INTEGRA COAL

OPERATIONS PTY LTD

ABN: 96 118 030 998

ENVIRONMENTAL ASSESSMENT
for the
Proposed Modification of
Development Consent DA86/2889

Integra Open Cut
Increase in Annual Run of Mine (ROM) Coal Production from 3.8Mt to 4.5Mt

Prepared by:
Integra Coal Operations
PMB 7
Singleton NSW 2330

Contents

This document was prepared to the best of my knowledge and the information contained in the report is neither false nor misleading and was current at the time of preparing the report.

Colin Davies
BSc CEnvP
29 February 2008

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1. EXECUTIVE SUMMARY

Integra Coal Operations Pty Ltd (Integra) is seeking to modify the Camberwell Coal Project development consent (DA 86/2889) to enable it to increase annual ROM coal production from its approved South Pit from 3.8Mt to a maximum of 4.5Mt. Integra Joint Venture is the owner of Camberwell Coal Pty Ltd, holder of DA 86/2889, and now refers to the former Camberwell Coal Project as the Integra Open Cut. All Integra Open Cut operations are conducted within Coal Lease (CL) 357.

This document supports the application which is being lodged under the provisions of section 75W of the *Environmental Planning and Assessment Act 1979*. Associated with the modification are ancillary operations including the transportation of the additional ROM coal from the open cut to the existing Coal Handling and Preparation Plant (CHPP) for processing. The CHPP also processes coal from the Integra Underground (formerly known as the Glennies Creek Colliery). The processing of ROM coal at the CHPP at a nominal throughput of 1200tph, together with the despatch of the resultant product coal by rail using the existing train loader, are existing approved activities by virtue of the June 2005 modification to DA 86/2889.

DA 86/2889 expires in March 2011, with coal production from the existing South Pit scheduled to be completed in late 2009. A further application for planning approval to enable the ongoing use of the CHPP and associated infrastructure required to enable the ongoing processing of the coal from the Integra Underground will be sought during 2010.

The increase in ROM production sought represents an opportunity which has arisen as a consequence of a detailed economic analysis of the former Camberwell operations subsequent to the formation of the Integra Joint Venture. In particular, the recognition that continued mining of the lowermost (75) seam and the overlying 23m of interburden throughout the South Pit was not economic in itself and, through its impact on the overall stripping ratio, was affecting the economic viability of the total Integra Open Cut operation. By not mining, or only selectively mining the 75 seam, the stripping ratio improves, thereby enabling the mine to be progressed laterally at a faster rate and produce an increased volume of coal whilst utilising the same equipment and manpower. The alternative, i.e. maintaining the maximum ROM coal production rate of 3.8Mta, would require less equipment hours and consequently a reduced workforce. Physical changes would not be required at the CHPP or train loader nor any modification to DA 86/2889 to enable the processing of the additional coal.

In summary, the increase in ROM coal production will be achieved with minimal changes on-site. A decrease in strip ratio will result in less overall material movement with the production increase offset by a substantially greater reduction in overburden

movement. This will result in the following environmental impacts.

- Minimal additional noise impact as the same equipment fleet will be used.
- Minimal additional impact to air quality as the overall volume of materials to be moved is similar to that with the existing operations.
- No additional groundwater impact as the saline aquifers are minor and are associated with coal seams. No additional coal seams will be mined under this proposal.
- No change to surface water systems, flora, fauna, visual amenity or heritage as the approved disturbance area will remain unchanged.
- Minor increase in short term greenhouse gas impact but overall no increased greenhouse gas emissions.
- No change to employment levels until the end of the current mine life.

  Overall the environmental impacts are considered to be minor and would be readily manageable under the existing conditions of consent.

2. CONSULTATION

Integra held discussions with the Department of Planning on the 31 May and the 18 July 2007. On the 26 July 2007, Integra forwarded a letter to the Department detailing the proposed modification and impacts; seeking clarification as to the appropriate form of application, and requesting the identification of specific issues which would need to be addressed in any subsequent documentation. On the 30 October 2007 the Department of Planning formally advised that on 16 October 2007 the Minister approved the treatment of development consent DA86/2889 as an approval for the purposes of section 75W of the Environmental Planning and Assessment Act 1979 in relation to the proposed application to increase ROM coal production. The preparation of this 75W application is a consequence of the Department's advice.

With respect to the proposed modification, the Director-General issued formal environmental assessment requirements and these are provided in **Appendix 1**.

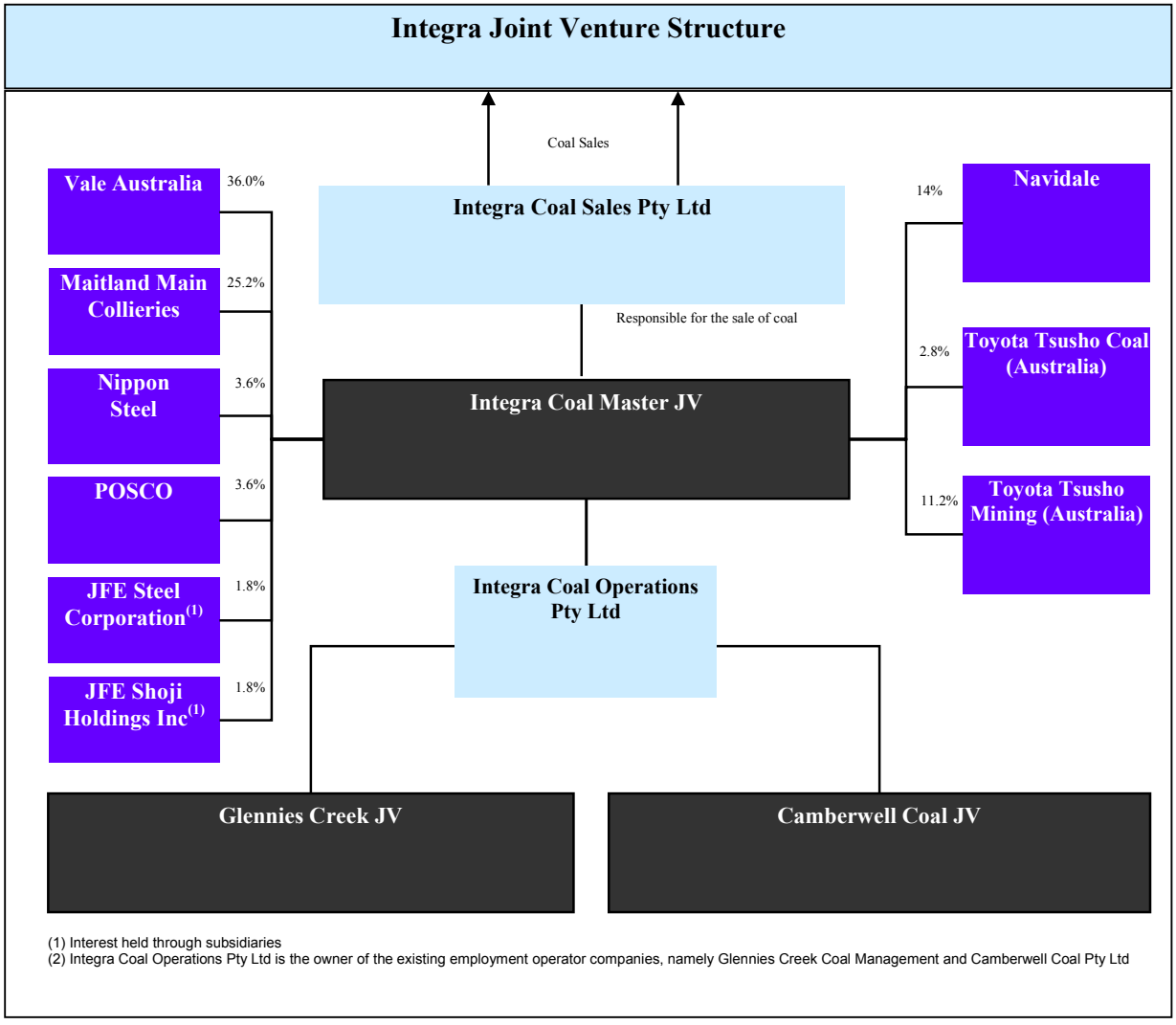
Additional consultation was undertaken with the Integra Coal Open Cut Community Consultative Committee, Singleton Council, adjoining open cut landowners, the Department of Primary Industries (Singleton), the Department of Environment, Conservation and Climate Change and the Department of Water and Energy.

3. INTRODUCTION

3.1 Applicant

This application is made by Integra Coal Operations Pty Ltd on behalf of the Integra Coal Joint Venture. Integra Coal Operations Pty Ltd is the owner of Camberwell Coal Pty Ltd and Glennies Creek Coal Management Pty Ltd. The Integra Coal Joint Venture ownership structure is detailed in **Figure 1**. **Figure 1** shows that the Glennies Creek JV participants hold a 72% share in the Integra Coal JV while the Camberwell Coal JV participants hold a 28% share.

Figure 1: Integra Joint Venture Ownership Structure

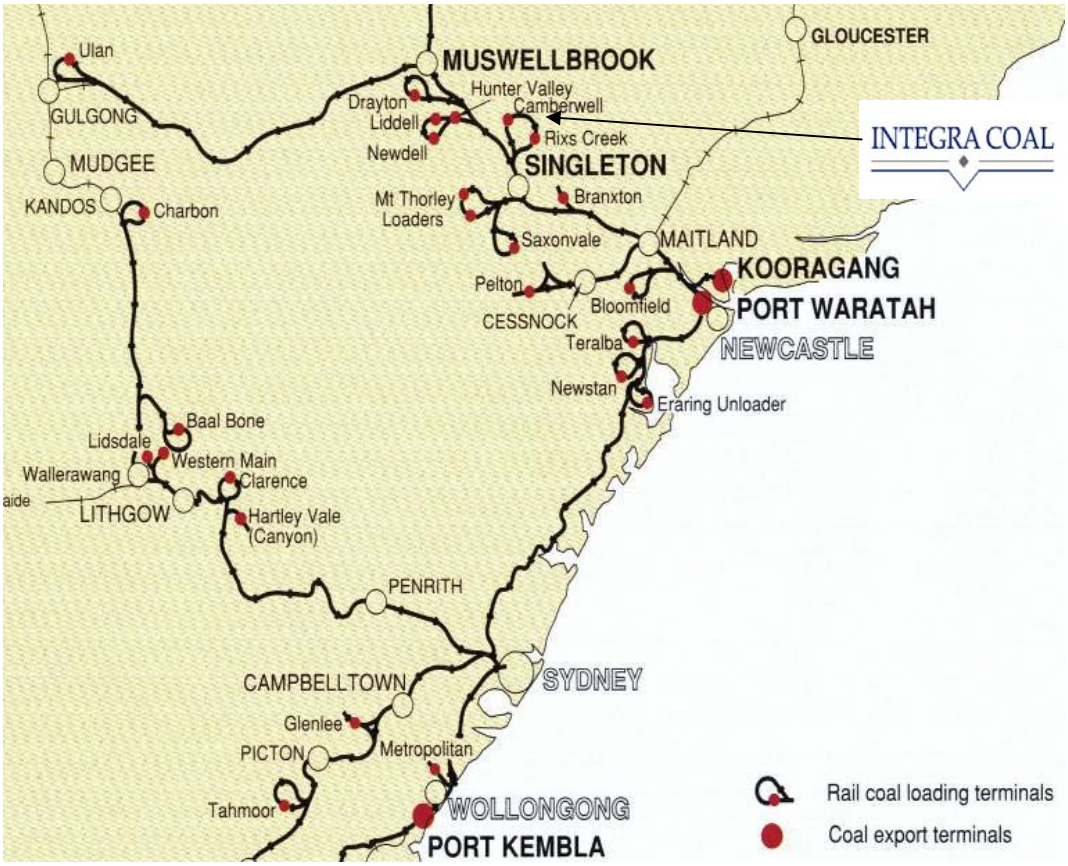


Glennies Creek JV parties have a 72% share in the Integra Coal JV and Camberwell Coal JV parties have a 28% share

3.2 Background

The Integra Open Cut operation is located in the Singleton Local Government area some 10km north-west of Singleton, NSW (**Figure 2**). Mining operations commenced in February 1991 and have been undertaken continuously since that time.

