Executive Summary

This report provides preliminary information to the NSW Department of Planning and Environment (DPE) to help inform a Request for Director General's Requirements, in relation to the future development of the Muswellbrook Waste Management Facility. This report has been prepared in accordance with provisions of Part 4 of the *Environmental Planning and Assessment Act, 1979*, which establishes an assessment and approval regime for developments to be assessed as State Significant Development under the provisions of the *State Environmental Planning Policy (State and Regional Development, 2011)*.

The existing operation comprises recycling, landfill and associated operations, including the production of pasteurised mulch. At current utilisation levels the existing Facility is expected to expire around 2025. There is limited opportunity to source and implement an alternative Facility. Failure to do so would impact not only on Council's constituency needs, but also those of sub regional customers, who are reliant on Council's services.

Muswellbrook Shire Council is a proactive advocate for effective waste minimisation and recycling. The existing Facility caters for separate domestic collection from within the Shire, Upper Hunter Council's domestic and commercial kerbside collection, and regional commercial and resource sector wastes. It provides an essential sub regional service, complying with various regulatory instruments including *Environmental Protection Licence (5980).*

The existing Facility is located within a former coal mine void, approximately 5 kilometres from Muswellbrook CBD. It has convenient transport access, and being topographically and physically located in a fairly compacted site, has proven to be excellent from both operational and environmental perspectives, since operation commenced in 1993.

It is fortunate that in close proximity to the Existing Facility, Muswellbrook Coal Company (MCC) has another former coal mine void (*known as Open Cut No 1 Void 3)*. As owner of the subject properties, MCC has authorised Council to lodge an application seeking approval for the new landfill development (*Appendix 2)*, consistent with a Memorandum of Understanding between Muswellbrook Coal Company and Muswellbrook Shire Council.

This void can provide an additional 2.8 million m^3 of landfill disposal space, providing up to 90 years operational capacity at current utilisation levels of about 30,000 tonnes per annum. This site is north of the Existing Facility, providing relatively easy connection, enabling utilisation of upgraded facilities at the existing operational site (*Figure 1).*

The collective development is 51.85 hectares and can be managed under the one planning framework and management plan. After having received notification of a successful

application to DPE to amend local zoning provisions, Council adopted *Muswellbrook Local Environment Plan Amendment No 11* on 4 July, 2014 (*Figure 7)*. The proposed highway by-pass route (*Figure 3)* is also shown, which can provide easier transport access for wastes from Upper and Lower Hunter Councils and regional commercial and resource sector services.

A preliminary environmental risk analysis is presented. Explanations about current environmental management and environmental reporting provisions are given for key issues, which are ranked as follows:

- High significance – Groundwater; Leachate; Surface Water
- Medium to High Significance – Dust (Air Quality)
- Medium Significance – Contaminated Land; Visual Amenity
- Low Significance – Heritage; Acoustics; Fire; Flora and Fauna; Odour; Traffic and Transport; Soils.

Reflecting the experience at the existing Facility, which is being upgraded continuously, and appreciating that the extended Facility will occupy a site featuring similar favourable characteristics, it is considered that potential environmental impacts can be managed.

Discussion with the Department of Environment, Climate Change and Water indicate that *Environment Protection Licence (5980)* will be modified under the one Licence.

Council intend to undertake an extensive stakeholder and community consultation process, utilising DPE *Guidelines for Major Project Community Consultation,* as well as observing Council's own *Community Engagement Survey.*

Contents

1 Introduction

1.1 Project Context and Purpose

Existing landfill at Muswellbrook Waste Management Facility is projected to expire around 2025. Muswellbrook Shire Council proposes to develop a new Muswellbrook Waste Management Facility comprising an upgrade to the existing waste management facility integrated with a new landfill development encompassed by the Facility.

This new Facility forms a part of Council's strategic waste management plan. Council is committed to resource recovery and waste minimisation as a major focus of our waste management plan. There is future need to provide additional landfill space, to be used initially by the residents of Upper Hunter Shire Council and Muswellbrook Shire Council, as well as serving as a viable Sub regional or Regional Waste Facility for the Hunter Region's LGA's. To address the regional waste management issue, Council proposes to develop a new landfill site in an existing but no longer used open cut coal void, with a capacity of 2.8 million m^3.

With Council as the proponent, the proposed Project would be designed to extend the Muswellbrook Waste Management Facility's capacity at a regional level by up to 90 years, dependent upon disposal needs. The waste stream accepted at the new landfill would be consistent with the existing solid domestic waste currently accepted at the existing landfill site. Annual tonnages from Hunter Valley LGA's are shown in Appendix 1.

This Request for Director General's Requirements has been prepared in accordance with the provisions of the *Environmental Planning and Assessment Act, 1979*. This report is designed to provide preliminary information to the NSW Department of Planning and Environment (DPE) about the proposal to help inform the Director General's Requirements (DGR's).

1.2 The Proponent

The proponent for the Project is Muswellbrook Shire Council (Council), which owns and operates the Existing Waste Management Facility. The parcels of land on which the proposed new landfill void is located are currently owned by Muswellbrook Coal Company. Muswellbrook Coal Company has provided a Letter of Support as part of this application. This Letter is available in Appendix 2.

1.3 Project Objectives and Key Features

The objectives of the Project are to:

- Meet future waste disposal needs of Muswellbrook LGA and Upper Hunter LGA areas.
- Secure future medium to long term capacity for a potential regional landfill site servicing other local government areas within the Hunter Region.

- Secure future capacity for waste disposal, to complement future alternate resource recovery management options in the Hunter Region.
- Improve the level of infrastructure and resource recovery services provided by Muswellbrook Shire Council
- Maintain an effective existing waste management facility and develop an extended facility in line with the outcomes and goals outlined in Council's Strategic Waste Management Plan.

1.4 Structure of the Request for Director General's Requirements

Executive Summary

1.0 Introduction
2.0 Project Description
3.0 Proposed Landfill Site Details
4.0 Planning Framework
5.0 Preliminary Environmental Risk Analysis
6.0 Community and Stakeholder Consultation
7.0 Conclusion
8.0 Appendices

2 Project Description

2.1 Strategic Context

With existing landfill space, at current rates of disposal, expected to expire in 2025, Muswellbrook Shire Council is undertaking strategic planning to future proof waste management services within the Shire and the Hunter Region. Upon closure of the existing landfill, Council will utilise a void that is currently part of Muswellbrook Coal Company's operations. This void (Open Cut No 1 Void 3) is no longer used as a coal extraction pit by Muswellbrook Coal Company. It will provide an additional 2.8 million m^3 of landfill disposal space.

Council also plans to upgrade existing infrastructure and services provided at the Muswellbrook Waste and Recycling Facility. This upgrade is designed to ensure that all infrastructure will meet Council's future waste management requirements. Council has an existing waste management agreement with Upper Hunter Shire Council, whereby Council manages the waste and recyclables from its domestic kerbside collection. The availability of increased landfill space will place Muswellbrook Shire Council in a strong position to supply a strategically located sub-regional or regional solution to the waste management requirements of the Hunter Region.

This Project will form part of a coordinated delivery of resource recovery and waste management considered within the *Draft Hunter Regional Waste Strategy (2014)*. Council is also strongly committed to increasing resource recovery and developing alternative waste treatment technology in collaboration with other Councils in the Hunter Region.

2.2 Muswellbrook Waste and Recycling Facility

The Project includes the design and construction of a new landfill void within Muswellbrook Waste and Recycling Facility and the upgrade of existing infrastructure and improvement of services provided by Council at the Facility.

Figure 1 shows the proposed Project area and the relationship between existing and proposed facilities.

The new landfill void has the capacity to provide an additional 90 years of landfill space servicing the waste disposal needs of Muswellbrook and Upper Hunter Shire LGAs. Increased waste acceptance from other Hunter Region LGAs, such as Singleton and Maitland, would shorten the lifespan of the void.

The new landfill void will be managed under Council's existing *Environmental Protection Licence (5980*) provisions. Preliminary discussions with the Department of Environment,

Climate Change and Water indicate that *Environment Protection Licence (5980)* (Appendix 3) can be modified and extended to cover the new landfill void proposed integrated facility under the one Licence.

Upon provision of the Director General's Requirements by the DPE, Council will undertake an extensive landfill design phase to be used as a guiding document in the preparation of an Environment Impact Assessment.

The integrated landfill design will include the following precautions;

- A leachate barrier system
- Leachate management
- Groundwater monitoring
- Site capping and revegetation
- Gas emission management and monitoring
- Fire management
- Surface water management

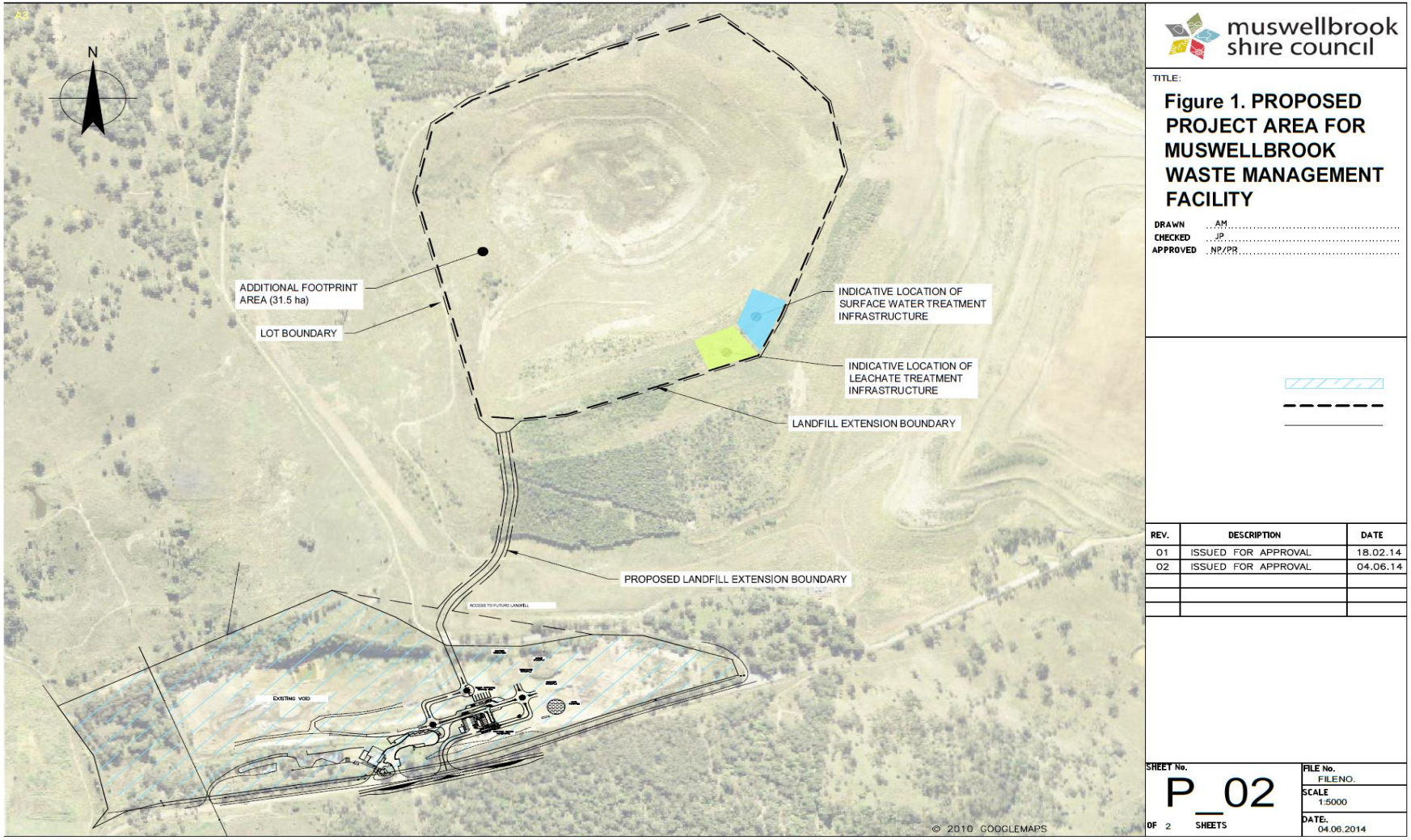


Figure 1: Proposed project area (dotted line) with access to the existing facility

The Project will feature a design and construction phase that will include an upgrade of the existing weighbridge from one weighbridge to dual weighbridges to allow for improved data collection and compliance, and improved access to the site for larger vehicles. New staff amenities will be built to provide better facilities for the staff including improved car parking. Councils aim in this upgrade is to increase the opportunities for resource recovery on site. Improved facilities are being provided for the recovery of e-waste, organics, recyclables and items suitable for resale. A problem waste drop off centre is being developed and will be incorporated in the design, allowing for greater control over the types of waste that are disposed of in the landfill. Hoarder's Haven will receive an upgrade and will become a larger focal point of the Waste and Recycling Facility to ensure that it does not remain an underutilised resource.

Figure 2 provides a design concept for the upgrade to the Existing Waste Management Facility.

The Muswellbrook Waste and Recycling Facility currently provide the following services;

- Small vehicle waste transfer station for mixed waste and recyclables
- Material storage areas
- Bulk material storage areas and processing areas
- Landfill
- Hoarder's Haven
- Weighbridge and office facilities
- Staff facilities
- Community Recycling Centre for collection of Problem Wastes (2014/2015)

The new landfill void site covers an area of 32.42 hectares and will join with the existing Waste Management Facility via an access road. Muswellbrook Waste and Recycling Facility currently covers an area of 19.43 hectares. The entire site will be 51.85 hectares in size and managed under the one planning framework and management plan.

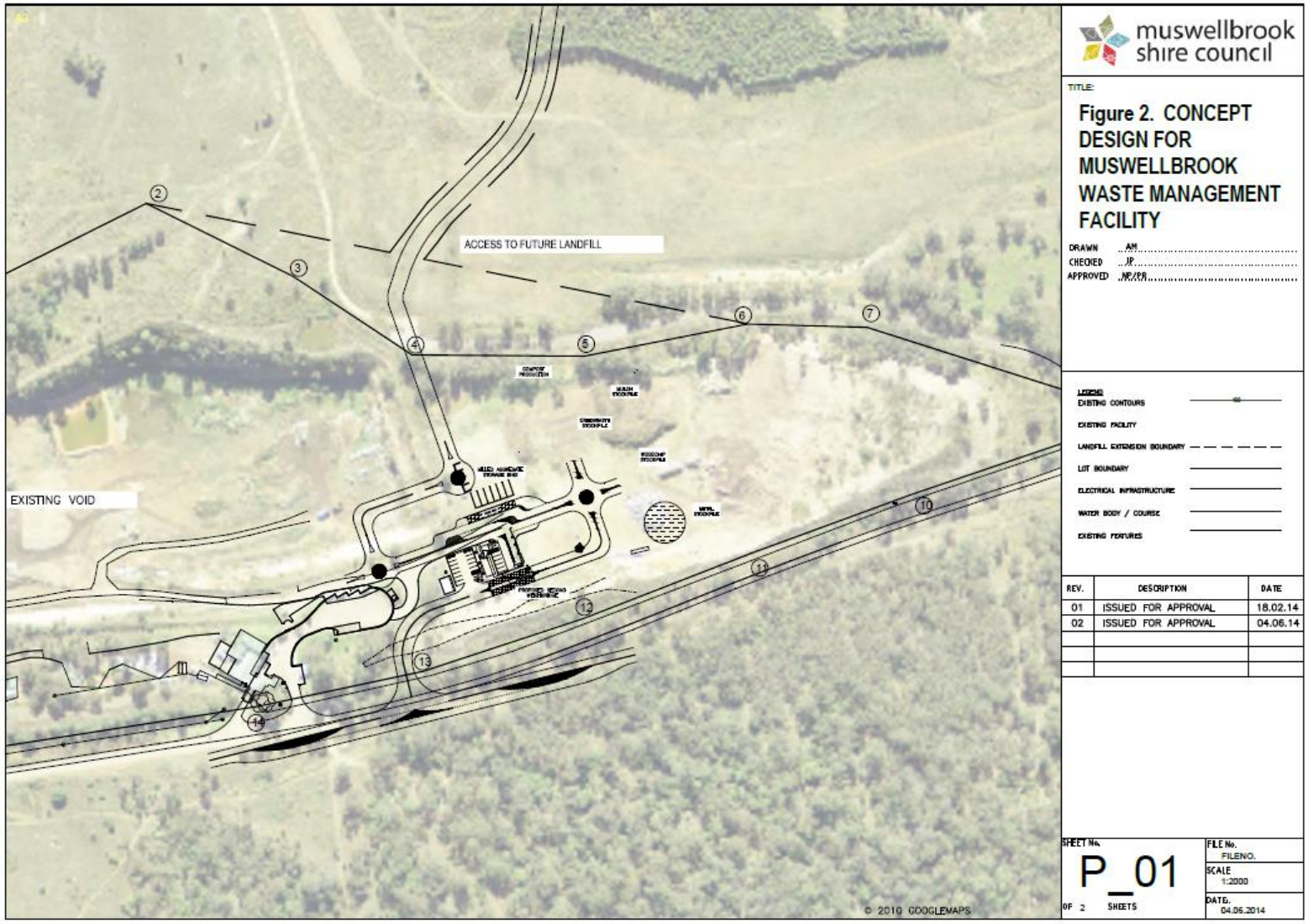


Figure 2: Concept design for proposed upgrade of entryway and infrastructure, Muswellbrook Waste and Recycling Facility.

