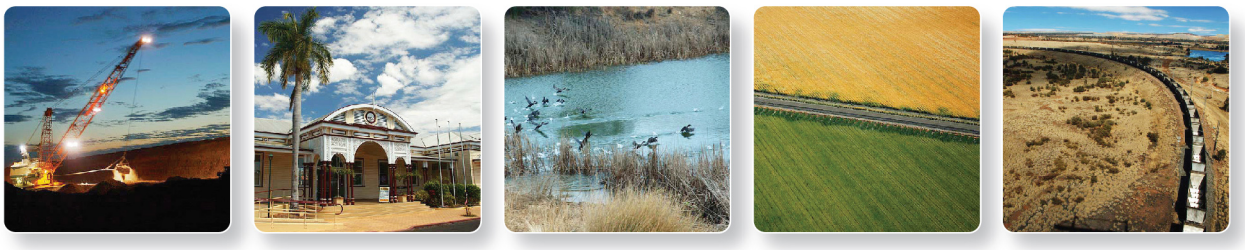

GREATER RAVENSWORTH AREA

TAILINGS PIPELINE MODIFICATION
Environmental Assessment

for

Glencore Coal Pty Limited

November 2015

Hansen Bailey

ENVIRONMENTAL CONSULTANTS

GREATER RAVENSWORTH AREA
TAILINGS PIPELINE MODIFICATION

ENVIRONMENTAL ASSESSMENT

Prepared by:

HANSEN BAILEY
6/127-129 John Street
SINGLETON NSW 2330

November 2015

For:

RAVENSWORTH OPERATIONS PTY LIMITED

LIDDELL COAL OPERATIONS PTY LIMITED &

MT OWEN PTY LIMITED

ENVIRONMENTAL ASSESSMENT STATEMENT

	Submission of Environmental Assessment Under Section 75W of the *Environmental Planning and Assessment Act 1979*
EA Prepared by Name:	James Bailey
Qualifications:	B. Natural Resources, MBA
Address:	Hansen Bailey PO Box 473 SINGLETON NSW 2330
In Respect Of:	Greater Ravensworth Area Tailings Pipeline Modification
Applicant Name(s):	Ravensworth Operations Pty Limited, Liddell Coal Operations Pty Limited & Mt Owen Pty Limited
Applicant Address:	Ravensworth Operations PO Box 294 MUSWELLBROOK NSW 2333
Land to be Developed:	Appendix A of this Environmental Assessment.
Proposed Development:	Implementation of the Modification as described in Section 4.
Environmental Assessment:	An Environmental Assessment for the Modification is attached.
Certification:	I certify that I have read and am aware of the terms of the *Expert Witness Code* of the Land & Environment Court of NSW. I further certify that I have prepared the contents of this EA, and to the best of my knowledge: • It is in accordance with Sections 75E and 75F of the *Environmental Planning and Assessment Act 1979*; • It contains all available information that is relevant to the environmental assessment of the activity to which the statement relates; and • The information contained in the statement is neither false nor misleading.
Signature:	
Name:	James Bailey Director
Date:	November 2015

EXECUTIVE SUMMARY

INTRODUCTION

Glencore Coal Pty Limited owns and operates a number of mining operations located throughout the Hunter Valley of New South Wales. Three such operations are adjacent to each other overlying the Singleton and Muswellbrook Local Government Areas: Ravensworth Operations; Liddell Coal Operations; and the Mt Owen Complex. Collectively, these three mines are referred to as the Greater Ravensworth Area operations.

Currently, open cut mining activities at the Ravensworth Operations are carried out in accordance with Project Approval (PA) 09_0176 (as modified), to provide high quality thermal and semi-soft coking coal to export and domestic markets at a maximum of 16 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal.

Liddell Coal Operations currently conducts open cut mining at up to 8 Mtpa ROM Coal under Development Consent (DA) 305-11-01.

The Mt Owen Complex currently holds three separate planning approvals for each of its mining areas:

- Glendell has approval to extract up to 4.5 Mtpa ROM coal from open cut mining under DA 80/952;
- Mt Owen Mine has approval to mine up to 10 Mtpa ROM coal under DA 14-1-2004; and
- Ravensworth East has approval to mine up to 4 Mtpa ROM coal under DA 52-03-99.

All operations within the Greater Ravensworth Area have had a long-established presence in the Upper Hunter Valley with mining commencing as early as the 1950s at Liddell Coal Operations. Since this time, there has been an ongoing commitment to meeting leading practice standards in relation to health, safety, community and environmental management. The Greater Ravensworth Area operations have also played a significant role in contributing to the economic development of the local area, the region and more generally to the State of New South Wales.

MODIFICATION

Ravensworth Operations Pty Limited, Liddell Coal Operations Pty Limited and Mt Owen Pty Limited are seeking approval from the NSW Minister for Planning or their delegate for a modification to each of Ravensworth Operations (PA 09_0176), Liddell Coal Operations (DA 305-11-01) and Ravensworth East (DA 52-03-99) planning approvals. This Modification is sought under section 75W of the *Environmental Planning and Assessment Act 1979* for the following:

- Construction of an approximately 11 kilometre tailings pipeline network connecting both the Ravensworth Coal Handling and Preparation Plant and Liddell Coal Handling and Preparation Plant to the West Pit Void at Ravensworth East;
- Construction of a Flocculant Plant within the vicinity of the West Pit Void at Ravensworth East, to allow flocculants to be mixed with tailings immediately prior to deposition in the emplacement area, a process known as secondary flocculation;
- The staged emplacement of tailings generated from Ravensworth Operations (approximately 12.5 million cubic meters of wet tailings between approximately 2017 – 2021) and Liddell Coal Operations (approximately 2 million cubic meters wet tailings between approximately 2018 – 2020) within the West Pit Void at Ravensworth East; and
- Interim utilisation of the Narama Void as a central water storage facility for the Greater Ravensworth Area prior to it being backfilled as per the existing approved Ravensworth Operations final landform.

This Modification is not proposing to increase the overall amount of tailings material emplaced in the West Pit Void at Ravensworth East, which will in turn not alter the final landform currently approved.

No increase above the currently approved production levels, life of mining, areas of disturbance or workforce limit at any operation is required to facilitate this Modification. Further, no changes are proposed at either Mt Owen Mine or Glendell and hence a modification to their respective approvals is not required.

The Greater Ravensworth Area operations have identified that there is both significant environmental and economic benefit in initiating an integrated approach to tailings management. It has been recognised however that a staged approval pathway is required to achieve a fully integrated life of mine tailings management strategy. This Modification is the logical first step in implementing such a disposal strategy across the Greater Ravensworth Area. This Modification has been developed as a stand-alone application and as such, its successful implementation is not dependent on any other future approvals.

Beyond this Modification it is also recognised that there is future opportunity to implement a larger strategy (Stage 2 tailings management strategy) aimed at further ensuring the logical and sequential filling of already approved tailings emplacement areas and reduce the need for additional tailings facilities at some Glencore mines in the Greater Ravensworth Area. It is anticipated that subject to market factors and engineering design confirmation, relevant Glencore operations will seek approval for the Stage 2 tailings management strategy in the future.

REGULATORY FRAMEWORK

Ravensworth Operations Pty Limited was granted Project Approval 09_0176 prior to the repeal of Part 3A of the *Environmental Planning and Assessment Act 1979*. Pursuant to clause 3 of Schedule 6A, this application is made under section 75W of the former Part 3A of the *Environmental Planning and Assessment Act 1979*.

Liddell Coal Operations was granted DA 305-11-01 in 2002 and Ravensworth East Mine was granted DA 52-3-1999 in March 2000. Both consents were therefore granted under Part 4 of the *Environmental Planning and Assessment Act 1979* prior to 1 August 2005. Subsequently, Clause 8J(8)(c) of the *Environmental Planning and Assessment Regulations 2000* allows DA 305-11-01 and DA 52-3-1999 to be modified under Section 75W of the former Part 3A of the *Environmental Planning and Assessment Act 1979*.

This Modification will entail only very limited environmental consequences beyond those which had been the subject of previous assessment and have been approved under PA 09_0176, DA 305-11-01 and DA 52-03-99. This Modification will not result in any change to the core elements across each operation such as:

- Total coal production rates, mining footprint or duration of mining;
- Existing method of mining or destination of ROM and product coal;
- The character of the currently approved infrastructure components;
- Already approved final landforms; and
- Existing manning levels or operational hours.

It is therefore available for the Minister (or his delegate) to modify the Development Consents under section 75W of the *Environmental Planning and Assessment Act 1979* as sought.

If a proposed Modification or '*action*' is likely to have a significant impact on one or more Matters of National Environmental Significance, the action is deemed to be a "*controlled action*". The approval of the Minister for the Environment must be obtained before a controlled action can be carried out.

The Modification has been determined not to have a significant impact to any Matters of National Environmental Significance. As such, there is no need to refer the action under Section 68 of the EPBC Act to the Federal Minister for the Environment for an approval under Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999.*

STAKEHOLDER ENGAGEMENT

The stakeholder engagement program over this Modification included consultation with Local and State government agencies, neighbouring land owners and industries and meetings with the individual Greater Ravensworth Area operations Community Consultative Committees.

RISK ASSESSMENT

A risk assessment was completed to identify potential environmental and socio-economic issues associated with the Modification. The primary purpose of the risk assessment process was to prioritise and focus the required environmental and socio-economic impact studies required for the Environmental Assessment.

Each of the potential environmental issues was ranked as being of low, moderate, high or critical risk dependent upon the probability of the impact occurring and the potential consequences should the impact materialise.

Due to the minor nature of the Modification no environmental aspects provided a critical or high risk. Aboriginal Archaeology, ecology, surface water and final landform impacts were determined to be of moderate risk with all remaining environmental and socio-economic issues identified as being low risk.

IMPACTS, MANAGEMENT AND MITIGATION

To determine the potential environmental and social impacts of the Modification, an ecological and Aboriginal archaeological assessment was undertaken. The assessments found that the majority of the proposed pipeline follows an already disturbed easement that contains an existing conveyor, tailings pipeline and access track.

The Ecological Assessment concluded that this Modification will not have a significant impact on threatened species populations or communities and/ or their habitat. In addition, the Aboriginal archaeological assessment found that no new sites of Aboriginal heritage items were identified along the tailings pipeline alignment and as a result no impacts are anticipated. Two areas of archaeological sensitivity were identified, as denoted by Sensitive Area 1 and Sensitive Area 2 in the vicinity of the tailings pipeline. Prior to construction of this Modification Sensitive Area 1 and 2 will be fenced and appropriately signposted to ensure no impacts.

A qualitative assessment was undertaken in relation to water resources, air quality, acoustics, visual and lighting, historical heritage and rehabilitation and final landform. The assessments undertaken for the environmental issues outlined above have confirmed that the impacts of this Modification will generally be consistent with those currently approved.

CONCLUSION

This Modification will facilitate the implementation of the first stage of a proposed fully integrated life of mine tailings management strategy across three of Glencore's coal mining operations positioned adjacent each other in the Upper Hunter NSW. This Modification has been developed as a stand-alone application and as such, its successful implementation is not dependent on any other future approvals.

A methodical environmental assessment over the proposed modifications to the Ravensworth Operations, Liddell Coal Operations and Ravensworth East development consents has confirmed immaterial environmental impacts will occur as a consequence of the proposed works. Further, the assessment has identified substantive environmental benefits from the implementation of the strategy.

Given the relatively small scale and nature of the Modification, Ravensworth Operations Pty Limited, Liddell Coal Operations Pty Limited and Ravensworth East Pty Limited will be capable of conducting the activities proposed under this Modification in accordance with the existing conditions of PA 09_0176 (as modified), DA 305-11-01 (as modified) and DA 52-3-1999 (as modified) respectively and the currently approved management plans implemented under each of these approvals. The relevant site Mining Operations Plans will be updated in consultation with the relevant agencies to incorporate this Modification, if approved.

As such it is concluded that this Modification will result in a net environmental improvement, and is in the public interest and should be approved.

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1 INTRODUCTION

This section provides an introduction to the Environmental Assessment (EA) for the Greater Ravensworth Area Tailings Pipeline Modification (this Modification). It describes the background and context of this Modification, introduces the proponent and explains the purpose and structure of the EA.

1.1 BACKGROUND

Glencore Coal Pty Limited (Glencore) owns and operates a number of mining operations located throughout the Hunter Valley of New South Wales (NSW). Three such operations are adjacent to each other overlying the Singleton and Muswellbrook Local Government Areas (LGAs) (see Figure 1): Ravensworth Operations; Liddell Coal Operations; and Mt Owen Complex. Collectively, these three mines are referred to as the Greater Ravensworth Area (GRA) operations.

The GRA operations are located 15 kilometres (km) north-west of Singleton and 17 km south-east of Muswellbrook. Figure 1 illustrates the location of the GRA operations and their approved operations boundaries while Figure 2 depicts active mining associated with each of the operations.

Ravensworth Operations Pty Limited encompasses the active Ravensworth North and Narama mining areas and the former Cumnock and Ravensworth West mining areas (Ravensworth Operations).

Liddell Coal Operations Pty Limited operates the Liddell Open Cut Mine on behalf of a joint venture between Glencore (67.5%) and Mitsui Matsushima Australia (32.5%) (Liddell Coal Operations).

Mt Owen Pty Limited operates three existing open cut mining operations: Mt Owen; Glendell; and the Ravensworth East mining areas (Mt Owen Complex).

All operations within the GRA have had a long-established presence in the Upper Hunter Valley with mining commencing as early as the 1950s at Liddell Coal Operations. Since this time, there has been an ongoing commitment to meeting leading practice standards of health, safety, community and environmental management. The operations have also played a significant role in contributing to the economic development of the local area, the region and more generally to the State of NSW.

Currently, open cut mining activities at the Ravensworth Operations are carried out in accordance with Project Approval (PA) 09_0176 (as modified), to provide high quality thermal and semi-soft coking coal to export and domestic markets at a maximum of 16 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal.

The Mt Owen Complex currently holds three separate planning approvals for each of its mining areas:

- Glendell has approval to extract up to 4.5 Mtpa ROM coal from open cut mining under Development Consent (DA) 80/ 952;
- Mt Owen Mine has approval to mine up to 10 Mtpa ROM coal under DA 14-1-2004; and
- Ravensworth East has approval to mine up to 4 Mtpa ROM coal under DA 52-03-99.

Liddell has approval for open cut mining up to 8 Mtpa ROM Coal under DA 305-11-01.

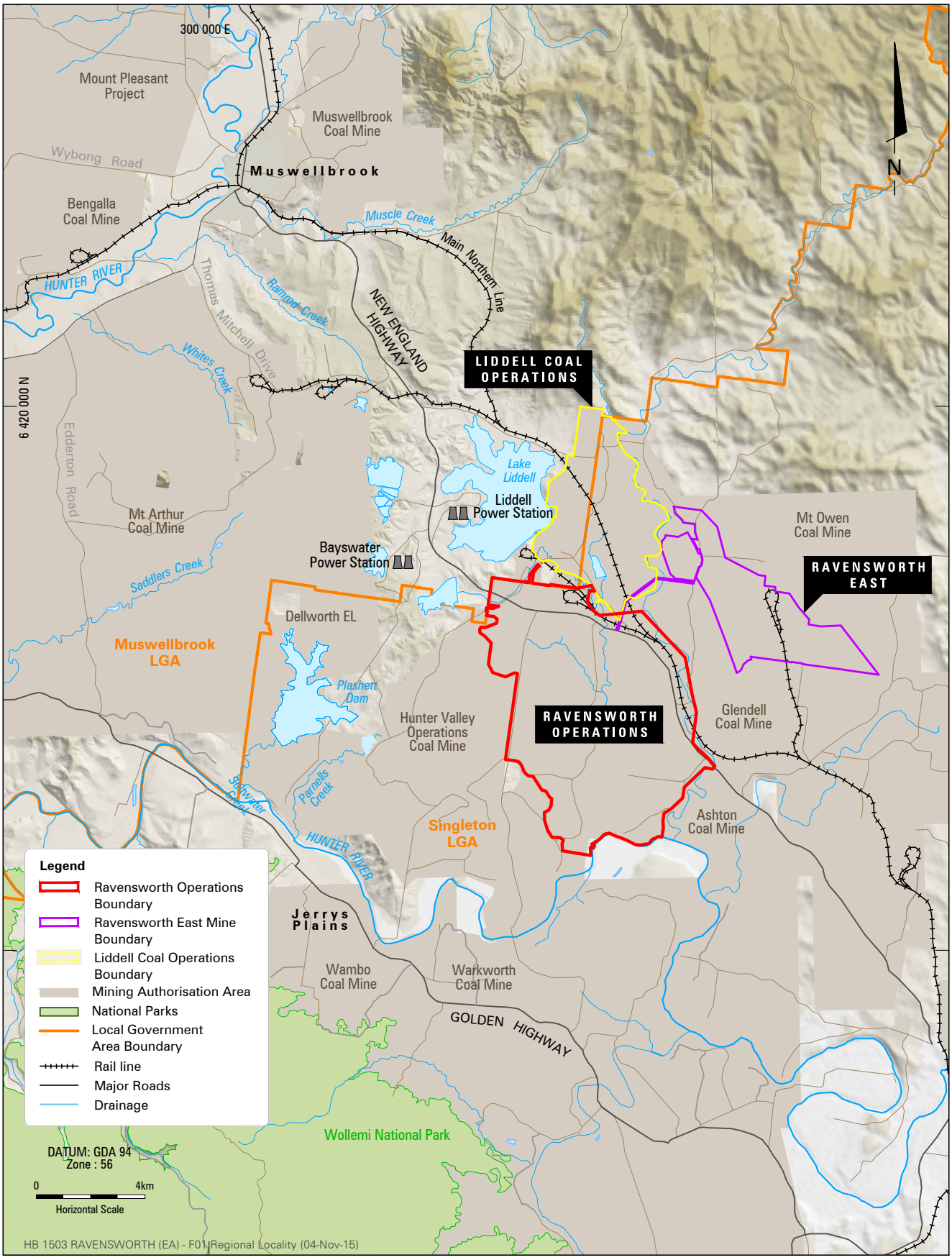
Ravensworth Operations Pty Limited, Liddell Coal Operations Pty Limited and Mt Owen Pty Limited are seeking approval for a modification to their development consents being Ravensworth Operations (PA 09_0176), Liddell (DA 305-11-01) and Ravensworth East (DA 52-03-99) respectively. No changes are proposed at either Mt Owen Mine or Glendell and hence a modification to their respective approvals is not required.

