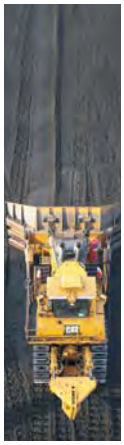
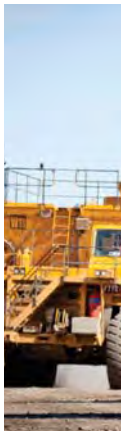
DURALIECOAL
Part of the Yancoal Australia Group

Duralie Open Pit Modification
Environmental Assessment





APPENDIX G

VISUAL ASSESSMENT

YANCOAL
兖煤澳大利亚有限公司

Resource Strategies

DURALIE OPEN PIT MODIFICATION

VISUAL ASSESSMENT

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AND
RESOURCE STRATEGIES PTY LTD

JULY 2014
Project No. GCL-14-23
Document No. 00600738

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1 INTRODUCTION

This Visual Assessment for the Duralie Open Pit Modification (the Modification) has been prepared to support an application to modify Project Approval (08_0203) for the Duralie Coal Mine (DCM) under Section 75W of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979*.

The DCM is located approximately 10 kilometres (km) north of the village of Stroud and approximately 20 km south of Stratford in the Gloucester Valley in NSW (Figure 1). Duralie Coal Pty Ltd (DCPL) is the owner and operator of the DCM. DCPL is a wholly owned subsidiary of Yancoal Australia.

To reflect the results of ongoing mine exploration and mine planning, the following changes to the currently approved DCM are proposed for the Modification:

- minor changes to the open pit surface development extents, including an increased maximum pit depth, to reflect the results of recent geological exploration, and associated changes to the DCM final voids;
- a reduction in low wall angles of the Clareval open pit and the removal of a pillar between the Clareval and Weismantel open pits to improve geotechnical stability, and the associated relocation of the upstream diversion to the west of the Clareval open pit, resulting in a minor increase in the extent of surface development of the DCM of approximately 2.5 hectares (ha);
- revised mining sequence (i.e. progression of mining in the Clareval and Weismantel open pits) to account for the revised open pit surface development extents and associated dumping requirements; and
- increased height of the central portion of the waste emplacement from the currently approved elevation of approximately 110 metres Australian Height Datum (m AHD) to approximately 135 m AHD.

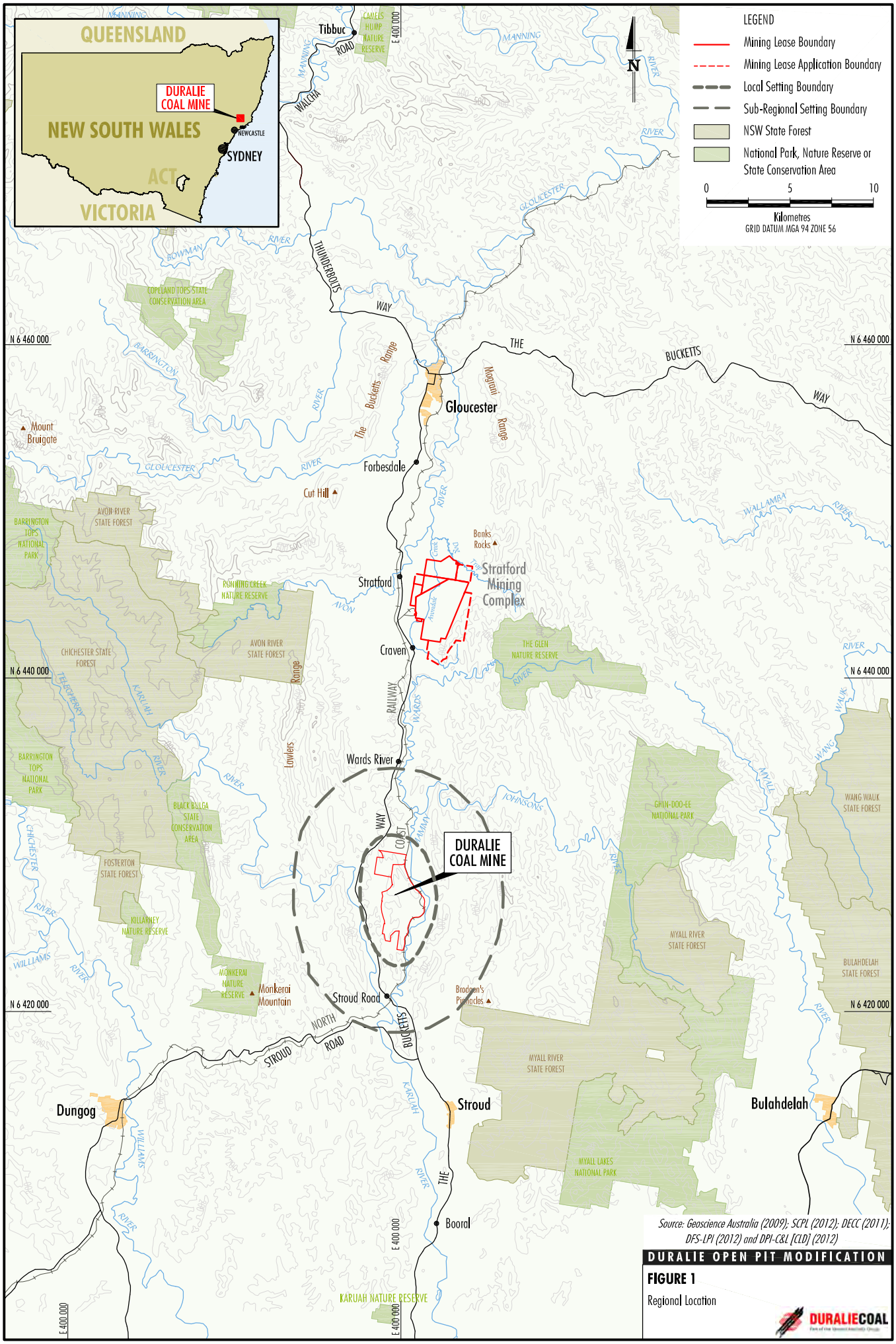
The Modification would result in no change to the following key elements of the currently approved DCM relevant to the Visual Assessment:

- mine life; and
- rehabilitation of surface disturbance areas.

Figure 2 shows the proposed layout of the Modification. Further description of the Modification is provided in Section 3 in the Main Report of the Environmental Assessment (EA).

The following components are included as part of this visual assessment:

- Review of previous visual assessments undertaken for the DCM and existing visual mitigation measures (Section 2).
- Characterisation of the existing landscape and visual setting (Section 3).
- Description of the changing landforms during the various stages of the Modification that could have potential visual impacts (Section 4).
- Assessment of (Section 5):
  - Visual modification at key viewpoints – *How would the modified DCM contrast with the landscape character of the surrounding setting relative to the approved DCM?*
  - Visual sensitivity at key viewpoints – *How sensitive would viewers be to the Modification?*
  - Potential night-lighting impacts.
  - Potential cumulative visual impacts.
- Proposed visual impact mitigation and management measures (Section 6).



Source: Geoscience Australia (2009); SCPL (2012); DECC (2011); DFS-LPI (2012) and DPI-C&L [CLD] (2012)

DURALIE OPEN PIT MODIFICATION

FIGURE 1

Regional Location

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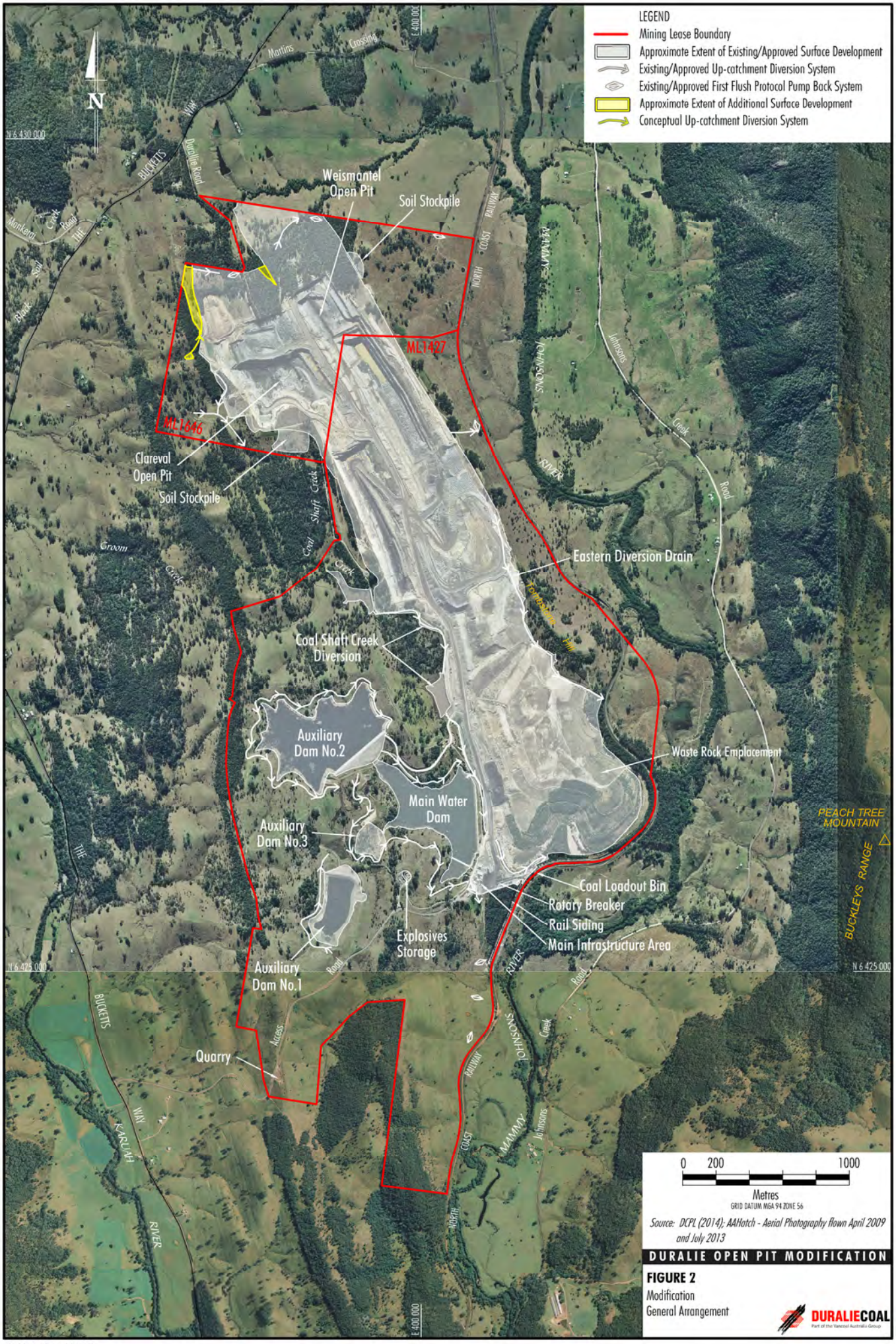