2.2.1 Key Features

The Key Features of the Project are:

- Provision of approximately 2.8 million m^3 of additional disposal capacity.
- Extending the landfill capacity of the Muswellbrook Waste Management Facility for up to 90 years at current disposal rates, of 30,000 tonnes per annum.
- Providing a disposal option for residual wastes not realised by resource recovery.
- Minimising waste management footprint by extending the size of the existing facility, rather than establishing a greenfield location.
- Providing a viable option for a Sub-regional or regional waste disposal site as part of the Hunter Regional Waste Strategy.

2.3 Project Need

This project is identified in Councils *Delivery Program and Operational Plan 2013 – 2014 (Appendix 4)* the need for the project includes:

- Existing landfill airspace at Muswellbrook Waste and Recycling Facility is projected to expire in 2025. No further sites within Muswellbrook LGA are available to establish an alternative site for a waste management facility.
- Council is committed to resource recovery targets and implementing future alternative waste treatment plans, however there is a strategic need to provide landfill space.
- Securing of Council's future waste disposal options whilst a viable landfill site is available.
- Securing adequate landscape to allow for the future medium and long term development of Alternative Waste Treatment options.

2.4 Alternatives Considered

A number of alternatives have been considered throughout the strategic planning of this Project, including;

- Development of alternative waste treatment (AWT) systems to minimise the amount of residual waste that is required to be landfilled.
- Change of behaviour programs that focus on education and communication with all waste users within the area, with the aim to increase resource recovery, source separation and waste avoidance.
- Alternative landfilling sites within Muswellbrook LGA.
- Closure of all landfill sites and diversion of waste to other landfill sites outside of the Muswellbrook LGA,

However, Council has assessed that the proposed Project is the most viable option.

2.4.1 Development of Alternative Waste Treatment System to minimise waste to landfill.

The reduction of waste to landfill is Council's preferred option for waste management. Council is continuously reviewing waste management options that will extend the life of the landfill. Current efforts include the successful three-bin kerbside collection system and education thereof, processing of commingled recyclables through an onsite Materials Recovery Facility, processing of collected garden organics, separation of e-waste, timber, concrete, waste oil, tyres, batteries, scrap metal and provision of a recovered goods shop. Further, efforts to determine appropriate, viable AWT partnerships continue. This will allow for Council to provide a long term waste management facility to other LGA's with possible access to alternative waste management options.

2.4.2 Change of Behaviour

Council is active in providing education and communication to the users of its waste service. Council has developed the successful "*Let's Get Sorted*" campaign which has been used in local media for both residential and commercial services. As part of the NSW EPA's *Waste Less Recycle More* program, Council intends to increase the use and visibility of the "*Let's Get Sorted*" campaign to improve the waste management practices of users of the services provided, both residential and commercial. Examples of the "*Let's Get Sorted*" behavioural change project are available in Appendix 5.

2.4.3 Closure of all Landfill Services within the LGA

The current landfill at the Muswellbrook Waste Management Facility is due for closure around 2025. If upon closure of the existing landfill there is no other landfilling option available, both Muswellbrook and Upper Hunter Shire Council will have to utilise a suitable disposal option outside the local area. This will worsen the increasing issue of long term landfill unavailability within the Hunter Region.

2.4.4 Alternative Landfilling Sites within Muswellbrook LGA

There are a number of open cut coal mines within the Muswellbrook LGA that have voids suitable for landfilling. However, the majority of them are still operational. Additionally, they are not within close proximity to the existing waste management infrastructure at the Muswellbrook Waste and Recycling Facility.

The proposed Project site is an ideal location for the integrated Muswellbrook Waste and Recycling Facility. The parcels of land of both sites share a boundary, providing ease of access around the site and the use of infrastructure. The Facility is located within an area

that has established transport routes, which create minimal disturbance to the residents of Muswellbrook.

The site can be accessed as a regional facility from the New England Highway, both north and south, via heavy vehicle roads that bypass the majority of Muswellbrook's residential areas. Roads and Maritime Services (RMS) is developing a concept for a heavy vehicle bypass of Muswellbrook. The preferred concept proposed a bypass route passes between the current Muswellbrook Waste and Recycling Facility and the proposed new void. (Figure 3). Convenient access and egress to the site can be provided and will have an appropriate buffer screening of waste management operations which can be implemented. RMS has held regular discussion with Muswellbrook Coal and Council, and is conducting geotechnical and other investigations, which support the route.

The New Landfill Development Site has been subjected to a high level of disturbance during its use as an open cut coal mine. Utilising this site will minimise the footprint of waste management in the LGA, by reducing the need for further greenfield site disturbance. Some rehabilitation work and tree planting has occurred within the site. This work provides an established buffer for the site for litter, dust, noise and provides a high level of visual amenity.

The Project site has a number of advantages for use as a waste management facility. Part of the site has been utilised as a well-managed and highly functioning waste management facility since 1993, whilst the new landfill void is a highly disturbed site located adjacent to the existing waste management facility, providing an ideal site for the new landfill void.

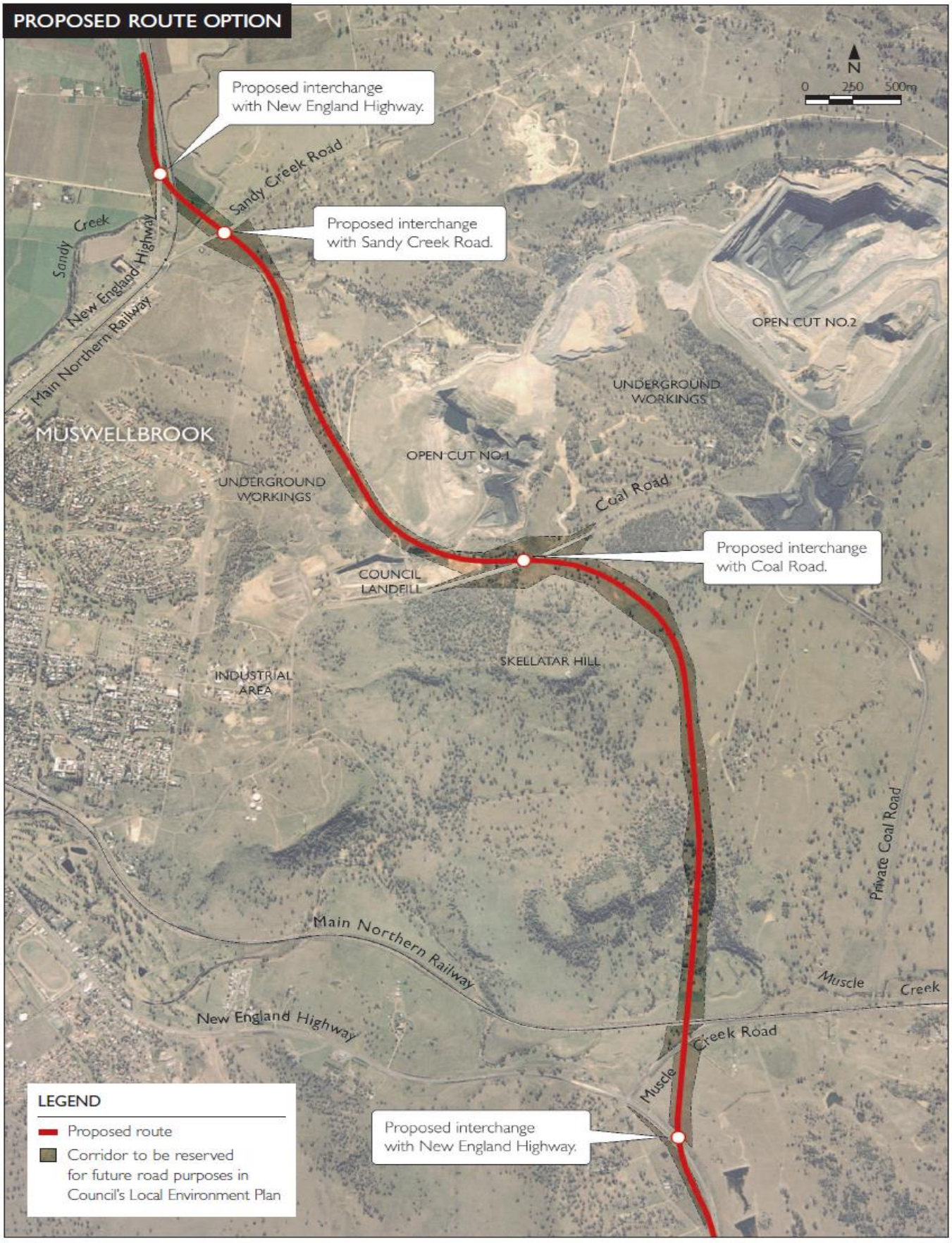


Figure 3: Roads and Maritime Services, Muswellbrook bypass concept design.

3 Site Description

3.1 Site Location and Surrounding Area

Muswellbrook Shire Council is bounded by Singleton Shire Council to the east, Wollemi National Park to the South West, Upper Hunter Shire Council to the north and Coricudgy State Forest to the south. Muswellbrook CBD is located approximately 130 kilometres north west of Newcastle.

Figure 4 locates Muswellbrook LGA within a regional context

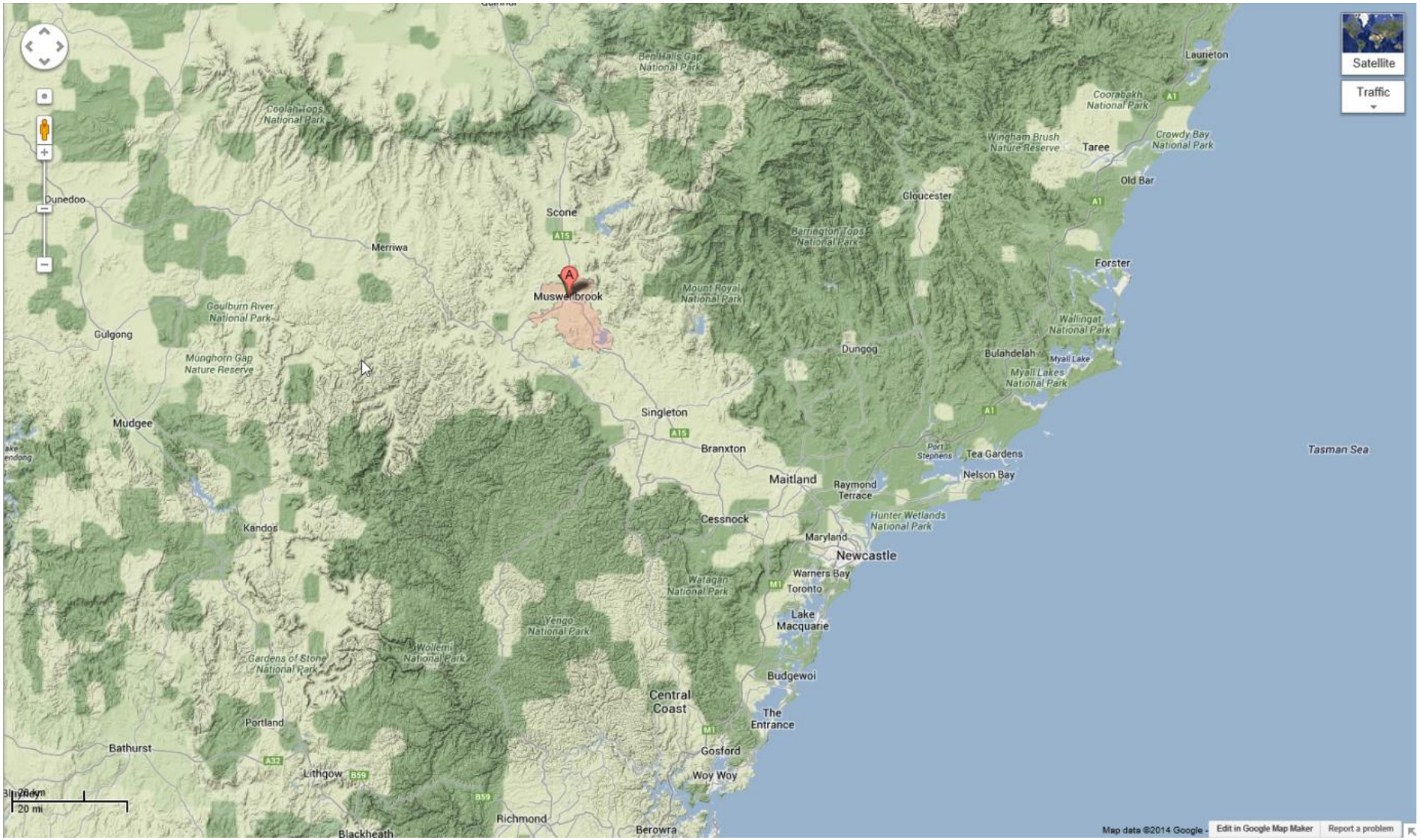


Figure 4: Location of Muswellbrook within the greater Hunter Region

Figure 5 locates the site of the proposed Project and the existing Muswellbrook WMF.

The Existing Muswellbrook WMF is located on Coal Rd Muswellbrook approximately 5 kilometres from the Muswellbrook CBD. The proposed site for the development of the new landfill void is shares a boundary with the existing Muswellbrook WMF as is shown in Figure 5. The parcels of land for the proposed Project are currently owned by Muswellbrook Coal Company. The proposed site is located with Open Cut No 1 Void 3.

The surrounding area of the proposed development site is Muswellbrook Coal Company and their existing operations to the north, the Existing Muswellbrook WMF to the south and scattered rural farmlands and light industrial activity to the east and west.

Figure 5: Location of proposed site and existing Muswellbrook Waste and Recycling Facility in relation to Muswellbrook CBD.

3.2 Land Tenure

3.2.1 New Landfill Development

The proposed development consists of the following parcels of land

- Lot 1 DP 1149806
- Lot 101 and Lot 102 (Part) DP578075.

These parcels of land are currently owned by Muswellbrook Coal Company. Muswellbrook Shire Council and Muswellbrook Coal Company have entered into a Memorandum of Understanding. Muswellbrook Coal Company has Development Consent DA 205/2002 for the extension of No 1 Open Cut Coal Mine. In seeking modification to the Development Consent, Muswellbrook Shire Council as the approval authority set an amendment on 15 July, 2009 to condition 11.3 Contribution to Council as follows:

"*The Applicant shall enter into a legally binding agreement with Council to provide an agreed area of land to incorporate Void No 3, and a suitable access road to the void from the existing waste disposal area*."

Muswellbrook Coal Company has agreed to Muswellbrook Shire Council commencing the planning process for a new landfill void within Open Cut No 1 Void 3.

Muswellbrook Shire Council applied to NSW Department of Planning and Environment for an amendment to Land Zoning Map Sheet LZN_008A, by rezoning part Lot 102 DP 578075 from E3 Environmental Management and part Lot 1 DP 1149806 from RU1 Primary Production zone to SP2 Infrastructure (Waste Management) as shown in Figure 6.