This Modification is being sought to permit tailings from both the CHPP at Ravensworth Operations and Liddell, to be pumped via a network of pipelines and emplaced within a void at Ravensworth East. Specifically this Modification is sought under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the following:

- Construction of an approximately 11 km tailings pipeline network connecting both the Ravensworth CHPP and Liddell CHPP to the West Pit Void at Ravensworth East;
- Construction of a Flocculant Plant within the vicinity of the West Pit Void at Ravensworth East, to allow flocculants to be mixed with tailings immediately prior to deposition in the emplacement area, a process known as secondary flocculation;
- The staged emplacement of tailings generated from Ravensworth Operations (approximately 12.5 Mm^3 wet tailings between approximately 2017 – 2021) and Liddell Coal Operations (approximately 2 Mm^3 wet tailings between approximately 2018 – 2020) within the West Pit Void at Ravensworth East; and
- Interim utilisation of the Narama Void as a central water storage facility for the GRA prior to it being backfilled as per the existing approved Ravensworth Operations final landform.

This Modification, if approved, will facilitate an integrated approach to tailings management across the GRA operations. This will allow currently approved tailings emplacement areas to be decommissioned and rehabilitated in an orderly sequence rather than all tailings areas remaining operational until the completion of mining at each individual mining complex. Further, this Modification is likely to negate the need for additional tailings emplacement areas to be constructed at each of the individual GRA mines, as current emplacement areas reach capacity.

A detailed description of this Modification is provided in Section 4.

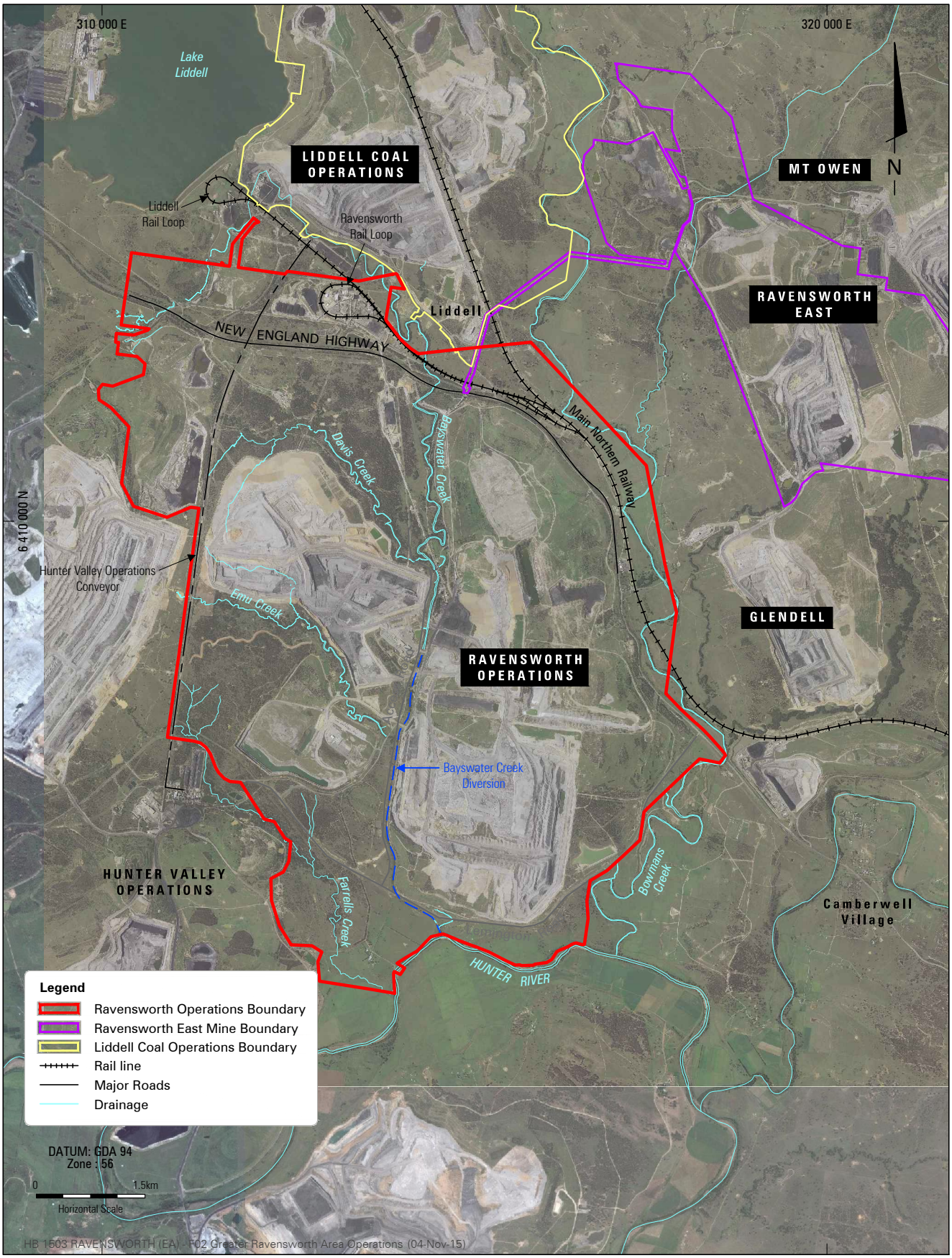


GREATER RAVENSWORTH AREA OPERATIONS

GLENCORE | Hansen Bailey ENVIRONMENTAL CONSULTANTS

Regional Locality

FIGURE 1



GREATER RAVENSWORTH AREA OPERATIONS

GLENCORE | Hansen Bailey ENVIRONMENTAL CONSULTANTS

Greater Ravensworth Area Operations

FIGURE 2

1.2 PROPONENTS

The proponents for the Modification and contact details for each include:

Ravensworth Operations Pty Limited
PO Box 294
Muswellbrook NSW 2333
Phone: (02) 6570 0700
Fax: (02) 6570 0747
http://www.ravensworthoperations.com.au

Liddell Coal Operations Pty Limited
Old New England Highway
Ravensworth NSW 2330
Phone: (02) 6570 9900
Fax: (02) 6570 9999
http://www.liddellcoal.com.au

Mt Owen Pty Limited
PO Box 320
Singleton NSW 2330
Phone: (02) 6570 0800
Fax: (02) 6576 1643
http://mtowencomplex.com.au

1.3 DOCUMENT STRUCTURE

The EA is structured as follows:

- Section 2 provides information relating to the existing environmental setting;
- Section 3 provides information relating to the current operations approved at Ravensworth Operations, Liddell and Ravensworth East;
- Section 4 provides a description of this Modification;
- Section 5 describes the regulatory framework relevant to this Modification;
- Section 6 details the stakeholder engagement program that has been undertaken and any issues raised during that process;
- Section 7 presents a high level risk assessment completed for this Modification;
- Section 8 assesses the predicted environmental impacts and outlines the management and mitigation measures to be implemented;
- Section 9 presents the statement of commitments for this Modification;
- Section 11 provides a conclusion to this Modification; and
- Section 11 and Section 12 list abbreviations and references used throughout this EA.

1.4 DOCUMENT PURPOSE

The applicants are seeking approval from the Minister for Planning for a modification to three of its GRA operations development consents: Ravensworth Operations (PA 09_0176); Liddell (DA 305-11-01); and Ravensworth East (DA 52-03-99) under section 75W of Part 3A of the EP&A Act to facilitate improved tailings management.

This EA has been prepared by Hansen Bailey Environmental Consultants (Hansen Bailey) on behalf of Glencore to support an application for this Modification as described in Section 4.

2 EXISTING ENVIRONMENT

This section provides a discussion on the topography, natural features, geology, land use and land ownership associated with this Modification.

2.1 TOPOGRAPHY AND NATURAL FEATURES

The topography within the vicinity of the GRA operations is typically undulating to hilly, extending to lower areas associated with waterways and drainage lines (see Figure 2).

Major alterations to the natural topography within and surrounding the approved operations have occurred as a result of progressive mining activities since the early 1950s. A significant ridgeline has been retained to the south-east of Ravensworth Operations, which has an elevation of approximately RL 100 m. This natural feature provides a barrier between neighbouring private residences, including Camberwell Village and mining activities.

The GRA is located within the catchments of Farrells Creek, Bowmans Creek and Bayswater Creek and its tributaries, including Davis Creek and Emu Creek. Major tributaries of Bowmans Creek within the vicinity of the Ravensworth East Mine include Yorks Creek, Swamp Creek and Bettys Creek. These watercourses traverse the area in a southerly direction to their confluences with the Hunter River (see Figure 2).

2.2 GEOLOGY

The GRA operations is located within the Hunter Coalfield and is situated in the Foybrook and/or Burnamwood Formations of the Whittingham Coal Measures. Extensive exploration activities have been conducted within the various mining authorisations associated with GRA operations since the 1950s providing comprehensive records of the quantity, quality and extent of the known coal resource. Coal washery waste has been proven to be largely inert and not prone to spontaneous combustion when appropriately managed from these formations.

2.3 LAND USE

The GRA is situated predominantly in an industrial setting surrounded by numerous open cut mining and power generation activities, including Hunter Valley Operations, Ashton Coal, Integra along with the AGL Macquarie Bayswater and Liddell Power Stations. The purpose built Lake Liddell lies immediately adjacent to Liddell Coal Operations providing cooling water for the Liddell Power Station. The Main Northern Railway and Liddell Rail Loop lines traverse through the GRA, whilst the New England Highway is located to the south and west of the proposed pipeline route (see Figure 1 and Figure 3).

Further afield to the east and south-east of the Ravensworth Operations remains some private freehold land utilised for grazing, other agricultural activities and rural residential areas (see Figure 3). There are also a small number of private residences located to the north-east of the Liddell Coal Operations.

The majority of the area directly within the proposed pipeline route has been extensively modified by current and former open cut mining activities and associated infrastructure. A portion of the land is considered to be agricultural grazing land, some of which exists as a result of mine rehabilitation. The majority of the proposed pipeline route follows an existing conveyor easement and access track, which already contains a tailings pipeline.

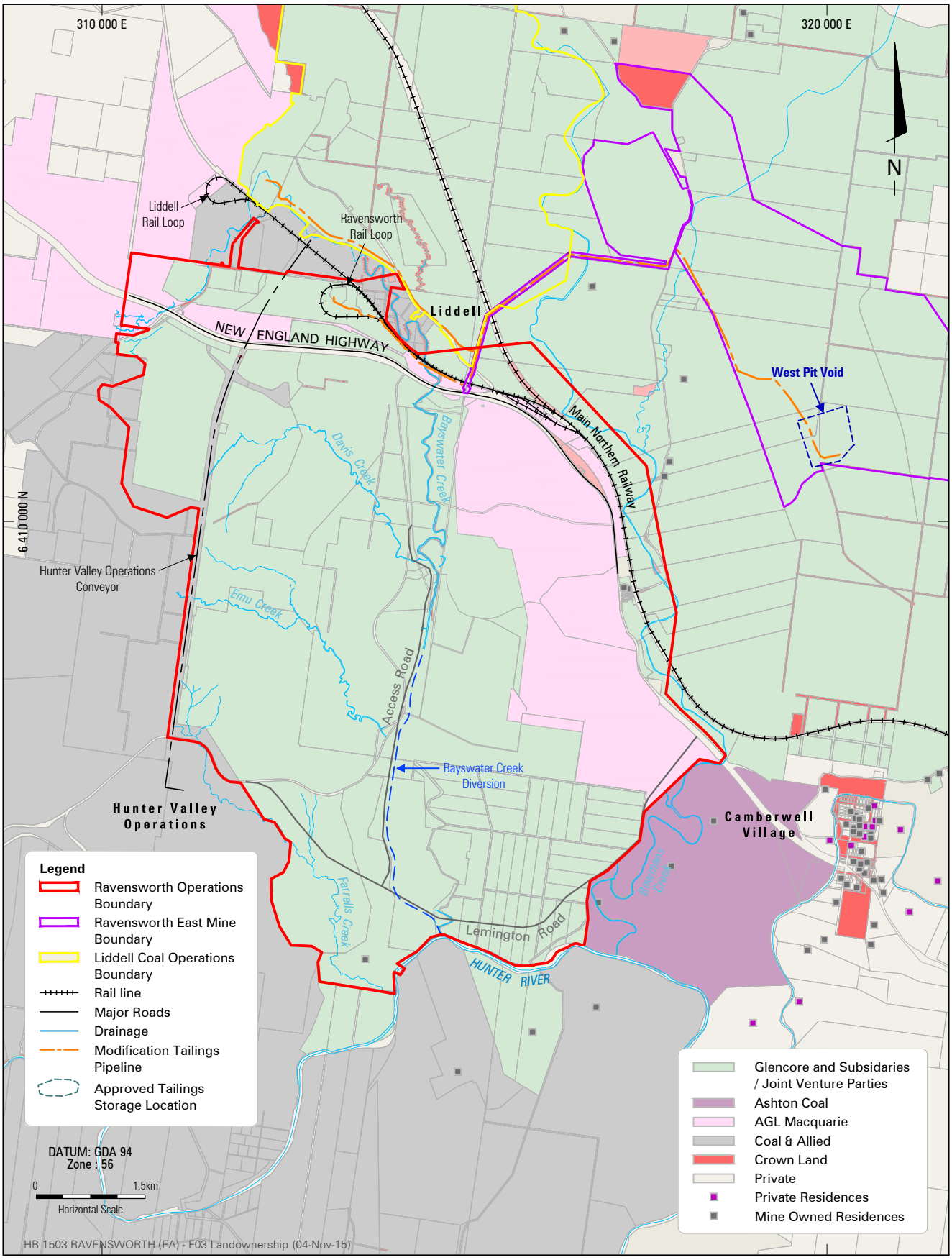
2.4 LAND OWNERSHIP

Land ownership in the vicinity of the GRA operations is shown on Figure 3. Glencore and its joint venture partners own the majority of the land required to construct the infrastructure associated with this Modification. The tailings pipeline will also traverse a small section of land owned by both AGL Macquarie and Australian Rail Track Corporation (ARTC) (held to accommodate the Main Northern Railway Line).

Other primary landowners proximate to, but unaffected by, the proposed Modification includes Yancoal Joint Venture who operate Ashton Coal and Coal & Allied's Hunter Valley Operations (see Figure 3).

A number of private rural residences are located more distant to the east and south-east of GRA with the majority centralised at Camberwell Village, which is more than 6 km from any aspect of the proposed Modification (see Figure 3).

The schedule of lands to which this Modification applies is provided in Appendix A.



GREATER RAVENSWORTH AREA OPERATIONS

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Land Ownership

FIGURE 3

3 APPROVED OPERATIONS

This section describes the approved works at each of the relevant GRA operations including existing approvals, current mining activities, coal handling and processing, equipment, infrastructure, workforce and the existing Environmental Management System (EMS).

3.1 PLANNING APPROVALS

3.1.1 Ravensworth Operations

Original Approval

On 11 February 2011, Ravensworth Operations was granted PA 09_0176 which permits open cut mining and transportation of up to 16 Mtpa of high quality thermal and semi-soft coking coal to export and domestic markets until 31 December 2039.

