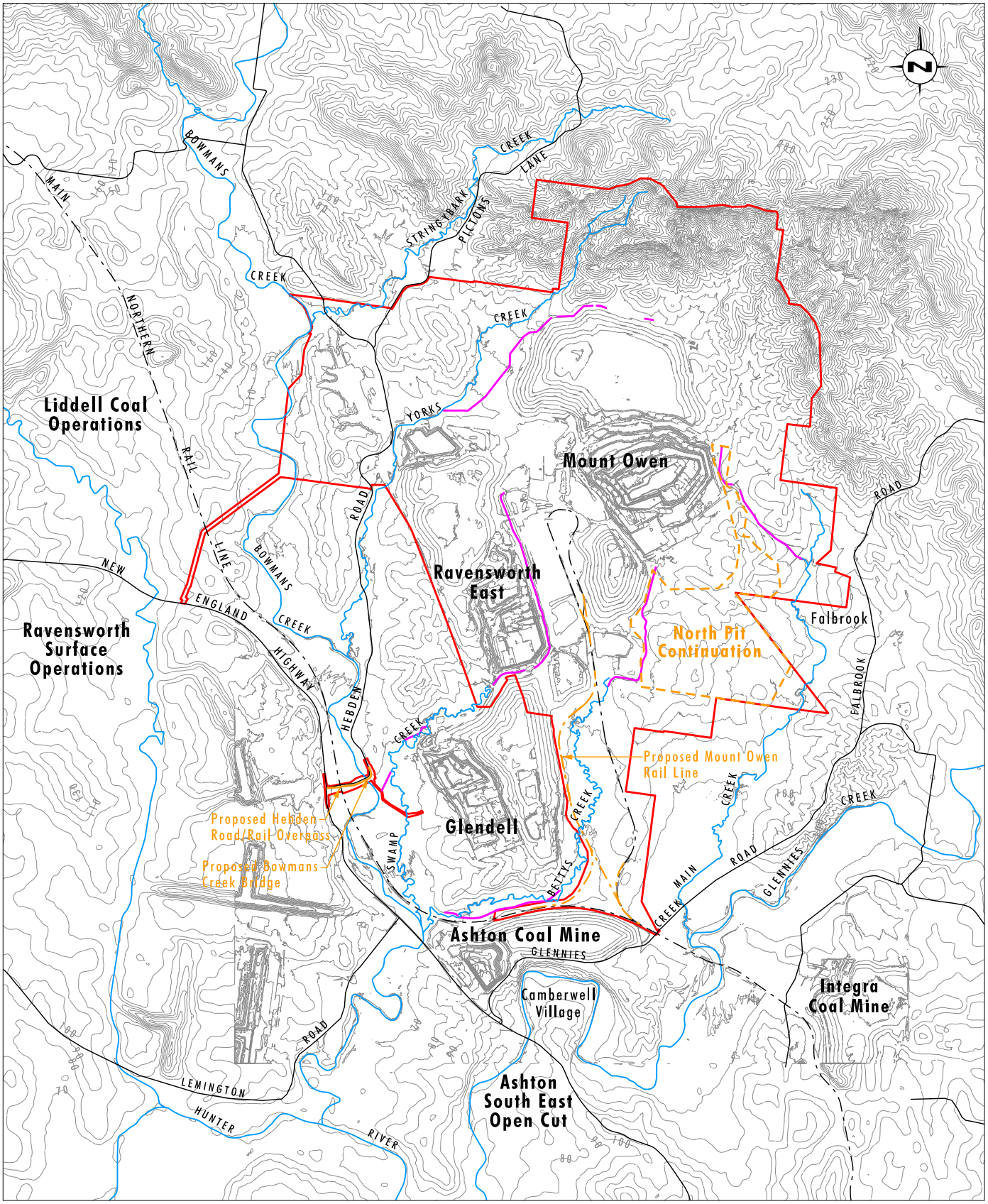


Data Source: Mount Owen (2014), Department of Lands (2006)
Note: Contour Interval 10m

Legend

- Project Area
- Proposed North Pit Continuation
- Rail Upgrade Works
- Hebden Road Upgrade Works
- Drainage Line
- Diversion Drainage Line

FIGURE 1.7

Topography of Mount Owen Complex and Surrounds

1.4 Overview of the Planning and Approval Process

The Project is State significant development as defined by the provisions of the *State Environmental Planning Policy (State and Regional Development) 2011* and requires development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Minister for Planning is the consent authority for the Project.