Council received notification of the successful application. Muswellbrook Local Environment Plan Amendment No 11 was made on 4 July 2014. Figure 7 shows the changes to the zoning of the proposed Project. (Appendix 6)

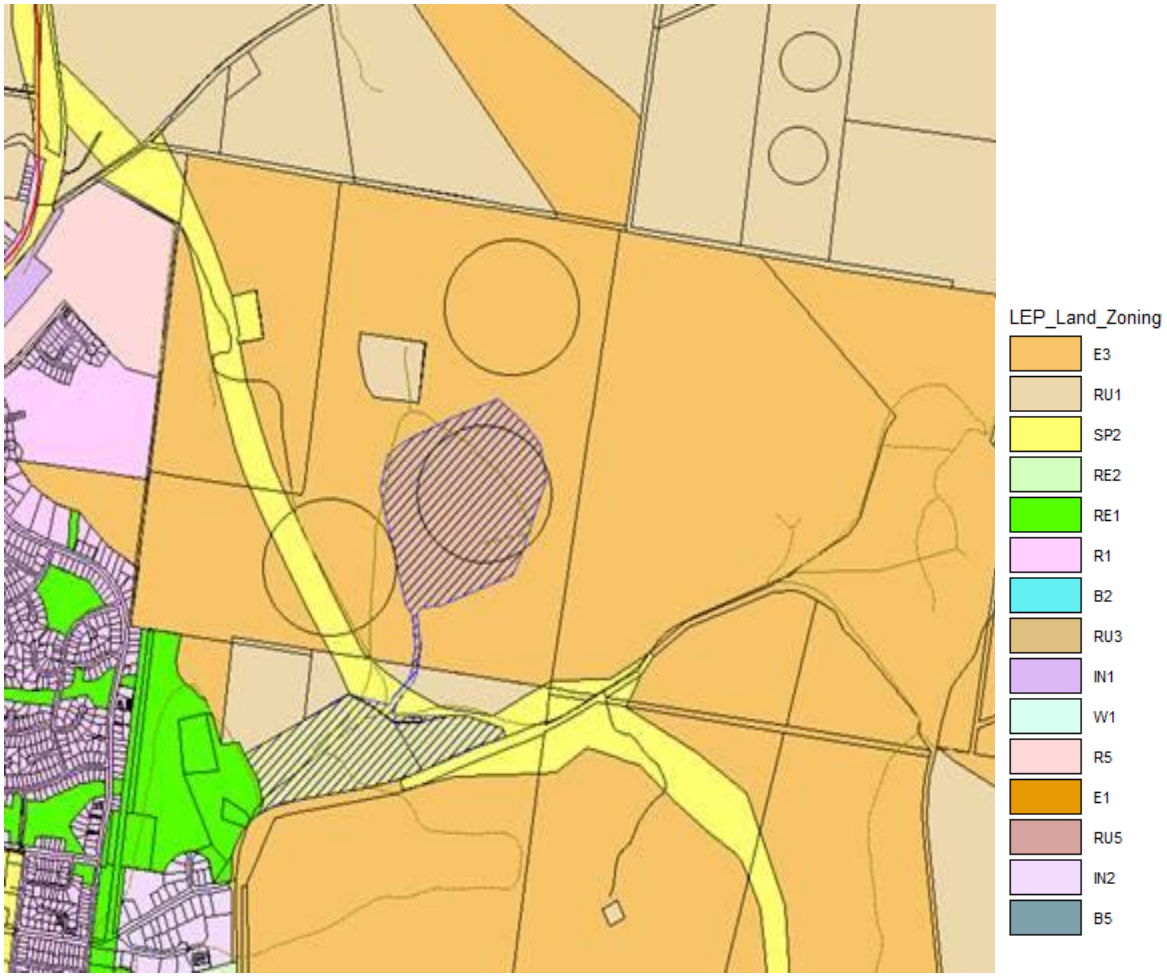


Figure 6: Current Land Zoning Map Sheet LZN-008A – Muswellbrook

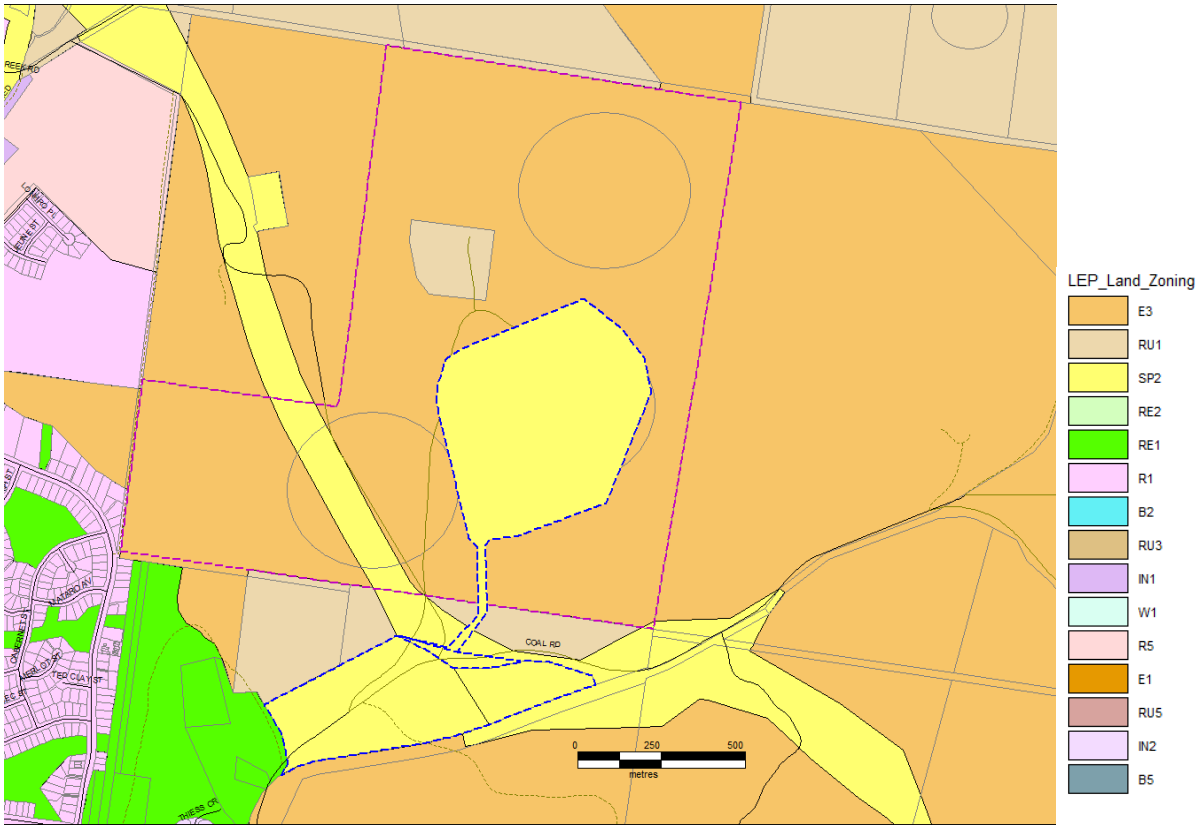


Figure 7: Muswellbrook Local Environment Plan Amendment No 11 made 04 July 2014.

3.2.2 Existing Waste and Recycling Facility

The existing Waste and Recycling Facility is located on lot 1 of DP 819014. The site is owned by Muswellbrook Shire Council.

The site is zoned SP2 Infrastructure (Waste Depot) under the Muswellbrook Local Environmental Plan (2009). The use of Lot 1 as a waste facility is permitted with consent.

3.3 Surrounding Land Use

Lot 1 DP 819014, Lot 1 DP 1149806 and Lot 101 and Lot 102 (Part) DP578075 are surrounded by a variety of land use zoned under the Muswellbrook LEP (2009).

- E3 Environmental Management, to the south and east
- RU1 Primary Production, to the north
- RE1 Public Recreation, to the east.

The closest residentially zoned land is located, 600m to the west and is part of the township of Muswellbrook. The nearest development land, other than for recreation purposes, is the

light industrial zoned land, 300m to the south west of Lot 1 DP 819014. This development contains a number of low density workshops and warehouses.

3.4 Site History

3.4.1 New Landfill Development

The proposed development site for the new landfill void has a long history of coal production and is one of the oldest mines in NSW still in operation. Underground mining first began here in 1907, with the open cut mine commencing in 1944.

3.4.2 Existing Waste and Recycling Facility

This site was previously part of Muswellbrook Common. In 1990, a development application and supporting environmental impact statement was submitted for the extraction of 200,000 tonnes of coal and the establishment of a waste disposal depot. In September 1990 Development Approval (DA92/90) was granted and extraction of the coal reserve commenced. In 1993, following the extraction of the coal reserve, Lot 1 was transformed into a waste disposal depot, which commenced operations in 1993.

3.5 Existing Development and Site Conditions

3.5.1 New Landfill Development

Muswellbrook Coal Company owned by Idemitsu Australia Resources Pty Ltd currently operates an Open Cut Coal Mining Operation on the proposed site and surrounding areas. The coal type is thermal and it is mined from multiple seams by a combination of face shovel, hydraulic excavators and front end loaders with a fleet of trucks. In 2012 4.8 million tonnes of coal was excavated.

The proposed Project site has been mapped as part of Council's Local Environmental Plan (2009) and been the subject of a number of Environmental Assessments, with the latest completed in 2002 for the extension of Open Cut No 1.

3.5.2 Existing Waste and Recycling Facility

The Muswellbrook Waste and Recycling Facility is located at Coal Road, Muswellbrook. It comprises of a large landfill void, a Material Recovery Facility which is owned by Council and operated by contractors, an office, Hoarder's Haven, a weighbridge upon entry and a recycling drop off area for residents.

Figure 8 is an extract from Council's GIS mapping showing in known hydrological lines over the site and surrounding parcels of land. The established creek and water course lines shown on the map do not run into the proposed Project area.

The proposed Project site is located with a Mine Subsidence Area, as is shown in Figure 9. Hatched areas indicate increased risk of mine subsidence.

Figure 10 maps the areas of bushfire risk on the project site and surrounding parcels of land.

The Muswellbrook Brickworks, a heritage item under Muswellbrook Local Environment Plan (2009), is located on a surrounding parcel of land which is owned by Muswellbrook Coal Company and will not be transferred to Muswellbrook Shire Council as part of this Project.

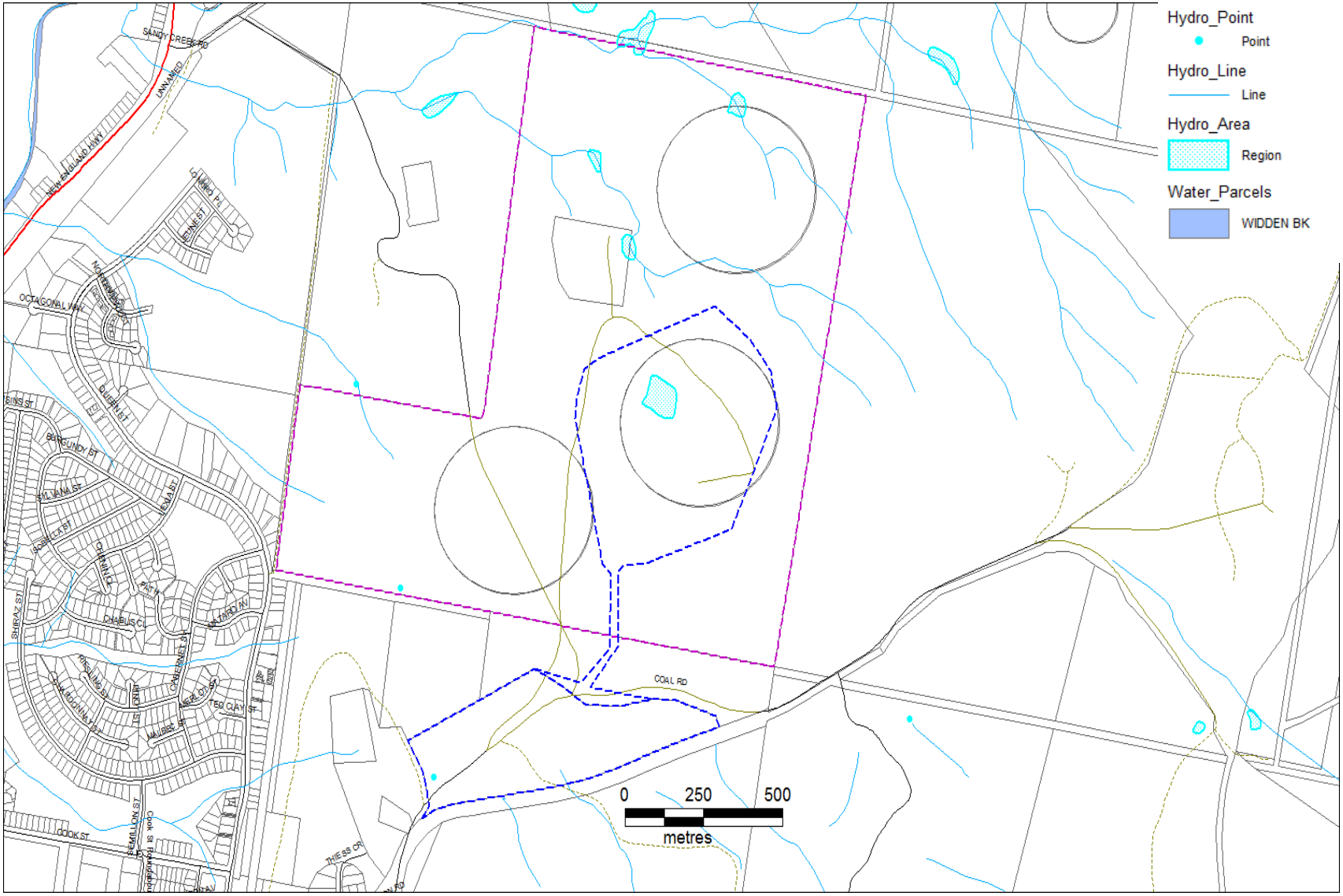


Figure 8: Hydrological Detail for Proposed Site

Figure 9. Extract from Council Mapping showing Mine Subsidence Areas for the proposed Project site**.**