PA 09_0176 was supported by the *Ravensworth Operations Project Environmental Assessment* (Ravensworth EA) (Umwelt, 2010a).

Since originally approved there have been two modifications to PA 09_0176 as described below.

Modifications

A modification to PA 09_0176 (Modification 1) was granted on 16 August 2013, providing approval for the following at Ravensworth Operations:

- The recovery of approximately 2.7 Mt of ROM coal by open cut mining methods within the Narama West mining area; and
- Various administrative amendments to PA 09_0176 including alteration to the approved operations boundary and changes to blasting and Aboriginal heritage management requirements.

The document supporting PA 09_0176 (Modification 1) was the *Narama West Modification Environmental Assessment* (Hansen Bailey, 2013).

Modification 2 was granted on 19 December 2014 to PA 09_0176, providing approval for changes to the overburden emplacement areas (OEA). The document supporting PA 09_0176 (Modification 2) was the *Final Landform Modification Environmental Assessment* (Hansen Bailey, 2014).

3.1.2 Liddell Coal Operations

Original Approval

Development Consent DA 305-11-01 was originally granted by the then Minister for Planning on 20 November 2002 under Part 4 of the EP&A Act. DA 305-11-01 was supported by *Liddell Colliery Continued Operations Environmental Impact Statement* (Liddell EIS) (Umwelt, 2001).

Since originally approved there have been several modifications to DA 305-11-01 as described below.

Modifications

Liddell Coal Operations' DA 305-11-01 now provides for the following:

- Minor modification to revise the property schedule included in the original development consent, granted on the 11 August 2003.
- Modification 1, granted on 18 July 2007, permitting a number of changes to mining operations including an increase in production from 4.5 Mtpa to 8 Mtpa, an increase in the open cut mining footprint and construction of

a new CHPP. The application was supported by *Liddell Colliery Modification to Development Consent Environmental Assessment* (Umwelt, Dec 2006).

- Modification 2, granted in 2007, to amend the development consent boundary to incorporate a groundwater monitoring bore.
- Modification 3, granted on 7 May 2008, to realign the Old New England Highway and access road intersection, and allow the reuse of treated effluent. The application was supported by *Liddell Coal Operations Pty Limited Statement of Environmental Effects for Liddell Colliery Modification to Development Consent* (Umwelt, Feb 2008).
- Modification 4, granted on 27 October 2009 for an application to extend the existing offices and workshop facilities; and
- Modification 5, granted 1 Dec 2014, to extend open cut operations in the South and Entrance Pits, extension of mine life from 2023 to 2028, construction of a tailings emplacement area within the final void of the South Pit. The modification also provides for changes to CHPP and transport/ conveyance arrangements with adjacent Cumnock, Mt Owen Complex and Ravensworth Central Coal Processing Facility. The approval also allows for the construction of associated minor infrastructure. The Application was supported by *Liddell Coal Operations Proposed Modification to DA 305-11-01 Environmental Assessment* (SLR, September 2013).

3.1.3 Ravensworth East

Original Approval

On 2 March 2000, Ravensworth East Mine was initially granted approval under DA 52-03-99 to produce up to 4 Mtpa ROM coal. The application was supported by the *Ravensworth East Mine - Environmental Impact Statement* (ERM Mitchell McCotter, January 1999).

Since originally approved there have been four modifications to DA 52-03-99 as described below.

Modifications

A modification to DA 52-03-99 was granted in 2000, permitting diversion works to Hebden Road. This modification was supported by the Statement of Environmental Effects titled *S96 Modification to the Ravensworth East Open Cut Coal Mine Consent*, dated May 2000(ERM, 2000).

A modification to DA 52-03-99 was granted in December 2002, allowing the processing of coal from Ravensworth East at the Mt Owen CHPP. This modification was supported by *Statement of Environmental Effects Mt Owen Mine Stage 3 Tailings Emplacement Area* (Umwelt, November 2002).

A further modification to DA 52-03-99 was granted in May 2004 allowing amendments to the receival and tailings disposal arrangements at Ravensworth East and Mt Owen. This Modification was supported by the *Statement of Environmental Effects Modifications to Coal Receival and Tailings Disposal System – Mt Owen and Ravensworth East Mines* (Umwelt, December 2003) and permits tailings to be pumped from the Mt Owen CHPP to the West Pit Void at Ravensworth East.

A modification to DA 52-03-99 was granted in August 2005, which provided for the integration of the mining operation's management with Mt Owen Mine. As discussed in Section 1.1 Ravensworth East now forms part of the wider Mt Owen Complex which also incorporates the Mt Owen and Glendell mining operations. A brief discussion in relation to the Mt Owen Complex approvals platform as relevant to this Modification is provided below.

3.1.4 Mt Owen Complex

Mt Owen Mine was initially granted approval in 1991 under DA 63/91 before being granted DA 14-1-2004 in December 2004. This application was supported by *Mt Owens Operations EIS* (Umwelt, December 2003). Following the granting of DA 14-1-2004 all previous consents were surrendered.

DA 14-1-2004 enables the continuation and extension of mining operations, increased production from 8 to 10 Mtpa, construction of a new CHPP to receive and process ROM coal from Ravensworth East and Glendell coal mines, continuing the disposal of tailings from the Mt Owen CHPP in voids at Ravensworth East Coal Mine and other minor modifications.

A modification to DA 14-1-2004 was granted in November 2010 to construct a rail provisioning facility on the existing Mt Owen railway line. A further modification was granted in November 2014 to increase the throughput at the Mt Owen CHPP and rail loadout facility from 15 to 17 Mtpa of ROM Coal.

Mt Owen Complex is currently seeking development consent for the Mt Owen Continued Operations Project. Approval is being sought to extract additional ROM coal from Mt Owen and Ravensworth East Mining areas, extending the mine life for a further 12 years to 2030 and to undertake associated infrastructure works. If approved, the existing development consents for Mt Owen and Ravensworth East are proposed to be consolidated as described in the *Mt Owen Continued Operations Project Environmental Impact Statement* (Umwelt, 2015).

This Modification is not proposing any changes to DA 14-1-2004 (as modified) or that being sought as part of the Mt Owen Continued Operations Project. It is anticipated that given the minor nature of this modification, if granted, this approval will likely be received prior to the pending Mt Owen Continued Operations Project approval, and as such should not affect its current approvals process.

3.2 CURRENT MINING OPERATIONS

An outline of the current approved works at each of the relevant GRA operations, that is Ravensworth Operations, Liddell and Ravensworth East, is provided in Table 1 below. This includes a summary of existing approvals, mining methods and areas, coal handling and processing as well as rejects and tailings management.

Table 1
Currently Approved Activities

Component	Ravensworth Operations	Liddell Coal Operations	Ravensworth East
Planning Approval & Supporting Documents	PA 09_0176 (as modified) • Modification 1, Aug 2013 • Modification 2, Dec 2014	DA 305-11-01 (as modified) • Modification, Aug 2003 • Modification 1, Jul 2007 • Modification 2, 2007 • Modification 3, May 2008 • Modification 4, Oct 2009 • Modification 5, Dec 2014	DA 52-03-99 (as modified) • Modification, July 2000 • Modification SEE, June 2003 • Modification SEE, May 2004 • Modification, August 2005
Life of Mine	31 December 2039	31 December 2028	2 March 2021
Mining Method	Open cut • Loader/ shovels • Truck & excavator • Dragline	Open Cut • Truck and excavator • Highwall Mining (Limited) • Dragline (approved but not in use)	Open cut • Truck & excavator
Approved Production Rate	• 16 Mtpa ROM Coal (from open cut mining operations) • 21 Mtpa ROM Coal (from combined Ravensworth Mine Complex)*	• 8 Mtpa ROM Coal	• 4 Mtpa ROM Coal
Coal Processing & Transport	• Hauled by truck to Coal Crushing Plant (CPP) for local power generation & CHPP for export coal 20 Mtpa product coal to/ from Ravensworth CHPP or Ravensworth Coal Terminal	• 8 Mtpa ROM Coal hauled by truck to Liddell CHPP o Including up to 2 Mtpa ROM Coal from Mt Owen • Transport 1.5 Mtpa ROM Coal to Ravensworth Central Coal Processing Facility • Extract up to 0.5 Mtpa Coal Tailings for transport to Power Stations	• 4 Mtpa ROM Coal (via internal haul roads) to Mt Owen CHPP for processing & export

Component	Ravensworth Operations	Liddell Coal Operations	Ravensworth East
Main Coal Processing & Transport Infrastructure	• CPP & CHPP • Ravensworth Coal Terminal • Truck dump station • Coal storage bins • Rail loop & rail loading facilities • ROM and product coal stockpiles	• CHPP • ROM Dump Bin & stockpiles • Conveyors • Product stockpiles and reclaim tunnel • Rail loading facilities	Mt Owen CHPP • Conveyor and rejects bin • ROM stockpiles & coal dump hoppers • Product stockpile, reclaim tunnel, travelling luffer stacker & conveyors • Train load out system • Rail provisioning facility
Rejects & Tailings Disposal	• Rejects transported to and blended within the OEAs • Flocculant is added to tailings stream immediately after it leaves the CPP (Primary Flocculation) • Tailings pumped to Tailings Emplacement Areas • Flocculant is added at the pipe head immediately prior to disposal (Secondary Flocculation) • Water decanted during transfer and recycled	• Reject material co-dispersed in layers into OEAs • Primary and secondary flocculation of tailings material • Tailings pumped to Tailings Emplacement Areas • Reclaimed tailings trucked to Macquarie Generation for domestic power	• Coarse reject from Mt Owen CHPP trucked to active OEAs • Primary flocculation of tailings material • Tailings from Mt Owen CHPP pumped to Tailings Emplacement Areas
Approved Tailings Emplacement Areas	• Cumnock Stage 1/2 void, Cumnock 3 void, Narama void, Wash Plant Pit void	• Antienne, Reservoir West, Reservoir South, South Cut and Durham voids • Overburden dumps in the South Pit mining area • South Pit Final Void	• TP1, NVS1, NVS2, RW Pit, West Pit Void Mt Owen • Eastern Rail Pit (ERP),
Current Tailings Emplacement Areas	• Cumnock 3 void	• Durham void	Ravensworth East • TP1, NVS2, RW Pit, West Pit Void Mt Owen • Eastern Rail Pit (ERP),

**Includes open cut and underground production*

3.2.1 COAL MINING AND PROCESSING

Ravensworth Operations

Operations at the Ravensworth Operations are currently undertaken 24 hours per day, seven days per week with a workforce of approximately 500 full time personnel. Mining occurs within in Coal Leases (CL) 380 and 580 and Mining Leases (ML) 1576, 1502, 1393 1683 and 1669. Coal resources are targeted from the Broonie seam down through to the Hebden seam by truck and shovel and/or dragline mining techniques.

Loaders/shovels, excavators and draglines are utilised for the removal of overburden. This equipment is supported by a fleet of haul trucks, which transport the overburden to an approved OEA. ROM coal is extracted by a loader and/or excavator before being loaded onto trucks and transported to the coal crushing plant. After initial processing, coal is conveyed to neighbouring power generation facilities or in the case of export coal is conveyed to the CHPP for further processing prior to being railed to the Port of Newcastle.

Rejects from the CHPP are transported to and blended within the OEAs whilst following primary and secondary flocculation tailings are pumped via above ground pipelines to the existing Cumnock voids. Water is decanted during the transfer and recycled in the Ravensworth Operations water management system.

Activities undertaken at Ravensworth Operations are supported by various mine infrastructure items including (but not limited to), administration facilities, workshop, maintenance areas and fuel farm, water and waste systems, vehicle wash stations, as well telecommunications and power infrastructure.

Liddell Coal Operations

Operations at Liddell are undertaken 24 hours per day, seven days per week with a workforce of approximately 360 full time personnel and 100 contractors.

Primarily mining at Liddell is currently undertaken within ML 1597. Coal resources are primarily targeted from the Lemington seam through to the Hebden seams however mining of the Bayswater seam (above the Lemington seam) has also been identified as economically viable in the southern areas of the Entrance Pit.

There are three mining methods approved, with truck and excavator being the main mining method utilised. The dragline mining method has previously been utilised. Highwall mining by way of auger or continuous miner is also approved and has historically been utilised to extract coal from old mine areas.

Following blasting, overburden is removed using excavator and hauled via dump trucks to active emplacement areas or to backfill old pits. ROM coal is extracted by hydraulic excavators and hauled via trucks to the ROM stockpiles and the CHPP for processing. Product coal is transported by rail to the port in Newcastle.

Coarse rejects generated from the processing of ROM coal are co-dispersed in layers in the OEAs. Following primary and secondary flocculation tailings are pumped via pipelines to Tailings Emplacement Areas, which are located in old mine voids. Water is reclaimed for reuse in the mine water system.

Liddell Coal has the option to also reclaim tailings material from historic emplacement areas, which has shown to contain residual energy. Up to 0.5 Mtpa is approved to be trucked to the nearby Power Generation Facilities for use as a fuel source.

Activities undertaken at Liddell are supported by various mine infrastructure including (but not limited to) administration facilities, workshop, fuel farm, water and waste systems, power and communications infrastructure as well as stockpile areas, conveyor network, truck loading bins and rail loading facilities.

Ravensworth East

Ravensworth East currently operates 24 hours per day, seven days per week with a workforce of up to 260 full time personnel.

Primarily mining at Ravensworth East is currently undertaken within CCL708 targeting the Ravensworth seams and the Bayswater seam utilising truck and excavators. ROM coal is hauled via internal haul roads to the Mt Owen CHPP for stockpiling and processing.

Coarse rejects is hauled to active OEA's with tailings undergoing primary flocculation before being pumped via pipelines to the Mt Owen and Ravensworth East tailings emplacement areas, including ERP and RW Pit.

Product coal is loaded onto trains at the Mt Owen Complex Loadout Facility and Rail Provisioning Facility for transport to the Port of Newcastle.

The current Ravensworth East approval (as modified) also allows for ROM coal to be transported via conveyor directly to the nearby power stations for domestic electricity generation.

Activities undertaken at Ravensworth East are supported by various mine infrastructure and facilities that are located and utilised across the Mt Owen Complex. Mine infrastructure located at Ravensworth East Mine includes (but not limited to) administration buildings, workshop, crushing facility, equipment laydown area, stockpile areas and conveyors.

3.3 ENVIRONMENTAL MANAGEMENT SYSTEM

All operations within the GRA are committed to undertaking their operations and activities in an environmentally responsible manner. As such, all operations currently undertake activities in accordance with an existing EMS. The EMS provides for the management and monitoring of a range of environmental aspects, including air quality, noise, water and waste management. The EMS aims to ensure regulatory compliance, continual improvement of performance and satisfy the expectations of stakeholders.

Each of the operations within the GRA has a series of Environmental Management Plans (EMPs), which form an integral part of the EMS, as well as an Environmental Policy and procedures. In most instances EMPs are statutory documents approved under current mine approvals, and cover the major environmental aspects of the operations.

A key component of the EMS is the environmental monitoring network. Monitoring is routinely undertaken to monitor the environmental performance of the operations, to ensure potential environmental impacts are being appropriately managed. Regular inspections and audits are also undertaken across the operations.

The Environmental performance of the operations, including environmental monitoring data and findings of environmental audits and inspections is reported on the company websites and is also included in an Annual Environmental Management Report. Environmental compliance information can be accessed via the company websites. The website addresses for the GRA sites are:

Glencore- http://www.glencorecoal.com.au/EN/Operations/Pages/CoalOperations.aspx

or

Ravensworth Operations - http://www.ravensworthoperations.com.au

Liddell Coal Operations - http://www.liddellcoal.com.au

Mt Owen Complex - http://www.mtowencomplex.com.au

4 MODIFICATION DESCRIPTION

This section provides a description of the Modification. Consideration of the Modification need and interactions with approved operations is also included.

4.1 OVERVIEW

This Modification is seeking approval to facilitate the first stage of the introduction of a fully integrated approach to tailings management across the GRA (see Section 4.2).

The implementation of an integrated tailings management strategy will ultimately result in Ravensworth Operations, Liddell Coal Operations and the Mt Owen Complex realising each operations life of mine tailings emplacement strategy in a sequential order. This will facilitate approved tailings emplacement areas to be decommissioned and rehabilitated in an orderly sequence rather than causing all tailings areas having to remain operational until the completion of mining at each individual mining complex.