Figure 2: Location Plan



3.3 History of Development Consent and Modifications

The original Development Consent for the Camberwell Coal Project, DA 86/2889, was approved on the 19 March 1990 and, since that time, has been the subject of a number of modifications in order to reflect changes in operational practices, production rates and installation of additional facilities. All prior modifications were approved under either s.102 or s.96 of the EP&A Act 1979. The current consolidated consent is provided in **Appendix 2**.

3.4 Existing Development

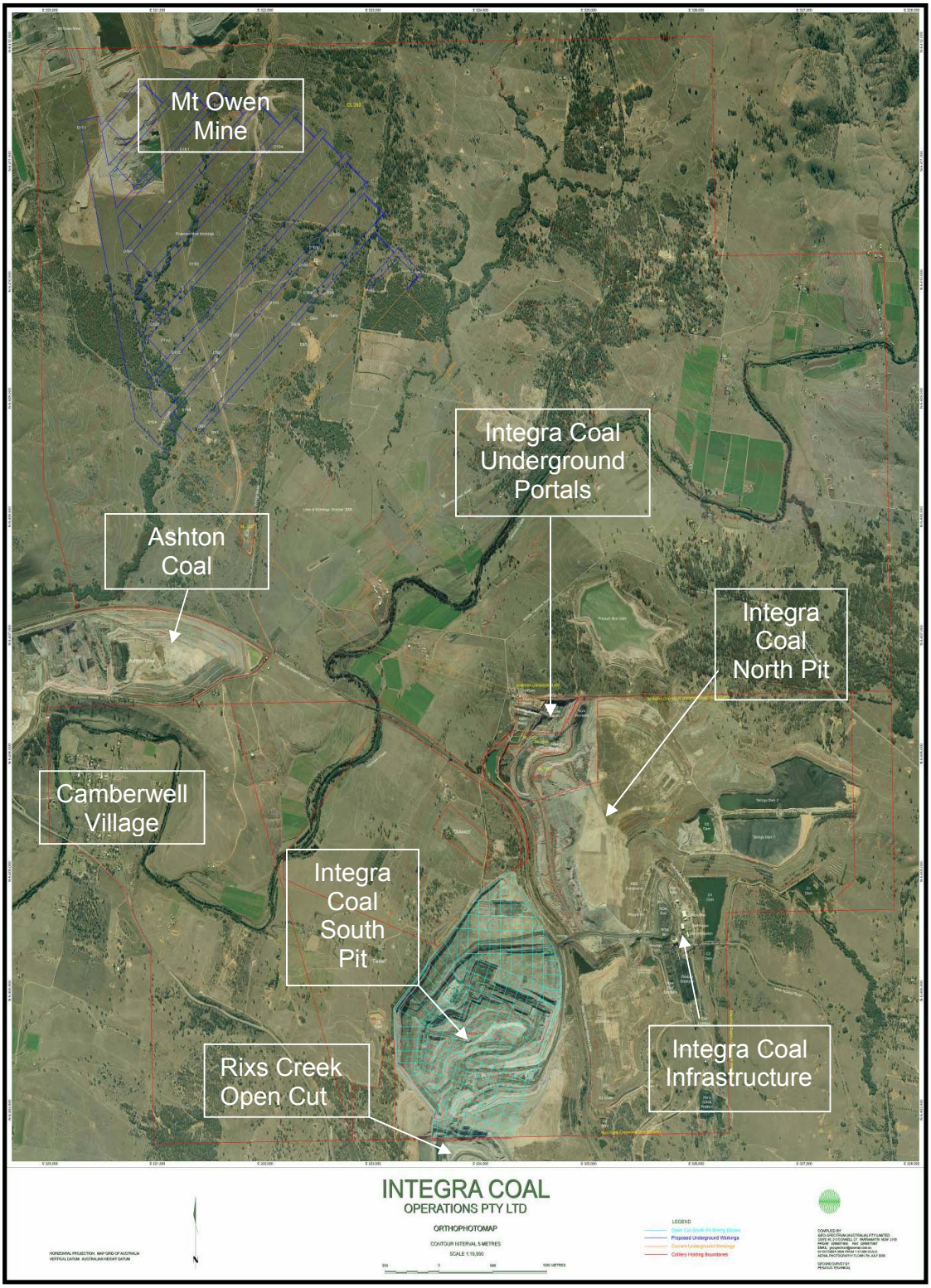
The Integra Open Cut has produced coal continuously since 1 March 1991, commencing in the North Pit and, post 1999, from the South Pit. The open cut operations are shown in the aerial photograph, **Figure 3**. The annual production since the mine commenced operation in 1991 has generally been between 2.5MT to 3.8MT ROM and 1.5MT to 2.5MT saleable coal. The production rates for ROM and product coal over the 2003 to 2007 period from Integra Coal Open Cut are presented in **Table 1**.

Table 1: Integra Coal Open Cut ROM and Saleable Coal Production 2003 to 2007[1]

Year (Sept to Aug)	ROM (Mt)	Saleable (Mt)
2003/04	3.51	2.30
2004/05	3.52	2.10
2005/06	3.77	2.31
2006/7	3.48	1.99

Note 1: Values were obtained from the relevant Integra Coal Open Cut Annual Environmental Management Reports (AEMRs)

Figure 3: Aerial Photograph - Integra Coal Open Cut Operations and Surrounding Features



The current development consent allows the CHPP to process a nominal 1200t/hr ROM coal which may be sourced from the Integra Open Cut and/or from the Integra Underground (at a rate of up to 4.5Mtpa). A Part 3A Application has also been lodged seeking approval for the development of a small scale open cut referred to internally as the Integra North Open Cut (Major Project 06_0076 - Glennies Creek Open Cut Coal Mine). ROM coal production from this open cut would, if approved, be up to a maximum rate of 1.5Mtpa, with that coal also transported to the CHPP for processing and despatch.

3.5 Mine Geology

The Integra Open Cut sits on the eastern flank of the Rix's Creek Syncline within the Vane Subgroup, Foybrook Formation, and Wittingham Coal Measures. Coal seams are numerous, thin and interbedded with sandstone, mudstone and a lesser amount of conglomerate. The seams dip west or northwest at between 2 and 10 degrees. Seams occasionally show roll structures and paleo-river channels. The steepest dips are located on the western side of the South Pit. The main seam sections are comprised of smaller coal plies.

The existing South Pit is cut by a <2m throw, horst fault system striking 180 degrees magnetic, preferentially occupied by one or more dykes. A further fault/dyke, parallel to this system is located 100m east of the horst structure. Previous experience has shown that generally coal is not minable within the 25m horst fault system. Minor normal faulting parallels this system with throws of up to 2 metres. Weathering depth in the South Pit is generally 10m but has been recorded to a maximum of 16m.

Seams that have been identified in previous and current geological models at the Integra Open Cut are shown in **Table 2**.

Table 2: Identified Coal Seams and Splits (Plies)

INTEGRA OPEN CUT FOYBROOK FORMATION STRATIGRAPHIC SEQUENCE				
Geological Seam	**1987 Model**		**1997/98 Model**	**2003 AND 2007 Models**
	Coalesced	**Primary**		
Lemington	(these seams excluded from previous studies)			460
				450
				440
				430
				420
				410
				400
				390
				380
				370
				360
Pikes Gully	(these seams excluded from the 1987 study)		350	350
			340	340
			330	330
			320	320
			310	310
			300	300
			291	291
			290	290
			280	280
Arties		270	271	271
			270	270
	255W	260W	261	261
			260	260
			259	259
		250W	254	254
			253	253
			252	252
			251	251
			250	250
		249W	249	249
	240W	240W	242	242
			241	241
			240	240
	230W	230W	230	230
			229	229

Table 2 continued:

Geological Seam	1987 Model		1997/98 Model	2003 AND 2007 Models
	Coalesced	Primary		
Upper Liddell	220W	220W	220	220
	205W	210W	210	210
		200	200	200
Middle Liddell	190W	190W	192	192
			191	191
			190	190
	175W	180W	180	180
		170W	170	170
Lower Middle Liddell	160W	160W	163	163
			162	162
			161	161
			160	160
Lower Liddell	150W	150W	150	150
	135W	140W	140	140
		130W	130	130
	(correlation horizon)		127	127
Upper Barrett	120W	120W	121	121
			120	120
Lower Barrett	105W	110W	112	112
			111	111
			110	110
		100W	100	100
Upper Hebden	90W	90W	90	90
	75W		80	80
		70W	73	73
			72	72
			71	71
			70	70
Lower Hebden	55W	60W	60	60
		50W	50	50
			49	49
		40	40	40
	25W	30W	30	30
		20W	20	20
		10	10	10

80 Seam Floor

70 Seam Floor

Source: Adapted from Frank Stoddart, SMG Consultants, Jan 2006

Mining in the South Pit currently occurs from seams 360 to 75, with the principal limiting economic mining factor being the ROM Coal Strip Ratio, i.e. the ratio of overburden bank cubic meters (bcm) to ROM coal tonnes mined. Below the 70 seam floor (pit floor) horizon within the South Pit, there is no seam of a mineable thickness at economic open cut strip ratios.

3.6 Proposed Development Modification - Increase ROM Production

There is a significant band of interburden between the Lower Barrett and the Upper Hebden coal seams which recent modelling has shown to often result in uneconomical strip ratios for 75 seam coal recovery.