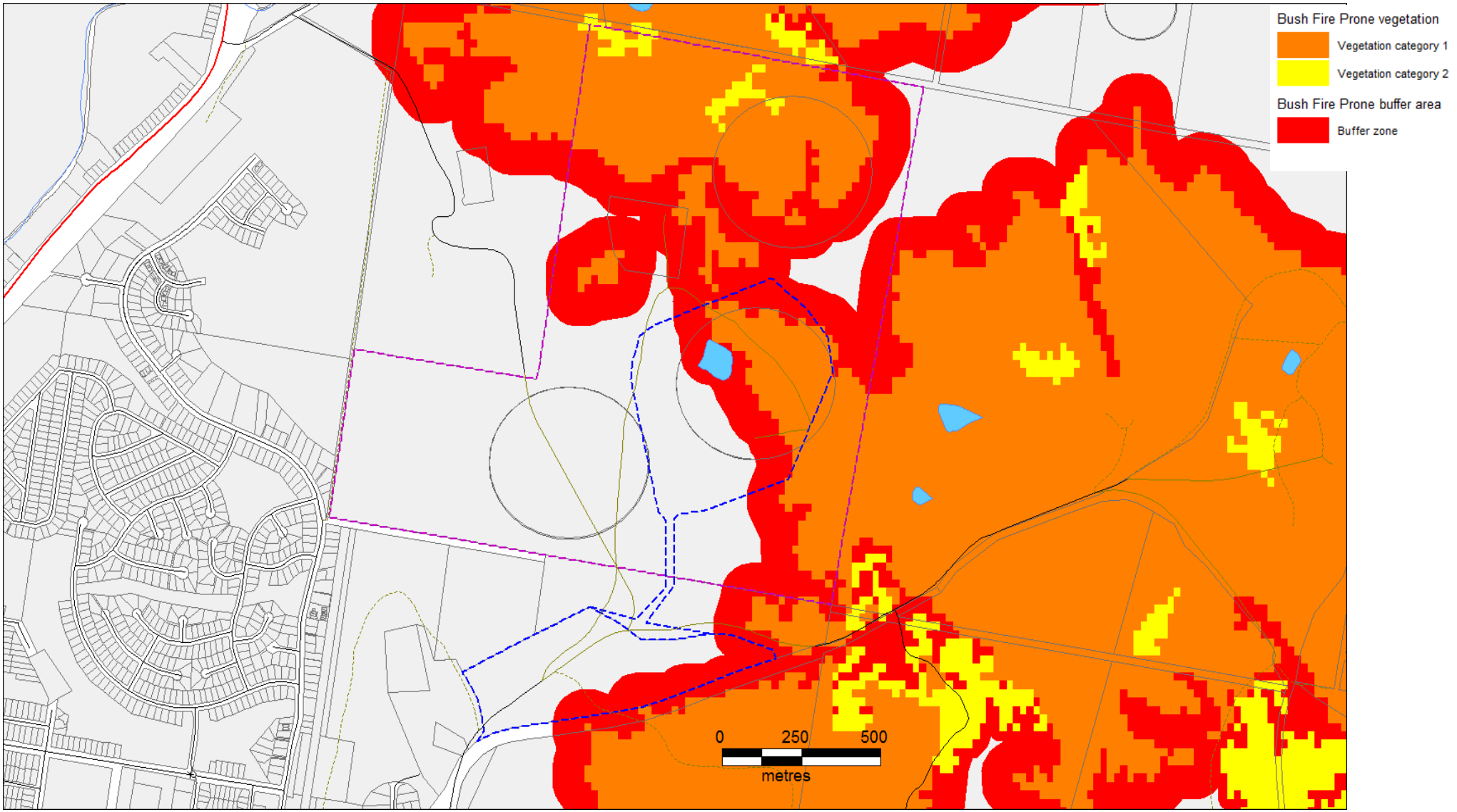


Figure 10. Bushfire Risk Areas on proposed Project site

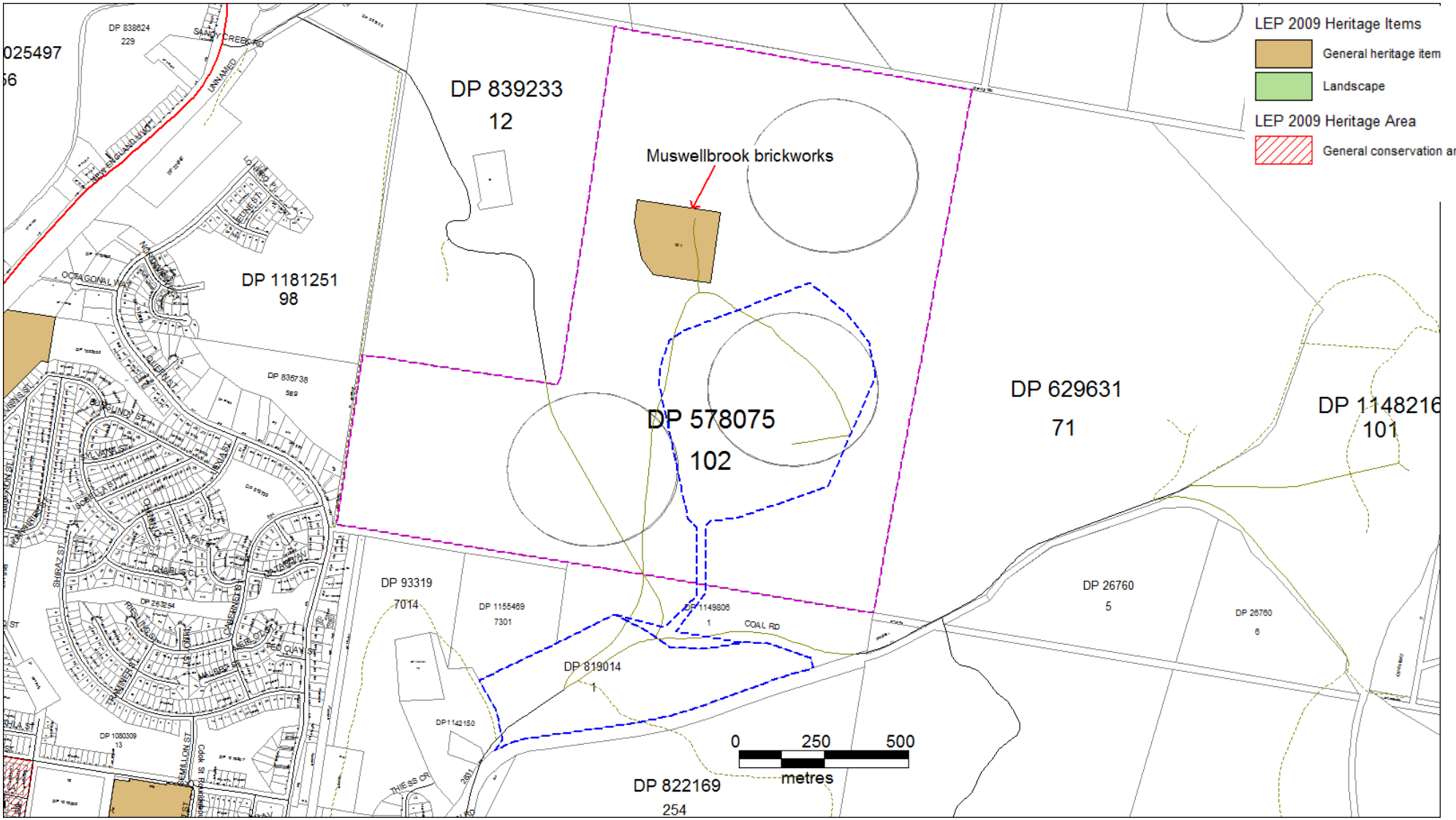


Figure 11.. Location of Muswellbrook Brickworks in relation to the proposed Project site**.**

4 Planning Framework

4.1 The Project Approval Process

Part 4 of the *Environmental Planning and Assessment Act (1979)* establishes an assessment and approval regime for developments to be assessed as State Significant. Within Part 4 is *State Environmental Planning Policy (State and Regional Development) (2011).* This development of a new landfill void within Muswellbrook Shire Council is within Schedule 1, Group 23, as shown below:

> *23. Waste and resource management facilities*
>
> *(1) Development for the purpose of regional putrescible landfills or an extension to a regional putrescible landfill that:*
>
> *(a) Has a capacity to receive more than 75,000 tonnes/ year of putrescible waste*
>
> *(b) Has a capacity to receive more than 650,000 tonnes of putrescible waste over the life of the site*
>
> *(c) Is located in an environmentally sensitive area of state significance.*

4.2 Commonwealth Legislation

Further flora and fauna assessment will determine if the following Commonwealth legislation may be applicable.

Environmental Protection and Biodiversity Act 1999

4.3 NSW Statutory Legislation

In addition to the *Environmental Planning and Assessment Act (1979),* the following NSW Statutory Legislation may be applicable to the development:

Protection of the Environment Operations Act 1997

Contaminated Lands Management Act 1997

Rural Fires Act 1997

Threatened Species Conservation Act 1995

National Parks and Wildlife Act 1974

Heritage Act 1977

Water Management Act 2000

Water Act 1912

Waste Avoidance and Resource Recovery Act 2001

Mines Subsidence Compensation Act 1961

4.4 Environmental Planning Instruments

Environmental Planning Instruments are required to be addressed as part of the assessment. The following Instruments may be relevant to the development:

SEPP Infrastructure (2007)

SEPP State and Regional Development (2011)

SEPP 55 Remediation of Land

SEPP 33 Hazardous and Offensive Development

SEPP 44 Koala Habitat, the Atlas of NSW Wildlife lists Koalas as a relevant species within the Hunter area.

4.5 Local Environmental Planning Instruments

Muswellbrook Shire Council Local Environmental Plan (2009)

4.6 Environmental Protection Licence

The Muswellbrook WMF is subject to an Environment Protection Licence.

The current *Environment Protection Licence (5980)* was issued by the Department of Environment, Climate Change and Water. The Environment Protection Licence anniversary date is 25 November and the review date is 27 May 2016.

Discussions with the Department of Environment, Climate Change and Water indicate that *Environment Protection Licence (5980*) will be modified and extended to cover the new landfill void and the existing Muswellbrook WMF under the one Licence.

4.7 Other Legislation and Documents

Department of Environment Climate Change and Water: *Landfill Design Environmental Guidelines* (Solid Waste Landfills, 1996)

Department of Environment Climate Change and Water: *Assessment and Management of Odour from Stationary Sources in NSW – Technical Framework*

Department of Environment Climate Change and Water: *Waste Classification Guidelines*

Department of Environment Climate Change and Water: *Environmental Guidelines: Solid Waste Landfill*

Department of Environment Climate Change and Water: *The NSW Waste Avoidance and Resource Recovery Strategy 2007*

Department of Planning: *Managing Land Contamination: Planning Guidelines – SEPP 55 Remediation of Land*

Department of Planning: *Guidelines for Major Project Community Consultation*

Department of Planning: *EIS Guideline - Landfilling*

Hunter Region Waste and Resource Recovery Strategy 2014 (DRAFT).

5 Preliminary Environmental Risk Analysis

Issue	Current Environmental Management	EA Reporting	Significance of Issue
Heritage		As part of the No 1 Open Cut Extension Environmental Impact Statement (HLA Envirosciences Pty Ltd, 2002) (Appendix 7) an Indigenous and Non-Indigenous Heritage Assessment was completed. This found a small number of sites, which had all suffered damage due to previous mining and were reported to be a low value. The sites no longer remain on the Project site. Council's mapping does not indicate the site currently has features of Aboriginal cultural heritage. Consultation will occur with the Wanaruah LALC prior to any further studies. The EA will contain at a minimum the implications on Aboriginal Heritage. The Muswellbrook brickworks, a heritage listed building is located within close proximity to the Project site; it will continue to be managed by Muswellbrook Coal Company.	**Low Significance**
Acoustic	Acoustic impacts are controlled by: • Machinery being utilized generally	Acoustic impacts will result from the construction and operational phases of the Project. The current landfill	**Low Significance**

	during daylight and business hours • Use of machinery that meets noise generation guidelines for this type of operation • The correct operation and maintenance of machinery	site has an existing EPL (Environmental Protection License) (Appendix 3) that outlines the conditions of acoustic impacts. Acoustic impacts from the current landfill site on surrounding receivers are low and it is expected that the new landfill void will also have a low acoustic impact. The location of the new landfill is within close proximity to the existing landfill site, to date there have been no recorded complaints regarding acoustic pollution from the existing landfill, therefore it is anticipated that there will be minimal acoustic disruptions. The EA will contain an acoustic report.	
Fire	The potential for fire is currently minimized by: • Access gate being locked at all times outside of opening hours • Maintenance of boundary fences and associated fire breaks • Maintenance of lockable gates and machinery including firefighting equipment • Regular litter patrols • Regular removal of waste from the resource recovery areas	Council mapping indicates that the site and its surrounds are bushfire prone land. (Figure 9) A buffer zone will be provided to create increased bushfire protection. A site perimeter road will be used to allow access for fire fighting vehicles and equipment around the Project Site. The EA will contain a bushfire threat assessment.	**Low Significance**
Contaminated Land		Controls will be put in place to safeguard the environment, surrounding site, contractors and	**Medium Significance**

		employees from any risk associated with possible contaminated land due to the prior use of the proposed project site.	
Dust (Air Quality)	Dust generation is controlled by • Maintaining the gravel and or sealed pavement on the trafficable areas • Restricting traffic to the access roads and storage areas • Enforcing speed restrictions within the site • Minimising disturbed areas • Watering of the gravel pavement	The current dust management procedures that are utilised at the current landfill site will be adopted at the new site. Water carts will be used for dust suppression during construction and operation of the landfill. Dust pollution will be minimal during construction phase as a large amount of excavation and site preparation has already been completed due to the previous use of the proposed site.	**Medium to High Significance**
Fauna and Flora		Due to the proposed Project site's current use as an Open Cut Coal Mine Void, site clearance has already occurred and will require rehabilitation under its conditions of current use. The proposed Project will remediate the site clearance of flora by replanting endemic species as part of its buffer and litter control program, along with a large planting to improve site amenity. According to HLA Envirosciences (2002) (Appendix 8) during the environmental impact assessment of the site, the	**Low Significance**

		study failed to identify any species of threatened flora and 2 species of threatened fauna. Establishment of a landfill void is expected to have minimal impacts on any existing flora and fauna. An ecological assessment of the site and direct or indirect impacts of the Project will be completed as part of the EA.	
Groundwater	Groundwater Level Monitoring	Groundwater level monitoring has been undertaken in a series of groundwater monitoring wells around the perimeter of the Existing Muswellbrook Waste Management Facility. The groundwater depths recorded during this period provides evidence that the free groundwater level has been lowered in the vicinity of the site by mining operations. (Appendix 9). Leachate generation modelling and site water balance modelling will be completed during the design phase. The landfill will be lined to prevent infiltration of leachate into groundwater and leachate will be collected to prevent any accumulation.	**High Significance**
Leachate	Leachate from the Facility is managed by • Removing waste on a regular basis • Covering of waste	An indicative location for both the leachate and sedimentation basins is shown on the Landfill Concept Plans (GHD, 2013)	**High Significance**

	• Diversion of storm water from waste deposition area • Minimising the amount of water used to clean the WTS and storage areas generally • Minimising the volume of leachate stored on the site.	(Appendix 10). The size and exact location shall be determined during design phase.	
Odour	Odour is controlled by • Regular site monitoring • Odour complaints received	Odour in the new landfill site will be managed in a similar manner as to the existing landfill site. Currently, odour is managed by using landfill lids on operational sections of the landfill void as daily cover, and excavated natural material as intermediate cover over compacted waste. The site has an existing Environment Protection License that places conditions on the impact of odour. This EPL will be extended to the new site.	**Low Significance**
Traffic and Transport	Traffic control signage is erected on site and includes: • Hours of operation • Conditions of Entry • Speed instruction signage • Directional signage	During the construction phase of the project, traffic to the site will increase. Once operational, traffic onto the site is unlikely to increase if the landfill remains solely for the use of Muswellbrook and Upper Hunter Shire Councils. However, if as planned, the site becomes a sub regional waste facility, traffic is expected to increase. A traffic impact statement will be prepared for the EA,	**Low Significance**

		for both regional and non regional scenarios, including the positive effect of the proposed Muswellbrook bypass.	
Soils		During the construction phase, further excavation of weathered material within the existing pit may be required; this could result in soil being stockpiled on site. This soil will then be used in the construction of roads, buffer zones, and landscaping and cover materials. An erosion and sedimentation management plan will be developed to cover the construction and operational phases of the landfill.	**Low Significance**
Surface Water	Surface Water is managed by: • Maintaining the surface water structures • Maintaining the revegetated zones • Controlling litter • Controlling vehicle movements • Diversion of ephemeral drainage lines around the Facility to a sedimentation pond.	An indicative location of the surface water treatment infrastructure is shown in Appendix 9. A surface water management plan will be developed for both construction and operational phases to contain and treat any surface water from the landfill cells, ensuring it does not mix with naturally occurring water flow on site.	**High Significance**
Visual Amenity		The new landfill site will be rehabilitated on site during both construction and operational phase, to ensure it is of the same high	**Medium Significance**

		standard of visual amenity as the existing landfill site. During the operational phase, daily cover will be used to lessen the visual impact inside the landfill cell. Landscaper screening will be established adjacent to RMS planned bypass.	

6 Community and Stakeholder Consultation

Due to the size and nature of this project, Council intend to undertake an extensive stakeholder and community consultation process to keep all concerned parties informed about proposed development.

Muswellbrook Shire Council will use the NSW Department of Planning *"Guidelines for Major Project Community Consultation"* during the establishment and operation of the new landfill site. Council will also consult with its own *"Community Engagement Strategy".*

6.1 Government Stakeholders

In preparing for applying for planning permission for the proposed Project, Muswellbrook Shire Council has consulted with NSW Planning regarding the application process and the EPA regarding extending the current EPL.

Prior to lodging the EA, Council will consult further with the following government agencies

- NSW Department of Planning
- Department of Environment, Climate Change and Water
- NSW Mine Subsidence Board
- Roads and Maritime Services
- Land and Property Management Services
- Office of Environment and Heritage

6.2 Key Stakeholders

There are a number of important key stakeholders that Council will consult during all phases of landfill management.

- Residents of Muswellbrook
- Local Aboriginal Land Council
- Hunter Regional Waste Group Councils
- Adjoining Landowners
- Government Agencies
- Muswellbrook Chamber of Commerce
- Muswellbrook Coal Company
- Community Organisations
- Muswellbrook Shire Council staff

6.3 Community Consultation

A Community Engagement Strategy will be developed for the proposed Project. This strategy will detail the methods of community engagement to be used. These will include

- Consultation with both residential and commercial nearby landowners
- Consultation with community groups and the community through local media and Council newsletter
- Community Forums
- Regular updates in local media and on Councils website.