The first stage of this longer term strategy sees Glencore seeking approval from the NSW Minister for Planning or their delegate for a modification to each of Ravensworth Operations (PA 09_0176), Liddell Coal Operations (DA 305-11-01) and Ravensworth East (DA 52-03-99) planning approvals. This Modification is sought under section 75W of the EP&A Act for the following:

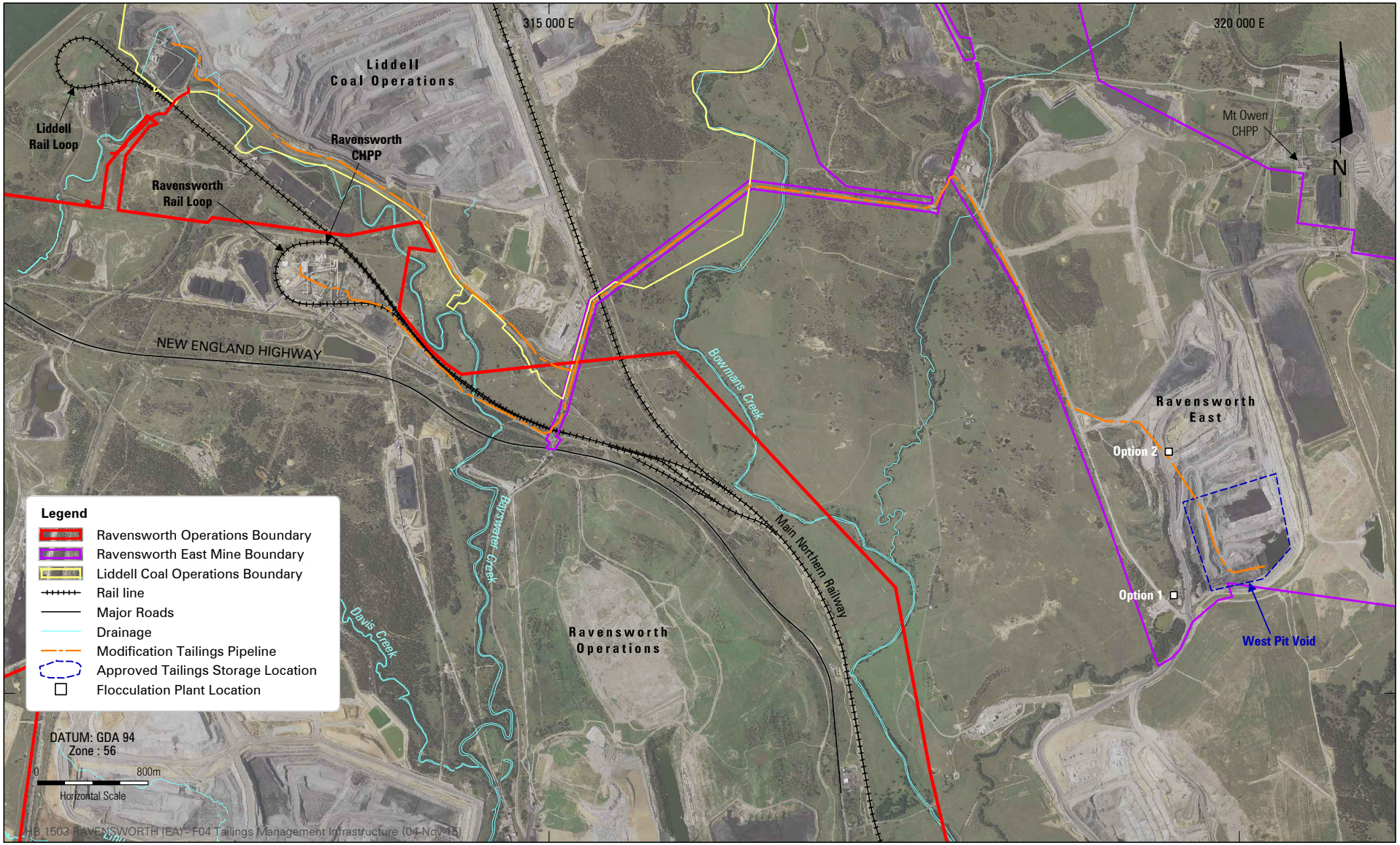
- Construction of an approximately 11 km tailings pipeline network connecting both the Ravensworth CHPP and Liddell CHPP to the West Pit Void at Ravensworth East;
- Construction of a Flocculant Plant within the vicinity of the West Pit Void at Ravensworth East, to allow flocculants to be mixed with tailings immediately prior to deposition in the emplacement area, a process known as secondary flocculation;
- The staged emplacement of tailings generated from Ravensworth Operations (approximately 12.5 Mm^3 wet tailings between approximately 2017 – 2021) and Liddell Coal Operations (approximately 2 Mm^3 wet tailings between approximately 2018 – 2020) within the West Pit Void at Ravensworth East; and
- Interim utilisation of the Narama Void as a central water storage facility for the GRA prior to it being backfilled as per the existing approved Ravensworth Operations final landform.

This Modification is not proposing to increase the overall amount of tailings material emplaced in the West Pit Void at Ravensworth East, which will in turn not alter the final landform currently approved.

The alignment of the integrated tailings management strategy pipeline network and flocculation plant locations associated with the Modification is presented conceptually on Figure 4.

It is proposed that the infrastructure associated with this Modification will be managed by way of a formal agreement between the GRA applicants. This agreement will provide clear delegation as to the roles and responsibilities for reporting, monitoring and maintenance of all components of this Modification. The sequence of the proposed staged emplacement of tailings from Ravensworth Operations and Liddell Coal Operations into the West Pit Void at Ravensworth East associated with this Modification is provided in Table 2. Tailings emplacement activities highlighted in green indicate the scheduling being sought in this Modification.

The GRA applicants currently distribute mine water through interconnected management infrastructure to maximise the efficient use and re-use of mine water. This system will be utilised to distribute the return water which is recovered from the proposed Ravensworth East West Pit Void tailings emplacement. Some upgrades will be required to this system to ensure efficient re-use of return water, however this will be achieved under existing approvals and regulations.



GREATER RAVENSWORTH AREA OPERATIONS

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Greater Ravensworth Tailings Management Infrastructure

FIGURE 4

Table 2
Tailings Emplacement Staging

Operation	Tailings Emplacement Area	2015	2016	2017	2018	2019	2020	2021	To Completion
Ravensworth Operations	Cumnock 3 Void (Approved)								
	West Pit Void at Ravensworth East (this Modification)								
	Narama Void (Approved)*								2039
Liddell Coal Operations	Railway Fines (Durham) Stage 1 & 2 (Approved)								
	West Pit Void at Ravensworth East (this Modification)								
	Liddell Coal Operations South Cut Void (Approved)								2028

** If stage two of the GRA integrated tailings emplacement strategy is implemented there may be no need for Ravensworth Operations to revert back to emplacing tailings in the Narama Void making it available for short to medium term water storage prior to its backfilling with overburden.*

4.2 MODIFICATION NEED

4.2.1 This Modification

The GRA operations have identified that there is both significant environmental and economic benefit in initiating an integrated approach to tailings management across all adjacent active mining areas. It has been recognised however that a staged approval pathway is required to achieve a fully integrated life of mine tailings management strategy. This Modification is the logical first step in implementing such a disposal strategy across the GRA.

Long term mine planning aimed at more effectively utilising an integrated tailings management approach indicates that proceeding with tailings disposal on an individual operations basis is not the optimal approach given the opportunity to aggregate the tailings capacity of the three mining complexes. As a result, this Modification will see the sequential filling of already approved tailings emplacement areas and reduce the need for additional tailings facilities at some Glencore mines in the GRA. These strategic tailings disposal activities will realise operational savings whilst also achieving a better environmental outcome across the GRA.

An assessment of the volume of mining void space required to accommodate all tailings generated from GRA has confirmed that the Ravensworth East - West Pit mining void will ensure tailings generation does not exceed tailings capacity across the associated Glencore mining operations as discussed in Section 8.8.1.

The proposed strategy negates the need to emplace tailings within the Narama Void as is currently approved. This void becomes available for water storage and distribution for the GRA operations as required on a day to day basis.

To facilitate the implementation of stage one of an integrated tailings management strategy across the GRA a modification is therefore sought to each of the following planning approvals:

- Ravensworth Operations - PA 09_0176 (as modified);
- Liddell Coal Operations – DA 305-11-01 (as modified); and
- Ravensworth East – DA 52-03-99 (as modified).

4.2.2 Future Opportunities

Beyond the Stage 1 approval, it is also recognised that there is future opportunity to implement a larger strategy (Stage 2 tailings management strategy) aimed at further ensuring the logical and sequential filling of already approved tailings emplacement areas and reduce the need for additional tailings facilities at some Glencore mines in the GRA. It is anticipated that the Stage 2 tailings management strategy will constitute the approval to enable further joint GRA tailings emplacement within the Liddell South Cut Void and/or other suitable void areas.

It is anticipated that subject to market factors and engineering design confirmation, relevant Glencore operations will seek the appropriate approval for the Stage 2 tailings management strategy in the future. The Stage 2 tailings management strategy will be subject to further assessment and will be prepared in consultation with key agencies and stakeholder groups.

It is noted that the Stage 1 Modification has been developed as a stand-alone application and as such, its successful implementation is not dependent on these future opportunities described in this section.

4.3 INTERACTIONS WITH THE APPROVED OPERATIONS

This Modification will not require any changes to the existing approved operations other than those described elsewhere in this Section 4. All mining and associated activities will continue to be conducted as part of those currently approved operations described in Section 3.2 and Table 1.

No increase above the currently approved production levels, life of mining, areas of disturbance or workforce limit at any operation is required to facilitate this Modification.

A description of the currently approved tailings emplacement strategy in the context of this Modification for each of the GRA operations is provided below.

4.3.1 Ravensworth Operations

PA 09_0176 (as modified) provides for tailings from the Ravensworth CHPP to be emplaced into the Cumnock 3 void, Ravensworth South and Narama mine voids via above ground pipelines. Currently tailings disposal from Ravensworth Operations is occurring within the Cumnock 3 Void however this is expected to reach capacity by December 2016.

This Modification is being sought to PA 09_0176 to permit the diversion of tailings from the Ravensworth Operations CHPP to the West Pit Void at Ravensworth East from approximately 2017-2021 (see Table 2). In the absence of the implementation of stage two of the GRA integrated tailings emplacement strategy in 2021, tailings will be diverted back to the Narama approved tailings receptacle consistent with currently approved operations.

In addition, approval is also being sought to utilise the Narama Void as an interim water storage area and then to infill this void with either tailings (should the Stage 2 integrated tailings emplacement strategy not eventuate) and or overburden from Ravensworth Operations and rehabilitate the site consistent with the approved final landform.

4.3.2 Liddell Coal Operations

Tailings generated at Liddell Coal Operations has previously been disposed of in the Antiene, Reservoir West, Reservoir South and the Railway Fines (now referred to as the Durham Tailings) emplacement areas. The Antiene tailings dam has reached capacity and use of this void as an active tailings emplacement area ceased in August 2009. Deposition into the Reservoir West Tailings Dam was completed in December 2013. Deposition into the Reservoir South Tailings Dam was completed in 2014.

The Durham Tailings Emplacement Area is currently the only active tailings dam at Liddell Coal Operations. The Durham Tailings emplacement is estimated to have capacity through to 2018. Subsequently, Liddell Coal Operations may emplace tailings in cells constructed on the advancing overburden dumps in the South Pit mining area and then ultimately place tailings in the South Cut Void.

This Modification is being sought to DA 305-11-01 to permit the diversion of tailings from the Liddell Coal Operations CHPP to the West Pit Void at Ravensworth East from approximately 2018 to 2020 (see Table 2).

Following the completion of tailings disposal in the West Pit Void at Ravensworth East, Liddell Coal Operations tailings will be placed in the already approved South Cut Void receptacle at Liddell Coal Operations and rehabilitated consistent with the approved final landform.

4.3.3 Ravensworth East

Ravensworth East is approved to operate in accordance with DA 52-03-99 (as modified). A modification to DA 52-03-99 was granted in May 2004 allowing amendments to the receival and tailings disposal arrangements at Ravensworth East and Mt Owen. The Modification was supported by the *Statement of Environmental Effects Modifications to Coal Receival and Tailings Disposal System – Mt Owen and Ravensworth East Mines* (Umwelt, 2003) and permits tailings to be pumped from the Mt Owen CHPP to the Ravensworth East – West Pit.

This Modification is being sought to DA 52-03-99 to permit the receival and emplacement of piped tailings from Ravensworth Operations and Liddell Coal Operations CHPPs within the West Pit Void at Ravensworth East for the period 2017 to 2021 (see Table 2).

This Modification is also seeking approval for the construction of a secondary flocculation plant adjacent to the West Pit Void at Ravensworth East to treat the tailings prior to their deposition in the void.

4.3.4 Mt Owen Complex

As described in the *Mt Owen Continued Operations Project Environmental Impact Statement* (Umwelt, 2015) Glencore is currently seeking approval for the continued use of Ravensworth East voids for tailings and coarse reject emplacement and provision for the use of in-pit tailings cells in the North Pit Continuation, as well as the co-disposal of coarse reject with overburden in nominated areas.

It is not anticipated that the quantity of tailings emplacement in the Ravensworth East West Pit as sought in this Modification will significantly alter the Mt Owen Complex's ability to appropriately manage tailings across its operation. Further, this Modification will not impact on the ability of the Mt Owen Complex to provide for tailings emplacement for the currently approved or proposed Mt Owen Complex operations (see Section 3.1.4 and Section 8.8).

4.3.5 GRA Water Management System

The GRA already have an integrated water management system, referred to as the Greater Ravensworth Water Sharing System (GRWSS). As part of this system, water can be transferred between the Mt Owen Complex, Ravensworth Operations and Liddell Coal Operations via a network of pipelines and pumps that connects each of the water storage facilities. The GRWSS allows water to be imported or exported to each operation depending on the individual need and storage availability. The GRWSS provides for an efficient use of water by ensuring the maximum amount of water is recycled/reused on site, minimises the amount of water that needs to be drawn from external sources such as surface water allocation licences and by reducing the amount of water that may need to be discharged in accordance with relevant EPL and the Hunter River Salinity Trading Scheme (HRSTS).

This Modification is seeking approval to utilise the Narama Void as an interim water storage facility and form part of the GRWSS. Under this Modification, this void will become available for water storage, which can then be distributed to the GRA operations for use in day to day operations.

The proposed longer term integrated tailings management strategy may negate the need for tailings emplacement in the Narama Void as is currently approved. As such this Modification is also seeking an alternate short to medium term use for this void as a mine water storage facility for the GRA prior to it being backfilled to its currently approved final landform profile.

This modification is not seeking to surrender the approval to emplace tailings in the Narama Void (or any other currently approved tailings emplacement facility) as currently approved under PA 09_0176 to provide flexibility for future mining operations.

4.4 PIPELINE CONSTRUCTION DETAILS

4.4.1 Earthworks

Clearing and Grubbing

Clearing and grubbing will involve the removal of all vegetation, timber, redundant concrete slabs, roadways and other debris which are not suitable for inclusion in the works. Where required clearing and grubbing will be completed in compliance with the following:

- Completed progressively to minimise the extent of the disturbed works;
- Clearing and grubbing will only commence after implementation of appropriate erosion and sediment controls;
- Holes remaining after trees and stumps have been grubbed will be backfilled promptly with sound material; and
- Clearing and grubbing extents will be approximately 4 m offset from the extent of the permanent works.

4.4.2 Topsoil Stripping

Topsoil stripping will involve the removal of topsoil from the footprint of any required earthworks and placement of it in temporary stockpiles or immediately back on completed works. Where required topsoil stripping will be completed in compliance with the following:

- Topsoil stripping will typically be to 100 mm thickness;
- The maximum height of topsoil stockpiles will not exceed 2.5 m;
- The maximum batter slope will not exceed 2H:1V; and
- Topsoil stripping extents will be a maximum of 4 m offset from the extent of the permanent works.

4.4.3 Piping Design Specification

All pipes will be polyethylene or equivalent as indicatively described in Table 3. All pipes, flanges, fittings and gaskets will be designed to meet relevant Australian Standards. Relevant testing and quality assurance measures will also be conducted to ensure all relevant industry and the higher Glencore standards are achieved.

A dual containment or double walled pipe will be installed to prevent potential damage to environmentally sensitive areas and to prevent pipelines from damage which may lead to spillage or leakage. The dual containment pipe shall consist of a pipe larger than the outside diameter of the carrier pipe or equivalent sound practice (see Table 3).

Following completion of the pipeline installation an as-built survey will be conducted to form an accurate record of the works.

Table 3
Indicative Pipe Class and Size Specification

Property	Carrier Pipe Specification	Containment Pipe Specification
Material Class	PE 100	PE 100
Pipe Class	PN 12.5 - PN 25 (SDR 9)	PN 8 (SDR 21)
Dimensions (mm)	400	500

4.4.4 Pumping Design Specification

The existing tailings disposal pumps at Ravensworth Operations consist of 3 sets of dual pumps fitted with 510 mm impellers in series. These will be reused, or upgraded where necessary, to facilitate the proposed tailings transfer.

The existing tailings pump configuration at Liddell Coal Operations comprises two tailings disposal pumps. These pumps will be reused, or upgraded where necessary, to facilitate the proposed tailings transfer.