If development consent is granted under Part 4 of the EP&A Act, various other approvals, licences and permits under other relevant NSW legislation will also be required. Further details on the planning and approval process are provided in **Section 3.0**.

The Project seeks to provide for a single approval that incorporates all of the existing and future mining activities within the Mount Owen and Ravensworth East Mines. The existing Mount Owen and Ravensworth East Mine development consents are proposed to be surrendered within two years of Project Approval, subject to an appropriate development consent being granted to provide for the Project.

1.5 Environmental Assessment of the Project

This EIS has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of Mount Owen in accordance with the EP&A Act and particularly the Director-General's requirements (DGRs) for the Project issued by the DP&E on 13 March 2013.

The DGRs outline the specific requirements to be addressed by this EIS. A copy of the DGRs is provided in **Appendix 1**. A checklist of the DGRs and where they have been addressed in the EIS is provided in **Section 3.2.1.2**.

The Project was also declared a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 24 October 2013. The decision notice from the DoE indicated that the assessment approach would be via Accredited Assessment. On 8 November 2013, supplementary DGRs were provided specifically relating to Matters of National Environmental Significance (MNES), refer to **Appendix 1**.

1.6 The Applicant

The Mount Owen and Ravensworth East Mines and all associated infrastructure are owned and managed by Mount Owen Pty Ltd (Mount Owen) a subsidiary of Glencore Coal Pty Limited. The applicant for this Project is Mount Owen Pty Limited (Mount Owen). Since issuing of the DGRs, Xstrata plc (Xstrata), the major shareholder in Mount Owen, has merged with Glencore plc creating Glencore Xstrata plc (Glencore). The applicant for the development application remains unchanged however, and references to Xstrata in the DGRs and sections of the EIS should be read as references to Glencore.

The Project Area is shown on **Figure 1.4** and a schedule of lands within the Project Area is included as **Appendix 2**.

1.7 Working with the Community and Stakeholders

Mount Owen is committed to maintaining ongoing open and honest communication by actively engaging and consulting with the surrounding community to provide information relating to the environmental, social and operational performance of the existing operations. Mount Owen has an established communication program which includes community meetings, the distribution of community information sheets and a 24-hour community response line for community members to raise any concerns they may have directly with relevant personnel. The Mount Owen Complex also has a Community Consultative Committee (CCC) which operates as a more formal mechanism for feedback between Mount Owen and the community.

Mount Owen has regularly met with Singleton Council, through the Coal Advisory Committee, to discuss the Project in detail and provide an update on the outcome of the environmental studies as results became available, and to receive feedback on potential impacts and proposed management and mitigation measures.

As discussed in **Section 4.0**, extensive Project specific consultation and engagement has also been undertaken with the community. This engagement included face to face meetings, community open days (the first held on 19 May 2013, the second held on 4 December 2013 and the third held over two days on 31st October and 1st November 2014). In addition updates have been provided via project specific newsletters and community information sheets (copies of the project specific newsletters and community information sheets are included in **Appendix 3**). Detailed stakeholder engagement was also undertaken as part of the social impact and opportunities assessment process for the Project (refer to **Section 4.0**).