In order to operate the mine economically, it is proposed to restrict open cut mining below the Lower Barrett (105) and Hebden (90W) seams (referred to as the 80 seam floor as shown in **Table 2)** , i.e. not mine the 75 seam in areas where the strip ratio proves uneconomic. By not mining the uneconomic sections of the 75 seam, the life of the mine would be reduced by approximately 3 months and, at the current approved ROM production rate of 3.8Mtpa, would not necessitate retention of the full current mining fleet or workforce. However, if an increase in ROM coal can be achieved, the current mining fleet could be utilised, recovery would be maximized and the current employment level could be maintained until end of mine life. That is, by not mining, or only selectively mining the 75 seam (based on economic analysis), the stripping ratio improves, thereby enabling the mine to be progressed laterally at a faster rate and produce an increased volume of coal within the same hours of operation whilst utilising the same equipment and manpower. The proposal would therefore result in an increase in the rate of ROM coal production but a reduction in the total materials (coal and overburden/interburden) movement to the end of mine life in 2009.

The strip ratios over the past three years and the predicted ratios under this proposal are provided in **Table 3**.

Table 3: ROM Strip Ratio: Historical 2004 -2007 and Predicted 2008-2009

Year	ROM Strip ratio
2004	5.31
2005	5.10
2006	5.49
2007	5.06
2008	**4.08**
2009[1]	**0.85**

Note 1: In 2009, the majority of the remaining coal has been previously uncovered resulting in the resultant significantly lower strip ratio.

3.7 Current and Proposed Annual ROM Production

The proposed modification will enable Integra to increase ROM coal production from within the existing approved open cut limits by 0.7Mtpa or 18%, i.e. from 3.8Mtpa to a

maximum of 4.5Mtpa. Subject to the approval of this application and the current mine plan, projected ROM coal production over the remaining life of the South Pit will be as follows.

- Calendar Year 2008 – 4.50Mt
- Calendar Year 2009 – 2.25Mt

Throughout this period and beyond, ROM coal from the Integra Underground and Integra North Open Cut (if approved) will also be processed through the Integra CHPP, with the actual mix of ROM coal from the Integra Open Cut, the Integra Underground and the Integra North Open Cut managed by Integra Coal Operations Pty Ltd such that the total coal processed (and dispatched) remains within the approved limit applying to the CHPP.

The environmental consequences of the proposal are discussed in **Section 6**.

3.8 Mineral Processing

All ROM coal is processed through the CHPP which comprises a two stage raw coal sizer (-250mm/-90mm); 80000t capacity ROM coal stockpile; the coal washery (incorporating a -50mm crusher, dense media cyclones, spirals, teetered bed separators and froth flotation (Jamison cells)); a 350,000t capacity product stockpile area and 4,600 tph train load out system on a rail loop connected to the Main Northern Rail Line. The rail loop also services the Rix's Creek Mine. No changes to mineral processing, stockpiling and loading facilities or activities are sought in this application.

4. STATUTORY PLANNING CONTEXT

4.1 Introduction

Integra Coal Operations Pty Ltd seeks to modify the existing development consent under section 75W of the Environmental Planning and Assessment Act 1979. The following sub-sections identify relevant statutory provisions applying to the application.

4.2 Environmental Planning and Assessment Act 1979

Clause 85(8) of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) prescribes how, in certain circumstances, a Development Consent can be modified under Section 75W of the EP&A Act. Clause 8J(8) states that:

> *(8) A development consent in force immediately before the commencement of Part 3A of the Act may be modified under section 75W of the Act as if the consent were an approval under that part, but only if:*
>
> *(a) The consent was granted with respect to development that would be a project to which Part 3A of the Act applies but for the operation of clause 6(2)(a) of State Environmental Planning Policy (Major Projects) 2005, and*
>
> *(b) The Minister approves of the development consent being treated as an approval for the purposes of the section 75W of the Act.*
>
> *The Development consent, if so modified, does not become an approval under Part 3A of the Act.*

In accordance with State Environmental Planning Policy (SEPP) (Major Projects) 2005, the Minister for Planning has formed the opinion that the Integra Open Cut is a development for the purposes of coal mining in accordance with clause 5(1)(a) of Schedule 1 to SEPP (Major Projects), and hence satisfies clause 85(8) of the EP&A Regulation. Consequently, the Minister for Planning has approved DA 86/2889 as an approval for the purposes of Section 75W of the EP&A Act.

4.3 Local and Regional Planning Issues/Permissibility

4.3.1 Singleton Local Environment Plan 1996

Under the Singleton Local Environment Plan 1996, the land within and surrounding the approved Integra Open Cut Project area is zoned Rural 1(a). Mining and associated activities are permissible land uses within this zone.

The area of the approved open cut is not listed in the LEP 1996 as being or containing any heritage item nor is it a heritage conservation area.

4.3.2 Local Car Parking and Erosion and Sediment Development Control Plans

The local Singleton Shire Council's car parking development control plan is not applicable to the proposal as there will be no increase in employment or any consequential increased demand for car parking as a result of the proposal. Current car parking is considered adequate. The requirements of the Singleton Shire Council's Erosion and Sediment Development control plan are adequately addressed by the conditions of existing development consent and within the Mine Operations Plan (MOP) that was submitted and accepted by the Department of Primary Industries in 2005. The MOP is current until December 2009 but will be amended if this application is approved.

4.3.3 Section 94 Contributions

Singleton Shire Council has in place a Section 94 contributions plan under which it may levy contributions to be applied to the provision of public facilities. Integra, through Camberwell Coal, has made the contribution required under the original conditions of consent for the Camberwell Mine. The proposed modifications will not generate any additional demand for services, which would be funded through section 94.

4.3.4 Hunter Regional Environmental Plan 1989

The Hunter Regional Environmental Plan 1989 (Hunter REP) outlines the factors that should be considered in preparing Local Environmental Plans and approving developments. As the proposed modification is minor in nature and neutral in terms of environmental impact, the proposal is in keeping with the goals of the Hunter REP.

4.3.5 Hunter Regional Environmental Plan (Heritage) 1989

The Hunter REP (Heritage) 1989 aims to preserve environmental heritage, to promote the appreciation and understanding of the Hunter region's distinctive variety of cultural heritage items and areas, and to encourage the conservation of the region's historic townscapes. It is not applicable to Singleton local government area and therefore does not apply to the proposed modification.

4.3.6 Hunter Valley Railway Programs Task Force

The Hunter Valley railway programs task force was formed to identify the impacts of rail traffic on residents within 200 metres of the rail network. The recommendations of the task force were that:

> *The conveyance of freight (including coal) remains the safest, most efficient, most economic and most environmentally responsible means of transport. The current policy and practice of rail encouragement and development should therefore be maintained.*

The proposed modification does not seek approval to increase the throughput at the CHPP nor approval for additional rail movements: processing of coal at a nominal 1200tph and the dispatch of the resultant product coal are existing approved activities.

4.4 State Planning Issues/Permissibility

The following State Environmental Planning Policies (SEPPs) are potentially applicable to the proposed modification.

4.4.1 State Environmental Planning Policy No 34 – Major Employment Generating Industrial Development

State Environmental Planning Policy No 34 – Major Employment Generating Industrial Development (SEPP 34) applies to certain developments listed under Schedule 1 of the policy and for such development:

- development consent is required;
- the Minister is the consent authority; and
- the local council must be consulted and any submissions received considered in the determination of the application.

The original development of the site is included within Schedule 1 but, as the proposed development is a modification to an existing consent, the provisions of SEPP 34 do not apply.

4.4.2 State Environmental Planning Policy No 44 – Koala Habitat Protection

State Environmental Planning Policy No 44 – Koala Habitat Protection (SEPP 44) applies to land within certain local government areas, including Singleton Shire. The policy requires that an assessment be undertaken to determine whether subject land constitutes potential koala habitat prior to consent being granted for the development.

As the proposed modification pertains to an increase in the rate of ROM coal production within the footprint of the approved South Pit open cut and will not necessitate the disturbance of any additional areas of vegetation SEPP44 has no practical application to the application.

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

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 was gazetted in February 2007 and repealed SEPP 37 – Continued Mines and Extractive Industries and SEPP 45 – Permissibility of Mining. The SEPP also removed mining developments from Schedule 1 of SEPP 11 – Traffic Generating Development, meaning that SEPP 11 no longer applies to mining projects.

This SEPP aims to:

(a) provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State; and

(b) facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources; and

(c) establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.

With regard to mining, this SEPP outlines where various minerals activities are permissible both with and without development consent and also defines mining developments that are prohibited, exempt or complying developments. These provisions do not affect the requirement for approval under Section 75W of the EP&A Act for the proposed increased rate of production at the Integra Open Cut.

4.5 Designated Development

Section 77 of the EP&A Act identifies designated development as development that is declared by an Environmental Planning Instrument (EPI) or the EP&A Regulation. The proposal is not an application for development but an application for modification to an existing consent and therefore does not constitute designated development.

4.6 Integrated Development

Integrated development is development (not being complying development) that in order for it to be carried out, requires development consent and approval from a government agency under certain legislation. The proposed modification to DA 86/2889 is not a development application requiring development consent and therefore the current application is not integrated development.

4.7 Environment Protection Licence

Integra Coal Operations Pty Limited, through Camberwell Coal Pty Limited, holds an Environment Protection Licence (EPL No 3390) for its current open cut mining operations. The EPL currently licenses the coal mining operations to produce up to 3,500,000 saleable product per annum and coal loading through the CHPP of >5,000,000 tonnes loaded per annum. The modification for the increase in ROM production to a maximum of 4.5Mtpa would produce a maximum saleable output from open cut operations of approximately 2.75Mt saleable tonnes which remains within the