4.4.5 Environmental Controls

All tailings pipelines required for this Modification will be designed in accordance with relevant Australian Standards and the Glencore Coal Assets Australia Pipeline Standards to minimise potential damage to environmentally sensitive areas and to protect pipelines from damage which may lead to spillage or leakage.

The environmental controls to be considered in the design are to include:

- Pipelines will be buried across creeks and drainage lines where possible. Where burial is not practical or for existing pipelines that are suspended across creeks, measures are to be implemented to confirm that they are to be adequately supported to prevent damage from creek flows and or flood debris;
- Double skinned or sleeved pipelines to minimise physical damage and or to contain potential leakages will be utilised in sensitive locations;
- Pipelines adjacent to roads or in trafficked areas will be buried or protected (e.g. use of bollards). Pipelines buried under road crossings will be protected by conduits or to have sufficient cover to prevent damage from vehicle loadings;
- Pumps of suitably rated capacity to the type and condition of the pipeline are to be used to prevent potential failures;
- Differential flow meters and/or other alternative methods of leak/burst detection will be included in the design;
- Other containment measures such as scour pits, bunding etc will be incorporated to ensure containment of any leaks or spills; and
- An inspection regime consistent with Glencore's Pipeline Management Protocol will be put in place to ensure that each pipeline continues to function as designed.

4.5 SECONDARY FLOCCULATION PLANT

Approval is also being sought to construct a single new Flocculation Plant within the vicinity of the West Pit Void at Ravensworth East, to allow pipe head flocculation of all tailings to be placed within the West Pit Void. This will facilitate the ongoing secondary flocculation of tailings from all GRA operations. Flocculation has proven to result in an immediate increase in the density of the tailings, which improves the recovery of water and also results in a more stable tailings storage facility. Improving the dewatering rate of the tailings will also lead to a decrease in the volume of tailings to be deposited and thereby increase the life span of this tailings storage facility.

This process involves injecting flocculants into the tailings delivery pipeline immediately prior to deposition. Secondary flocculation will facilitate the maximum recovery of water from the slurry for reuse and also increases the immediate density of the tailings, thereby improving the overall stability and lifespan of the tailings emplacement area.

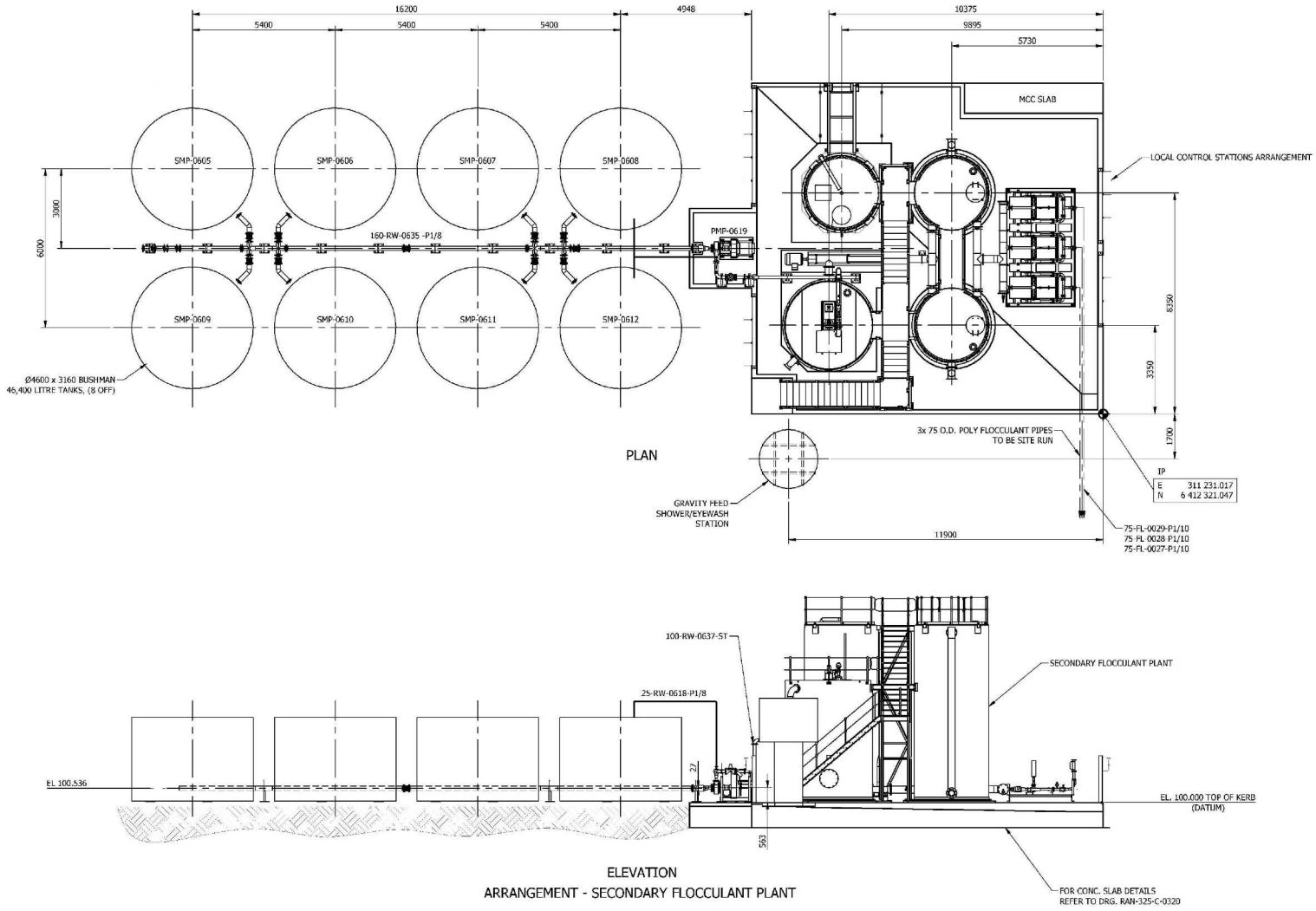
A Flocculant Plant will be constructed within the vicinity of the West Pit Void at Ravensworth East to facilitate secondary (or pipe head) flocculation immediately prior to the point of disposal. A conceptual general arrangement is provided on Figure 5.

This will maximise the amount of water recovered from the slurry and result in a more solid tailings medium being deposited in the Emplacement Area. Flocculating in the pipeline near the discharge point will provide sufficient turbulence to allow mixing without causing the breakdown of the flocculant.

Secondary flocculation of the tailings will realise the following benefits:

- Improved water recovery volume and quality for reuse/ recycling in site operations;
- Increased initial settlement and density of tailings material;
- Development of a significant beach slope, which will promote further water run-off and recovery of water from the tailings;
- Improved sheer strength characteristics of the emplaced tailings medium;
- Improved overall stability of the Tailings Emplacement Area;
- Reduced time to reach final settlement (long term consolidation) due to increased initial density;
- Facilitate earlier rehabilitation following decommissioning of the emplacement area; and
- Increase the overall life-span of the tailings storage facility (as the material is denser and less water is stored within the area).

The system will feed into the pipeline and pumping system described in Section 4.4.



HB 1503 RAVENSWORTH (EA) - F05 CSF Plant General Arrangement (04-Nov-15)

GREATER RAVENSWORTH AREA OPERATIONS

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Conceptual Secondary Flocculant Plant General Arrangement

FIGURE 5

5 REGULATORY FRAMEWORK

This section briefly describes the regulatory framework under which each of the relevant GRA operations are approved as relevant to this Modification. It discusses the ability of the Minister for Planning and Environment to modify each of PA 09_0176, DA 305-11-01 and DA 52-03-99 under section 75W of the EP&A Act and describes the approvals process.

5.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

5.1.1 Existing Development Consents

Ravensworth Operations

On 11 February 2011 the Minister for Planning granted PA 09_0176 for the Ravensworth Operations Project pursuant to section 75J of the EP&A Act.

Ravensworth Operations have modified PA 09_0176 on two occasions (see Section 3.1.1).

PA 09_0176 authorises the undertaking of mining operations on site until 31 December 2039.

Liddell Coal Operations

Liddell Coal Operations was originally assessed as State Significant Development (SSD), with DA 305-11-01 granted in 2002 by the then Minister for Planning pursuant to sections 76A(9) and 80 under Part 4 of the EP&A Act.

Liddell Coal Operations have modified DA 305-11-01 on five occasions (see Section 3.1.2).

DA 305-11-01 authorises the undertaking of mining operations on site until 31 December 2028.

Ravensworth East

Ravensworth East Mine was originally assessed as SSD with DA 52-3-1999 granted in March 2000 by the then Minister for Urban Affairs and Planning pursuant to sections 76A(9) and 80 under Part 4 of the EP&A Act.

Ravensworth East Mine DA 52-3-1999 has been modified on four occasions (see Section 3.1.3).

DA 52-3-1999 authorises the undertaking of mining operations on site until 2 March 2021.

5.1.2 Power to Modify

Ravensworth Operations' PA 09_0176 is a "transitional Part 3A Project" for the purposes of the EP&A Act (refer to clause 2 of Schedule 6A of the EP&A Act), as it was approved under Part 3A.

Clause 3 of Schedule 6A of the EP&A Act states that *"Part 3A of this Act (as in force immediately before the repeal of that Part and as modified under this Schedule after that repeal) continues to apply to and in respect of a transitional Part 3A project."*

Therefore, section 75W of the former Part 3A appropriately applies to the modification of PA 09_0176.

In regard to Liddell Coal Operations' DA 305-11-01 and Ravensworth East's DA 52-3-1999, Clause 8J(8) of the *Environmental Planning and Assessment Regulations 2000* (EP&A Regulations) provides an avenue for major projects approved under Part 4 of the EP&A Act to be modified under section 75W, stating that:

> *(8) For the purposes only of modification, the following development consents are taken to be approvals under Part 3A of the Act and section 75W of the Act applies to any modification of such a consent:*
>
> *(a) a development consent granted by the Minister under section 100A or 101 of the Act,*

(b) a development consent granted by the Minister under State Environmental Planning Policy No 34—Major Employment-Generating Industrial Development,

(c) a development consent granted by the Minister under Part 4 of the Act (relating to State significant development) before 1 August 2005 or under clause 89 of Schedule 6 to the Act,

(d) a development consent granted by the Land and Environment Court, if the original consent authority was the Minister and the consent was of a kind referred to in paragraph (c).

The development consent, if so modified, does not become an approval under Part 3A of the Act.

Liddell Coal Operations was granted DA 305-11-01 in 2002 and Ravensworth East Mine was granted DA 52-3-1999 in March 2000. Both consents were therefore granted under Part 4 of the EP&A Act prior to 1 August 2005. Subsequently, Clause 8J(8)(c) of the EP&A Regulations allows DA 305-11-01 and DA 52-3-1999 to be modified under Section 75W.

5.1.3 Landowner Consent and Notification

Under Clause 8F of the EP&A Regulations the consent of the landowner is not required for a modification application under section 75W of the EPA Act for a " … mining or petroleum production project… " which (under clause 8F(4)) includes '… *any activity that is related to mining …*'.

Notice of the development application must be given through an advertisement published in a newspaper circulating in the area of the project within 14 days after the making of the application. Glencore will give notice to the public in accordance with clause 8F of the EP&A Regulation.

All land which is the subject of the Modification application is owned by Glencore-controlled companies, AGL Macquarie or is ARTC rail corridor. Ravensworth Operations either has arrangements in place to facilitate the use of this land or is in advanced consultation for such access.

5.1.4 Section 75W of the EP&A Act

This application for Modification is made under section 75W of the EPA Act. The relevant aspects of that section are as follows:

(2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.

(3) The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.

(4) The Minister may modify the approval (with or without conditions) or disapprove of the modification.

Section 75W(2) states that the Minister's approval is not required where the modified project would be consistent with the approved project. It is arguably the case that the proposed Modification is not entirely consistent with the operations as already approved (due to the need for the tailings pipeline to be constructed and the descriptions of the source of tailings, and locations for tailings deposition, in the existing approvals). Accordingly, the proponent is seeking a modification to PA 09_0176, DA 305-11-01 and DA 52-03-99 under section 75W of the EP&A Act.

This Modification will entail only very limited environmental consequences beyond those which had been the subject of previous assessment and what has been approved under PA 09_0176, DA 305-11-01 and DA 52-03-99. The Modification will not result in any change to the core elements across each operation such as:

- Total coal production rates, mining footprint or duration of mining;
- Existing method of mining or destination of ROM and product coal;
- The character of the currently approved infrastructure components;
- Already approved final landforms; and
- Existing manning levels or operational hours.

Additional discussion regarding the approved operations with the modified operations (as proposed) is provided in Section 4.

The principal changes to the development which would arise from the Modification are as follows:

- Construction of a flocculation plant and associated electrical works and approximate 11 km pipeline network connecting both the Ravensworth CHPP and Liddell CHPP to the West Pit Void at Ravensworth East;
- The staged emplacement of tailings generated from Ravensworth and Liddell Coal Operations within the West Pit Void at Ravensworth East; and
- Interim utilisation of the Narama Void as a central water storage facility for the GRA prior to being backfilled as per the existing approved Ravensworth Operations final landform.

A detailed description of the Modification is provided in Section 4. However the principal changes as described above will have limited environmental consequences beyond those which have previously been assessed and approved in respect of PA 09_0176, DA 305-11-01 and DA 52-03-99. It is therefore available for the Minister (or his delegate) to modify the Development Consents under section 75W of the EP&A Act as sought.

5.1.5 Environmental Assessment Requirements

Section 75W(3) states that the Director-General may notify the proponent of Environmental Assessment Requirements for the proposed modification.

The DP&E advised in July 2015 that Environmental Assessment Requirements would not be issued due to the minor nature of the Modification.

5.1.6 Objects of the EP&A Act

The objects of the EP&A Act are stated in section 5 of the Act.

The objects of this Act are:

(a) to encourage:

(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,

(ii) the promotion and co-ordination of the orderly and economic use and development of land,

(iii) the protection, provision and co-ordination of communication and utility services,

(iv) the provision of land for public purposes,

(v) the provision and co-ordination of community services and facilities, and

(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and

(vii) ecologically sustainable development, and

(viii) the provision and maintenance of affordable housing, and

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

As the proposed Modification will result in an improved environmental outcome it is consistent with the objects of the EP&A Act.

5.2 ENVIRONMENTAL PLANNING INSTRUMENTS

5.2.1 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (SEPP Mining) determines the permissibility of mining developments and the matters that must be considered by consent authorities when evaluating development applications for mining developments.

Under clause 7 of SEPP Mining, the proposed development is permissible with consent under the EP&A Act.

5.2.2 NSW Strategic Regional Land Use Policy

The requirement for a Gateway Certificate or Site Verification Certificate in respect of certain modification applications for mining and petroleum development comes from clause 50A of the *Environmental Planning and Assessment Regulation 2000* and Part 4AA of SEPP Mining.

The term "mining or petroleum development" is defined in clause 17A of SEPP Mining as:

(a) development specified in clause 5 (Mining) of Schedule 1 to State Environmental Planning Policy (State and Regional Development) 2011, but only if:

(i) A mining lease under the Mining Act 1992 is required to be issued to enable the development to be carried out because:

(a) The development is proposed to be carried out outside the mining area of an existing mining lease, or

(b) There is no current mining lease in relation to the proposed development.

None of the elements of the development proposed by this Modification are within the definition of "mining or petroleum development" because none of these activities give rise to the requirement for a Mining Lease (see Section 5.3.1). Accordingly, neither a Site Verification Certificate nor a Gateway Certificate is required to accompany this application.

5.3 APPROVALS UNDER OTHER NSW LEGISLATION

5.3.1 Mining Act 1992

The mining of coal in NSW is regulated by the *Mining Act 1992* (Mining Act). Section 5 of the Mining Act provides that mining cannot be undertaken except in accordance with a valid mining authorisation. Section 65(1) of the Mining Act states:

(1) The Minister must not grant a mining lease over land if development consent is required for activities to be carried out under the lease unless an appropriate development consent is in force in respect of the carrying out of those activities on the land.

> *Note. Section 380AA prevents an application for development consent to mine coal from being made or granted unless the applicant is the holder of an authority that is in force in respect of coal and the land concerned.*

Section 380AA of the Mining Act notes that the applicant for a development consent for a coal mining project must be the holder of an authority in respect of coal for the land where mining is proposed by the application. An 'authority' is defined in the Mining Act as an exploration licence, an assessment lease or a mining lease. The requirement that there be an authority for coal applies only in respect of the areas where 'mining for coal' is proposed. As this Modification does not entail mining for coal, section 380AA of the Mining Act will not preclude the application for, or grant of, consent for this Modification.