The Project Area is located within the traditional lands of the Wonnarua people. Extensive consultation has been undertaken with 60 Registered Aboriginal Parties (RAPs), including three knowledge holder groups, being Wonnarua Traditional Custodians (WTC), Wonnarua Nation Aboriginal Corporation (WNAC) and the Plains Clans of the Wonnarua People (PCWP) as part of the Aboriginal Cultural Heritage and Aboriginal Archaeology Assessment process for the Project (refer to **Sections 4.0** and **5.9**).

The feedback and input obtained during these engagement processes has informed the development of the detailed design for the Project.

1.8 Project Team

This EIS has been prepared by Umwelt on behalf of Mount Owen. Studies contributing to and included in the EIS were undertaken by a number of technical specialists, including:

- Air Quality Impact Assessment (Pacific Environment 2014) – Pacific Environment Limited;
- Noise Impact Assessment (Umwelt 2014a) – Umwelt;
- Blast Impact Assessment (ESC 2014a) – Enviro Strata Consulting (ESC);
- Ecological Impact Assessment (Umwelt 2014b) – Umwelt;
- Surface Water Resources Assessment (Umwelt 2014c) – Umwelt;

- Site Water Balance (Umwelt 2014c) – Umwelt;
- Groundwater Impact Assessment (Jacobs 2014) – Jacobs (formerly Sinclair Knight Merz (SKM));
- Agricultural Impact Statement (Umwelt 2014d) – Umwelt;
- Aboriginal Cultural Heritage Assessment:
  - Australian Cultural Heritage Management (ACHM 2014) (Cultural Heritage);
  - OzArk Environmental and Heritage Management Pty Limited (Archaeology) (OzArk 2014);
- Social Impact and Opportunities Assessment (Umwelt 2014e) – Coakes Consulting and Umwelt;
- Historical Heritage Assessment (Umwelt 2014f) – Umwelt;
- Greenhouse Gas and Energy Assessment (Umwelt 2014g) – Umwelt;
- Traffic Impact Assessment (TAUP 2014) – Transport and Urban Planning (TAUP);
- Visual Impact Assessment – Umwelt;
- Economic Impact Assessment (DAE 2014) – Deloitte Access Economics (DAE); and
- Mine Closure and Rehabilitation Strategy (Umwelt 2014h) – Umwelt.

Further details of the Project Team are provided in **Appendix 2**.

1.9 Environmental Impact Statement Structure

The EIS has been prepared in accordance with the EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (refer to the EIS Statement of Authorship in **Appendix 2**). An overview of the structure of this EIS is provided below.

The **Executive Summary** provides a brief overview of the Project and the key outcomes of the EIS.

Section 1.0 introduces the Project, outlines the key objectives of the Project, provides a summary of the Project details and outlines the EIS Project team and the structure of this document.

Section 2.0 contains a detailed description of the Project, including existing and approved operations.

Section 3.0 outlines the planning context for the Project, including the applicability of State and Commonwealth legislation.

Section 4.0 describes the stakeholder consultation program and details the environmental and community issues identified for consideration in the EIS.

Section 5.0 contains a description of the existing environment and a comprehensive analysis and assessment of the EIS issues relevant to the Project, including the Project specific and cumulative impacts.

Section 6.0 includes a summary of the measures proposed to be adopted through the life of the Project in order to mitigate the impacts.

Section 7.0 summarises the key conclusions arising from the detailed environmental assessment. This section also provides the Project justification and demonstrates the Project outcomes with reference to the principles of Ecologically Sustainable Development (ESD).

Section 8.0 lists references cited in the EIS.

2.0 Description of Continued Operations

The Project provides for continued operations at Mount Owen and Ravensworth East Mines. The Project will allow for extraction of approximately an additional 92 Mt of ROM coal from proposed continued operations in a manner that optimises the use of existing infrastructure and provides for effective integration of Glencore's existing approved mining operations in this locality. This section describes the Project and in accordance with the DGRs includes:

- details of the existing and approved mining operations and infrastructure at the Mount Owen and Ravensworth East Mines (**Section 2.1**);
- details of the need for the Project (**Section 2.2**);
- a detailed description of the Project including the anticipated staging of construction and operational stages and rehabilitation (**Section 2.3**);
- proposed management of interactions with other mines, including Integra Underground Mine (currently on care and maintenance) (**Section 2.3.3**);
- alternatives considered, efficiency of resource recovery, mine safety, environmental protection and maintaining biodiversity offset obligations (**Section 2.5**); and
- consideration of opportunities for improved integration between the Mount Owen Complex and Glencore's existing approved mining operations in the region (**Section 2.3**).