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2 REVIEW OF PREVIOUS VISUAL ASSESSMENTS AND EXISTING VISUAL MITIGATION MEASURES

Resource Strategies (2009) undertook a visual assessment as a component of the *Duralie Extension Project Environmental Assessment* (DCPL, 2010). It was assessed that the extension and development of the open pits and waste rock emplacement (including associated vegetation clearance) would potentially increase the views available from nearby public roads (e.g. The Bucketts Way) and privately owned residential dwellings to the north of the DCM. The level of visual modification would change following progressive rehabilitation, reducing as vegetation becomes established and matures. The assessment concluded that the potential visual impact would be very low to low at relevant sensitive receivers.

DCPL has implemented a number of measures at the DCM to minimise potential visual impacts:

- The waste rock emplacement has been designed to produce a landform which integrates with the adjoining natural landform (i.e. Tombstone Hill) and incorporates relief to integrate with the surrounding natural landforms.
- Boundary vegetation has been retained along the eastern toe of the waste rock emplacement to provide a visual screen between users of the North Coast Railway and the DCM.
- Substantial fabricated infrastructure has been painted with a colour ("Rivergum") that assists it to blend in with the adjoining landscape.
- The placement, configuration and direction of lighting has been designed to reduce off-site nuisance effects of stray light.
- All external lighting has been operated in accordance with Australian Standard 4282 (INT) 1995 - *Control of Obtrusive Effects of Outdoor Lighting* as required by Condition 49, Schedule 3 of Project Approval (08_0203).
- A visual screen has been constructed along an approximate 360 m section of The Bucketts Way (Figure 2) by DCPL in accordance with Condition 51, Schedule 3 of Project Approval (08_0203) to minimise views of the DCM along the section of The Bucketts Way with the greatest potential to for visual impact to occur.

3 EXISTING LANDSCAPE AND VISUAL SETTING

3.1 LANDSCAPE CHARACTER AND SCENIC QUALITY

It has been established through previous studies that scenic quality increases as topographic ruggedness and relative relief increase (Burns and Rundell, 1969; Leonard and Hammond, 1984; Anderson *et al*., 1976 in EDAW Australia, 2006). EDAW Australia (2006) also found that scenic quality can increase as the patterning of vegetation increases.