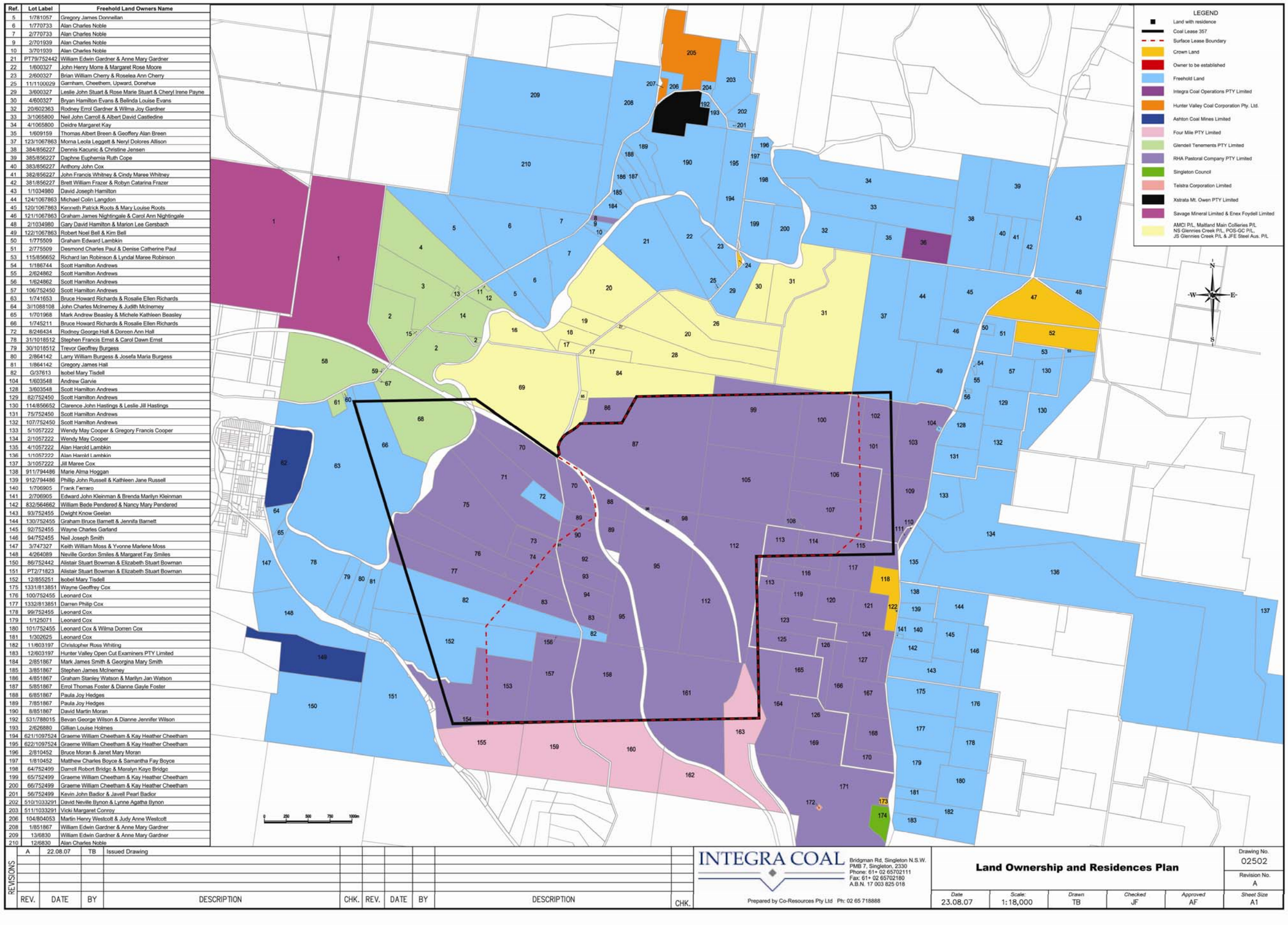
current EPL scales for the open cut. A variation to the Camberwell Coal EPL will not be required.

5. ENVIRONMENTAL SETTING

5.1 Land Ownership

The current land ownership plan is presented in **Figure 4**. The land description of the original Camberwell Coal Project applies to this modification and is reproduced in **Appendix 3**. The increase to ROM production and associated activities will occur wholly within the boundary of lands as described in **Appendix 3** and identified on **Figure 4** as CL 357.

Ref.	Lot Label	Freehold Land Owners Name
5	1/781057	Gregory James Donnellan
6	1/770733	Alan Charles Noble
7	2/770733	Alan Charles Noble
9	2/701939	Alan Charles Noble
10	3/701939	Alan Charles Noble
21	PT79/752442	William Edwin Gardner & Anne Mary Gardner
22	1/600327	John Henry Morre & Margaret Rose Moore
23	2/600327	Brian William Cherry & Roselea Ann Cherry
25	11/1100029	Garnham, Cheethem, Upward, Donehue
29	3/600327	Leslie John Stuart & Rose Marie Stuart & Cheryl Irene Payne
30	4/600327	Bryan Hamilton Evans & Belinda Louise Evans
32	20/602363	Rodney Errol Gardner & Wilma Joy Gardner
33	3/1065800	Neil John Carroll & Albert David Castledine
34	4/1065800	Deidre Margaret Kay
35	1/609159	Thomas Albert Breen & Geoffery Alan Breen
37	123/1067863	Morna Leola Leggett & Neryl Dolores Allison
38	384/856227	Dennis Kacunic & Christine Jensen
39	385/856227	Daphne Euphemia Ruth Cope
40	383/856227	Anthony John Cox
41	382/856227	John Francis Whitney & Cindy Maree Whitney
42	381/856227	Brett William Frazer & Robyn Catarina Frazer
43	1/1034980	David Joseph Hamilton
44	124/1067863	Michael Colin Langdon
45	120/1067863	Kenneth Patrick Roots & Mary Louise Roots
46	121/1067863	Graham James Nightingale & Carol Ann Nightingale
48	2/1034980	Gary David Hamilton & Marion Lee Gersbach
49	122/1067863	Robert Noel Bell & Kim Bell
50	1/775509	Graham Edward Lambkin
51	2/775509	Desmond Charles Paul & Denise Catherine Paul
53	115/856652	Richard Ian Robinson & Lyndal Maree Robinson
54	1/186744	Scott Hamilton Andrews
55	2/624862	Scott Hamilton Andrews
56	1/624862	Scott Hamilton Andrews
57	106/752450	Scott Hamilton Andrews
63	1/741653	Bruce Howard Richards & Rosalie Ellen Richards
64	3/1088108	John Charles Mclnerney & Judith Mclnerney
65	1/701968	Mark Andrew Beasley & Michele Kathleen Beasley
66	1/745211	Bruce Howard Richards & Rosalie Ellen Richards
72	8/246434	Rodney George Hall & Doreen Ann Hall
78	31/1018512	Stephen Francis Ernst & Carol Dawn Ernst
79	30/1018512	Trevor Geoffrey Burgess
80	2/864142	Larry William Burgess & Josefa Maria Burgess
81	1/864142	Gregory James Hall
82	G/37613	Isobel Mary Tisdell
104	1/603548	Andrew Garvie
128	3/603548	Scott Hamilton Andrews
129	82/752450	Scott Hamilton Andrews
130	114/856652	Clarence John Hastings & Leslie Jill Hastings
131	75/752450	Scott Hamilton Andrews
132	107/752450	Scott Hamilton Andrews
133	5/1057222	Wendy May Cooper & Gregory Francis Cooper
134	2/1057222	Wendy May Cooper
135	4/1057222	Alan Harold Lambkin
136	1/1057222	Alan Harold Lambkin
137	3/1057222	Jill Maree Cox
138	911/794486	Marie Alma Hoggan
139	912/794486	Phillip John Russell & Kathleen Jane Russell
140	1/706905	Frank Ferraro
141	2/706905	Edward John Kleinman & Brenda Marilyn Kleinman
142	832/564662	William Bede Pendered & Nancy Mary Pendered
143	93/752455	Dwight Know Geelan
144	130/752455	Graham Bruce Barnett & Jennifa Barnett
145	92/752455	Wayne Charles Garland
146	94/752455	Neil Joseph Smith
147	3/747327	Keith William Moss & Yvonne Marlene Moss
148	4/264089	Neville Gordon Smiles & Margaret Fay Smiles
150	86/752442	Alistair Stuart Bowman & Elizabeth Stuart Bowman
151	PT2/71823	Alistair Stuart Bowman & Elizabeth Stuart Bowman
152	12/855251	bobet Mary Tisdell
175	1331/813851	Wayne Geoffrey Cox
176	100/752455	Leonard Cox
177	1332/813851	Darren Philip Cox
178	99/752455	Leonard Cox
179	1/125071	Leonard Cox
180	101/752455	Leonard Cox & Wilma Dorren Cox
181	1/302625	Leonard Cox
182	11/603197	Christopher Ross Whiting
183	12/603197	Hunter Valley Open Cut Examiners PTY Limited
184	2/851867	Mark James Smith & Georgina Mary Smith
185	3/851867	Stephen James Mclnerney
186	4/851867	Graham Stanley Watson & Marilyn Jan Watson
187	5/851867	Errol Thomas Foster & Dianne Gayle Foster
188	6/851867	Paula Joy Hedges
189	7/851867	Paula Joy Hedges
190	8/851867	David Martin Moran
192	531/788015	Bevan George Wilson & Dianne Jennifer Wilson
193	2/626880	Gillian Louise Holmes
194	621/1097524	Graeme William Cheetham & Kay Heather Cheetham
195	622/1097524	Graeme William Cheetham & Kay Heather Cheetham
196	2/810452	Bruce Moran & Janet Mary Moran
197	1/810452	Matthew Charles Boyce & Samantha Fay Boyce
198	64/752499	Darrell Robert Bridge & Maralyn Kaye Bridge
199	65/752499	Graeme William Cheetham & Kay Heather Cheetham
200	66/752499	Graeme William Cheetham & Kay Heather Cheetham
201	56/752499	Kevin John Badior & Javell Pearl Badior
202	510/1033291	David Neville Bynon & Lynne Agatha Bynon
203	511/1033291	Vicki Margaret Conroy
206	104/804053	Martin Henry Westcott & Judy Anne Westcott
208	1/851867	William Edwin Gardner & Anne Mary Gardner
209	13/6830	William Edwin Gardner & Anne Mary Gardner
210	12/6830	Alan Charles Noble



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Land Ownership and Residences Plan

Drawing No.	Revision No.	Date	Scale:	Drawn	Checked	Approved	Sheet Size
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Figure 4: Current Land Ownership Plan

6. ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Introduction

This section provides a brief description of the relevant aspects of the existing environment within or in the area of the Integra Open Cut and discusses the likely impacts that may arise from the proposed increase in ROM coal production. Environmental aspects considered include the following.

- Air Quality
- Flora and Fauna
- Cultural Heritage
- European Heritage
- Surface Water
- Groundwater
- Noise and Blasting
- Visual and Lighting
- Greenhouse

Where appropriate, background levels of environmental parameters are provided to assist the discussion of potential impacts.

From the investigation, the proposal is assessed to result in:

- minimal noise impact as the same equipment fleet will be used;
- reduced blast impact from fewer blasts as less material will require fragmentation
- minimal impact to air quality as overall volume of materials moved is similar to existing;
- no additional groundwater impact as the saline aquifers are minor and are associated with coal seams. No additional coal seams will be mined under this proposal;
- no change to surface water systems, flora, fauna, visual amenity, and heritage as the approved disturbance area is unchanged;
- a minor increase in short term greenhouse gas impact but the same impact overall; and
- no change to employment levels.

Current environmental monitoring sites are provided in **Figure 5**.