2.1 Description of Existing and Approved Operations

The Mount Owen Complex includes the Mount Owen, Ravensworth East and Glendell Mines. The proposed Project includes continuation of the currently approved haulage of coal mined from the Glendell Mine through the Mount Owen Complex for processing at the Mount Owen Coal Handling and Preparation Plant (CHPP) and transportation from the site. No change is proposed to the existing approved Glendell Mine and it does not form part of the Project. This section provides an overview of the current approved mining operations at the Mount Owen and Ravensworth East Mines.

2.1.1 Development Consent History

2.1.1.1 Mount Owen Mine

Operations at the Mount Owen Mine commenced in 1993 pursuant to development consent (DA 63/91) granted in 1991, with an extraction limit of 1.4 Mtpa ROM coal. Subsequent development consents and modifications were granted to provide for extensions to the North Pit and / or allow an increase in the extraction limit. The approved extraction limit increased to 5.3 Mtpa (ROM coal) in 1994 and to 8 Mtpa (ROM coal) in 1999.

Mount Owen Mine currently operates pursuant to development consent DA 14-1-2004, which was granted in December 2004 and allowed for the continuation of open cut operations over a 17 to 21 year mine life with an increase in ROM coal production to 10 Mtpa. Following the approval of DA 14-1-2004 all previous consents for the Mount Owen Mine were surrendered.

DA 14-1-2004 included:

- continuation of open cut mining operations within an extended North Pit, increasing the approved extraction rate from 8 Mtpa to 10 Mtpa ROM coal;
- mining to depths of approximately 270 metres;
- construction and operation of a ROM coal receivable facility and haul road to enable the Mount Owen CHPP to continue to receive and process ROM coal from the Ravensworth East and Glendell mining operations;
- increase to the approved processing rate of the Mount Owen CHPP to 15 Mtpa ROM coal;
- increase to the approved capacity of the Mount Owen rail loading facility and rail line to 15 Mtpa ROM coal;
- development of the Eastern Rail Pit (ERP);
- development of an out of pit overburden emplacement area known as the Western Out of Pit emplacement area (WOOP);
- upgrade works to the coal stockpile, infrastructure area and the water management system;
- continued disposal of tailings from the Mount Owen CHPP in voids within Ravensworth East Mine; and
- modifications to the water management system, office buildings and other ancillary infrastructure.

DA 14-1-2004 has been the subject of two modifications, the first modification in 2010 allowed for the establishment of a rail provisioning facility installed on the existing Mount Owen Rail Line to service the Glencore Rail (previously X-Rail) trains. The rail provisioning facility included the construction of hydrocarbon and water storage tanks, sanding facility, maintenance gantry, an access road and ancillary mechanical and electrical equipment. The second modification submitted to DP&E in 2014 to seek an increase in throughput at the Mount Owen CHPP and rail load out facility from 15 to 17 Mtpa of ROM coal. This modification is required to realise the benefits of implementation of operational efficiencies (such as improved operating hours and input rate with the existing infrastructure) at the CHPP.