7 Conclusion

This report provides preliminary information to the NSW Department of Planning and Environment (DPE) to help inform a Request for Director General's Requirements, in relation to the future development of the Muswellbrook Waste Management Facility. This report has been prepared in accordance with provisions of Part 4 of the *Environmental Planning and Assessment Act, 1979*, which establishes an assessment and approval regime for developments to be assessed as State Significant Development under the provisions of the *State Environmental Planning Policy (State and Regional Development, 2011)*

The proponent for the Project is Muswellbrook Shire Council (Council), which owns and operates the Existing Waste Management Facility. The parcels of land on which the proposed new landfill void is located are currently owned by Muswellbrook Coal Company.

The objectives of the Project are to:

- Meet future waste disposal needs of Muswellbrook LGA and Upper Hunter LGA areas.
- Secure future medium to long term capacity for a potential regional landfill site servicing other local government areas within the Hunter Region.
- Secure future capacity for waste disposal, to complement future alternate resource recovery management options in the Hunter Region.

Muswellbrook Shire Council remains committed to resource recovery, actively promoting it within our community and adopting resource recovery as a major principle in our waste management strategies. However, there is a need at a local, sub regional and regional level for secure future landfilling and disposal options. This project would provide a future option for domestic and commercial waste disposal, in an established waste management area with minimal environmental impacts.

8 Appendices

Appendix 1
Predicted Forecast of MSW for Hunter Councils

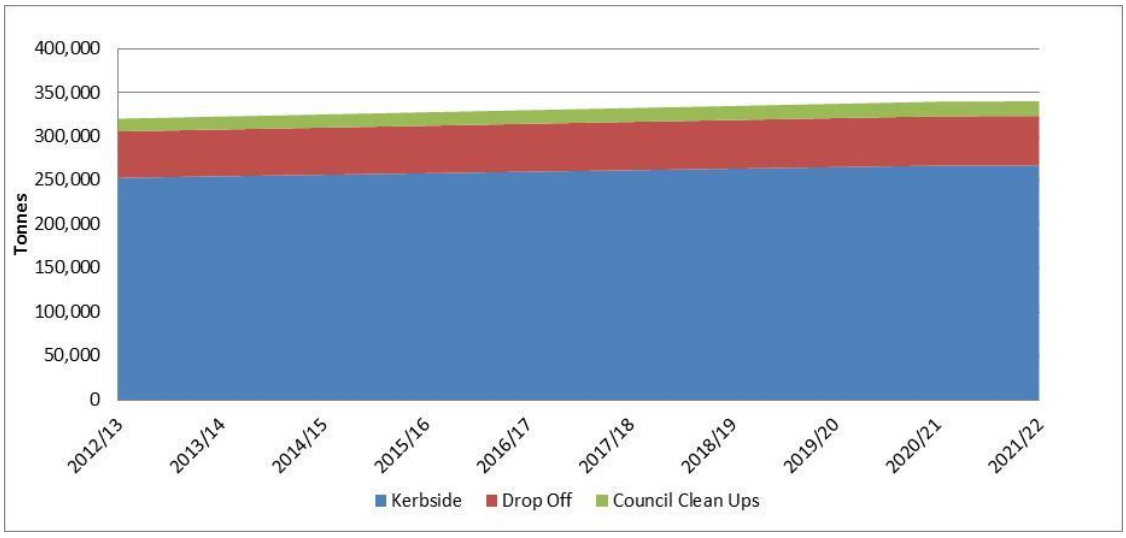
Hunter Region Waste Avoidance and Resource Recovery Strategy 2014 -2021 (DRAFT)

Table 1: MSW 2021-22 forecast for each Council (tonnes) based on an estimated 1.5% annual population increase

Tonnes	2011-2012	2021-22
Cessnock	29,368	33,579
Dungog	3,428	3,919
Lake Macquarie	88,354	101,023
Maitland	45,181	51,587
Muswellbrook	11,814	13,508
Newcastle	66,368	75,885
Port Stephens	37,340	42,694
Singleton	13,535	15,476
Upper Hunter	11,381	13,013
Total	**306,705**	**350,683**

Source: Hunter Waste Strategy 2014 (draft) (confidential).

Figure 4: MSW Waste Forecast by source



Appendix 2
Muswellbrook Coal Company Letter of Support

John Furner

General Manager

Muswellbrook Coal Company

MUSWELLBROOK COAL COMPANY LIMITED
A.C.N. 000 009 521 ABN 32 000 009 521

Established 1907

HEAD OFFICE
Level 28 AMP Building
10 Eagle Street
Brisbane Qld 4000

POSTAL ADDRESS
Po Box 123
Muswellbrook NSW 2333

TELEPHONE
02 6543 2799

3rd June 2014

Muswellbrook Shire Council
PO Box 122
Muswellbrook NSW 2333

Attn: Pathum Gunasekara

RE: Proposed Landfill Site – Owner's Consent

Muswellbrook Shire Council proposes to utilise an existing open cut mining void currently owned by the Muswellbrook Coal Company as a future landfill site and a Memorandum of Understanding between Muswellbrook Shire Council and Muswellbrook Coal Company was signed in 2010 setting out the agreed terms of the arrangement.

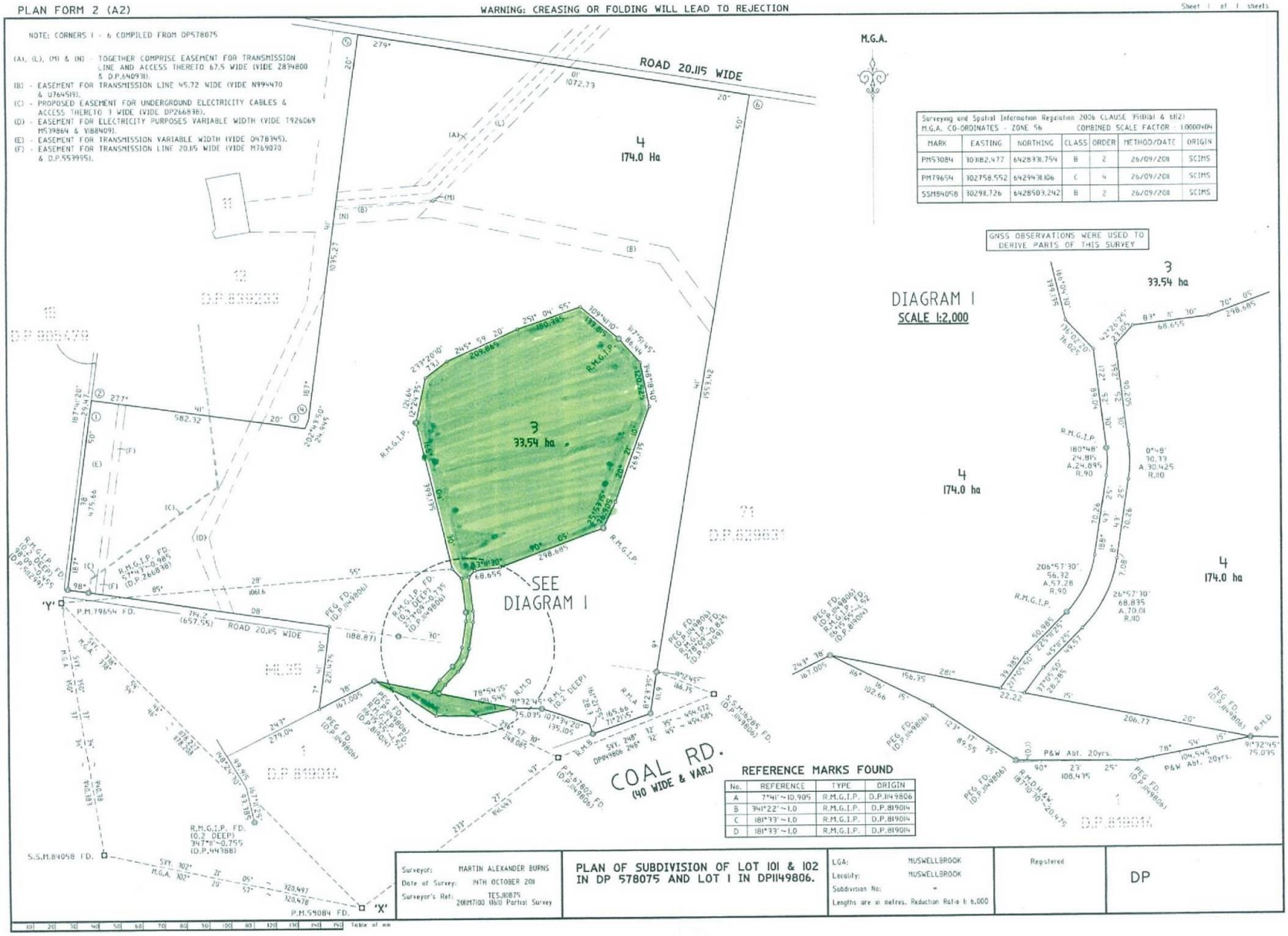
The proposed landfill site covers part Lot 1 DP 1149806 and part Lot 101 and 102 DP 578075 as shown in green on the attached subdivision plan.

As owner of the above properties, Muswellbrook Coal Company authorise Muswellbrook Shire Council to lodge application to the NSW Planning & Environment seeking approval for new landfill development within the area shown in green on the attached plan under Part 4 of the *Environmental Planning and Assessment Act 1979.*

Yours faithfully,

John Furner
General Manager
Muswellbrook Coal Company Limited

ph: 02 6543 2300
fax: 02 6542 2344
mob: 0488 031 582
email: *john.furner@muscoal.com.au*


PLAN FORM 2 (A2)
WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION
Sheet 1 of 1 sheets
NOTE: CORNERS 1 - 6 COMPILED FROM DP578075
(A), (L), (M) & (N) - TOGETHER COMPRISE EASEMENT FOR TRANSMISSION LINE AND ACCESS THERETO 67.5 WIDE (VIDE Z834800 & D.P.640970).
(B) - EASEMENT FOR TRANSMISSION LINE 45.72 WIDE (VIDE N994470 & U764519).
(C) - PROPOSED EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS THERETO 3 WIDE (VIDE DP266838).
(D) - EASEMENT FOR ELECTRICITY PURPOSES VARIABLE WIDTH (VIDE T926069 M539864 & V188409).
(E) - EASEMENT FOR TRANSMISSION VARIABLE WIDTH (VIDE 0478345).
(F) - EASEMENT FOR TRANSMISSION LINE 20.115 WIDE (VIDE M769070 & D.P.553995).
ROAD 20.115 WIDE
4
174.0 Ha
3
33.54 ha
SEE DIAGRAM 1
COAL RD.
(40 WIDE & VAR.)
M.G.A.
Surveying and Spatial Information Regulation 2006 CLAUSE 9(1)(b) & 6(2)
M.G.A. CO-ORDINATES - ZONE 56
COMBINED SCALE FACTOR - 1.0000404
MARK | EASTING | NORTHING | CLASS | ORDER | METHOD/DATE | ORIGIN
PM53084 | 303882.477 | 6428838.754 | B | 2 | 26/09/2011 | SCIMS
PM79654 | 302758.552 | 6429431.106 | C | 4 | 26/09/2011 | SCIMS
SSM84058 | 302981.726 | 6428503.242 | B | 2 | 26/09/2011 | SCIMS
GNSS OBSERVATIONS WERE USED TO DERIVE PARTS OF THIS SURVEY
DIAGRAM 1
SCALE 1:2,000
REFERENCE MARKS FOUND
No. | REFERENCE | TYPE | ORIGIN
A | 7741'~10.905 | R.M.G.I.P. | D.P.1149806
B | 341°22'~1.0 | R.M.G.I.P. | D.P.819014
C | 181°33'~1.0 | R.M.G.I.P. | D.P.819014
D | 181°33'~1.0 | R.M.G.I.P. | D.P.819014
Surveyor: MARTIN ALEXANDER BURNS
Date of Survey: 14TH OCTOBER 2011
Surveyor's Ref: TES.J0875 2011M7100 (1&2) Partial Survey
PLAN OF SUBDIVISION OF LOT 101 & 102 IN DP 578075 AND LOT 1 IN DP1149806.
LGA: MUSWELLBROOK
Locality: MUSWELLBROOK
Subdivision No: -
Lengths are in metres. Reduction Ratio 1: 6,000
Registered
DP

Appendix 3
Environmental Protection Licence (5980)

Department of Environment and Climate Change

Environment Protection Licence - Link

Appendix 4
Delivery Program and Operational Plan 2014/15

Muswellbrook Shire Council

8. Utilities

Context

Council as the Water Authority provides water treatment and reticulated drinking water supply services to the urban areas of Muswellbrook, Denman and Sandy Hollow and sewerage reticulation and treatment to the urban areas of Muswellbrook and Denman. The fully regulated Hunter River provides a high reliability source for both Muswellbrook and Denman. Sandy Hollow relies for its water supply on the Goulburn River, which over the course of the last drought proved to be very reliable for the village at its current size.

In the last 7 years new water treatment plants have been built for both Sandy Hollow and Denman, however there are ongoing water quality problems with the Sandy Hollow supply owing to its extreme hardness and other water chemistry parameters. Council is currently developing solutions to this problem. The Muswellbrook water source from the Hunter River, though reliable in quantity, suffers from high variability in quality and risk associated with physical, chemical and biological factors. Council needs to pursue options to address these risks, in conjunction with upgrading its treatment capacities in the next 5 years.

Quality Water Supplies (Strategic Planning & Asset Management)

Strategic Planning

Councils are now being required to fully fund their water & sewer systems and to provide evidence of their capability of doing so by complying with the State Government's Best Practice in Management of Water & Sewerage Systems Guidelines. Muswellbrook Shire Council is now fully compliant with all the requirements of these guidelines; however the Demand Management Plan requires review. As a matter of good management Council also needs to review its Strategic Business Plans for Water & Sewer this year.

Following a significant review of the Local Water Authorities in 2008 and 2009, the State Government is encouraged Councils to form Alliances that are broadly based on catchments or sub-catchments and intended to foster resource sharing and strategic planning on a regional scale. The Shires of Muswellbrook, Singleton and Upper Hunter have formed such an alliance which is called the Upper Hunter Water Authorities Alliance (UHWA). The UHWA has achieved a number good outcomes for the member Councils including coordinated Integrated Water Cycle Management Plans (IWCM), and a combined Liquid Trade Waste (LTW) Policy, with sharing of resources for regulation of businesses under these policies. Council is committed to encouraging further advances in this respect, through a higher level of commitment to developing cooperation and efficiencies under the auspice of the UHWA from each Council in the coming year.

The Muswellbrook Local Government Area is experiencing significant growth pressures requiring major upgrades of the water & sewer systems to ensure Council is able to provide these services to areas of new residential land release in both Muswellbrook & Denman. Council has adopted a strategy to deliver the infrastructure; however funding availability may constrain the amount of development that can occur.

Asset Management

An Infrastructure Asset Management Plan was adopted by Council in June 2011. The Asset Management Plan documents the extent of infrastructure holdings, the existing levels of service, strategies for the proper management of risk and future demand, life cycle costs for new services and assets, and a long term cash flow analysis of required expenditure, including maintenance, renewal costs and depreciation.

Waste Services

Quality Domestic Waste Kerbside Collection

Council has provided traditional waste collection for residential mixed waste and commercial waste for many years, however in 2006 in conjunction with a new 10 year collection contract with JR Richards, Council introduced a three bin system, with the weekly mixed waste bin being reduced from 240L to 140L and commencement of a fortnightly recycling and green waste service using 240L bins. This has worked extremely well and has resulted in Council being amongst industry leaders in domestic recycling rates.

Council also operates a bulky waste collection service once a year for non-putrescible waste and for garden organic waste. This complements the three bin system, in providing service to allow residents to dispose of large items free of charge without the need for the required transport and handling facilities. This service has evolved through careful management to a convenient and efficient service to the community.

Quality Waste Management & Resource Recovery

The Council's Waste Management Facilities (WMF's) include:

1. At Muswellbrook a landfill, a contractor run Materials Recycling Facility (MRF), an internal transfer station, and a Council run recycling area for all non-MRF recyclables including green waste, scrap metal, pallets, batteries and drums, which operates 7 days a week; and
2. A transfer station and recycling centre for domestic waste at Denman, which is open Friday to Monday inclusive.

Council is committed to continuously improving the service levels and productivity, and reducing the environmental footprint of its waste services through adoption of innovative technologies and landfill management practices.

This has resulted in substantial improvements in efficiency, recycling and exclusion of organics from the landfill in this the last decade. There is however still significant scope through structural review, pricing and cultural change to improve this performance, especially in the commercial and industrial waste area, where the existing facilities are not designed to handle the commercial quantities of recyclable materials now being generated.