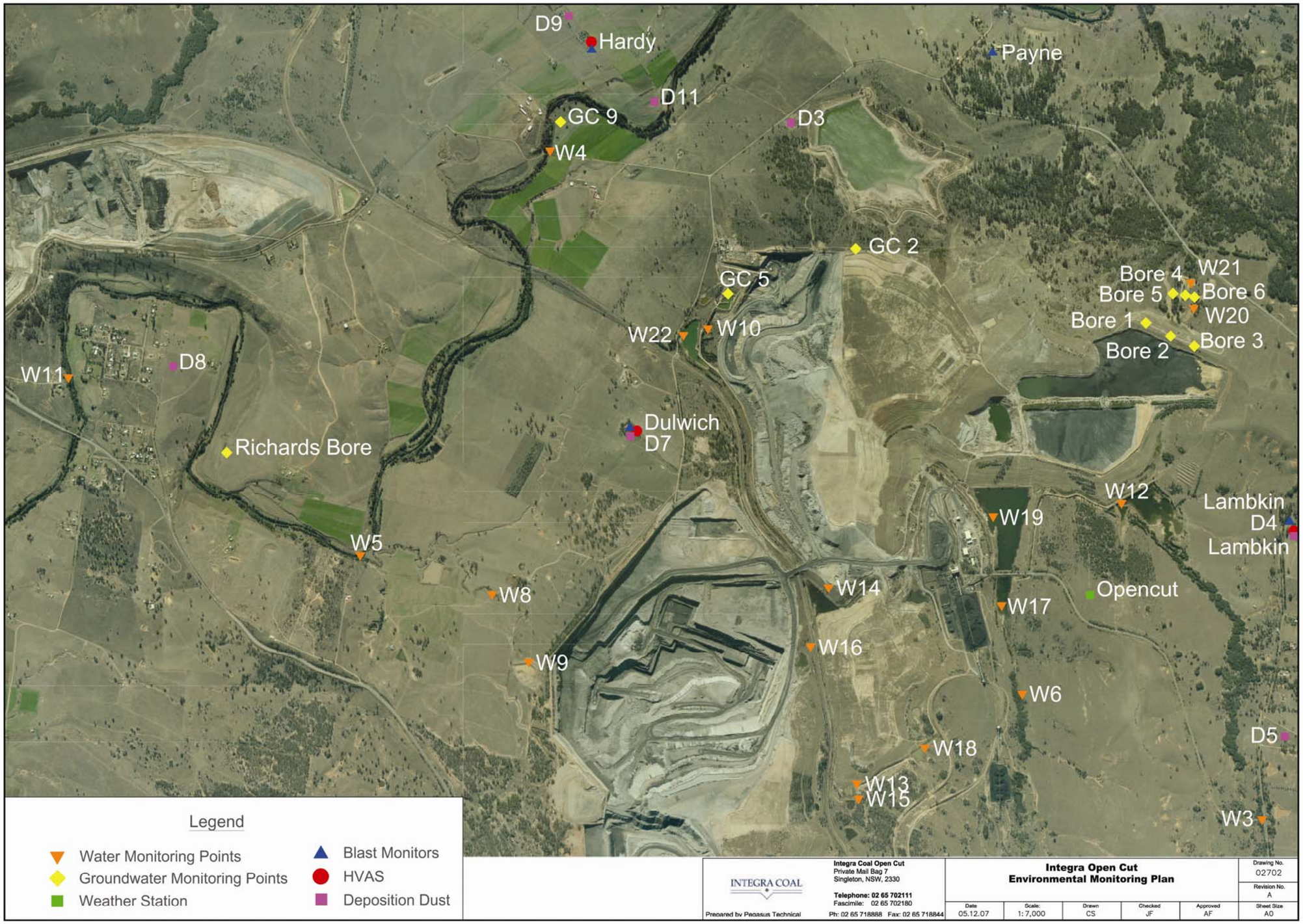

Figure 5: Current Environmental Monitoring Plan

6.2 Air Quality

Existing air quality in the vicinity of the Integra Open Cut is principally influenced by the various open cut coal mining activities in the locality, with a lesser contribution from agricultural activities and vehicle movements on unsealed roads and farm access tracks. Integra currently maintains a monitoring system comprising dust deposit gauges, and three total suspended particulate (TSP) and two fine particulate (PM_{10}) high volume air samplers (HVAS) as shown on **Figure 5**. These are operated under an approved Air Quality Management Plan.

Historical air quality monitoring undertaken shows that with the exception of Dulwich (Site D7 - **Figure 5**), average annual deposited dust levels within the vicinity of the Integra Open Cut only marginally exceed those typical of rural areas in NSW and satisfy the NSW DECC assessment criteria. TSP levels have also been shown to satisfy the criteria except at Dulwich, whilst the PM_{10} results demonstrate compliance with the applicable criteria at each monitoring location. It should be noted, however, that Dulwich lies within the zone of affectation identified in the original Camberwell Coal Project Environmental Impact Statement.

Impact levels determined by the modelling conducted for the 2006 CHPP upgrade, are not being exceeded, with the results from the 2005/6, 2005/6 and 2006/7 AEMR periods presented in **Table 4** (deposited dust), **Table 5** (TSP/PM_{10} annual average) and **Table 6** (PM_{10} 24 hour maximum). The AEMR period runs from 1 September to 31 August each year.

Table 4: Air Quality Monitoring Data – Dust Deposit Gauge Annual Averages[1]

Site	Parameter	Annual Average 2004/5	Annual Average 2005/6	Annual Average 2006/7	Impact criterion[2]	Compliance
		Units: (g/m^2/month)				
D2	Insoluble Solids	1.9	2.4	2.7	4.0	Yes
D3	Insoluble Solids	1.6	1.5	2.3	4.0	Yes
D4	Insoluble Solids	1.9	1.6	1.5	4.0	Yes
D5	Insoluble Solids	1.2	1.9	1.5	4.0	Yes
D6	Insoluble Solids	1.4	1.8	1.8	4.0	Yes
D7[3]	Insoluble Solids	2.7	3.0	3.2	6.2[4]	Yes
D8	Insoluble Solids	2.3	2.7	2.4	4.0	Yes
D9	Insoluble Solids	1.9	2.3	2.7	4.0	Yes
D10	Insoluble Solids	2.0	2.1	1.9	4.0	Yes
D11[3]	Insoluble Solids	2.6	3.5	2.7	4.0	Yes

Note 1: The data was obtained from the relevant Integra Open Cut Annual Environmental Management Reports.
Note 2: Impact criteria based on the DECC maximum dust deposition rate of 4.0g/m^2/month.
Note 3: Gauges D7 and D11 are located within the zone of affectation identified in the original Camberwell EIS where deposited dust levels were predicted to exceed the impact criterion.
Note 4: Maximum modelled criteria identified in 2006 CHPP upgrade air quality assessment.

Table 5: Air Quality Monitoring Data – High Volume Air Samplers Annual Average[1]

Site	Parameter	Annual Average 2004/5	Annual Average 2005/6	Annual Average 2006/7	Impact Criterion (Annual Average)[2]	Compliance
		Units: ug/m^3				
Dulwich	TSP HVAS	**95**	**80**	**97**	**105.6**[3]	Yes
Bridgman Road (Lambkin)	TSP HVAS	**47**	**40**	**40**	**90**	Yes
Bridgman Road (Lambkin)	PM_{10} HVAS	**NA**[4]	**18**	**18**	**30**	Yes
Glennies Creek Rd (Hardy/Donellan)	TSP HVAS	**46**	**52**	**62**	**90**	Yes
Glennies Creek Rd (Hardy/Donellan)	PM_{10} HVAS	**NA**[4]	**20**	**23**	**30**	Yes

Note 1: The data was obtained from the relevant Integra Open Cut Annual Environmental Management Reports.
Note 2: Impact criteria based on the DECC maximum TSP annual average maximum of 90ug/m^3, PM_{10} maximum annual average of 30ug/m^3 and PM_{10} maximum24 hour average of 50ug/m^3.
Note 3: Maximum modelled criteria identified in 2006 CHPP upgrade air quality assessment.
Note 4: NA – PM_{10} HVAS installed in August 2005.

Table 6: Air Quality Monitoring Data – High Volume Air Sampling 24 hour maximum PM_{10}

Site	Parameter	Number of results >50ug/m^3 2004/5	Number of results >50ug/m^3 2005/6	Number of results >50ug/m^3 2006/7	NEPM Criterion[1] No of days /year >50ug/m^3	Compliance
Bridgman Road (Lambkin)	PM_{10} HVAS	**NA**[2]	**0**	**2**	**5**	Yes
Glennies Creek Rd (Hardy/Donellan)	PM_{10} HVAS	**NA**[2]	**1**	**0**	**5**	Yes

Note 1: NEPM criterion – National Environment Protection Measure (NEPM) Maximum exceedances >50ug/m^3 is 5 days/year
Note 2: NA – PM_{10} HVAS installed in August 2005.

Notwithstanding the above, from a regional perspective, air quality is recognised as a significant issue, with many areas exhibiting TSP and PM_{10} concentrations which already approach or exceed the DECC assessment criteria due to the cumulative impacts of multiple operations and local climatic conditions.

The extent of dust generation from open cut coal mines is primarily a function of the volume and nature of materials excavated, transported and dumped; the distance travelled by mining equipment on unsealed surfaces; hours of dozer use; the frequency and area of blasts; the area of exposed surfaces susceptible to wind erosion

and the nature and efficiency of dust control measures.

Given that the principle dust generating activities at the Integra Open Cut will remain essentially unchanged or may reduce as a consequence of the improved stripping ratio, the increase in ROM production would not be expected to result in any diminution in local air quality. The accelerated creation of the final landform in mined-out areas and the associated potential to rehabilitate areas earlier than would otherwise have been the case (and hence reduce wind erosion of exposed surfaces), together with the minor reduction in the mine's life would potentially result in a small, but positive impact on local air quality.

Air quality management and monitoring will continue under the approved Air Quality Management Plan.

6.3 Flora/Fauna

Mining operations until the proposed end of mine life are restricted to within the current area of disturbance. The area of disturbance has previously been stripped of topsoil and vegetation. Consequently, the increase in ROM coal production will not have any further impacts on flora or fauna.

6.4 Cultural Heritage

The area of the Integra Coal South Pit mining operations was assessed for features/items of cultural heritage significance in the original EIS for the Camberwell Coal Project. No sites were identified in the South Pit mining area and the area has since been disturbed to the extent approved. The increase in ROM production will therefore not have any potential to impact on cultural heritage.

6.5 European Heritage

There are no European heritage issues associated with the current South Pit operations. The most significant item of European heritage in the vicinity, the Dulwich homestead, lies outside of the approved limits of surface disturbance, to the west of mining operations and will continue to be monitored under existing arrangements.

6.6 Surface Water

Water management in the South Pit area is undertaken in conformance with the Site Water Management Plan incorporating the Hannan Site Water Management Plan (2001).

6.6.1 Surface Water Quality Monitoring Program

The Integra (Camberwell Coal) Environment Protection Licence (EPL) requires the

monitoring of water at three sites on a monthly basis for pH, Total Suspended Solids (TSS) and Total Dissolved Solids (TDS). Integra also records Electrical Conductivity (EC) at all sites. These three sites are shown on **Figure 5** and comprise:

- Site W3 - Martins Creek, where it enters the mine site ;
- Site W1 - Station Creek, where it leaves the mine site; and
- Site W6 - Black Wattle Creek, where it enters the mine site.