2.1.1.2 Ravensworth East

The Ravensworth East Mine, formerly known as the Swamp Creek Mine, has been operating since the 1960s. Ravensworth East Mine currently operates under DA 52-03-99 which originally allowed for the supply of coal to the domestic market through the transportation of ROM coal via conveyor to both the Bayswater and Liddell power stations. Subsequent modifications to DA 52-03-99 from 2000 to 2005 allowed for an increase of the approved extraction rate to 4 Mtpa ROM coal, the production of coal for the export market following processing at the Mount Owen CHPP and the emplacement of tailings from the Mount Owen CHPP within voids at Ravensworth East Mine. Ravensworth East Mine consists of the West Pit (currently operational), the formerly mined Stage 3 Pit, the RW Pit and two shallow pits

known as TP1 and TP2. TP1 has been used for tailings emplacement, whilst TP2 has been partially backfilled with overburden from the Glendell Mine.

Mount Owen anticipates that mining will commence within the BNP in approximately 2015 in accordance with the existing Ravensworth East DA (DA 52-03-99).

The current Ravensworth East (DA 52-03-99) and Mount Owen (DA 14-1-2004) approvals allow for the emplacement of tailings and rejects from the Mount Owen CHPP within the Eastern Rail Pit (ERP) and Raw Water (RW) Pit at Mount Owen Mine, and within the Ravensworth East voids (including the North Void Stage 1 and 2 (NVS1 and NVS2), Tailings Pit 1 (TP1) and West Pit).

2.1.1.3 Current Development Consents

There are two existing development consents for the Mount Owen and Ravensworth East Mines which are listed in **Table 2.1**. The existing approved development consent boundaries for the Mount Owen and Ravensworth East Mines are presented on **Figure 1.5**.

Table 2.1 – Existing Development Consents for Mount Owen and Ravensworth East Mines

Development Consent	Date Approved	Description	Approval Lapse Date	Modifications	Brief Description of Modification
DA 14-1-2004	8/12/2004	Mount Owen Open Cut Coal Mine	2025	1 – 2010	Construction and operation of the rail provisioning facility
				2 – 2014	Increased throughput at the Mount Owen CHPP and rail load out facility from 15 to 17 Mtpa of ROM coal.
DA 52-03-99	2/03/2000	Ravensworth East Open Cut Coal Mine	2021	1 – 2000	Diversion works to Hebden Road
				2 – 2003	Emplacement of tailings within the Stage 3 void
				3 – 2004	Transfer and processing of ROM coal from Ravensworth East to the Mount Owen CHPP for export and emplacement of tailings from Mount Owen CHPP within Ravensworth East voids
				4 – 2005	Integrated management and implementation of combined management processes across the Mount Owen Complex

2.1.2 Existing Mining Titles

Details of the existing mining titles, including coal leases (CLs), mining leases (MLs) and exploration authorisation (A), relevant to Mount Owen Complex are presented in **Table 2.2**. **Table 2.2** also presents both the approved areas and depths of each mining title. The existing mining titles are shown on **Figure 2.1**.

Table 2.2 – Mining Titles Relevant to the Mount Owen Complex

Lease No	Expiry Date	Area (ha)	Depth (m)
CL 383	12/11/2033	874	Surface to unlimited
ML 1355	27/07/2015 (renewal sought)	439.8	Surface to unlimited
ML 1419	12/11/2012 (renewal sought)	82.65	Surface to unlimited
CL 715	12/09/2019	82	Surface to unlimited
ML 1453	4/07/2020	140.3	Surface to unlimited
ML 1561	17/02/2026	160	Surface to 15.24
ML 1415	4/07/2020	1,557.6	Various*
ML 1475	24/11/2021	240.7	Surface to 15.24 m
ML 1476	24/11/2021	153.9	Surface to 15 m below floor of Bayswater Seam
ML 1694	22/10/2034	501.6	Varying
CL358	27/03/2032	747	Varying
CL382 (Sublease)	Transfer pending – awaiting renewal of head lease	65.2	Varying
ML1410	14/07/2020	52.99	Surface to 106.68
ML1608	19/12/2028	30.17	Surface to unlimited
MPL343	04/01/2026	442.1	Surface to 5
ML1629	09/03/2030	128.2	Surface to 15.24
AL08	10/07/2013 (renewal sought)	287.2	Surface to 15.24
A423	21/12/2015	555	Varying
A429	Renewed awaiting reissue	1,094	Surface to 900
A268	25/08/2016	252	Varying

