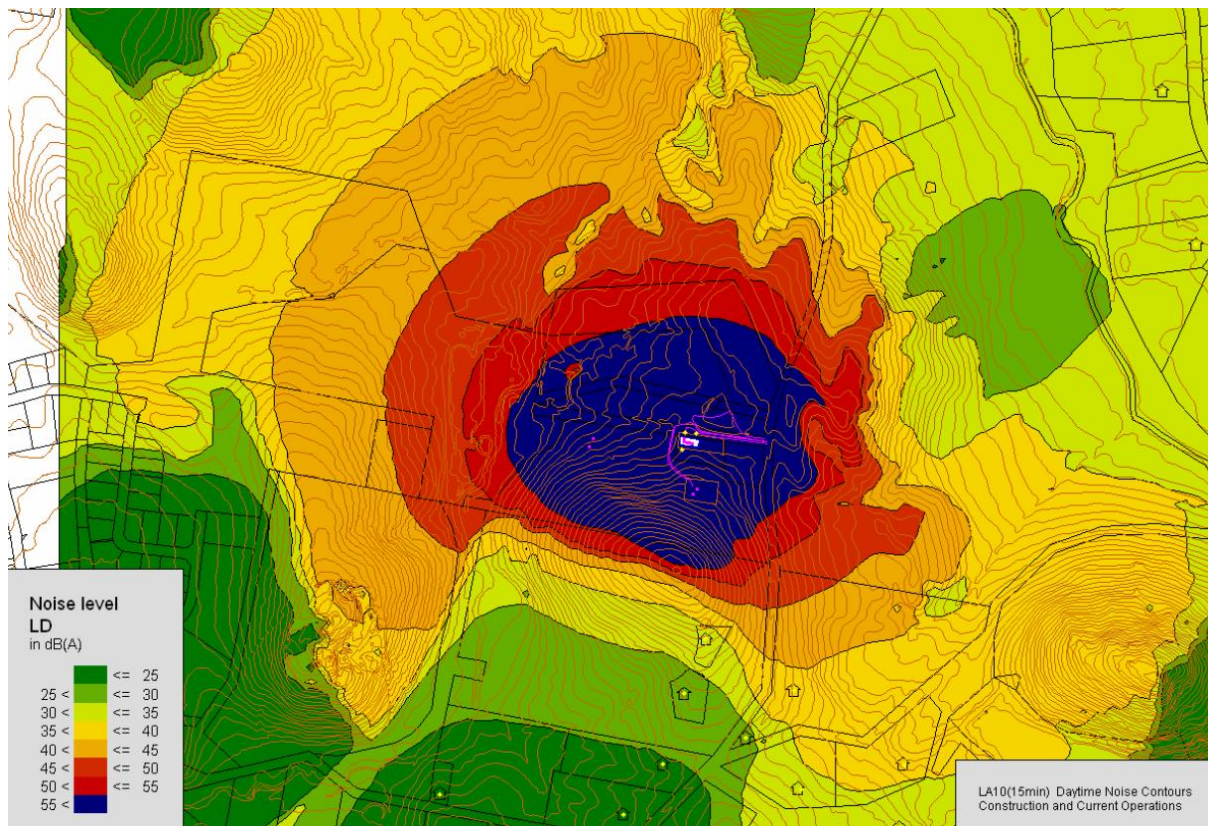


Figure B.5-6 Noise contours for construction

Operation

Daytime operations

The daytime operational scenario comprises the plant and equipment items denoted in Table B.5-13. The resulting noise contours for the daytime operational scenario are presented in Figure B.5-7.

Table B.5-13 Daytime operational scenario plant items

Activity - Location	Equipment	Number of equipment
Future operation - Old MRF building	Hopper	1
	Conveyors	1
	Trommel	1
	Baling machine	1
	FEL	1
Old operation - New MRF building	Hopper	1
	Conveyors	1
	Trommel	1
	FEL	1

Activity - Location	Equipment	Number of equipment
Transport	Cars	2
	Trucks	3 movements
Landfilling - north	Compactor	1
	Dozer	1

The predicted daytime LAeq(15minute) noise emissions from the operations on the site from noise modelling indicate that noise emissions from the daytime operational scenario under calm daytime conditions would be below the Ophir Road Site specific criteria at the nominated residences.