In addition, Council is committed to establishing mechanisms to reduce the expected impact of carbon pricing on the waste management service in order to maintain a healthy and resilient business.

Council has recently completed a five year Strategic Waste Management Business Plan covering operation of its waste management facilities in Muswellbrook and Denman. Two key issues identified in this Plan were the need to:

1. Pursue development of a new landfill cell to supplement the existing landfill when it is eventually filled; and
2. Move toward a more businesslike approach in running the Waste Business Unit, taking advantage of the commercial opportunities to achieve a commercial return on investment in relation to the value of the existing landfill and any new landfill.

The Strategic Business Plan will be due for review in 2014.

The Muswellbrook WMF currently receives waste from domestic waste sources within Muswellbrook Shire and part of Upper Hunter Shire, and from commercial operators servicing the Upper Hunter sub-regional area. The Denman Transfer Station services Denman and the surrounding rural area as a domestic waste drop off facility.

Council's current landfill had an original volume of 800,000 m^3 and Council currently disposes of approximately 30,000 tonnes of waste per annum, comprising municipal, commercial & industrial, construction and demolition waste. At current growth estimates the landfill has a remaining life of 20 years. In addition, Council is currently investigating the options for a new landfill extension with a life expectancy of 70+ years on current loading rates, to ensure ongoing capacity for sub-regional landfill requirements in the context of;

1. Increasing pressures from Government for aggregation of facilities;
2. A local sub-regional shortage of available landfill capacity, and;
3. Increasing difficulty in obtaining approval for new landfills.

The NSW Government imposed, from June 2009, a $10.00 per tonne levy on waste going to landfill (increasing by $10.00 plus Consumer Price Index per year for 6 years to 2015). Returns to Councils paying the levy under the former WASIP programme are currently under review.

Council has an obligation under the Protection of the Environment (Operations) Act to manage materials that are technically classified as waste from all of its construction and operational activities. A proportion of these materials have potential for reuse. Those that do not will be transported straight to an appropriate waste disposal facility. Council has in the past year investigated, obtained approval for and developed within the waste management facility, a stockpiling area for the re-useable materials pending their reuse in other areas of Council's operations. This area will be further developed in order to optimise the amount and cost of materials so reused.

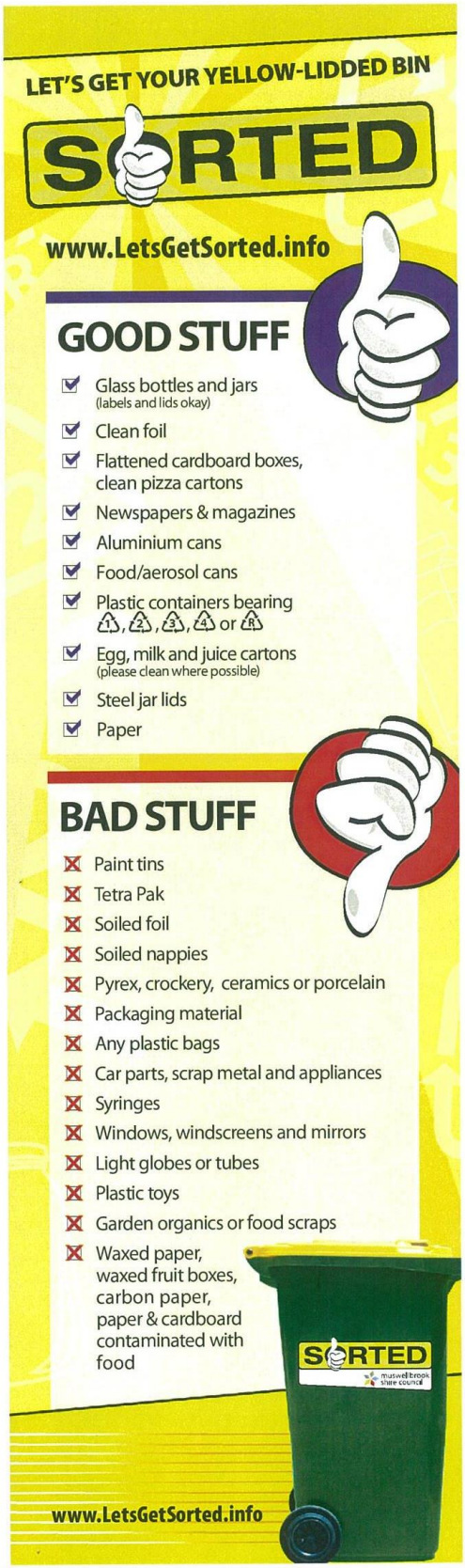
Key Strategies for next 4 years

The abovementioned Asset Management Plans have highlighted a number of areas in which Council needs to invest over the next 20 years, in order to provide a sustainable adequate level of service. These areas are as follows:

1. Muswellbrook sewage treatment plant requires upgrade or replacement. Design is currently under way, with a scheduled date for completion at the end of 2013, construction subject to funding commitment. An interim capacity increase is planned at the current side by recommissioning a pasveer channel;
2. Muswellbrook water treatment plant (expected to reach design capacity within the next 5 years – potential regional resource sharing and supply security issues to be assessed);
3. Muswellbrook water reservoirs and pumping stations (require renewal and upgrade for growth capacity and level of service);
4. Muswellbrook industrial estate water carrier main (replace pumped supply with reservoir in conjunction with item 3 above);
5. Muswellbrook industrial estate sewer (complete stage 2 – carrier main);
6. Muswellbrook sewage pumping stations (upgrade for future growth capacity, septicity control and asset renewal);
7. Muswellbrook & Denman sewage reticulation (asset inspection programme and renewal for old mains);
8. Muswellbrook, Denman & Sandy Hollow water reticulation (asset inspection programme and renewal for old mains);
9. Denman sewage pumping station 1 (at design capacity – complete construction of new station to accommodate growth capacity);
10. Sandy Hollow water treatment plant (hardness issues – aesthetic guideline only);
11. Manage the Waste Management facility to the strategic business plan developed in 2010 including;
    a) Potential for operation of the business unit as a category 1 business under the Government's Competitive neutrality rules;
    b) Development of a robust corporate structure that ensures the best outcome for the Muswellbrook community in relation to waste management at both a local and regional level;
    c) Establishment of a fee structure in accordance with the principles outlined above; and
    d) Pursuit of regional business opportunities relating to waste management.
12. Finalise investigations into acquisition of a new landfill void, and as required, secure approval to operate the landfill as an extension of the existing landfill;
13. Supplement adopted pricing regimes with education programmes and performance agreements with major clients to achieve significant reductions in the amount of organic and other recyclables disposed of to landfill by major clients;
14. Provide continuous improvement in kerbside waste collection and landfill management;
15. Investigate opportunities to participate in regional or subregional cooperation in waste collection contracts;
16. Investigate the potential for processing commercial quantities of recyclable material, particularly cardboard, in order to reduce the amount of organic material going to landfill; and
17. Develop and implement education programmes as funds become available from the Waste and Sustainability Improvement Payment (WaSIP) and the Waste Less, Recycle More program.

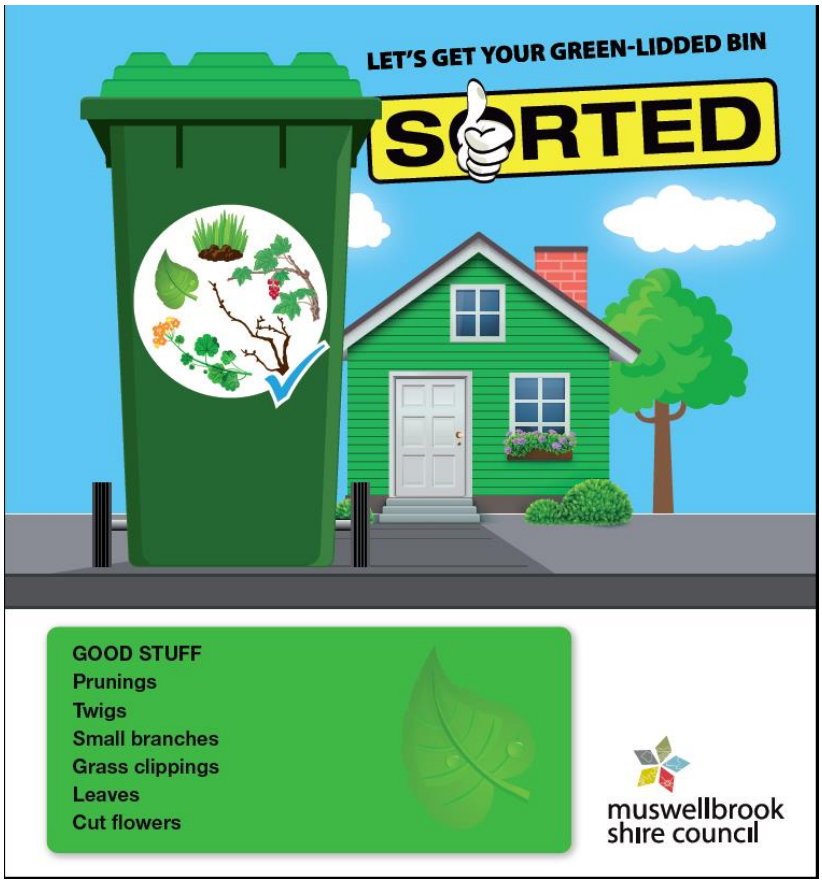
Appendix 5
Let's Get Sorted

Muswellbrook Shire Council


LET'S GET YOUR YELLOW-LIDDED BIN
SORTED
www.LetsGetSorted.info
GOOD STUFF
Glass bottles and jars (labels and lids okay)
Clean foil
Flattened cardboard boxes, clean pizza cartons
Newspapers & magazines
Aluminium cans
Food/aerosol cans
Plastic containers bearing 1, 2, 3, 4 or 5
Egg, milk and juice cartons (please clean where possible)
Steel jar lids
Paper
BAD STUFF
Paint tins
Tetra Pak
Soiled foil
Soiled nappies
Pyrex, crockery, ceramics or porcelain
Packaging material
Any plastic bags
Car parts, scrap metal and appliances
Syringes
Windows, windscreens and mirrors
Light globes or tubes
Plastic toys
Garden organics or food scraps
Waxed paper, waxed fruit boxes, carbon paper, paper & cardboard contaminated with food
SORTED
muswellbrook shire council
www.LetsGetSorted.info


LET'S GET YOUR RED-LIDDED BIN
SORTED
www.LetsGetSorted.info
GOOD STUFF
Household waste
Cigarette butts
Plastic bags and non-recyclable plastics
Packaging material such as bubble wrap and polystyrene foam
Disposable nappies
Mirrors and broken glass
Light globes and tubes
Crockery, ceramic & Pyrex
Kitty litter
BAD STUFF
Recyclable materials, these go in your yellow lidded bin
Car parts & batteries
Paints & solvents
Motor & cooking oils
Asbestos and other hazardous materials
Concrete, bricks or timber
Soil and rock
Gas bottles or fire extinguishers
SORTED
muswellbrook shire council
www.LetsGetSorted.info


LET'S GET YOUR YELLOW-LIDDED BIN
SORTED
GOOD STUFF
Glass bottles and jars (labels and lids okay)
Clean foil
Flattened cardboard boxes, clean pizza cartons
Newspapers & magazines
Aluminium cans
Food/aerosol cans
Plastic containers bearing
Egg, milk and juice cartons (clean where possible)
Steel jar lids
Paper
muswellbrook
shire council


LET'S GET YOUR GREEN-LIDDED BIN
SORTED
GOOD STUFF
Prunings
Twigs
Small branches
Grass clippings
Leaves
Cut flowers
muswellbrook
shire council

MUSWELLBROOK WASTE MANAGEMENT FACILITY-COAL RD MUSWELLBROOK

The rubbish in your red lidded bin goes straight to landfill. Please make sure there are no recyclables in it.

The recyclables in your yellow lidded bin are taken to the recycling centre, where they are hand sorted into separate streams for recycling. Please put only recyclables in your yellow lidded bin no rubbish.

The garden organics in your green lidded bin is emptied and hand sorted to remove any rubbish. Your green waste is then chipped and composted into garden improvement products. Please ensure no rubbish goes into your green lidded bin.

All recyclables, e-waste and scrap metals can be disposed of for free, so make sure you separate your load and save money.

muswellbrook shire council

GOOD STUFF
Household waste
Cigarette butts
Plastic bags and non-recyclable plastics
Packaging material such as bubble wrap and polystyrene foam
Disposable nappies
Mirrors and broken glass
Light globes and tubes
Crockery, ceramic & Pyrex
Kitty litter

muswellbrook shire council

Appendix 6
Rezoning Gateway Determination

NSW Department of Planning and Environment

Gateway Determination

***Planning Proposal (Department Ref: PP_2013_MUSWE_002_00)**: to undertake a number spot rezonings and to correct an administration error in the RU1 Primary Production Land Use Table.*

I, the Acting General Manager, Hunter & Central Coast Region at the Department of Planning and Infrastructure as delegate of the Minister for Planning and Infrastructure, have determined under section 56(2) of the EP&A Act that an amendment to the Muswellbrook Local Environmental Plan (LEP) 2009 to rezone land to facilitate a future Waste Management Facility, Aged Care Facility, the removal of split zones and to permit "Intensive plant agriculture" without consent in the RU1 Primary Production zone should proceed subject to the following conditions:

1. Council is to amend the planning proposal prior to commencing public exhibition as follows:-
   - remove the minimum lot size (leave blank) for the land being rezoned SP2 Infrastructure (Waste Management) to facilitate the future subdivision of the Waste Facility.
   - Include a reclassification information map to identify the additional land being reclassified from Community to Operational lands.

2. Prior to public exhibition, Council is to review the proposed zoning of the landfill access strip, where it crosses the proposed by-pass corridor, to ensure the ongoing permissibility of the proposed by-pass.

3. Community consultation is required under sections 56(2)(c) and 57 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") as follows:

   (a) the planning proposal is classified as low impact as described in *A Guide to Preparing LEPs (Department of Planning & Infrastructure 2013)* and must be made publicly available for a minimum of **14 days**; and
   (b) the relevant planning authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 5.5.2 of *A Guide to Preparing LEPs (Department of Planning & Infrastructure 2013)*.

4. Consultation is required with the following public authorities under section 56(2)(d) of the EP&A Act and/or to comply with the requirements of relevant S117 Directions:

   - NSW Department of Primary Industries - Minerals and Petroleum (S117 Direction 1.3 Mining, Petroleum Production and Extractive Industries)
   - NSW Rural Fire Service (S117 Direction 4.4 Planning for Bushfire Protection)
   - Mine Subsidence Board (S117 Direction 4.2 Mine Subsidence and Unstable Land)
   - Environmental Protection Agency (with respect to the proposed landfill)
   - Roads & Maritime Services (with respect to proximity to the proposed by-pass corridor)

Each public authority is to be provided with a copy of the planning proposal and any relevant supporting material, and given at least 21 days to comment on the proposal. Once the consultation is undertaken with the public authorities, and information is provided, Council is to update its consideration of S117 Directions.

5. A public hearing is not required to be held into the matter by any person or body under section 56(2)(e) of the EP&A Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing for the reclassification of land under the Local Government Act 1993.

6. The timeframe for completing the LEP is to be **6 months.**

Dated 18th day of December 2013.

M.Leavey

Michael Leavey
Acting General Manager
Hunter & Central Coast Region
Department of Planning and Infrastructure

Delegate of the Minister for Planning and Infrastructure

Appendix 7

Indigenous and Non Indigenous Heritage

HLA Envirosciences Pty Limited, (2002) Muswellbrook Coal Company Ltd. *No 1 Open Cut Extension; Environmental Impact Statement.* Section 3 pp 36-45.