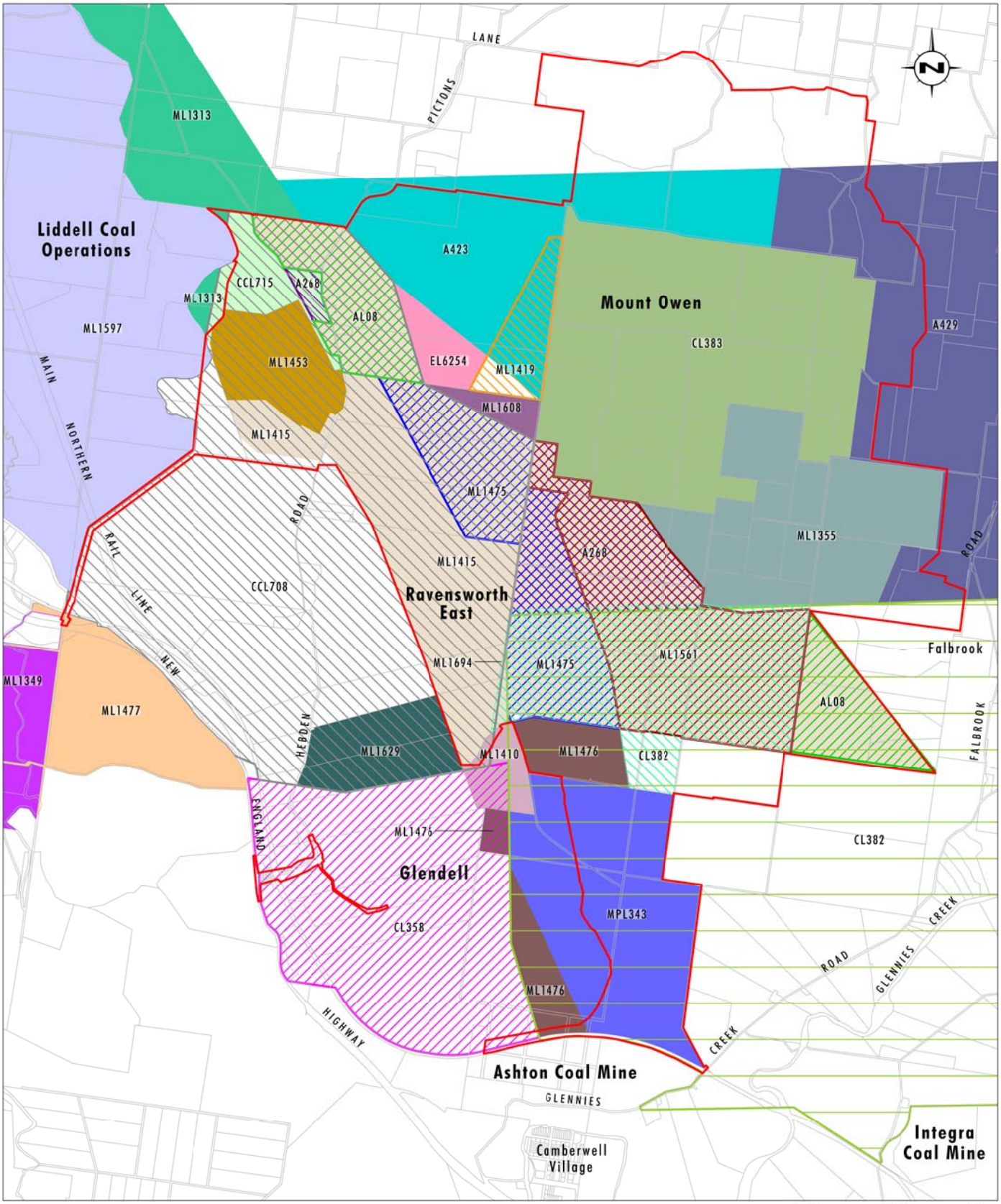
Note: *Encompasses the Stratum between the surface or 15.24 and 152.4- 243.84 metres from the surface.