Section 6(3) of the Mining Act identifies activities requiring a mining lease for mining purposes and states:

(3) The mining purposes specified for the purposes of this section are the following mining related purposes:

> *(a) the construction, maintenance or use of any reservoir, dam (including a tailings dam), drain or water race, other than any reservoir, dam, drain or water race principally used for purposes not connected with mining or any other activities regulated by or under an authorisation,*
> *(b) opal puddling,*
> *(c) the removal, stockpiling or depositing of overburden, ore or tailings to the extent that it is associated with mineral extraction or mine beneficiation.*

The activities sought in this Modification do not conform to any of the mining purposes specified in Section 6(3) of the Mining Act.

The activity will be largely undertaken within existing mining authorities currently held by Ravensworth Operations, the Cumnock Joint Venture (which is majority-owned by Glencore) or the Mt Owen Complex, which is wholly-owned by Glencore.

In accordance with existing mining authorisation requirements, the existing Ravensworth Open Cut & Ravensworth Coal Handling Preparation Plant Mining Operations Plan (Ravensworth MOP), Liddell Coal Operations MOP and Mt Owen Complex MOP (Mt Owen and Ravensworth East) will be updated for the Modification in consultation with the relevant agencies to the satisfaction of Division of Resources and Energy (DRE).

5.3.2 Protection of the Environment Operations Act 1997

Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act) provides that an Environment Protection Licence (EPL) is required for scheduled activities under the Act. Under clause 28 of Schedule 1 of the POEO Act, "*mining for coal*" is deemed to be a scheduled activity if the daily production exceeds 500 tonnes, or if the disturbance area exceeds 4 ha.

Each GRA operation holds current EPLs administered by the Environment Protection Authority (EPA) under section 43(b) of the POEO Act as relevant to each operation. The relevant Glencore operating company currently holds EPL 2652 for Ravensworth Operations, EPL 2094 for Liddell Coal Operations and EPL 10860 for Ravensworth East.

To the extent necessary, the EPLs will be varied to reflect this Modification sought.

5.3.3 Water Management Act 2000 & Water Act 1912

The licensing and approvals provisions of the *Water Management Act 2000* (WM Act) apply to water sources that are the subject of a water sharing plan (WSP). Water sources that are not the subject of a WSP are regulated by the *Water Act 1912* (Water Act).

The Modification activities are situated entirely within the Jerrys Water Source under the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009,* which was proclaimed under the WM Act.

Each respective GRA operation associated with this Modification holds all required licences, share component and allocation to comply with the WM Act and Water Act.

As outlined in Section 8.3, no additional impacts requiring additional water licences under either the WM Act or Water Act are predicted for this Modification.

5.3.4 National Parks and Wildlife Act 1974

Under section 86 of the *National Parks and Wildlife Act 1974* (NPW Act), it is an offence to harm an Aboriginal object unless the harm is authorised by an Aboriginal Heritage Impact Permit (AHIP). Management of Aboriginal sites would ordinarily be undertaken through application to OEH for an AHIP in accordance with Section 90 of the NPW Act for the destruction and salvage of impacted sites.

Pursuant to section 75U of the EP&A Act, an AHIP under section 90 of the NPW Act is not required for Ravensworth Operations given that it is an approved Part 3A project.

Aboriginal archaeological surveys have determined that there are no Aboriginal objects located within the additional disturbance area proposed for the Modification provided the management and mitigation measures identified in Section 8 are implemented. Therefore, an AHIP is not required for the Modification. Management of Aboriginal heritage items will be managed in accordance with the existing approved GRA Aboriginal Archaeological and Cultural Heritage Management Plans.

5.3.5 Native Vegetation Act 2003

Under the *Native Vegetation Act 2003* (NV Act), it is an offence to clear native vegetation without development consent for the clearing.

Section 25(l) of the NV Act provides that clearing authorised under the Mining Act is exempt from the provisions of the NV Act. Any vegetation clearing required in relation to the Modification will occur within existing mining leases.

5.3.6 Local Environmental Plans

Section 89E(2) of the EP&A Act provides that "*Development consent may not be granted if the development is wholly prohibited by an environmental planning instrument*".

Section 89E(3) EP&A Act provides that "*Development consent may be granted despite the development being partly prohibited by an environmental planning instrument*".

The Modification is located primarily within the Singleton LGA in land predominately zoned as "RU1 Primary Production" under provisions of the *Singleton Local Environmental Plan 2013* (Singleton LEP). However, several parcels of land are situated within the Muswellbrook LGA associated with the Liddell Coal Operations CHPP. These parcels of land are regulated by the provisions of the *Muswellbrook Local Environment Plan 2009* (Muswellbrook LEP) and include RU1 Primary Production" and "SP2 Power Station".

The land use table in the Muswellbrook LEP and Singleton LEP provides that open cut mining is permissible with Development Consent in zone RU1. The Modification is partially located on land zoned SP2, which is specifically dedicated for a power station. Section 7 of SEPP Mining provides that mining is permissible on any land where agriculture or industry is permissible. Therefore, the Modification is permissible with consent.

5.3.7 Exemptions

As a transitional Part 3A project, Ravensworth Operations will continue to be subject to section 75U and 75V of the EP&A Act. Section 75U states that the following authorisations and approvals are not required for projects that have been approved under Part 3A of the EP&A Act:

(a) the concurrence under Part 3 of the Coastal Protection Act 1979 of the Minister administering that Part of the Act,

(b) a permit under section 201, 205 or 219 of the Fisheries Management Act 1994,

(c) an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,

(d) an Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974,

(e) an authorisation referred to in section 12 of the Native Vegetation Act 2003 (or under any Act to be repealed by that Act) to clear native vegetation or State protected land,

(f) a bush fire safety authority under section 100B of the Rural Fires Act 1997,

(g) a water use approval under section 89, a water management work approval under section 90 or an activity approval under section 91 of the Water Management Act 2000.

Section 75V of the EPA Act provides:

An authorisation of the following kind cannot be refused if it is necessary for carrying out an approved project and is to be substantially consistent with the approval under this Part:

(a) an aquaculture permit under section 144 of the Fisheries Management Act 1994,

(b) an approval under section 15 of the Mine Subsidence Compensation Act 1961,

(c) a mining lease under the Mining Act 1992,

(d) a production lease under the Petroleum (Onshore) Act 1991,

(e) an environment protection licence under Chapter 3 of the Protection of the Environment Operations Act 1997 (for any of the purposes referred to in section 43 of that Act),

(f) a consent under section 138 of the Roads Act 1993,

(g) a licence under the Pipelines Act 1967.

As stated in Section 5.1.2, Liddell Coal Operations DA 305-11-01 and Ravensworth East DA 52-3-1999 are modified under section 75W subject to Clause 8J(8) of the EP&A Regulation which provides that a development consent modified using section 75W of the EP&A Act does not become an approval under Part 3A of the Act. Accordingly, Sections 75U and 75V of the EP&A Act do not apply to Liddell Coal Operations or Ravensworth East.

5.4 COMMONWEALTH LEGISLATION

5.4.1 Environment Protection and Biodiversity Conservation Act 1999

If a proposed action is likely to have a significant impact on one or more Matters of National Environmental Significance (MNES), the action is deemed to be a "*controlled action*". The approval of the Minister for the Environment must be obtained before a controlled action can be carried out.

On 8 April 2011, the Ravensworth Operations Project received approval EPBC No. 2010/5389 pursuant to sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Neither Liddell Coal Operations or Ravensworth East hold a current EPBC approval.

The Ecological Impact Assessment completed for this EA (see Section 8.1) has determined that this Modification will not have a significant impact to any communities listed under the EPBC Act.

This Modification has also considered the potential impacts on water resources in relation to the Federal Guidelines: *Matters of National Environmental Significance Significant Impact Guidelines 1.1* and the *Significant Impact Guidelines 1.3; Coal seam gas and large coal mining developments – impacts on water resources* (EPBC Water Guidelines). The following extract from the EPBC Water Guidelines are relevant to the Modification:

> *"4.2.1 If a referral for a proposed expansion or modification to a project does not involve extraction of … coal, then it will not be within the definition of … 'large coal mining development', and the water trigger will not apply …."*

A *"large coal mining development"* is defined under the EPBC Act (section 528) as:

> *"any coal mining activity that has, or is likely to have, a significant impact on water resources (including any impacts of associated salt production and/or salinity):*
>
> *(a) in its own right; or*
>
> *(b) when considered with other developments, whether past, present or reasonably foreseeable developments."*

Further extracts from the EPBC Water Guidelines are also relevant to the Modification:

> *"3.4. Extraction of CSG or coal*
>
> *The definitions of '… 'large coal mining development' relate to impacts on a water resource of activities that form part of the process of extracting coal …. The development of associated infrastructure that is not part of the extraction process is not included in the definitions of … large coal mining development.*
>
> *Extraction of … coal must form part of the activity and not merely be associated with it. Where referred along with new or modified extraction of … coal, the following activities will form part of the extractive process:*
>
> - *water supply for use in the extraction of … coal*
> - *management of water generated as a result of extraction of … coal, such as holding dams or water treatment facilities*
> - *management of waste generated as a result of extraction of … coal, such as spoil heaps.*
>
> *However, these activities will not independently be … coal mining development where there is no new or modified extraction of … coal…."*
>
> *"3.5. Associated infrastructure*

The development of associated infrastructure that is not part of the extraction process is not included in the definitions of'… 'large coal mining development'. This may include:

- *transport infrastructure, such as pipelines, road or rail infrastructure*
- *office/housing and amenity construction*
- *environment protection, monitoring and associated land management activities…*"

This Modification does not entail any extraction of coal. The Modification only relates to "*management of waste generated as a result of extraction of coal"* and "*associated infrastructure that is not part of the extraction process*" (the extraction process itself was all assessed and approved under existing approvals). Therefore, the Modification does not constitute 'large coal mining development' for the purposes of section 24D of the EPBC Act.

The Modification will not have a significant impact to any MNES. As such, there is no need to refer the Action under Section 68 of the EPBC Act to the Federal Minister for the Environment for an approval under Part 9 of the EPBC Act.

5.4.2 Native Title Act 1993

The *Native Title Act 1993* (NT Act) provides for the recognition and protection of native title. Under section 13 of the NT Act, any person can apply to the Federal Court for a determination of native title.

Section 23A of the NT Act states that native title is extinguished by "previous exclusive possession acts" attributable to the Commonwealth. Under section 23B of the NT Act, native title over land is extinguished by the grant of a freehold estate over that land, provided that the grant occurred on or before 23 December 1996. Native title has the potential to exist on Crown Land.

Searches of the National Native Title Register (determinations) and the Register of Native Title Claims (for current claims) have revealed that the Modification is situated within land currently subject to a Native Title Claim by Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People (Tribunal File No. NC2013/006, Federal Court No. NSD1680/2013).

The Modification will not require the grant of any new mining leases, and will not result in the disturbance, or the placement of infrastructure, on any Crown Land.

6 STAKEHOLDER ENGAGEMENT

This section provides a summary of the stakeholder engagement undertaken for the Modification by Glencore and Hansen Bailey.

6.1 STAKEHOLDER ENGAGEMENT

Table 4 outlines the consultation activities undertaken for this Modification. The stakeholder engagement program over this Modification included consultation with Local and State government agencies along with neighbouring land owners and industries and meetings with the individual Greater Ravensworth Area operations Community Consultative Committees.

6.2 ONGOING STAKEHOLDER ENGAGEMENT

Various mechanisms will be implemented to ensure the effective ongoing engagement with stakeholders during the life of the Modification as relevant to each GRA operation. Each respective operation associated will ensure that key messages will continue to be conveyed to the relevant stakeholders for the duration of the Modification.

Key stakeholder consultation avenues that are maintained by the GRA operations include:

- Regular consultation with neighbouring land owners and industry;
- Updates to each of the Ravensworth Operations, Liddell Coal Operations and Ravensworth East (incorporated into the Mt Owen Complex) Community Consultative Committee;
- Distribution of regular community newsletters; and
- Preparation and distribution of Annual Review for Ravensworth Operations, Liddell Coal Operations and Ravensworth East (incorporated into the Mt Owen Complex).

Table 4
Stakeholder Engagement and Consultation

Stakeholder	Consultation
DP&E	• EA Modification briefing (30 July 2015)
NSW Office of Water	• EA Modification briefing offer (31July 2015)
Division of Resources and Energy	• Environment – Preliminary Modification discussion (16 February 2015) • Safety – Preliminary Modification discussion (25 February 2015) • Safety - EA Modification briefing discussion (6 August 2015) • Environment - EA Modification briefing discussion (10 August 2015)
Environment Protection Authority	• EA Modification briefing (22 June 2015)
SSC	• EA Modification overview (31 July 2015) • EA Modification briefing (12 August 2015)
AGL Macquarie	• EA Modification briefing (17 August 2015)
GRA Operations Community Consultative Committee	• Ravensworth Operations (17 June and 4 November 2015) • Liddell Coal Operations (13 November 2015) • Mt Owen Complex (6 November 2015)

7 RISK ASSESSMENT

A risk assessment was completed to identify potential environmental and socio-economic issues associated with the Modification. The primary purpose of the risk assessment process was to prioritise and focus the required environmental and socio-economic impact studies required for the EA.

Each of the environmental and social-economic issues has been assessed and where appropriate, management and mitigation options developed. Each of the potential environmental issues was ranked as being of low, moderate, high or critical risk. The risk rating allocated to an impact is dependent upon the probability of the impact occurring and the potential consequences should the impact materialise.

Due to the minor nature of the Modification no environmental aspects provided a critical or high risk. Ecology, Aboriginal archaeology, surface water and final landform were determined to be of moderate risk with all remaining environmental and socio-economic issues identified as being low risk. Table 5 summarises findings from the risk assessment.

Aspects identified as having a higher environmental impact risk ranking formed the primary focus of this EA and were more intensively assessed. Aspects which have been identified as having a low risk were also assessed however a lesser scope of works was conducted for these secondary issues, based on their lower risk rating.

Table 5
Environmental and Socio-Economic Risk Rating

Risk Rating	Aspect
Critical	None
High	None
Moderate	Ecology, Aboriginal archaeology, surface water and final landform
Low	Visual and lighting, historic heritage, air quality and acoustics

8 IMPACTS, MANAGEMENT AND MITIGATION

This section provides a qualitative review of the environmental and social impacts of the Modification and the measures that will be implemented to mitigate and manage these impacts.

8.1 ECOLOGY

8.1.1 Impact Assessment

An Ecological Assessment was completed by Forest Fauna Surveys Pty Ltd and Eastcoast Flora Survey for this Modification and is presented in Appendix B. Specifically the objectives of the Ecological Assessment was to undertake an ecology assessment of the proposed tailings pipeline from the Ravensworth Operations and Liddell Coal Operations CHPP to the West Pit Void at Ravensworth East approved tailings emplacement area. The Ecological Assessment was conducted to identify the vegetation communities and fauna habitat along the length of the proposed route and identify threatened ecological communities (TECs) listed under the NSW TSC Act and/or the Commonwealth EPBC Act. The assessment also sought to identify if this Modification would require any ameliorative actions to minimise the impact.

An ecology due diligence inspection was undertaken along the proposed pipeline route (from Ravenswoth CHPP to the West Pit at Ravensworth East) to identify the vegetation communities and fauna habitat. A search of the OEH Atlas (4 August 2015) was also undertaken to identify records of threatened species recorded within a 10 km radius of the pipeline alignment. A review of the ecological findings from the Liddell Coal Operations Proposed Modification to DA 305-11-01 Environmental Assessment (SLR, 2013) was also completed for the assessment.

The assessment found the tailings pipeline route traverses a highly modified landscape with limited ecological value. The original character of the land which the tailings pipeline traverses has been greatly altered as a result of historical and current land uses including former grazing lands or disturbed as part of approved mining operations (existing haul roads, conveyor easements, etc.).

No flora or fauna species currently listed as rare or threatened under the EPBC Act or TSC Act were observed or are identified along the tailings pipeline route. Grassland habitats inspected were deemed unlikely to support viable populations of *Diuris tricolor* given the extent of exotic grass species dominance.

Four vegetation communities were identified during the field inspections, all of which were severely disturbed and / or are in an early colonising phase following previous land clearing. All communities were representative of low-quality vegetation, and only one, the regrowth Ironbark-Box Woodland, considered to be part of a listed TEC. Isolated trees and small regenerating patches of *Eucalyptus crebra* and *Eucalyptus moluccana* allude to the Central Hunter Grey Box – Ironbark Woodland TEC. This was identified to be only small patches of regrowth and unlikely to be disturbed during construction of the pipeline, as the route will generally follow an already disturbed easement with any minor disturbance not resulting in an significant impact.

A total of 18 threatened fauna species have been previously recorded within 10 km radius of the proposed tailings pipeline route. Limited suitable remnant habitat exists along the pipeline route for the majority of these species and hence the likelihood of most species occurring was low. There are a small number of species where suitable habitat exists within the vicinity of the tailings pipeline route, including:

- Farm dams for frogs including the Green and Golden Bell Frog, and waterbirds;
- Small pockets of regrowth woodland as foraging habitat for threatened woodland birds and microbats; and
- Riparian habitat along Bowmans Creek.