3.16 Indigenous and Non-Indigenous Heritage

An Indigenous and Non-Indigenous Heritage Assessment was completed for the proposed No. 1 Open Cut Extension area by HLA-Envirosciences Pty Limited. The survey team included members of the Upper Hunter Wonnarua Council, the Wanaruah Local Aboriginal Land Council and HLA-Envirosciences Pty Limited. This section provides a summary of these studies. The complete Indigenous and Non-Indigenous Heritage Assessment is included in **Appendix I.** Victor Perry of the Upper Hunter Wonnarua Council has prepared a Cultural Heritage Assessment to identify the concerns of the Aboriginal community regarding the development and this assessment is included in **Appendix J.**

The Indigenous and Non-Indigenous Heritage Assessment incorporated field surveys and a review of archaeological, historical and environmental information to place the proposed No. 1 Open Cut Extension in local context. The main aims of the study were:

- To identify and record the extent and nature of archaeological material of human occupation and land use within the limits of the No. 1 Open Cut Extension area;
- To identify areas of archaeological potential within the proposed No. 1 Open Cut Extension that may contain additional material evidence;
- To assess the significance of the archaeological resource identified;
- To consult with the relevant local Aboriginal communities;
- To assess the impacts of the proposed mine development on the known archaeological material within the proposed No. 1 Open Cut Extension and areas of archaeological potential;
- To provide details of any archaeological sites or relics in accordance with statutory requirements, specifically those of the NSW NPWS and the NSW Heritage Office; and
- To present recommendations for the management of and/or mitigation of development impact to the archaeological resource identified.

The survey recorded a total of eight Indigenous artefacts and two scarred trees. The No. 1 Open Cut Extension area has been subject to considerable disturbance, since European settlers arrived in the Hunter Valley in the 1820s. Disturbance has been caused by three main activities:

- Pastoral grazing;
- Domestic construction; and
- Coal mining.

Until 1944, pastoral activity was the dominant activity throughout the lease area. Pastoral grazing accelerates natural erosion rates and has been known to impact on and destroy archaeological material

The construction of, at least, two domestic residences has also impacted on the proposed No. 1 Open Cut Extension area. Both structures have access roads (high-level, localised disturbance), that required the clearance of native vegetation (low-scale, generalized disturbance).

Areas within the proposed No. 1 Open Cut Extension have been subject to both underground and open cut mining and associated infrastructure. Extension A has experienced a number of impacts from subsidence of underground workings. Any archaeological materials once contained within this area have most likely experienced post-depositional movement, by either falling into the underground workings or from the movement associated with subsidence. Essentially, subsidence impacts within the proposed No. 1 Open Cut Extension are contained within the subsidence exclusion zone currently defined by MCC and illustrated by **Figure 3.16.**

Areas that have experienced open cut mining have resulted in the destruction of any archaeological sites. Additionally, the associated mining activity has led to the construction of a number of access roads within the area, most notably the Coal Road. **Figure 3.17** shows disturbance to the No. 1 Open Cut Extension area mapped according to zones as described in **Table 3.15.**

TABLE 3.15
ZONES OF DISTURBANCE
NO. 1 OPEN CUT EXTENSION

Disturbance Zone	Description (as relating to the proposed No. 1 Open Cut Extension)
High	Areas which have been mined currently or in the past. Sites or areas of archaeological potential in this zone would be destroyed.
Moderate-High	This zone contains the subsidence exclusion area where parts of the surface soils have already collapsed due to mining underneath. Although some of the surface is intact, its structure is unstable due to this area being thoroughly mined beneath.
Moderate	During the field survey, areas of moderate disturbance were determined as being those of high erosion, construction areas and those disturbed to a lesser extent from mining and pastoralism.
Low	There were no almost or completely undisturbed areas noticed during the survey of the proposed No. 1 Open Cut Extension.

Four landform units (LFUs) were defined as occurring within the study area, based on morphological type, slope, dimensions and geomorphological agents of landform elements throughout the study area. LFUs are used in archaeological surveys to divide the landscape into standardised elements that can be used for comparative analyses. The four LFUs used in assessing the No. 1 Open Cut Extension are illustrated in **Figure 3.18.**

A total of 31 intensive pedestrian survey units or archaeological survey units (ASU) were conducted across the proposed No. 1 Open Cut Extension area. The ASU are illustrated in **Figure 3.19**.

3.16.1 Indigenous Heritage

A total of four sites were located during the field survey of the proposed No. 1. Open Cut Extension area. **Table 3.16** identifies the recorded sites, site type and positioning within the proposed No. 1 Open Cut Extension. Site locations are illustrated in **Figure 3.18**. Each site is discussed individually below.

TABLE 3.16
ARCHAEOLOGICAL SITE DESCRIPTIONS

SITE NO	SITE TYPE	ASU	LFU	AMGE	AMGN	DIMENSIONS	% EXPOSURE	% VISIBILITY	CONDITION / POTENTIAL
M1	Artefact Scatter	1	2	304327	6429316	3m by 3m	10	60	Highly disturbed.
M2	Isolated Find	2	2	304546	6429286	1m by 1m	30	70	Highly disturbed.
M3	Artefact Scatter	15	4	305006	6429742	2m by 2m	30	70	Highly disturbed.
M4	Artefact Scatter	13	1	305091	6429633	15m by 5m	20	60	Disturbed.
M5	Scarred Tree	1	2	304487	6429332	5m by 5m	15	60	Fair.
M6	Scarred Tree	5	4	304564	6429578	5m by 5m	30	60	Fair.

M-1: Artefact Scatter

This site was recorded in ASU 1 and in LFU 2 (hillslope). It consists of two stone artefacts - one silcrete flaked piece (3-4 cm) and one mudstone flaked piece (1-5cm) – located within a 3 m^2 area.

The site was located near the western limit of Extension A. The degree of slope at the site was approximately 1%, and the site was located approximately 80 m from a watercourse (LFU 4). The immediate area has been highly disturbed by previous geotechnical test pits, and the artefacts are obviously no longer in situ as they are located within a rectangular trench resulting from subsurface testing. This portion of the proposed No. 1 Open Cut Extension is currently utilised for grazing activity, which has accelerated the clearance of vegetation in this portion of the proposed No. 1 Open Cut Extension. As a result, much of the area is covered by a moderate to dense grass cover, with the only remnant vegetation more indicative of regrowth rather than native vegetation.

Although there is no surface indication of additional subsurface materials at this locality, the surrounding area is considered to be of moderate archaeological potential. As it is considered likely that the subsurface geotechnical testing exposed the recorded artefacts at this site, additional archaeological materials may be found in the subsurface context surrounding the site.

M-2: Isolated Find

This site was recorded in ASU 2 and in LFU 2 (hillslope). This site consists of a single artefact – one mudstone flaked piece (2-3 cm).

The site is located within a ridge crest, with the degree of slope less than 1%. The site is located near the borrow pit of the subsidence zone, where soil to the west of the mine subsidence exclusion zone has been removed to stabilize the collapsing earth. The artefact is directly associated with the spoil heap resulting from the excavation of the borrow pit, being on the fringes of the mound, and was most likely deposited here from the earthwork excavation. Vegetation surrounding the site has been essentially cleared, although there is a patch of regrowth vegetation to the northwest.

There is no surface indication of additional subsurface materials at this locality. Based on the high level of disturbance in this locality, the area is considered to be of low archaeological sensitivity as any materials located here have most likely been destroyed or severely damaged.

M-3: Artefact Scatter

This site was recorded in ASU 15 and in LFU 4 (lower order drainage channel). The site contains two artefacts – a silcrete flaked piece (2-3 cm) and a broken silcrete fragment (2-3 cm).

The artefacts are positioned on the edge of the drainage cutting, atop the steep sidewalls of the channel. The area surrounding the site is therefore very disturbed, being contained within a drainage channel cut into the hillslope. It is likely that the artefacts were deposited in their current location through post-depositional movement, specifically through the movement from the upper hillslope areas through water movement (sheetwash erosion).

There is no surface indication of additional subsurface materials at this locality. Based on the high level of disturbance in this locality, the area is considered to be of low archaeological sensitivity as any materials located here have most likely been destroyed or severely damaged. However, the artefacts located are considered to be indicative of land use of the upper hillslope and ridge landform units, which are defined to be of moderate archaeological sensitivity.

M-4: Artefact Scatter

This site was recorded in ASU 13 and in LFU 1 (ridge crest). This site contains three artefacts - 1 mudstone flake (2-3 cm), 1 mudstone flaked portion (2-3 cm) and 1 silcrete flaked piece (1-2 cm).

The site is located within the limits of a vehicle access track to the north of Bimbadeen homestead, on a ridge crest with a degree of slope less than 1%. The original vegetation of the crest has been wholly cleared for the construction of a nearby domestic structure and for the access track that passes through the site. This construction activity has left the site highly disturbed, and accordingly, visibility within the track is quite high (80%). This visibility is only reduced by a light grass cover and by localised patches underlying conglomerate pebbles, exposed by the construction of the road. Beyond the cleared limits of the vehicle access track, a moderate to dense grass cover covers the crest and reduces general visibility to below 20%.

There is no surface indication of additional subsurface materials at this locality. Based on the high level of disturbance due to the local construction (vehicle access track, associated domestic structure) in this locality, this area of the ridge crest is considered to be of low archaeological sensitivity. However, the artefacts located are considered to be indicative of land use of this ridge crest, and areas beyond this central area of disturbance are considered to be of moderate archaeological sensitivity.

M-5: Scarred Tree

This site was recorded in ASU 1 and in LFU 2 (hillslope). The site is located within Extension A of the study area on a gently inclined hillslope (2% degree of slope). The original vegetation of the area has been predominantly cleared for the pastoral and mining use of the land. A large gully passes approximately 20 m to the east of the tree, constructed to funnel the drainage of excess construction into the nearby small dam. Visibility surrounding the tree is moderate to low, with the dense grass cover of the area the primary constraint. Exposures in this area are approximately 15%, with visibility within those exposures approximately 60%.

The tree is a large gum, approximately 25m high in total. The trunk forks approximately 150 cm from the ground into two main branches, from which there are numerous smaller branches. One scar was identified on the main east branch of the trunk. The scar is located on the northern face of the trunk and is elliptical in shape, tapering at the top and base of the scar. It is located 173 cm above ground level, and its dimensions are:

- 195 cm high;
- 15 cm wide; and
- 7 cm in depth.

There has been some minor damage to the base of the scar, resulting from the weathering of the bark. No associated archaeological materials were identified in the immediate area.

Additionally, the health of the tree appears to have been negatively affected by subsidence, with heat from underground spontaneous combustion emerging from cracking. However, subsequent discussions with an arboreal specialist indicated that the tree requires professional assessment to determine the status of its health and its' chance of regrowth.

M-6: Scarred Tree

This site was recorded in ASU 5 and in LFU 4 (lower order stream). The site is essentially positioned on the boundary of the study area within Extension A, being found approximately 40 m from the wall of a large dam. The tree is the only remaining vegetation within a small fenced paddock at this location, with the surrounding vegetation wholly cleared. This has increased average visibility surrounding the tree to approximately 30%, although the moderate grass cover of the paddock is the primary restraining factor to visibility.

The tree is large Ironbark, approximately 30 m high in total. The trunk forks approximately 15 m from the ground into a number of smaller branches. Two scars were identified on the main trunk of the tree, positioned one above the other in a vertical line on its' eastern face. Approximately 50 cm separates the two scars. The dimensions for the scars are as follow:

Scar 1 (base scar):	130 cm above ground
	122 cm total length
	23 cm total width
	6.5 cm deep
Scar 2 (top scar):	340 cm above ground
	110 cm total length
	20 cm total width
	Depth unknown

Both scars are elliptical in shape, tapering at the top and base of the scars. Both have minor bark damage around the scar, from the natural weathering of the tree. The area of damage for each scar is approximately 80 cm for Scar 1 (below base of scar) and approximately 60 cm for Scar 2 (below base of scar). The tree was dead at the time of survey.

No associated archaeological materials were identified in the immediate area.

Table 3.17 presents a summary of the material recorded in all sites.

TABLE 3.18
SIGNIFICANCE ASSESSMENT
MCC

Site	Site Type	Representative-ness	Integrity / Condition	Research Potential	Overall Significance
M-1	Artefact Scatter	Representative	*Poor.* Disturbed by grazing and geotechnical test-pit. Likely post-depositional movement.	*Moderate.* Small surface assemblage. Potential for sub-surface deposit.	Low
M-2	Isolated Find	Representative	*Very poor.* Very disturbed by earthworks. Likely post-depositional movement.	*Low.* Isolated Find with no indication of sub-surface deposit.	Low
M-3	Artefact Scatter	Representative	*Poor.* Disturbed by grazing and vehicles.	*Low.* Small surface assemblage. No indication of sub-surface deposit.	Low
M-4	Artefact Scatter	Representative	*Poor.* Disturbed by drainage channel construction and erosion.	*Low.* Small surface assemblage. No indication of sub-surface deposit.	Low
M-5	Scarred Tree	Rare	*Fair.* Tree potentially dead in current position.	*Moderate.* Tree	Moderate
M-6	Scarred Tree	Rare	*Fair.* Tree potentially dead in current position.	*Moderate.* Tree	Moderate

3.16.3 Non Indigenous Heritage Assessment

No. 1 Open Cut Extension Study Area

Three non-Indigenous items of potential heritage significance were observed during the field survey, as identified below:

- Domestic Structure,
- Road and Culvert, and
- Stockyards.

Analysis of the fabrics utilised in their construction as the construction techniques indicated that these items may have been over 50 years in age, and therefore classified as relics under Section 139 of the NSW *Heritage Act* (1977 as amended 1998).

However, subsequent historical research indicated that none of the above items were over 50 years in age, as they all dated to Alan Cowley's occupation of the land (post-1954). The below history is derived from oral sources within Muswellbrook.

This section of the study area was originally part of a 3000 acre holding that extended from Muscle Creek Road across the ridge line of the study area. It also included the Bimbadeen Homestead. This land was owned by the Bowman family, who subdivided it in 1954 for sale. At this time, Cowley bought this section of land and within two years had constructed a stockman's hut (slab construction, corrugated iron roof) and a nearby stockyards. These two items were observed during the survey. The road and culvert items also noted during the survey post-date the construction of the stockman's hut, and most likely date to the 1960s.

As none of the above items are over 50 years in age, they will no longer be considered in this assessment.

Muswellbrook Brickworks

The Muswellbrook Brickworks are located to the northwest of the study area, removed from the MCC proposed development area by approximately 400m. They are accessed from Coal Road, to the west of the study area.

The Brickworks reportedly date to 1949, when it was established by Muswellbrook Industries to exploit the clay deposits of the Muswellbrook Coal Company open cut mine. The kilns have a total capacity of 180,000 bricks. The Brickworks were briefly closed in 1975, but were then reopened by O.J. O'Brien. The original fabric of the Brickworks has remained intact since its construction, including the three draft kilns and associated timber buildings. However, the conditions of the kilns have been described as requiring some repair to the roofs. The Brickworks also have several brick presses dating to the 1860s, which were imported from England. At the time of the 1996 MSC Heritage Study these machines were being restored for the production of bricks for heritage buildings that were built with these bricks.

When the 1996 recording of the item was made, the Brickworks were still operational, with three of the draft kilns actively firing coal. The Brickworks ceased operation in late 1997 (Mark Howes, pers. comm.).

The historic themes identified in the heritage assessment of the Brickworks are: Booms and Busts, Industrialisation and Decentralisation, and Technology. The Brickworks also reflect on the local themes of: The Economic Cycle of Muswellbrook, Coal Mining in the Muswellbrook District, and The Manufacture of Bricks in the Muswellbrook Area.

Appendix 8
Flora and Fauna Assessment

HLA Envirosciences Pty Limited, (2002) Muswellbrook Coal Company Ltd. *No 1 Open Cut Extension; Environmental Impact Statement.* Section 3 pp 36-45.

3.3.3 Rainfall

The annual average rainfall recorded at Jerry's Plains is 640 mm occurring on an average of 86 days. The highest rainfall levels at Jerry's Plains were recorded during January with an average of 79 mm and August recorded the lowest average rainfall with 37 mm.

Rainfall in the Muswellbrook district has a low reliability and is highly variable for any one month. Short periods of sustained heavy rainfall occur periodically in the Hunter Valley, which can be attributable to the tail end of a cyclone passing down the east coast of Australia or from a stationary low pressure trough in the region.

3.3.4 Wind

The typical seasonal wind pattern for the Hunter Valley is dominated by southerlies and south easterlies during summer and more intense north westerlies in winter. Windroses produced from data collected as part of the Air Quality Impact Assessment produced by Holmes Air Sciences are shown in **Figure 3.1**.

3.3.5 Inversions

Temperature inversions occur when relatively dense, cool air bodies are trapped below warmer, lighter air masses. Inversions typically represent still wind conditions at the surface and the air bodies do not readily mix. An inversion inhibits the dispersion of dust and gases, tending to cause higher concentrations at ground level. An inversion can also effectively "trap" sound energy near the ground and lead to an increase in noise levels. Inversions tend to be more prevalent in winter, during cold still nights, and can persist until 11.00 am. Mild temperature inversions are likely to occur on greater than 25% of mornings and evenings in winter.