No additional mining leases are required for the Project. AL08 will be transferred to a Mining Lease once the DA has been approved.

2.1.3 Existing Approved Mining Operations

2.1.3.1 Mount Owen Mine Existing Operations

The North Pit (refer to **Figure 1.3**) is currently operating as a multi-seam truck and excavator operation, with an approved ROM extraction rate of 10 Mtpa, mining to depths of approximately 270 metres down to the Lower Hebden coal seam. The sequence of mining involves the clearing of vegetation and topsoil followed by drilling and blasting of overburden and then the excavation and haulage of overburden to emplacement areas and ROM coal to the Mount Owen CHPP for processing. Product coal is then loaded onto trains using the rail loading facility.



Data Source: Mount Owen (2014), Department of Lands (2009)

0 1.0 2.0 3km
1:60 000

Legend

Project Area	CL715	ML1349	ML1475	ML1629
AL08	CL358	ML1355	ML1476	ML1694
A423	CL382	ML1410	ML1477	MPL343
A268	CL383	ML1415	ML1561	
A429	EL6254	ML1419	ML1597	
CCL708	ML1313	ML1453	ML1608	

FIGURE 2.1

Mount Owen Complex
Mining Titles

File Name (A4): R02/3109_829.dgn
20140901 16.09

The existing Mount Owen CHPP (**Figure 2.2**) consists of the following key components:

- South ROM stockpile and coal dump hopper and haul road to enable Mount Owen CHPP to receive and process ROM coal from Ravensworth East and Glendell mines;
- North ROM stockpile and coal dump hopper and haul road to enable Mount Owen CHPP to receive and process ROM coal from the Mount Owen North Pit;
- two temporary ROM stockpile areas (one located within the North Pit, one within the West Pit);
- three 750 tonne per hour CHPP modules;
- coarse reject handling system comprising a conveyor and an 800 tonne rejects bin;
- travelling luffer stacker serviced by the product coal stockpiling conveyor and designed to stack coal out on the product stockpile;
- the product stockpile (approximate capacity of 600,000 tonnes) and associated reclaim tunnel;
- train load out system;
- rail provisioning facility; and
- other CHPP components, ancillary infrastructure and staff, visitor and contractor buildings.

Where possible, to minimise re-handle, coal is directly fed to the Mount Owen CHPP without stockpiling. Coarse reject is trucked back into the active overburden emplacement areas and tailings (fine reject) material from the Mount Owen CHPP is pumped to the ERP, RW Pit and West Pit tailings emplacement areas.

Export product coal is currently loaded onto trains using the Mount Owen Complex Load out Facility and rail line (refer to **Figures 2.2** and **2.3**), and is transported to the Port of Newcastle via the Main Northern Rail Line. Mount Owen also occasionally transports domestic coal on the Main Northern Rail Line (within the currently approved train movements) and via M series conveyor.

The current layout of the existing MIA is shown on **Figure 2.2** and includes:

- administration buildings;
- car parks;
- heavy and light vehicle workshops;
- fuel and hydrocarbon storage;
- tyre storage;
- heavy vehicle hardstand areas;
- bath houses;

Image Source: Mount Owen (2013)
Data Source: Mount Owen (2014)

0 100 200 400m
1:7 500

Legend

- CHPP Boundary
- MIA Boundary

FIGURE 2.2

Mount Owen Existing Mine Infrastructure Area

Image Source: Mount Owen (2012-2013)
Data Source: Mount Owen (2014), Department of Lands (2006)

0 0.5 1.0 1.5km
1:30 000

FIGURE 2.3

Mount Owen and Ravensworth East Mine
Current Approved Coal Handling Facilities
and Mine Infrastructure Areas

File Name (A4): R02/3109_831.dgn
20140725 12.01

- stores;
- raw water processing;
- sewage treatment plant;
- vehicle washdown facilities;
- water management structures;
- helipad; and
- associated ancillary infrastructure.