In addition to the above, Integra monitors a further 16 sites within and surrounding CL357, in order to provide background water quality information and to enable quantification of impacts from its mining operations (if any). The additional sites (**Figure 5**) comprise:

- W4 Glennies Creek upstream of the Station Creek confluence
- W5 Glennies Creek downstream of the Station Creek confluence
- W7 Stony Creek where it crosses Stony Creek Road
- W8 Tisdell Creek
- W9 Clean Water Dam - C9
- W10 Clean Water Dam - C4
- W11 Glennies Creek downstream at Camberwell Village
- W13 Clean Water Dam - C6
- W14 Clean Water Dam - C3
- W15 Clean Water Dam - C6A
- W16 Sediment Control Dam - C7
- W17 Clean Water Dam - C2
- W18 Clean Water Dam - C5
- W19 Dirty Water Dam D1
- W20 Tailings seepage management dam
- W21 Tailings seepage management dam

Most stormwater from the site occurs as overflow or releases from Dam C4.

Samples from each of the above additional sites are collected monthly (where available) and analysed for pH, EC, TSS and TDS.

6.6.2 Clean Water Management

Within the CL357 area east of the Main Northern Railway Line, rainwater runoff from non-mined or rehabilitated areas, as well as from the diversion of the Martins Creek and Blackwattle Creek catchments, is collected in a series of four dams C1, C2, C3 and C4 (**Figure 5**) which are interconnected by a vegetated clean water channel. Water from C3 and C4 can be pumped to other water storage dams for on-site use as required. All dams are maintained with sufficient freeboard to ensure adequate surge capacity during storm events.

The water management system was designed to direct the clean water from Dam C1 through the series of dams to Dam C4. There are three additional clean water dams, C5, C6 and C6a which, overtop to Dam C3.

Release of storm water through Dam C4 has occurred in the past during storm events. Water is decanted after these events in order to keep the dam capacity below 70%, thereby maintaining freeboard to allow sufficient residence time to settle any solids in the next first flush event.

West of the Main Northern Railway Line in the South Pit mining area, a series of dams separate clean and dirty water. The water management system in this area comprises clean water Dams C7, C8, C9 and C11. The dams and diversion banks divert clean runoff water from entering mine workings. Dams C7, C8 and C11 overtop and flow into C4 via the vegetated channel while Dam C9 (to the west of the south pit) overtops into Station Creek. Diversion drains constructed on the north-western boundary of CL357 prevent clean water from undisturbed areas entering the South Pit.

6.6.3 Dirty or Mine Water Management

All runoff from the Integra Open Cut surface facilities is intercepted by diversion drains and directed to Dam D1. Tailings dam return water, together with North Pit seepage water collected adjacent to the Integra Underground portals (**Figure 3**), is also pumped to Dam D1 while mine water collecting in the South Pit remains in the mine excavation until pumped back to the dirty water holding dams. In the South Pit area, Dam D4 functions as a holding dam for mine water with a pump and pipeline connecting this dam to dirty water Dam D1. Saline mine water is held on site and used within the CHPP and for dust suppression. Integra Coal does not hold a licence to discharge saline mine water.

As the proposed increase in ROM coal production will be achieved within the existing approved open cut limits, there will be no additional impact on surface water or any projected requirements for amendments to the existing water management system.

6.7 Groundwater

The Integra Open Cut holds an approval under Part 5 of the Water Act 1912 for groundwater interception by its open cut mining operations.

The volume of water pumped from the South Pit provides an indication of the amount of groundwater extracted, that is, once an allowance is made for the catchment area and the amount of rainfall to determine the contribution from surface water. A groundwater licence extraction limit of 100ML applies over a 12-month period.

Water transferred from the open cut workings to the mine water Dam D1, is monitored using a flow meter on the main dewatering pipeline.

Groundwater flows over the life of the mine have been minimal, typically around 1 – 2 ML per annum.

6.7.1 Groundwater Quantity and Quality Monitoring Program

A total of four bores are monitored to assess groundwater impacts and are shown in **Figure 5**. The bores comprise two deep (coal measures) monitoring bores located to the north of current South Pit open cut operations and two bores in the Glennies Creek alluvium located to the north and west of current South Pit operations. A description of the bores is provided in **Table 7**.

Table 7: Open Cut Groundwater Monitoring Bores

Bore No.	Aquifer	Logic for Selection	Impact Assessment
GC02	Coal seam monitoring bore	To detect water level and quality changes in the coal seams aquifer.	To assess changes in the coal seam aquifer from open cut mining and overburden emplacements
GC05	Coal seam monitoring bore	To detect water level and quality changes in the coal seams aquifer.	To assess changes in coal seam aquifers outside of mining influence
GC09	Glennies Creek Alluvium	To detect water level and quality changes in the alluvial aquifer adjacent to Glennies Creek north of the mining operations. To determine water quality impacts during and post mining.	To assess impacts from open cut operations on the Glennies Creek alluvial aquifer north of mining operations.
Richards DIPNR Bore	Glennies Creek Alluvium	To detect water level and quality changes in the alluvial aquifer adjacent to Glennies creek west of the mining operations. To determine water quality impacts during and post mining.	To assess impacts from open cut operations on the Glennies Creek alluvial aquifer west of mining operations.

Groundwater monitoring results have shown similar water qualities to those provided in the original EIS, i.e. prior to mining, and indicate that there has been minimal impact on groundwater quality and level from mining operations. The increase in ROM coal production would not be expected to have any additional groundwater impacts as the only aquifers in the South pit are associated with the coal seams and no additional coal seams will be mined under this modification.

Groundwater will continue to be managed and monitored under the approved Part 5 Licence and the associated Groundwater Management Plan.

6.8 Noise and Blasting

6.8.1 Noise

The local noise climate is dominated by existing coal mining and related activities, with other noise sources including traffic on the New England Highway and local roads, train movements, animals and wind in trees.

Noise surveys at the Integra Open Cut are undertaken on a quarterly basis by an acoustical consultant in accordance with the approved Noise Management Plan for the Integra Open Cut and the NSW Industrial Noise Policy (EPA, 2000). Noise surveys involve attended noise monitoring at three locations (the Lambkin, Payne and Hall

residences – **Figure 5**), on three occasions over a period of 24 hours. Meteorological data is also recorded throughout the surveys. Noise criteria are specified in the modified development consent and summarized in **Table 8**.

Table 8: Noise Criteria at Sensitive Receivers

Residence	Noise Level Criteria $L_{eq\ (15minutes)}$ dB(A)	Noise Affectation Criteria $L_{eq\ (15minutes)}$ dB(A)
Hall	39	44
Lambkin	38	43
Payne	36	41

The results from the quarterly noise monitoring over the past 4 years are provided in **Table 9**. The data includes the range of Leq totals from all sources and the range in the Leq attributable to Integra Coal open cut operations at the time of the surveys.

Table 9: Range of Noise Monitoring Results Summary 2004-2007[1]

Residence	Noise Total $L_{eq\ (15minutes)}$ dB(A)	Noise Attributed to Integra Coal Open Cut $L_{eq\ (15minutes)}$ dB(A)
Hall	<30 – 58	Not audible to 39
Lambkin	<30 – 58	Not audible to 36
Payne	<30 – 70	Not Audible to 34

Note 1: The data was obtained from the relevant Integra Open Cut Annual Environmental Management Reports.

Noise monitoring has shown compliance with the development consent criteria.

The mine currently has approval to operate continuously, 24 hours/day, seven days/week. Given that the proposed increase in coal production would be achieved within the existing and approved hours, utilizing the same mining equipment, no additional noise impacts from mining activities would be expected. To the contrary, the reduced volume of overburden/interburden to be drilled, blasted and removed over the remaining life of the mine as a consequence of not mining or only selectively mining the 75 seam will result in a reduction in the elevation of the waste emplacement, proportionally greater in-pit waste disposal and increased activity at areas more remote from the nearest residences, all of which will potentially have a positive (albeit minor) impact on the local noise climate.

The increased rate of ROM coal production will necessitate an increase in throughput at the CHPP and a proportional increase in the volume of coal dispatched by rail. However, given that the approval to increase CHPP throughput to 1200tph included an assessment of the noise from the expanded CHPP operations and the consequential

noise associated with the dispatch of coal from the plant, no further consideration of this aspect is warranted i.e. the processing and dispatch of the product coal from a 1200tph CHPP are existing approved activities.

In summary, the proposed increase in ROM coal production will not result in any increase in noise levels and Integra's Open Cut operations will continue to satisfy the existing criteria.

6.8.2 Blasting

The NONEL shot firing system is used within the Integra Open Cut to fragment overburden and interburden. No blasting of the coal seams is undertaken. Explosives used comprise Anfo, Heavy Anfo and waterproof explosives. An automatic Datamasters blasting sensor array around the mine records ground vibration and overpressure from each blast at six community receptors. Air overpressure and vibration are monitored for each blast. The DEC Environment Protection Licence specifies that overpressure shall not exceed 120 dB (L), and maximum peak particle velocity shall not exceed 10 mm/s. Five percent of blasts may exceed 115 dB (L) and 5 mm/s.

Blast monitoring performance for the past 3 years is summarised in **Table 10**.

Table 10: Blast Monitoring Results Summary 2004 to 2007[1]

Year/ No of blasts	% (No) of blasts Overpressure (dBL)		% (No) of blasts Ground Vibration (mm/s)	
	115 to 120	**>120**	**5 to 10**	**>10**
2004-5 (266)	3.0 (8)	1.1 (3)	1.5 (4)	0.0 (0)
2005-6 (245)	2.4 (6)	0.8 (2)	0.0 (0)	0.0 (0)
2006-7 (263)	3.0 (8)	0.4 (1)	0.0 (0)	0.0 (0)
DECC Criteria	**<5.0**	**0.0**	**<5.0**	**0.0**
Conformance	**YES**	**NO**	**YES**	**YES**

Note 1: DECC reportable sites outside the zone of affectation.

Between 2004 and 2007, there have not been any instances of ground vibration exceeding 10mm/s outside the zone of affectation although overpressure results have exceeded 120dBL on six occasions. Integra Coal has investigated all exceedences and in each instance has supplied reports to the DECC. The reduction in blasts resulting in an overpressure >120dBL over the past three years demonstrates the improvement in blast performance. Integra Coal is committed to continuous improvement and will utilise the necessary resources to minimise any future blast impacts. An example of this is the commitment by Integra to join the SODAR Joint

Venture to install and operate a local atmospheric detection system to assist in the prediction of atmospheric phenomena responsible for blast overpressure enhancement. Additionally, Integra Coal has recently conducted a risk assessment review of its blasting operations in order to improve performance and reduce the risk of blast overpressure and ground vibration impacting nearby residents.

The increase in ROM coal production through a reduction in the stripping ratio would necessitate an increase in blast frequency in 2008 with a subsequent decrease in 2009. However, overall the same number of blasts and amount of explosives would be required for the currently approved and the proposed mine production rates.

The existing monitoring network will continue to assess blast impacts. Improved operational performance, through the continuous improvement program will allow Integra Coal to meet blast criteria.

6.9 Visual Aspects and Night Lighting

The existing Integra Open Cut operations, in particular the overburden emplacements, are significant features within the local visual environment from vantage points panning from the north to the west and south-west, with the visual impact exacerbated by the presence of the adjacent Rix's Creek Mine and nearby Ashton and Mt Owen operations. Fixed lighting from the various CHPPs, mobile lighting plants in the active mining areas and on the overburden emplacements and from the movement of mining equipment at these operations also impact on night-time visual amenity.