The proposed tailings pipeline route will mostly avoid disturbance to these habitat areas, with only minor disturbances required for the construction of the pipeline.

8.1.2 Mitigation and Management

The Ecological Assessment concluded that this Modification will not have a significant impact on threatened species populations or communities and/ or their habitat. In order to further ensure impacts are minimised the following general mitigation measures will be implemented for the Modification to avoid significant disturbance to native vegetation and fauna habitat:

- Minimise the area to be disturbed during the construction of the tailings pipeline;
- If any River Oak Casuarina *cunninghamiana* subsp. *cunninghamiana* trees are removed during construction of the tailings pipeline, compensatory plantings will be undertaken along the Bowmans Creek bank;
- The pipeline will be slightly elevated (approximately 10 cm) above the ground level (or alternatively buried) for a short distance near the farms dams located near Yorks Creek. This will allow terrestrial vertebrates, such as ground frogs and turtles, to move between the dams; and
- During construction, if the pipeline is to be buried and trenches are to remain temporarily open, daily inspections will be undertaken to locate and remove any fauna that may become trapped within the trench. Temporary escape structures, such as large sticks or posts, could also be placed in the trench to enable animal to escape, in situations where the trench is to remain open for an extended period.

In addition to the above, measures outlined in the each of the existing GRA operations biodiversity management plans including:

- Biodiversity Management Plan (including the Flora and Fauna Management Plan), Mt Owen Complex;
- Ravensworth Complex Federal Offset and Green and Golden Bell Frog Management Plan;
- Ravensworth Complex Biodiversity Management Plan; and
- Biodiversity Management Plan, Liddell Coal Operations.

8.2 ABORIGINAL HERITAGE

8.2.1 Impact Assessment

An Aboriginal archaeological due diligence assessment was undertaken by OzArk Environmental and Heritage Management (OzArk) and is provided in Appendix C. The assessment applied due diligence to the areas proposed to be disturbed by this Modification in accordance with the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010a).

Information regarding the known and potential Aboriginal archaeological resource of the area was obtained by:

- Conducting a background desktop study to identify any possible heritage constraints to the Modification and existing Aboriginal Heritage Information Management System (AHIMS) registered archaeological sites;
- Recording any possible Aboriginal sites and sensitive landforms associated with the tailings pipeline alignment during a site inspection; and
- Assessing the likely impacts of the proposed works to any recorded sites and provide management recommendations.

A background desktop study was undertaken to identify any possible heritage constraints and existing AHIMS registered archaeological sites. Results indicate that the closest extant sites to the tailings pipeline corridor include Nardell N2 (37−3−0491) and Nardell N4 (37−3−0492) with both being located greater than 50 m from the tailings pipeline alignment (see Figure 6). Further to this, both sites are already currently fenced and will not be impacted as a result of this Modification.

Following the site inspection conducted on 9 July 2015 no new sites of Aboriginal heritage items were identified along the tailings pipeline alignment. Two areas of archaeological sensitivity were identified, as denoted by Sensitive Area 1 and Sensitive Area 2 on Figure 6.

Although no Aboriginal sites were recorded within Sensitive Area 1 it is located on a terrace to the west of Bowmans Creek, which is a known focus for Aboriginal occupation with sites to the north and south of the proposed tailings pipeline crossing. The area of the proposed pipeline crossing is already disturbed, and therefore sensitivity is limited to the adjacent areas.

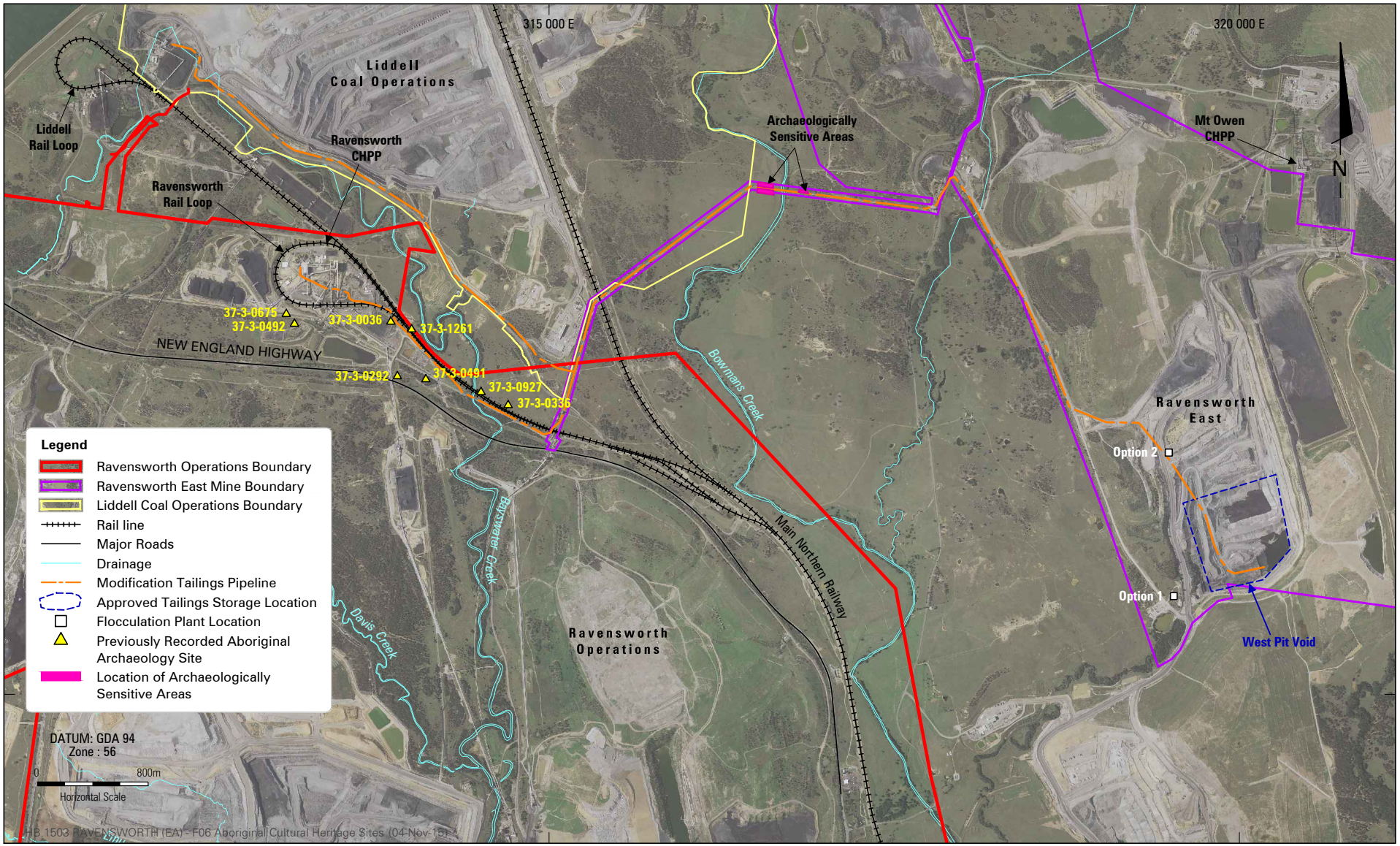
As with Sensitive Area 1 no Aboriginal sites were recorded within the Sensitive Area 2. Sensitive Area 2 is located approximately 100 – 150 m to the east of Bowmans Creek and is bound on the north by an ephemeral waterway and to the south by a fence line that marks the northern edge of the proposed tailings pipeline.

8.2.2 Mitigation and Management

Impacts as a result of the Modification will be managed in accordance with the existing GRA operations Aboriginal Archaeology and Cultural Heritage Management Plans (ACHMP), as required. In addition, the following specific mitigation measures for the Modification will be implemented to avoid inadvertent impacts to Aboriginal heritage:

- Fencing of Sensitive Areas 1 and Sensitive Areas 2 with appropriate signage to delineate and identify the archaeological sensitivity of the area;
- Induction and training of the pipeline construction workforce to ensure the areas are not accessed or disturbed; and
- Should any unidentified Aboriginal archaeological sites be located during operations, the procedures of the approved ACHMPs for the relevant operations within the GRA will be implemented.

The assessment concluded there will be no impacts to Aboriginal heritage as a result of this Modification.



GREATER RAVENSWORTH AREA OPERATIONS

GLENCORE | Hansen Bailey ENVIRONMENTAL CONSULTANTS

Aboriginal Cultural Heritage Sites

FIGURE 6

8.3 WATER RESOURCES

8.3.1 Impact Assessment

Comprehensive surface water and groundwater assessments have been undertaken for the GRA operations, as included in the Liddell Coal Operations EA (SLR, 2013), Ravensworth East RERR EA (Umwelt, 2012), and Ravensworth EA (Umwelt, 2010a). Previous assessments indicate that the West Pit Void at Ravensworth East does not receive significant quantities of groundwater inflow and is generally considered a dry pit. Further previous assessments indicated that there are no beneficial aquifers or privately owned bores predicted to be impacted by currently approved operations.

As discussed in Section 3.1.3 the West Pit Void at Ravensworth East is currently approved for the emplacement of tailings material under DA 52-03-99. This Modification is not proposing to alter the usage of this void as a tailings emplacement facility, nor are any changes proposed to the final landform. As such, there are no detrimental changes to groundwater impacts anticipated, as compared to that previously assessed and currently managed and mitigated.

Given there will be no changes to land disturbance, final landforms, drainage and catchment areas reporting to site storages, impacts on the receiving environment compared with the approved existing operation are anticipated to be insignificant.

The introduction of pipe head flocculation will result in more efficient use of water onsite by extracting more water from the tailings slurry. This improved water efficiency will lead to a more robust long-term consolidation of the tailings material due to increased initial density. This in turn will result in the tailings facility being rehabilitated more readily following the completion of mining and reduce the time for recovery of depressurisation in the hard rock aquifers.

As detailed in Section 4.3.5, the GRA operations have an integrated water management system referred to as the GRWSS, which enables water transfer and sharing between the mining operations. The proposed utilisation of the Narama Void as a water storage facility, will play an integral component of the GRWSS, if this Modification is approved. The Narama Void is estimated to have capacity in the order of 20,500 m^3. The use of this void as an interim water storage facility greatly increases the overall storage capacity of the GRWSS and provides greater flexibility for the transfer and storage of mine water.

The Narama Void is currently approved for the emplacement of tailings material in accordance with PA 09-0176 (as modified), with the void to be filled and shaped to the agreed landform plan, followed by capping and revegetation in accordance with the rehabilitation strategy (Ravensworth Operations EA, Hansen Bailey 2014). Current approvals also allow for the progressive dewatering of the tailings material via a decant system.

As discussed in Section 4.3.1 this Modification is not proposing to alter the decommissioning or final landform plans for the Narama Void. The usage of Narama Void to store water in the interim, as compared to the storage of tailings material, will not significantly change the current approved water regime or system, as the ability to transfer and reuse water across the GRA operations will remain.

8.3.2 Mitigation Measures

The proposed pipeline route will cross a number of ephemeral waterways including Bowmans Creek, York Creek and Bayswater Creek. Where possible the alignment will follow existing infrastructure and hence utilise existing bridges and waterway crossings. Where this is not feasible, the following measures will be implemented:

- Pipelines will be buried across minor creeks and drainage lines where possible. Where burial is not practical or for existing pipelines that are suspended across creeks, measures are to be implemented to confirm that they are to be adequately supported to prevent damage from creek flows and or flood debris;
- Pipelines will be double skinned or sleeved to minimise physical damage and or to contain potential leakages in sensitive locations such as waterways;
- Differential flow meters or other similar mechanisms will be installed to detect any leaks or spillages in the pipelines;
- Other containment measures such as scour pits and bunding will be incorporated to ensure containment of any leaks or spills; and
- An inspection regime consistent with Glencore's Pipeline Management Protocol will be put in place to ensure that each pipeline continues to function as designed.

A number of controls will be implemented during the construction of the pipeline to minimise potential impacts to receiving waters, including:

- Installation of erosion and sediment controls in accordance with existing Erosion and Sediment Control Plans and Glencore standards, such as cleanwater diversion drains and banks, catch drains, silt fences and sediment basins; and
- Erosion and sediment controls will be installed in accordance with *Managing Urban Stormwater Soils and Construction Volume 1* (Landcom 2004) and Volume 2E Mine and Quarries (DCCEE 2008).

The existing surface water and groundwater monitoring network and programs for the GRA will continue to be implemented in accordance with the approved operations plans and programs including:

- Mt Owen Complex Water Management Plan;
- Mt Owen Complex Groundwater Monitoring Program;
- Mt Owen Complex Surface Water and Groundwater Response Plan;
- Ravensworth Complex Water Management Plan; and
- Water Management Plan, Liddell Coal Operations.

Water monitoring including water usage and balances for the GRA operations will be updated accordingly for each respective operation, and reported in the Annual Reviews, as required.

8.4 AIR QUALITY

8.4.1 Impact Assessment

There are not anticipated to be any significant changes to the existing air quality due to the Modification to that described and assessed in the current approvals for the GRA operations. The West Pit Void is currently approved as a tailing emplacement facility for the Mt Owen Complex CHPP, and as such any additional tailings material received from Liddell or Ravensworth Operations will be managed in the same manner as the current disposal of tailings. No change to the staged development or final landform which may alter current air quality criterion are also proposed.

8.4.2 Mitigation Measures

Given there are no additional air quality impacts predicted due to this Modification, GRA Operations will continue to implement existing management and mitigation measures to comply with appropriate standards.

There may be minimal and short term dust generated during the construction of the pipeline network. This will managed in accordance with the approved Air Quality Management Plans currently in place at the GRA operations, including:

- Mt Owen Complex Air Quality and Greenhouse Gas Management Plan;
- Air Quality Management and Monitoring Plan, Liddell Coal Operations; and
- Ravensworth Complex Air Quality and Greenhouse Gas Management Plan.

In accordance with these plans, relevant controls that may be implemented during construction of this Modification include:

- Application of water on roadways and active disturbed areas to limit visible dust emissions;
- Stripping of topsoil only when there is sufficient moisture within the soil when practicable;
- Continued utilisation of the meteorological forecasting and real-time dust monitoring network to manage air quality emissions;
- Restriction or ceasing of dust-generating activities during adverse weather conditions;
- Minimising the areas of disturbance required during construction; and
- Revegetating any topsoil stockpiles as soon as practicable following completion of activities.

Further to the above, commitments arising from Coal Mine Particulate Matter Control Best Management Practice Determination (2013) for each of the GRA operations will also continue to be implemented.

8.5 ACOUSTICS

8.5.1 Impact Assessment

Due to the r minor nature of this Modification, and with respect to the distance to private land, no significant additional noise or blasting impacts are predicted to occur above currently approved operations. There may be minimal and short term construction noise associated with the construction of the tailings pipeline and associated flocculation plant.

It is anticipated that no additional impacts to the relevant noise criterion as listed in Ravensworth Operations PA 09_0176 (as modified), Liddell Coal Operations DA 305-11-01 (as modified) and Ravensworth East DA 52-03-99 (as modified) are anticipated as a result of this Modification.

8.5.2 Mitigation Measures

Existing noise mitigation and management measure will continue to be implemented to ensure compliance with appropriate standards and to minimise noise during construction activities, including:

- Relocation of equipment under adverse weather conditions or during certain time periods; and
- Implementation of meteorological forecasting and real-time noise monitoring to indicate when noise levels are approaching relevant criteria.

These controls will continue to be implemented for the Modification and managed in accordance with the approved GRA operations Noise Monitoring and Management Plans, including:

- Ravensworth Open Cut Noise Management Plan;
- Noise Monitoring Program, Mt Owen Complex; and
- Noise Monitoring Program, Liddell Coal Operations.

8.6 VISUAL AND LIGHTING

8.6.1 Impact Assessment

As construction activities will only be carried out in daylight hours there will be minimal requirement for night time lighting during the construction period.

Due to the distance from public vantage points and the minor nature of this Modification no significant additional visual impacts are predicted as a result of this Modification. Visual and lighting impacts associated with the Modification will remain similar to those previously assessed.

The route of the proposed tailings pipeline network will predominantly follow an existing easement that already contains a pipeline and conveyor. The land is primarily an industrial setting surrounded by mines and power stations. The area has been extensively modified by current and former open cut mining activities and associated infrastructure, and as such the installation of a tailings pipeline is considered to have a negligible impact on the visual amenity.

The final landform associated with the West Pit Void at Ravensworth East will not alter as a result of this Modification and as a result visual impacts as assessed in the Visual Impact Assessment in the Ravensworth East RERR EA (Umwelt, 2012) will remain consistent. The Visual Impact Assessment (Umwelt, Dec 2012) characterised the local visual landscape within the vicinity of the approved operations boundary as being dominated by mining and power generation industries, with distant limited views from the south-east as restricted by a north-south ridgeline east of Mt Owen Complex and Ashton Mine OEA. There are some views of the Ravensworth East operations from the west along the New England Highway.