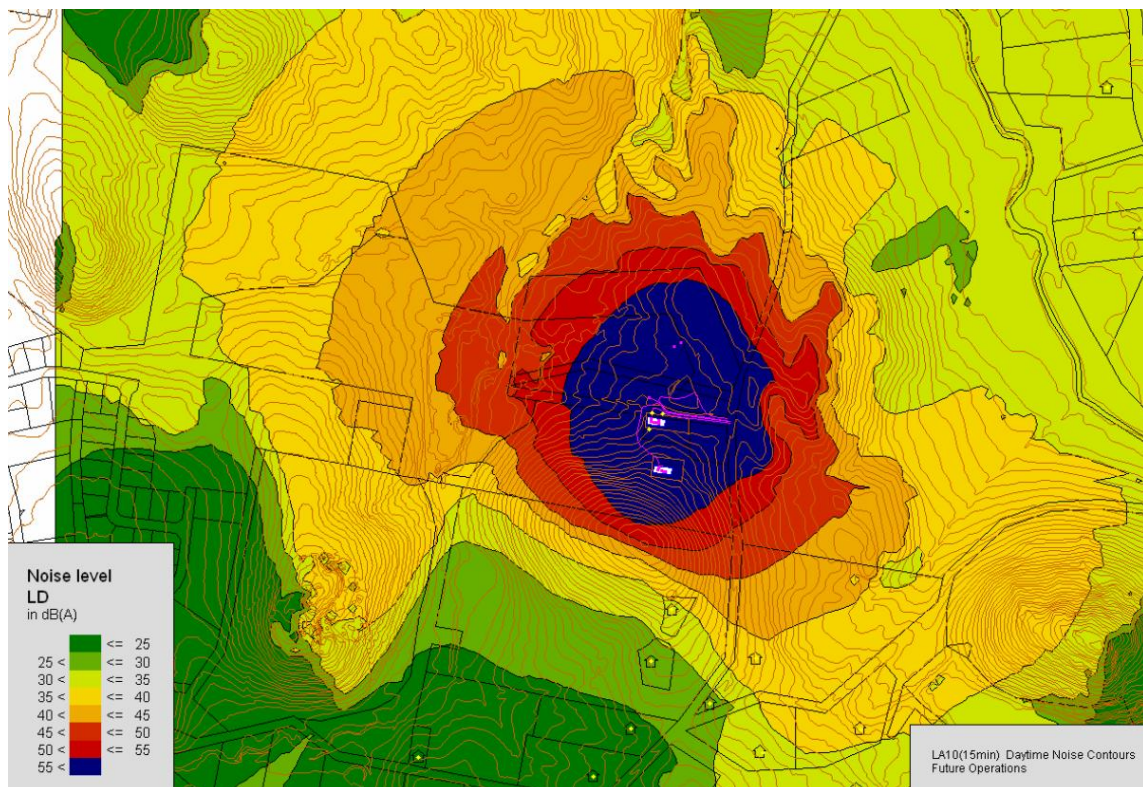


Figure B.5-7 Operational day-time noise contours

Night-time operations

Operation at night would only occur in a case of day-time equipment breakdown and overnight baling. The Night-time operational scenario comprises the plant and equipment items denoted in Table B.5-14. The resulting noise contours for the night-time operational scenario are presented in Figure B.5-8.

Table B.5-14 Night-time operational scenario plant items

Activity - location	Equipment	Number of equipment
Future operation - Old MRF building (door closed)	Hopper	1
	Conveyors	1
	Trommel	1
	Baling machine	1
	FEL	1

The predicted daytime $LA_{eq}(15\text{minute})$ noise emissions from the night-time operations on the site from noise modelling indicate that noise emissions from the night-time operational scenario under adverse conditions would be below the Ophir Road Site specific criteria at the nominated residences.