The existing operations utilise the MIA at the Mount Owen Mine for administration, stores, amenity and workshop facilities for Mount Owen's staff and mining equipment. The existing explosives magazine is located to the north west of the MIA.

Mount Owen also maintains a mobile crushing unit on an as required basis for the crushing of gravels and overburden for use and maintenance of its internal haul roads.

Further description of the existing mining, coal preparation, reject disposal and transport operations is provided in the context of the proposed continued operations in **Section 2.3**.

2.1.3.2 Existing Ravensworth East Mine Operations

Current approved operations at Ravensworth East include the West Pit (currently operational), the West Pit Overburden Emplacement Area, Stage 3 water storage, the RW Pit (currently part of the tailings management system), and two shallow pits known as TP1 and TP2 (refer to **Figure 1.3**).

TP1 was previously used intermittently for tailings emplacement, and is now planned to be capped using overburden from mining operations within the Mount Owen Complex from 2016 and rehabilitated by approximately 2017.

Approved mining operations are currently occurring within the West Pit, where coal is extracted from the Ravensworth seams and the Bayswater seam to a depth of approximately 200 metres at an approved extraction rate of 4 Mtpa. Mining operations are expected to continue in Ravensworth East Mine in the BNP in accordance with the existing Ravensworth East development consent (DA 52-03-99) on completion of mining within the currently operational area of West Pit.

Ravensworth East operates as a multi seam truck and excavator operation, with ROM coal hauled to the Mount Owen CHPP ROM stockpiles via internal haul roads for processing within the Mount Owen CHPP. Where possible, to minimise re-handle, coal is directly fed to the Mount Owen CHPP without stockpiling.

The existing Ravensworth East Infrastructure area is located on the north-west side of the Ravensworth East Mine (refer to **Figure 2.3**) and includes:

- administration buildings;
- conveyors;

- workshop;
- crushing facility; and
- ROM stockpile.

The Ravensworth East Infrastructure area is also used as a laydown area for mining equipment and for equipment and vehicle maintenance. The operational workforce use various facilities across the Mount Owen Complex, as required.

2.1.3.3 Mine Workforce and Hours of Operation

The workforce required to operate the North Pit and the Mount Owen CHPP fluctuates and peaks at about 660. The current Ravensworth East development consent allows for a workforce of up to 260.

Mining activities at Mount Owen and Ravensworth East Mine currently occur 24 hours per day, 7 days per week.

2.1.4 Progressive Mine Rehabilitation

The primary objective of mine site rehabilitation at the Mount Owen and Ravensworth East Mines is to create a stable final landform with acceptable post-mining land use capability. Rehabilitation of the overburden emplacement areas and backfilled pits is conducted progressively over the life of the mine as an integral component of mining operations, with all rehabilitation works scheduled to occur progressively as soon as practicable after mining disturbance.

Mount Owen is committed to the ongoing rehabilitation of disturbed areas, providing habitat for endangered fauna known to occur in the region. The current end land use objective for the rehabilitation of the overburden emplacement areas at Mount Owen Mine is to create a conservation area comprising dry sclerophyll forest and open woodland that will complement the remnants of Ravensworth State Forest (RSF) and the Biodiversity Offset Areas in surrounding lands.

The rehabilitation activities at Ravensworth East Mine have primarily involved the establishment of pasture with vegetated corridors comprised of native ecosystems to achieve a final land use with both rehabilitated pasture and native trees and shrubs consistent with pre-mining conditions.

The Mount Owen Complex is a showcase for setting rehabilitation standards which is now listed as a ‘Highly Commended’ site on the Global Restoration Network of the Society for Ecosystem Restoration, International. Further details regarding ongoing progressive rehabilitation are provided in **Section 5.19**.