Condition 36 of Ravensworth East DA 52-03-99 requires measures to be implemented to mitigate the visual impacts, including the design and construction of development infrastructure in a manner that minimises visual contrast. This condition will continue to be implemented and met with materials that minimises visual contrast utilised in the construction of the flocculation plant where practicable.

8.6.2 Mitigation Measures

Given there are no additional visual impacts arising from the Modification, GRA Operations will continue to implement existing management and mitigation measures to comply with appropriate standards and Management Plans including:

- Positioning of infrastructure areas to maximise, to the extent practicable, shielding from natural topographical features;
- Landform design and maximisation of progressive rehabilitation to limit impacts on natural topography of the sites;
- External fixed lights which do not shine above the horizontal;
- Light shields to direct light on fixed lights;

- Communication (via toolbox talks, crew talks and the site familiarisation) of potential impacts of lighting to operators of mobile plant;
- Ensuring that all external lighting associated with the operations complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*; and
- Colouring all buildings potentially visible to the public in suitable natural tones.

8.7 HISTORICAL HERITAGE

8.7.1 Impact Assessment

Several historic heritage items have been identified within and surrounding the GRA operations. The Ravensworth Homestead is listed on the Register of the National Estate (RNE) and Singleton Local Environment Plan (LEP, 2013) as having local significance. This is located some 2 km from the Ravensworth East – West Pit at the closest point; the Modification tailings pipeline route is approximately 700 m from the homestead. Given the distance to the homestead, it is not anticipated that any impacts to the Ravensworth Homestead will occur as a result of this Modification.

The Chain of Ponds Hotel and Outbuildings is listed on both the RNE and the State Heritage Register, and are assessed as having State Significance. The Chain of Ponds Inn is also registered on the Singleton LEP as being of State Significance. The proposed route for the tailings pipeline will pass within approximately 65 m of the Chain of Ponds Inn. Liddell Coal Operations currently has measures in place to ensure impacts to the Inn are avoided, including ongoing monitoring of the condition of the building and undertake stabilisation works where required. These measures will continue to be implemented during the construction and operation of the tailings pipeline.

The Ravensworth EA (Umwelt, 2010a) identified several historic heritage items within and surrounding the Ravensworth Operations. Heritage Site referred to as HH23, is the only site within the vicinity of the proposed pipeline route. This is a timber stockyards located east of the main Northern Railway, and was considered to have nil local significance with no to low research potential (EA, Umwelt 2010a). As such any impacts to this site are of limited consequence and no mitigation measures are proposed. Notwithstanding this, the pipeline will be laid in a manner to avoid any direct impacts to this site, where possible.

8.7.2 Mitigation Measures

Existing heritage management measure will continue to be implemented to ensure compliance with appropriate standards during construction activities.

In the unlikely event that any unexpected potential heritage items are discovered during construction of the tailings pipeline, all works in the immediate area will cease and the items inspected by a qualified heritage consultant.

8.8 REHABILITATION AND FINAL LANDFORM

8.8.1 Impact Assessment

As described in Section 4 this Modification is not proposing to alter the usage of the West Pit Void at Ravensworth East as a tailings emplacement facility or alter the approved final landform. This Modification aims to improve rehabilitation outcomes by allowing tailings emplacement areas to be decommissioned and rehabilitated in an orderly sequence rather than having numerous tailings areas across the GRA operational until the completion of mining at each individual mining operation. The capping and rehabilitation process of emplacement facilities will remain unchanged and be undertaken in accordance with current approvals and commitments.

There will be some minor land disturbance associated with the construction and layout of the 11 km tailings pipeline network, which connects both the Ravensworth CHPP and Liddell CHPP to the West Pit Void at Ravensworth East. As outlined in Section 8.1.1, the majority of the proposed pipeline follows an already disturbed easement that contains an existing conveyor, tailings pipeline and access track.

The Narama Void is currently approved for the emplacement of tailings material under PA 09-0176 (as modified), with the void to be filled and shaped to the agreed landform plan, followed by capping and revegetation in accordance with the rehabilitation strategy (Hansen Bailey 2014). No changes are proposed to the final landform as a result of this modification however the Narama void will be used for a water storage facility, prior to being backfilled with overburden consistent with existing approvals.

8.8.2 Mitigation Measures

Rehabilitation of the West Pit Void at Ravensworth East will be completed in accordance with the approved *Mt Owen Complex Landscape Management Plan* (incorporating the Rehabilitation Management Plan, Mine Closure Management Plan and Final Void Management Plan) and Mt Owen Complex MOP. This includes all requirements outlined in Ravensworth East's DA 52-03-99, including Condition 31, which requires at least 30 percent of the site to be established and maintained as native woodland. The area of native woodland must allow for future connection with the Southern Remnant of the Ravensworth State Forest following the cessation of mining and removal of existing infrastructure at Mt Owen Mine.

Existing facilities are currently managed in accordance with relevant regulatory design criteria and Glencore's policy document CAA DB PRO 0002 "Tailings Storage Management,(Ver 0.3)". Tailings is placed in a manner that facilitates water run-off and dewatering of the material, which leads to improved consolidation. Water decanted from the tailings facility is then returned to the mine water system for reuse in site operations. Once the tailings facility is filled to capacity, following a period of drying and consolidation, the tailings material is capped, generally with at least 2 m of benign material. The facility is then shaped and rehabilitated in accordance with the Mining Operations Plan and an approved final landform design.

All existing commitments outlined in PA 09_0176 (as modified) for Ravensworth Operations will remain consistent with, and will continue to be maintained as a result of the Modification. PA 09_0176 Schedule 3, Condition 40 (a) notes that rehabilitation should be conducted progressively as soon as practicable following disturbance and Schedule 3, Condition 40(b) notes that Ravensworth Operations will achieve rehabilitation objectives consistent with commitments in the Ravensworth EA (and associated Response to Submissions).

PA 09_0176 Schedule 3, Condition 32 states that as a component of the Biodiversity Offset Strategy (which constitutes a minimum area of 3,725 ha) a total of 1,767 ha of woodland vegetation will be established within the Ravensworth Operations rehabilitation area over the life of the project. The Modification will not result in any reduction in the total rehabilitation or existing offset commitment.

Liddell Coal Operation's DA 305-11-01, condition 37, 38 and 39 relating to rehabilitation objectives, progressively rehabilitating disturbed land and the development of a Rehabilitation Management Plan will continue to be implemented and met.

The principle objective for rehabilitation is to return the site to a condition where its landforms, soils, hydrology and biodiversity are self-sustaining and compatible with surrounding land uses.

Existing rehabilitation objectives of the approved Rehabilitation Management Plans and MOPs will continue to be employed as a result of the Modification. These typically include:

- Rehabilitation designs in accordance with the Synoptic Plan Integrated Landscapes for Rehabilitation in the Hunter Valley of NSW;
- Stabilising disturbed landforms and ensuring they are free-draining;
- Predominantly re-establish those vegetation communities and fauna habitats currently occurring or previously occurring at the site and connect revegetated areas as far as reasonably practical with existing remnant vegetation;
- Deep ripping of final shaped surfaces along the contour to allow for the ingress of water and to minimise erosion;
- Install contour drains, dams, toe drains and silt trap dams;
- Topsoil and/ or ameliorants are to be generally placed at an average thickness of 100 mm over disturbed areas;
- Where required, the ground is to be selectively treated with surface ameliorants such as gypsum, and also fertiliser;
- Where possible salvaged features such as logs and hollows are to be placed within the woodland rehabilitation areas to aid with habitat creation; and
- Ongoing monitoring and maintenance of rehabilitated areas is to occur to ensure rehabilitation is progressing in accordance with any approval criteria that applies to rehabilitation.

This Modification is not proposing to increase the overall amount of tailings material emplaced in the West Pit Void at Ravensworth East, which will in turn not alter the final landform currently approved. Based on an approved RL of 85m (AHD), the West Pit Void has a capacity of 33.6 Mt (53.5 Mm^3) of tailings. Current staging arrangements allow for Ravensworth Operations to continue to dispose of tailings into the Cumnock 3 Void until approximately 2016 and Liddell Coal Operations into the Durnham void until 2018.

Following the completion of tailings emplacement within these receptacles, the facilities will be decommissioned and rehabilitated, with tailings disposed of into the West Pit Void at Ravensworth East. Based on this arrangement and current indicative production and recovery rates, the West Pit Void will have capacity for tailings disposal associated with the Modification and beyond based on a dry density of 0.71 t/m^3.

The indicative disposal volumes and capacity of the respective tailings facilities is provided in Table 6 below. Tailings emplacement activities highlighted in green indicate the scheduling being sought in this Modification.

Table 6
Approximate Tailings Disposal Volumes and Facility Capacity

Operation	Tailings Emplacement Area	Approx Capacity (End 2014) (Mm^3)	Indicative Tailings Disposal Volume (Mt)								
			2015	2016	2017	2018	2019	2020	2021	2022	To Completion
Ravensworth Operations	Cumnock 3 Void (Approved)	4.2	1.9	2.1							
	West Pit Void at Ravensworth East	32.3			2.3	2.8	3.0	3.3	0.8		
	Narama Void (Approved)*	20.5							2.5		2039
Liddell Coal Operations	Railway Fines (Durham) Stage 1 & 2 (Approved)	2.3	0.8	0.7	0.8						
	West Pit Void at Ravensworth East	32.3				0.7	0.8	0.2			
	Liddell Coal Operations South Cut Void (Approved)	37.7						0.6	0.7		2028
Mt Owen Complex	West Pit Void at Ravensworth East** (Approved)	32.3	2.2	2.4	2.0	2.8	2.2	2.6	1.3	0.9	2022
West Pit Void at Ravensworth East (indicative cumulative remaining capacity)		32.3	30.1	27.7	23.4	17.1	11.1	5.0	2.9	2.0	

** If stage two of the GRA integrated tailings emplacement strategy is implemented there may be no need for Ravensworth Operations to revert back to emplacing tailings in the Narama Void, thereby making it available for short to medium term water storage, prior to being backfilled with overburden.*

*** The Mt Owen Continued Operations Project has estimated production of approximately 17 Mt dry tailings, which may be disposed of in the West Pit and Ravensworth East Resource Recovery (RERR) Mining Area. At the end of the Project, it was identified that the combined dry tailings capacity of these areas will not be fully exhausted (Umwelt, 2015). As such, this Modification will not impact on the current activities or those proposed within the Continued Operations Project, should it be approved.*

9 STATEMENT OF COMMITMENTS

Further to the conditions of Ravensworth Operations (PA 09_0176), Liddell Coal Operations (DA 305-11-01) and Ravensworth East (DA 52-03-99) planning approvals, the statement of commitments in Table 7 summarises the key management and mitigation measures proposed in this EA.

The objectives of the statement of commitments is to ensure that this Modification's environmental and social impacts are minimised by implementing the appropriate management, monitoring and mitigation strategies.

Table 7
Statement of Commitments

Ref.	Commitment	EA Section
Applicable to Ravensworth Operations PA 09_0176, Liddell Coal Operations DA 305-11-01 and Ravensworth East DA 52-3-1999		
1	During construction, if the pipeline is to be buried and trenches are to remain temporarily open, daily inspections will be undertaken to locate and remove any fauna that may become trapped within the trench.	8.1.2
2	The pipeline will be slightly elevated (approximately 10 cm) above the ground level (or alternatively buried) for a short distance near the farm dams located near Yorks Creek. This will allow terrestrial vertebrates, such as ground frogs and turtles, to move between the dams.	8.1.2
3	If any River Oak Casuarina *cunninghamiana* subsp. *cunninghamiana* trees are removed during construction of the tailings pipeline, compensatory plantings will be undertaken along the Bowmans Creek bank.	8.1.2
4	Erosion and sediment controls will be installed during construction of the Modification in accordance with *Managing Urban Stormwater Soils and Construction Volume 1* (Landcom 2004) and *Volume 2E Mine and Quarries* (DCCEE 2008) (or other applicable guideline).	8.3.2
5	Existing air quality measures will continue to be implemented to ensure compliance with appropriate standards and to minimise dust emissions during construction activities.	8.4.2
6	Existing noise mitigation and management measure will continue to be implemented to ensure compliance with appropriate standards and to minimise noise during construction activities.	8.5.2
Applicable to Ravensworth Operations PA 09_0176		
7	The existing Ravensworth Open Cut & Ravensworth Coal Handling Preparation Plant MOP, will be updated in consultation with the relevant agencies to the satisfaction of DRE to incorporate changes arising from this Modification.	8.8.2
Applicable to Liddell Coal Operations DA 305-11-01		
8	The existing Liddell Coal Operations MOP will be updated in consultation with the relevant agencies to the satisfaction of DRE to incorporate changes arising from this Modification.	8.8.2
Applicable to Ravensworth East DA 52-3-1999		
9	Aboriginal archaeology Sensitive Area 1 and Sensitive Area 2 will be fenced with appropriate signage to delineate and identify the archaeological sensitivity prior to construction of the relevant components of the Modification.	8.2.2

Ref.	Commitment	EA Section
10	Materials that minimise visual contrast will be utilised in the construction of the flocculation plant where practicable.	8.6.2
11	Rehabilitation of the West Pit Void at Ravensworth East will be completed in accordance with the approved *Mt Owen Complex Landscape Management Plan* (incorporating the Rehabilitation Management Plan, Mine Closure Management Plan and Final Void Management Plan) and Mt Owen Complex MOP.	8.8.2
12	The existing Mt Owen Complex MOP will be updated in consultation with the relevant agencies to the satisfaction of DRE to incorporate changes arising from this Modification.	8.8.2

10 CONCLUSION

This Modification will facilitate the implementation of the first stage of a proposed fully integrated life of mine tailings management strategy across three of Glencore's coal mining operations positioned adjacent each other in the Upper Hunter NSW. This Modification has been developed as a stand-alone application and as such, its successful implementation is not dependent on any other future approval.

A methodical environmental assessment over the proposed modifications to the Ravensworth Operations, Liddell Coal Operations and Ravensworth East development consents has confirmed immaterial environmental impacts will occur as a consequence of the proposed works providing that they are undertaken in accordance with the Statement of Commitments contained in Section 9 of this document. Further, the assessment has identified substantive environmental benefits from the implementation of the strategy.

A comprehensive consultation process involving discussions with the local community, adjacent local and industrial landholders and all of the relevant regulatory authorities has confirmed in principle support for the application.

As a consequence of the above it is concluded that the proposed works as described in Section 4 are in the public interest and should be approved.

11 ABBREVIATIONS

Abbreviation	Description
AHIP	Aboriginal Heritage Impact Permit
AHIMS	Aboriginal Heritage Information Management System
ARTC	Australian Rail Track Corporation
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
CL	Coal Lease
CPP	Coal Crushing Plant
CMHS Act	*Coal Mine Health and Safety Act 2002*
DP&E	NSW Department of Planning and Environment
DRE	Division of Resources and Energy
EA	Environmental Assessment
EMP	Environmental Management Plans
EMS	Environmental Management System
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA& Regulations	*Environmental Planning and Assessment Regulations 2000*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ERP	Eastern Rail Pit
GRA	Greater Ravensworth Area, incorporating Ravensworth Operations, Mt Owen Complex and Liddell Coal Operations
GRWSS	Greater Ravensworth Water Sharing System
Hansen Bailey	Hansen Bailey Environmental Consultants
HRSTS	Hunter River Salinity Trading Scheme
km	Kilometre
LGA	Local Government Area
M	Million
Mining Act	*Mining Act 1992*
ML	Megalitre
ML	Mining Lease
MOP	Mining Operations Plan
Mt Owen Complex	Consisting of the operations at Mt Owen, Glendell and the Ravensworth East mining areas
MNES	Matters of National Environmental Significance
Muswellbrook LEP	*Muswellbrook Local Environment Plan 2009*
NT Act	*Native Title Act 1993*

Abbreviation	Description
The Modification	Greater Ravensworth Area Tailings Pipeline Modification
Mt	Million tonnes
Mtpa	Million tonnes per annum
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
NV Act	*Native Vegetation Act 2003*
OEA	Overburden Emplacement Area
PA	Project Approval
RNE	Register of the National Estate
POEO Act	*Protection of the Environment Operations Act 1997*
Ravensworth Operations	Ravensworth Operations Pty Limited
RL	Reduced Level
ROM	Run of Mine
Singleton LEP	*Singleton Local Environmental Plan 2013*
SSC	Singleton Shire Council
SSD	State Significant Development
SEPP Mining	*State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*
TEC	NSW Threatened Ecological Communities
Water Act	*Water Act 1912*
WM Act	*Water Management Act 2000*
WSP	Water Sharing Plan

12 REFERENCES

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