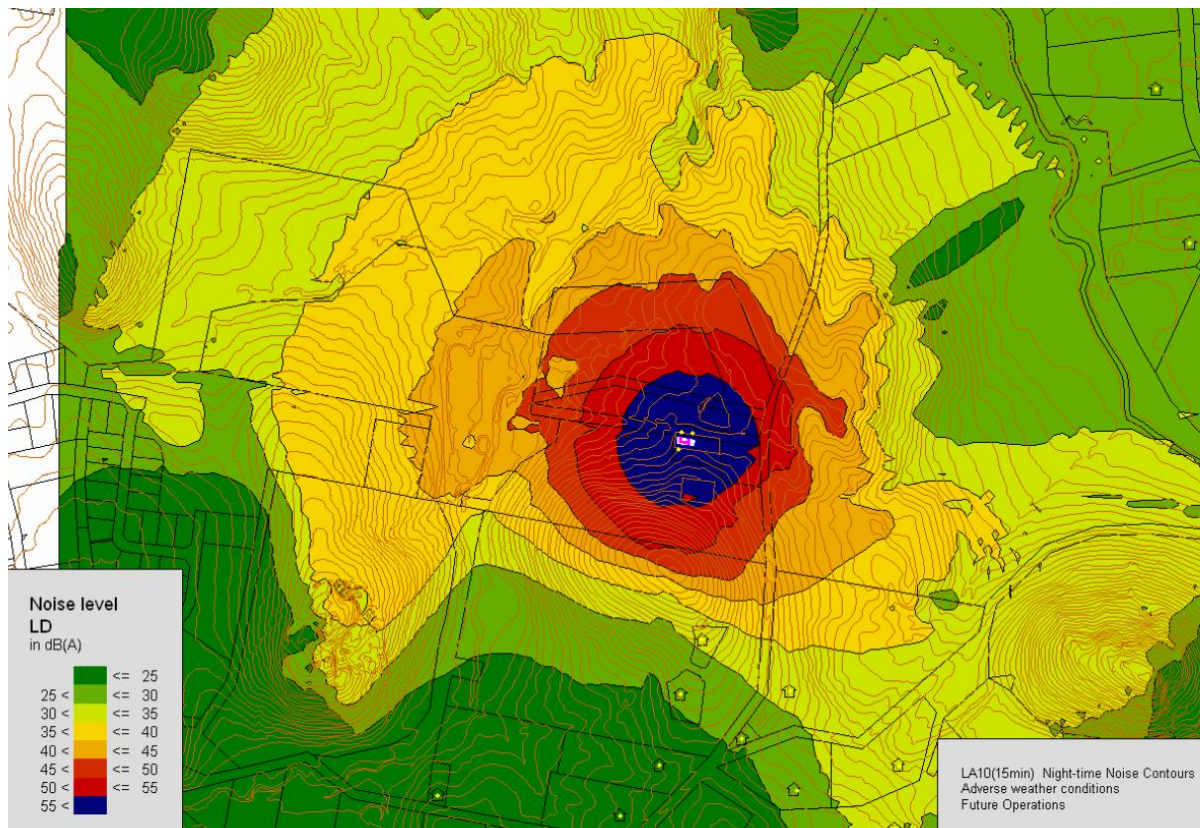


Figure B.5-8 Operational night-time noise contours

Cumulative noise emissions

As stated earlier, the INP provides non-mandatory cumulative noise assessment guidelines that address existing and successive industrial development by setting acceptable (and maximum) cumulative $LA_{eq}(\text{period})$ amenity levels for all industrial (i.e. non-transport related) noise in an area.

However, as there is no significant industrial noise from other developments in the locality, the cumulative noise emissions from the Ophir Road Site and other developments would be below the

relevant acceptable amenity criteria for industrial noise (i.e. non-traffic related) during the daytime, evening and night-time periods.

Traffic noise assessment

A review of the current operations and the estimated future operations indicates that the number of vehicles travelling to and from the Ophir Road Site in the future will remain comparable with existing levels. The traffic noise levels would therefore remain generally the same for all the receivers in the vicinity of the Ophir Road Site and therefore would be acceptable.

B.5.9 Visual Impact

B.5.9.1 Existing environment

The Ophir Road Site is quite discrete in terms of its visibility. The hill on its southern boundary provides complete screening of views from the south of the site. The eastern boundary of the site, along Ophir Road, is also a high point which is well vegetated and thus screens views to the site from the east. The undulating nature of the terrain to the north and west provides limited views of the site including from the Charles Sturt University Campus, a few dwellings on the eastern side of Leeds Parade, and along Ophir Road in the vicinity of Kennett Place. These views however are from a distance of more than one km from the Ophir Road Site.

B.5.9.2 Impact assessment

The proposed MRF building would initially be visible from the abovementioned locations. However from these distances it would appear as a small building adjacent to those already existing. Further, once landfilling has been finalised, the central ridge of the site would obscure the MRF building from any external views. The other proposed improvements on site would not be visible external to the site.

In this regard, the proposed improvements and operation of the Ophir Road RRC would not have an adverse visual impact for the locality.



Photo B.5-2 Proposed new MRF at Ophir Road RRC