The increase in ROM coal production will not result in any increase in visual impact. Rather, the accelerated rate of mining; the reduced volume of overburden to be moved; the marginal increase in the rate of final landform creation and rehabilitation, the less intrusive final landform, together with the minor reduction in the life of the approved Integra Open Cut, would have a minor positive impact on local visual amenity in the short to medium term.

A preliminary closure plan for the Integra Open Cut was prepared in 2001 and a final mine closure plan is currently in preparation. The minor changes to the landform resulting from the reduction in total materials movement will be identified in this closure plan and form part of the final MOP required by the Department of Primary Industries.

6.10 Greenhouse Gas Assessment

6.10.1 Background

It is important to recognise that the current proposal is for an increase in production from 3.8Mtpa to 4.5Mtpa only and not for a new development and, furthermore, will not

necessitate any change in equipment, processing or manpower. Therefore, this section not only quantifies the production of greenhouse gas emissions from the proposed operations, but also compares them to the quantities of emissions which would be produced in the event that the maximum mine production level was to remain unchanged.

Table 11 shows that the proposal will not result in any change to the total amount of coal to be extracted over the remaining life of the mine, albeit that the mine life will be reduced by approximately 3 months.

Table 11: Comparison of Current and Proposed Mine Production Rates[1]

	3.5Mtpa Production	4.5Mtpa Production
Year 1 Extraction	3.8Mt	4.5Mt
Year 2 Extraction	2.95Mt	2.25Mt
Remaining Mine Life	1.75yrs	1.5yrs
Total Coal Extracted	**6.75Mt**	**6.75Mt**

Note 1: Figures are approximate and based on current projections.

For the purposes of this assessment, the current extraction rate of maximum 3.8Mtpa is considered to be the mine operating at 100% capacity. Greenhouse gas emissions from proposed extraction rates are calculated based on this assumption (i.e. maximum extraction of 4.5Mtpa equals the mine operating at 118% capacity, with equivalent increases in current resource consumption).

6.10.2 Greenhouse Gas Emissions

Emissions of greenhouse gases will result from activities associated with the Project that consume energy or release fugitive emissions. In the context of this assessment, greenhouse gas emissions refer to the six direct greenhouse gases regulated by the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, namely:

- carbon dioxide (CO_2);
- methane (CH_4);
- nitrous oxide (N_2O);
- hydrofluorocarbons (HFCs);
- perfluorocarbons (PFCs); and
- sulphur hexafluoride (SF_6).

The project will release greenhouse gases, predominantly carbon dioxide through the combustion of fossil fuels, and methane through fugitive emissions released from the exposed/mined coal resource.

6.10.3 Greenhouse Gas Legislation and Guidance

The two international frameworks addressing the issue of climate change are the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol.

These frameworks guide the reporting of greenhouse gas emissions internationally, and form the basis of the approach to estimating greenhouse gas emissions. Other relevant legislation and standards which also provide further guidance with respect to estimating and assessing impacts of greenhouse gases include:

- World Resources Institute (WRI) The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, 2004;
- Australian Greenhouse Office (AGO) Factors and Methods Workbook[1];
- Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2005 series;
- National Greenhouse Gas Inventory;
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007; and
- The 2002 Draft NSW Energy and Greenhouse Guidelines in EIA (Department of Infrastructure Planning and Natural Resources, Department of Energy, Utilities and Sustainability).

6.10.4 Global Warming Potential

The various greenhouse gases absorb radiation at different wavelengths and with different efficiency. Further, the lifetime of the gases in the atmosphere varies and must be taken into account: the longer they remain in the atmosphere, the greater their overall effects, with the lifetime chosen to express global warming potential typically being 100 years.

In order to compare the effects of individual substances on the climate, the global warming potential (GWP) of various greenhouse gases has been defined as the warming effect relative to CO_2. This enables the effect of the various greenhouse gases to be converted into the equivalent quantity of CO_2 (CO_2-e), *i.e.* the quantity of CO_2 giving the same effect in absorbing solar radiation.

The Australian Greenhouse Office (AGO) *Factors and Methods Workbook* adopts the following Intergovernmental Panel of Climate Change (IPCC) 1996 global warming potential values for a 100-year time horizon:

- Carbon dioxide CO_2: 1

[1] http://www.greenhouse.gov.au/workbook/

- Methane (CH_4): 21
- Nitrous oxide (N_2O): 310
- Hydrofluorocarbons (HFCs): 140 – 11,700 (depending on the molecule)
- Perfluorocarbons (PFCs): 6,500 – 9,200 (depending on the molecule)
- Sulphur hexafluoride (SF_6): 23,900.

Using these values, CH_4 therefore has a global warming potential 21 times greater than CO_2, while N_2O has a global warming potential 310 times greater than CO_2.

6.10.5 Direct and Indirect Emissions

Emissions of greenhouse gases from the Integra Open Cut can be categorised as 'direct' and 'indirect' emissions.

The *AGO Factors and Methods Workbook* adopts the emissions categories of the international reporting framework of *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (WRI/WBCSD). These emission categories are as follows.

Scope 1 - Scope 1 emissions cover direct emissions from sources within the boundary of an organisation such as fuel combustion and manufacturing processes.

Scope 2 - Scope 2 emissions cover indirect emissions from the consumption of purchased electricity, steam or heat produced by another organisation. Scope 2 emissions result from the combustion of fuel to generate the electricity, steam or heat but do not include emissions associated with the production of the fuel used. Scopes 1 and 2 are carefully defined to ensure that two or more organisations do not report the same emissions in the same scope.

Scope 3 - Scope 3 emissions include all other indirect emissions that are a consequence of an organisation's activities but are not from sources owned, or controlled, by the organisation.

Sources of greenhouse gases from the current and proposed Integra Open Cut operation assessed include:

- direct emissions which result from the combustion of fossil fuels (*eg* diesel) in equipment used on site, such as front-end loaders, haul trucks and excavators (Scope 1 emissions);
- indirect emissions which result from electricity consumption during the mining operations, at the CHPP and at associated infrastructure and buildings (*eg* administration offices) (Scope 2 emissions); and
- indirect emissions through combustion of coal off-site from the transportation of the coal and those emissions associated with the extraction of fuels to supply diesel

and electricity (Scope 3 emissions). Consistent with the methodologies described, the assessment does not consider other Scope 3 indirect emissions associated with the development including:

- disposal of waste generated at the mine;
- employee business travel;
- employees commuting to and from work;
- extraction, production and transport of other purchased materials and goods;
- out-sourced activities; and
- sea transport of product beyond Newcastle Harbour.

6.10.6 Estimating Emissions

This section estimates greenhouse gas emissions from the current and proposed operations.

Emission factors for calculating emissions of greenhouse gases are generally expressed in the form of a quantity of a given greenhouse gas emitted per unit of energy (kg CO_2-e /GJ), fuel (t CH_4/t coal) or a similar measure. Emission factors are then used to calculate greenhouse gas emissions by multiplying the factor (e.g. kg CO_2/GJ energy of diesel) with activity data (e.g. kilolitres x energy density of diesel used).

Table 12 details the greenhouse gas emission sources included in this assessment.

Table 12: Greenhouse Gas Emission Sources in this Assessment

Scope 1 –direct emissions	Scope 2 –indirect emissions from purchased energy	Scope 3 – other indirect emissions
Liquid fuel combustion on-site (including use for transport)	Electricity Usage	End use combustion of coal for electricity generation or steel production.
Explosives (ANFO, Heavy ANFO and Emulsion)		Indirect emissions from provision of liquid fuel
Fugitive methane emissions		Transport of product (by rail). Indirect emissions from fuel extraction and transmission line loss.

Of the emissions sources identified in **Table 12,** it is important to note that Scope 1 and 2 sources are those under direct management control of the Integra Coal

Management, that is, Integra Coal Management can implement measures which will directly affect emissions associated with these sources, e.g. in the case of electricity usage, through reducing consumption. Scope 3 sources are not under direct management control and therefore the opportunity to reduce emissions from these sources is less direct.

The inclusion of Scope 3 emissions may result in inconsistencies in international greenhouse gas emission reporting in that it can result in 'double counting' of emissions. This assessment therefore only provides emission estimates of Scope 3 emissions to provide context regarding these emissions and an indication of emissions magnitude with respect to Scope 1 and 2.

Scope 1

Table 13 provides the yearly resource consumption and total mine life emission estimates from Scope 1 sources associated with the current approved and proposed rates of production.

Table 13: Scope 1 Sources Emission Estimate (Current Approved and Proposed Mine Production)

Source	Activity Level [1]				Emission Factor	Total Mine Life Emissions (t/CO_{2-e})[4]	
	3.8Mtpa Production		4.5Mtpa Production			3.8Mtpa Production	4.5Mtpa Production
	Year 1	Year 2	Year 1	Year 2			
Liquid fuel combustion on-site	20,149 kL	15,514 kL	23,775 kL	11,887 kL	2.7 tCO_{2-e}/kL[2]	96,292	96,292
Explosives (ANFO, Heavy ANFO and Emulsion)	13,266 t	10,214 t	15,653 t	7,826 t	ANFO 0.167 tCO_{2-e}/t Heavy ANFO 0.178 tCO_{2-e}/t Emulsion 0.166 tCO_{2-e}/t [3]	4,129	4,129
Fugitive methane emissions	3,800,000 tonne ROM coal	2,950,000 tonne ROM coal	4,500,000 tonne ROM coal	2,250,000 tonne ROM coal	0.0455 t CO_{2-e}/tonne raw coal	307,125	307,125
Total						**407,546**	**407,546**

Note 1: Activity level based upon normal operation of open cut mine.
Note 2: Diesel consumption estimated for all on-site mobile equipment and transport.
Note 3: Scope 1 ANFO emission factor AGO Factors and Methods Workbook 2006.
Note 4: Annual CO_2 –e emissions from each source identified in Table 16

As highlighted by **Table 13,** fugitive methane emissions represent the most significant source of greenhouse gas emissions from the Integra Open Cut.

Scope 2

Table 14 presents the yearly resource consumption and total mine life emissions from Scope 2 sources for the current approved and proposed rates of production.

Table 14: Scope 2 Sources Emission Estimate (Current Approved and Proposed Mine Production)

Source	Activity Level [1]				Emission Factor	Total Mine Life Emissions (t/CO_{2-e})[3]	
	3.8Mtpa Production		4.5Mtpa Production			3.8Mtpa Production	4.5Mtpa Production
	Year 1	Year 2	Year 1	Year 2			
Electricity Consumption[2]	32,805,213 kWh	25,260,014 kWh	38,710,151 kWh	19,355,075 kWh	0.893 tCO_{2-e} / MWh[2]	51,852	51,852
Total						**51,852**	**51,852**

Note 1: Activity level based upon normal operation of open cut mine.
Note 2: Scope 2 NSW & ACT emission factor for consumption of purchased electricity, AGO Factors and Methods Workbook 2006.
Note 3: Annual CO_2 –e emissions from each source identified in Table 16

Scope 3

Table 15 presents the yearly resource consumption and total mine life emissions from Scope 3 sources for the current and proposed increased rates of production including the emissions associated with rail transportation of the coal to Newcastle Harbour and the indirect emissions associated with the extraction (and transmission loss in the case of electricity supply) of fuels to supply diesel and electricity.