3.4 Flora and Fauna Habitat

An assessment of flora and fauna was completed for the proposed No. 1 Open Cut Extension by HLA-Envirosciences Pty Limited. This section provides a summary of the flora and fauna assessment. The complete flora and fauna assessment is provided in **Appendix F**.

The flora and fauna assessment incorporated field studies and the results of ecological studies undertaken previously in the Muswellbrook area. This assessment has been prepared in accordance with the requirements of Section 5A of the *EP&A Act 1979*; and the Director-General's Requirements issued by planningNSW. The assessment also considered the legislative aspects of the *Threatened Species Conservation (TSC) Act 1995*, *SEPP No. 44 – Koala Habitat Protection*, and the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

The main objectives of the assessment were:

- To identify the flora and vegetation communities;

- To identify fauna and their habitats;
- Complete targeted surveys for threatened species, populations, ecological communities and critical habitat;
- Review survey findings in accordance with existing legislation; and
- Assess the potential impact of the proposed development in accordance with Section 5A of the *EP&A Act* 1979, *TSC Act* 1995 and *EPBC Act* 1999.

This study failed to identify species of threatened flora during past or the present field investigations. Two threatened fauna species were detected being the Grey-crowned Babbler (Vulnerable) and Eastern False Pipistrelle (Vulnerable). An assessment pursuant to Section 5A of the *EP&A Act 1979* found that there will be no significant impact on threatened species or their habitat either locally or for the Sydney Bioregion.

The majority of the proposed No. 1 Open Cut Extension is extensively altered from its natural state through past agricultural activity and current mining operations. Impacts associated with European occupation include land clearing, pasture improvement and the grazing of cattle. Scattered throughout this landscape are remnants of native vegetation including grassland and dry sclerophyll open woodland (HLA 1998). No critical habitat mapped under the *TSC Act 1995* was identified within the study area.

3.4.1 Flora Assessment

A total of 157 species were identified during the flora survey, which included 106 native and 51 exotic species. A detailed list of flora species identified within the proposed No. 1 Open Cut Extension is provided in **Appendix F**. The proposed No. 1 Open Cut Extension was categorised into five separate flora communities as described below. The locations of the flora communities are shown in **Figure 3.2**.

Rehabilitated Grasslands / Forest

The Rehabilitated Grasslands/Forest flora community has been established throughout the overburden emplacement areas to prevent erosion, improve scenic amenity and restore past land use. To a large extent, this flora community has been created through deliberate plantings of specific grass and tree species, which are capable of withstanding this environment. The Rehabilitated Grasslands/Forest flora community is a grassland - shrubland complex characterised by open expanses of grassland throughout isolated open to dense shrubs which grow to a maximum height of 10 m. This community is restricted to the eastern and western limits of the proposed No. 1 Open Cut Extension and has been artificially created through deliberate plantings and ongoing management. Grazing by the rabbit, feral goat and Eastern Grey Kangaroo is also evident.

Red Gum - Rough-barked Apple Open Forest

The Red Gum - Rough-barked Apple Open Forest flora community is restricted in its occurrence to an isolated remnant within the central western portion of the proposed No. 1 Open Cut Extension. It is characterised by a mixture of grasses and shrubs which grow to a maximum height of 3.5 m. Much of the tree canopy is even-aged suggesting past clearing activities, however regeneration is well advanced and may be resultant from natural rehabilitation. Approximately 3% of the ground's surface within this area is characterised by natural bush rock (sandstone-conglomerate).
Approximately 40% of this community was subject to disturbance including power line maintenance and grazing pressure from feral goats, rabbits and kangaroos.

Narrow-leaved Ironbark Woodland

The Narrow-leaved Ironbark Woodland is the most common flora community occurring throughout moderately flat to steeply sided slopes, within the central and western sections of the proposed No. 1 Open Cut Extension. This flora community has been allowed to persist and naturally regenerate. The Narrow-leaved Ironbark Woodland flora community is a eucalypt - grassland complex characterised by a sparse to open canopy of Narrow-leaved Ironbark, with a well-developed grass - herb understorey amid isolated dense shrub growths.

This community has experienced a range of human induced impacts including selective logging, clearing for agriculture, cattle grazing, subsidence, minor gully erosion and grazing by kangaroos and exotic species such as rabbits and feral goats.

Grassland

The Grassland flora community is representative of a regenerating agricultural landscape that has been excluded from intensive grazing for a number of years. The Grassland community is characterised by an open expanse of grasses and non-woody forbs. The area is void of any trees or shrubs. This community dominates the majority of the western and central portions of the proposed No. 1 Open Cut Extension. Natural regeneration within this community appears to be ongoing due to the absence of cattle grazing and other significant human related impacts. These impacts including selective logging, clearing for agriculture, cattle grazing, subsidence, minor gully erosion and small mammal grazing by kangaroo and exotic species including the rabbit and feral goat.

Aquatic Forbland

The Aquatic Forbland flora community is restricted to open water bodies such as dams and can vary substantially in structure and diversity. This flora community is characterised by either an emergent growth of Cumbungi or submerged growth of Blunt Pondweed, however neither species co-exist within the same environment. Minor salinity may be present within these water bodies, as evidenced by a high-water mark stained by an unknown white compound.

3.4.2 Fauna Assessment

Fauna surveys were conducted within each flora community identified in **Section 3.4.1**. The location where particular fauna survey techniques were employed is illustrated in **Figure 3.3**. These fauna studies found a total of 76 vertebrate fauna species during field investigations. A complete list of fauna species, identified within each flora community, is listed in **Appendix F**.

The most common taxonomic group found were avifauna species, of which 50 species were observed, including two exotic species. Other taxonomic groups observed within the proposed No. 1 Open Cut Extension include reptiles (total of 10 species), mammals (total of 13 species) and amphibians (total of three species).

Birds

Most of the avifauna observed within the proposed No. 1 Open Cut Extension was recorded from the Woodland flora communities. Ecological specialists, including ducks, grebes, herons and other waterfowl were mostly restricted to the aquatic habitats of the proposed No. 1 Open Cut Extension. Exceptions include the common Wood Duck, which was occasionally observed foraging around the Bimbadeen homestead and other suitable foraging grounds.

Nesting activity was evident within the woodlands of the proposed No. 1 Open Cut Extension, including species such as the Currawong, Grey Butcher Bird, Variegated Fairy Wren, White-winged Cough, Spur-winged Plover and Grey-crowned Babbler.

Noisy Friarbirds were observed in the Narrow-leaved Ironbark Woodland flora community. Large numbers of Eastern Rosellas were observed foraging in grasslands. Corellas and Sulphur-crested Cockatoos were also observed as dusk approached.

Mammals

A number of native mammals were observed within the proposed No. 1 Open Cut Extension including the Eastern Grey Kangaroo, Yellow-footed Antechinus, Common Dunnart, Brush-tailed Possum and Echidna. The Eastern Grey Kangaroo was considered to be the most abundant native mammal species and was frequently observed foraging in both the woodlands and grasslands of the proposed No. 1 Open Cut Extension.

Introduced Mammals

Introduced mammal fauna were also observed including the European Rabbit, Feral Goat, Feral Cat and European Fox. Grazing pressure and territory usage by the European Rabbit and Feral Goat have substantially affected selected areas throughout the western section of the proposed No. 1 Open Cut Extension including the Grassland and Woodland flora communities. Predation by the Feral Cat and European Fox was not quantitatively assessed within this study. However, it is considered that this ecological aspect is having a negative impact on the site's native and exotic faunal populations due to the relative low abundance of small to medium sized mammals.

Reptiles

The field survey identified the presence of a number of reptile species. The two most common reptile species encountered were *Egernia modesta* and *Egernia striolata.* Other reptiles observed include the Southern Rainbow Skink (*Carlia tetradactyla), Anomalous leuckartii,* Thick-tailed Gecko (*Underwoodisaurus milii),* and the Robust Velvet Gecko (*Oedura robusta).*

Amphibians

Target surveys for amphibians resulted in the identification of three species. The Dwarf Green Tree Frog, Green Tree Frog and Peron's Tree Frog were heard vocalising during humid, wet conditions.

3.4.3 Threatened Species, Populations and Ecological Communities

To assess the likelihood of threatened species of the proposed No. 1 Open Cut Extension, several habitat assessments were undertaken. The *Wildlife Atlas* database (NPWS, 2001), was consulted to acquire any potential occurrence of threatened flora in a 10 km radius of the locality. This method resulted in the identification of 2 threatened flora species and 14 fauna species requiring further investigation to assess whether a section 5A assessment (eight part test) is required. These threatened species are listed in **Table 3.2.**

Eight part tests were conducted for vulnerable species where indicated in **Table 3.2.** An eight part test considers a number of factors to determine if a proposed development will have a significant effect upon the environment of threatened fauna and flora. The results of the eight part tests are detailed in **Appendix F** and any impact on flora and fauna are outlined in **Section 6.2.**

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TABLE 3.2
THREATENED SPECIES SUMMARY AND ASSESSMENT REQUIREMENTS
MCC

Species	Conservation Status		Is a Section 5A Assessment Required? (Eight Part-Test)
	TSC Act 1995	*EPBC Act 1999*	
Flora			
Bothriochloa biloba	Vulnerable	Vulnerable	Yes
Olearia cordata	Vulnerable	Vulnerable	No
Fauna			
Green and Golden Bell Frog	Endangered	Vulnerable	Yes
Freckled Duck	Vulnerable	Migratory	No
Square-tailed Kite	Vulnerable	Migratory	Yes
Regent Honeyeater	Endangered	Endangered	No
Grey-crowned Babbler	Vulnerable	-	Yes
Spotted-tailed Quoll	Vulnerable	Vulnerable	Yes
Koala	Vulnerable	-	No
Large-eared Pied Bat	Vulnerable	-	Yes
Eastern False Pipistrelle	Vulnerable	-	Yes
Eastern Little Mastiff Bat	Vulnerable	-	Yes
Little Bent-wing Bat	Vulnerable	-	Yes
Common Bent-wing Bat	Vulnerable	-	Yes
Large-footed Myotis	Vulnerable	-	Yes
Greater Broad-nosed Bat	Vulnerable	-	Yes

3.4.4 SEPP 44 – Koala Habitat Protection

The proposed No. 1 Open Cut Extension was assessed for koala activity and habitat during the fauna survey. No evidence of recent koala activity within close proximity to the proposed No. 1 Open Cut Extension was evident. Given that the evidence collected during the field and desktop survey clearly indicate that there are no current koala populations utilising the proposed No. 1 Open Cut Extension as foraging or core habitat, it is considered that there are no requirements of MCC to provide a koala management plan.

Appendix 9
Groundwater Monitoring

Quadro, Australia Pty Ltd (2011), *Environmental Management Plan; Muswellbrook Waste Management Facility.*

The Loader Coal Seam immediately overlies the basement bedrock. The stratum dips approximately 10° to the north west and the coal seams are interbedded with fine grained sandstones and siltstones with the occasional intermediate volcanics.

Previous investigations suggested that faulting is to be anticipated throughout the stratum and that paleosoils development is indicated over the basement rock.

These investigations encountered bedrock at a depth of between 6m and 12m below the original ground level.

2.7.2.2 Site Soils

Investigations undertaken in the 1980's, and subsequent experience on site, confirmed a shallow soil layer comprised of clays, sandy clays and shales overlies the underlying stratum.

2.7.3 Surface and Ground Water

2.7.3.1 Surface Water

A number of minor ephemeral drainage lines radiate from the ridge located to the south of Lot 1 within Muswellbrook Common. These have been diverted around the Facility as part of the diversion of Coal Road and the construction of the Facility.

Sandy Creek, the nearest permanent stream, is located approximately 2.5km to the north of Lot 1.

Surface water falling within the Facility, but outside the landfill, is diverted to the sedimentation ponds located at the western end of the Facility or drains in a north easterly direction towards the abandoned No. 1 Open Cut void (see Figure 2.1).

Water which drains into this void is either lost by evaporation or by infiltration into the groundwater system as the void has no overland flow outlet.

Rainfall falling on the operational landfill is absorbed into the landfill as there are currently no facilities within the landfill void to collect the stormwater and pump it to sedimentation ponds.

2.7.3.2 Ground water

Ground water within the Greta Coal Measures is reported to occur mainly in the secondary fractures and aquifers in the coal seam due to their partial confinement.

The original EIS for the Facility prepared by Patterson Britton & Partners in 1990 indicated that:

> *"The groundwater within the Greta Coal Measures is reported to occur mainly in the secondary fractures and the main water bearing zones, or aquifers, are the coal seams. The interburden and overburden have partially confined the coal seams such that the aquifers are confined.*
>
> *Measures of water levels undertaken as part of a study of mine water makes for the Muswellbrook Coal Company (9) indicated that the regional groundwater flow was away from the elevated subcrop towards the North-West. The then existing Muswellbrook mine was reported to be making 0.5 megalitres per day.*
>
> *Monitoring of the groundwater for three years during mining showed a 10m to 15m decline in water level within 100m to 150m of the mine edge, decreasing to 5m to 10m at 500m from the edge of the pit. This sharp cone of depression of the groundwater table adjacent to the mine was confirmed by the mine geologist during the geotechnical inspection where workings in the current pit at a depth of 150m showed the sharp cone of influence encountered within blasting holes adjacent to the mine face.*
>
> *The existing groundwater flow is expected to be away from the proposed pit into the adjacent backfilled No. 1 Open Cut, some 30m north of the site. From there it should flow along the filled void and enter into the abandoned No. 1 Open Cut through spoil dumped in the western end of the No. 1 working. Once in the No. 1 Open Cut void it will make its way towards the collection*

pond where it will be used for dust suppression or lost by evaporation or infiltration into the No. 1 workings and workings further to the north.

Further evidence that the free groundwater level has been lowered in the vicinity of the site is given by the fact no free groundwater was encountered during the drilling of the exploratory boreholes by the Muswellbrook Coal Company."

Groundwater depth monitoring has been undertaken in a series of groundwater monitoring wells (MW) around the perimeter of the Facility.

These four (4) MW are located:

MW 1. Adjacent to the entry facilities and the southern fenceline of the site.

MW 2. Adjacent to the south east corner of the landfill

MW 3. On the northern border of the site

MW 4. Adjacent to the western extremity of the landfill

Monitoring of the depth of the groundwater in these MW has been carried out since June 2004. The results of this monitoring is detailed in Table 2.1.

Table 2.1 Groundwater Depth Monitoring

Date	Depth to Groundwater (m)			
	MW 1	MW 2	MW 3	MW 4
June 2004	Dry	18.87	26.18	32.9
November 2006	Dry	Dry	Dry	33.08
February 2007	Dry	Dry	Dry	32.08
September 2007	Dry	Dry	Vandalised	Not Recorded
November 2007	Dry	Dry	Vandalised	32.6
February 2008	Dry	Dry	Vandalised	32.65
May 2008	Dry	Dry	Vandalised	32.55
August 2008	Dry	Dry	Vandalised	32.9
January 2009	Dry	Dry	Vandalised	33.5
May 2009	Dry	Dry	Vandalised	33.13
September 2009	Dry	Dry	Vandalised	24.0
November 2009	Dry	Dry	Vandalised	35.0
May 2010	Dry	Dry	Vandalised	34.0
August 2010	Dry	Dry	Vandalised	32.8

The groundwater depths recorded during this period, would seem to provide further evidence that the free groundwater level has been lowered in the vicinity of the site by mining operations.

2.7.4 Local Meteorology

Muswellbrook (Lower Hill Street) is the nearest local weather station (Station 061053) and has been recording rainfall data since 1870, however, there is no temperature data available from this station.

The nearest documented weather station for which temperature data is available is Scone SCS (Station 061089). Data from this station commenced in 1950.

Appendix 10

Indicative Location Map of Groundwater and Surface Water Infrastructure.

GHD, (2013).

Plot Date: 25 November 2013 - 8:38 AM Plotted by: Craig Davies

Cad File No: N:\AU\Tuggerah\Projects\22\16877\CAD\Drawings\22-16877-SK001.dwg

PRELIMINARY

C	ISSUE TO CLIENT	DMB	25.11.13
B	ISSUE TO CLIENT	DMB	15.11.13
rev	description	app'd	date

MUSWELLBROOK SHIRE COUNCIL

PROPOSED EXTENSION AREA

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