Table 15: Scope 3 Sources Emission Estimate (Current Approved and Proposed Mine Production)

Source	Activity Level [1]				Emission Factor	Total Mine Life Emissions ($t/CO2-e$)[4]	
	3.8Mtpa Production		4.5Mtpa Production			3.8Mtpa Production	4.5Mtpa Production
	Year 1	Year 2	Year 1	Year 2			
Emissions associated with extraction and production of liquid fuel consumed	20,149 kL	15,514 kL	23,775 kL	11,887 kL	0.3 tCO_{2-e}/kL	10,699	10,699
Emissions for fuel extraction and transmission line loss associated with electricity supply	32,805,213 kWh	25,260,014 kWh	38,710,151 kWh	19,355,075 kWh	0.176 tCO_{2-e}/MWh	10,219	10,219

Source	Activity Level [1]				Emission Factor	Total Mine Life Emissions (t/CO2-e)[4]	
	3.8Mtpa Production		4.5Mtpa Production			3.8Mtpa Production	4.5Mtpa Production
	Year 1	Year 2	Year 1	Year 2			
Offsite transport of product (by rail)	2,234,400[2] t	1,734,600[2] t	2,646,000[2] t	1,323,000[2] t	12.3g $CO_{2\text{-}e}$/net tonne-km[3]	4,394	4,394
End use combustion of coal for electricity generation.	2,234,400[2] t	1,734,600[2] t	2,646,000[2] t	1,323,000[2] t	97.6kg $CO_{2\text{-}e}$ / GJ	9,858,678	9,858,678
Total						**9,883,991**	**9,883,991**

Note 1: Activity level based upon normal operation of proposed open cut mine.
Note 2: Based on 58.8% saleable coal content on previous 3 years operations.
Note 3: Emission factor taken from report commissioned by QR Network Access (2002)
Note 4: Annual CO_2 –e emissions from each source identified in Table 16.

6.10.7 Impact Assessment

Table 16 presents a summary of information presented in **Tables 13** to **15** and shows that annual Scope 1, Scope 2 and Scope3 emissions would increase with the proposed increased annual production rate (for a maximum of one year). However, over the shortened remaining mine life, the total emissions from these sources would be the same: the same amount of coal would be mined under both production scenarios.

Table 16: Comparison of Greenhouse Gas Emissions, (Current Approved and Proposed Mine Production)

Scope	Source	ANNUAL EMISSIONS (t CO2-e emissions)				TOTAL MINE LIFE EMISSIONS (t CO2-e)	
		3.8Mtpa		4.5Mtpa		3.8Mtpa	4.5Mtpa
		Year 1	Year 2	Year 1	Year 2	(*further 21 months*)	(*further 18 months*)
1	Liquid Fuel	54,402	41,890	64,195	32,097	96,292	96,292
	Explosives	2,333	1,796	2,753	1,376	4,129	4,129
	Fugitive emissions	172,900	134,225	204,750	102,375	307,125	307,125
2	Electricity	29,295	22,557	34,568	17,284	51,852	51,852
TOTAL (1+2)		**258,930**	**200,468**	**306,266**	**153,133**	**459,399**	**459,399**
3	Liquid Fuel	6,045	4,654	7,133	3,566	10,699	10,699
	Electricity	5,773	4,446	6,813	3,406	10,219	10,219
	Transport	2,473	1,920	2,929	1,465	4,394	4,394
	Combustion	5,550,071	4,308,608	6,572,452	3,286,226	9,858,678	9,858,678
TOTAL (1+2+3)		**5,823,292**	**4,520,096**	**6,895,593**	**3,447,796**	**10,343,389**	**10,343,389**

At the proposed increased production rate, the Integra Open Cut is anticipated to

extract up to 4,500,000 t of ROM coal in Year 1 to produce approximately 2,646,000 t of saleable coal. Year 1 emissions of greenhouse gases (Scope 1 and 2) are estimated at 306,266 tCO_{2-e} which represents a contribution of approximately 0.19% to New South Wales' reported greenhouse gas emissions in 2005[2] and 0.05 % of Australia's reported greenhouse emissions in 2005[2]. Further comparisons of greenhouse emissions as a percentage of NSW and Australian emissions are presented in **Table 17**.

Table 17: Current Approved and Proposed Mine ROM Production Greenhouse Gas Emissions as a Percentage of NSW and Australian Annual Emissions

	3.8Mtpa		4.5Mtpa	
	Year 1	Year 2	Year 1	Year 2
% of NSW 2005 Emissions (CO2-e) [1]	0.16	0.13	0.19	0.10
% of Australia's 2005 Emissions (CO2-e) [1]	0.05	0.04	0.05	0.03

Note 1: Reporting year 2005, Kyoto framework, Australian Greenhouse Emissions Information System http://www.ageis.greenhouse.gov.au/

Based on the magnitude of the maximum increase in annual emissions estimated, there would be no direct measurable consequential environmental effect resulting from increasing maximum annual ROM production from 3.8 to 4.5Mt at the Integra Open Cut Coal Mine. Over the remaining life of the mine, the total greenhouse gas emissions under both the 3.8Mtpa and 4.5Mtpa production scenarios would be the same.

6.10.8 Minimising Energy Consumption and Greenhouse Gas Emissions

Measures are already in place at the Integra Coal Open Cut to ensure that energy consumption and greenhouse gas emissions are minimised. These measures include membership of the Greenhouse Challenge and the implementation of an Energy Saving Action Plan. The following actions will be undertaken as a continuation or extension of the measures currently in place at the Mine.

- Consideration of the efficiency of any new diesel and electric powered mobile and fixed equipment during the procurement phase.
- Ensuring equipment is maintained to retain high levels of energy efficiency.
- Regularly updating and maintaining the inventory of emissions developed for this assessment.
- Reporting annually on the emissions and abatement strategies.

[2] Reporting year 2005, Kyoto framework, Australian Greenhouse Emissions Information System http://www.ageis.greenhouse.gov.au/

6.11 Final Landform and Use

The final landform in the North and C3 pits east of the Main Northern Railway Line as identified in the approved MOP for the Integra Open Cut will be unaffected by this proposal. However, by not mining to the previously planned extent in the remaining area of the South Pit, the final void will be shallower than previously planned and approved but approximately 15% larger in surface area. This is a result of historic overburden emplacement design in the South Pit and activities which were planned and undertaken at the time to ensure adequate storage capacity for the full volume of overburden to be mined whilst at the same time producing a final landform with slopes which would be stable over the longer term. The refined final landform will be reflected in an amendment to the Mine Operations Plan and the Mine Closure Plan.

Consistent with the original Environmental Impact Statement, the final land use for the majority of the Integra Open Cut site is and will remain a mixture of grazing and natural vegetation areas. The ultimate land use for the final void has yet to be determined.

6.12 Traffic and Transportation

6.12.1 On-Site Transport

ROM coal is transported from the South Pit by internal haul road to the ROM stockpile area or ROM receival bin. There will be no change to the principal internal haul road for ROM coal transport and no impacts other than those already discussed from on-site transportation of ROM coal.

6.12.2 Off-Site Transport

ROM coal is not transported off-site and the proposed increase in production will not necessitate any increase in employment or changes in equipment or infrastructure. Consequently there will be no additional impacts on the off-site road network. Product coal will continue to be transported by rail at a rate which is consistent with the current development approval.

6.13 Social and Economic

Currently, a total of 231 employees, comprising 193 production and 38 staff, work at the Integra Open Cut. There are also 92 full time equivalent contractors on site. The increase in ROM coal production will not affect the number of employees at the mine and will assist in maintaining this employment level to the end of mine life. However, the increased production will lead to the approved open cut closing in mid 2009, approximately 3 months sooner than would occur if the maximum production rate was to remain at its current level: the reduced mine life as a consequence of not mining or only selectively mining the 75 seam would occur independent of the production rate but, as noted in section 3.6, would require less equipment hours and hence

employment if the maximum approved production was to remain at its current level.

As noted in section 3.4, Integra Coal has lodged an application (MP06_0073) with the Department of Planning, seeking approval for the development of the Glennies Creek Open Cut, and has also commenced planning for a western extension to the Integra Open Cut. Both projects provide potential opportunities for the longer term employment of the existing workforce and, subject to the receipt of the required planning approvals before the final closure of the Integra Open cut, would reduce the potential social impacts which might otherwise result.

6.14 Cumulative Impacts

The likely environmental impacts arising as a consequence of the increase in ROM production range from negligible to potentially positive. Similarly, the likely cumulative impacts on the local environment would be minimal or positive. Consequently, no further assessment of cumulative impacts is considered necessary.

6.15 Conclusion

Given the limited remaining life of the existing approved Integra Open Cut, the impacts arising from the increase in ROM coal production over a period of less than 2 years will be temporary, negligible or positive and will not result in any long term or significant impacts on the physical, biological or socio-economic environment.

7. DRAFT STATEMENT OF COMMITMENTS

The increase in ROM coal production will result in minimal environmental impacts for the reasons identified in this document and summarised in **Section 1 Executive Summary**. Integra Coal will continue to monitor and manage the sites environmental impacts and makes the following commitments.

- Air quality impacts will continue to be assessed as described in **Section 6.2** using the existing air quality monitoring network with the outcomes reported in the AEMR;
- Surface water management will continue to be monitored and managed as described in **Section 6.6** and will be maintained with the outcomes reported in the AEMR;
- The existing groundwater monitoring and management as described in **Section 6.7** will be maintained with the outcomes reported in the AEMR;
- The existing noise monitoring and management as described in **Section 6.8.1** will be maintained with the outcomes reported in the AEMR;
- The existing blast monitoring and management as described in **Section 6.8.2** will be maintained with the outcomes reported in the AEMR;and

- Integra Coal will continue to monitor and meet the Greenhouse Challenge Plus commitments and implement an Energy Saving Action Plan.

REFERENCES

Camberwell Coal Project, Glennies Creek, NSW. Environmental Impact Statement, 1989, Camberwell Coal Joint venture.

HLA-Envirosciences Pty limited, 2005, Statement of Environmental effects – Modification of Development Consent. Coal Handling and Preparation Plant Upgrade – Camberwell Mine.

Camberwell Coal 2005 Mine Operations Plan.

Integra Coal Operations Pty Limited, Open Cut Annual Report 2004/5, 2005/6, 2006/7.

Integra Coal Operations Pty limited Greenhouse Challenge Report 2005/6.

http://www.ageis.greenhouse.gov.au/

http://www.greenhouse.gov.au/workbook/

APPENDIX 1: Director Generals Requirement's

APPENDIX 2: Consolidated Consent

APPENDIX 3: Property Description