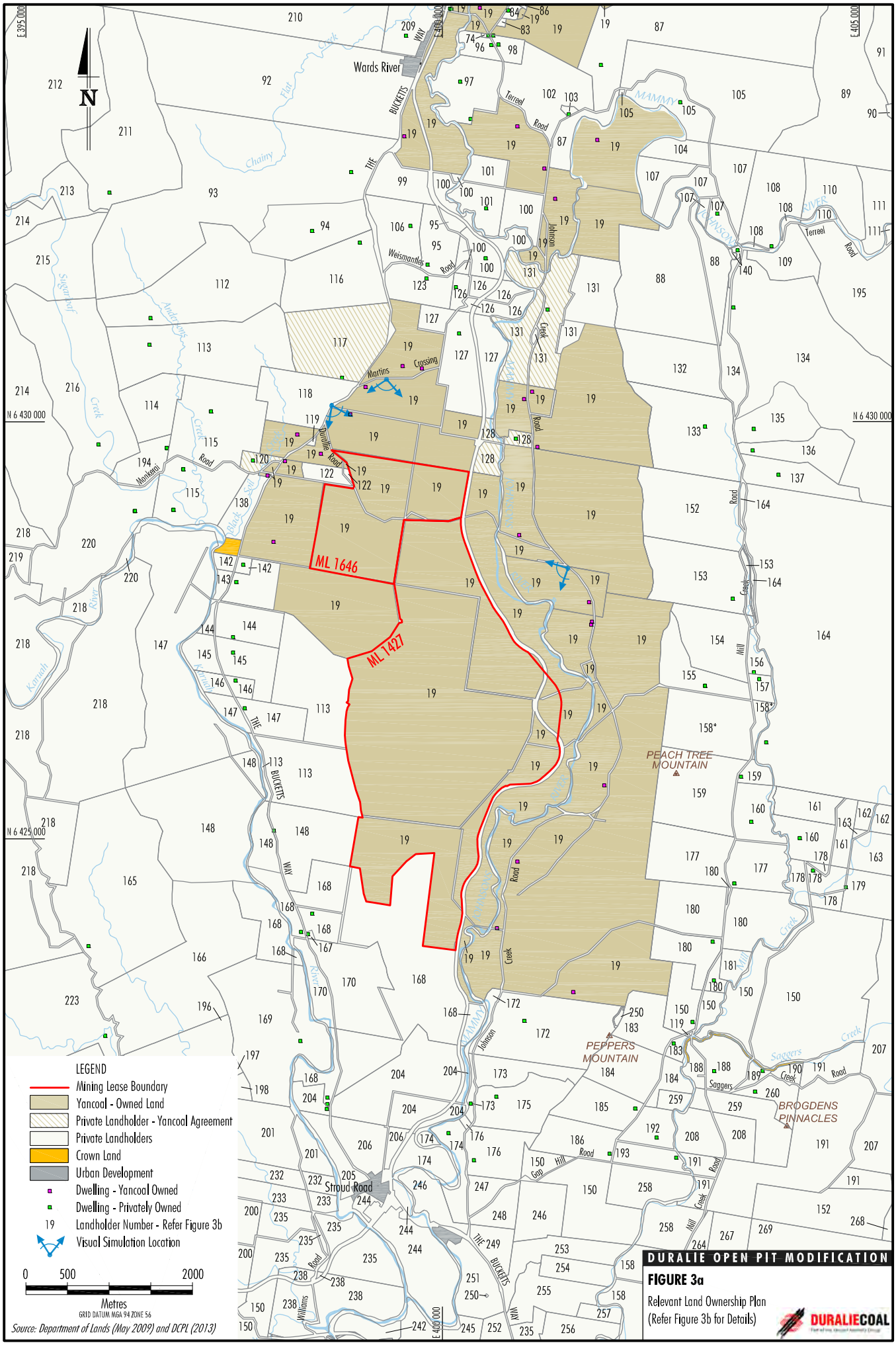
The DCM is located in the Gloucester Basin which is a linear valley which extends approximately 37 km in length and is 10 km in width (DCPL, 1998). The valley is a strongly defined landform that is visually enclosed and displays an attractive landscape resulting from a combination of natural features and rural land uses. Remnant vegetation generally occurs along ridgelines that define the valley, along watercourses and in isolated patches within the cleared landscape.

The DCM area and surrounds are comprised of a number of distinct land use types and landscape units of varying levels of landscape quality. These have been defined as follows:

- Agricultural Areas – the DCM area is located in a rural area characterised by cattle grazing on native and improved pastures, along with some poultry farming and other agricultural production.
- Existing Mine Developments – the predominant land use at the DCM is mining operations.
- Residential Dwellings – detached dwellings surrounding the DCM, mostly to the north and north-west of the DCM (Figures 3a and 3b).
- Peach Tree Mountain (approximately 305 m AHD) – is located off Johnsons Creek Road approximately 1.5 km to the east of the DCM.
- Peppers Mountain (approximately 350 m AHD) – is located approximately 4 km south-east of the DCM.
- Buckley's Range (approximately 350 m AHD) – is located approximately 1.5 km east of the DCM. The vegetated ridgeline, the dominant landscape feature, runs approximately north-south and separates largely cleared agricultural land in the Gloucester valley to the west and the Mill Creek Valley to the east.
- Ridgeline to the west of the DCM (approximately 170 m AHD) – runs generally north-south and is located approximately 0.5 km to the west/south-west of the DCM. The ridgeline runs parallel to and east of The Bucketts Way and along the western boundary of the DCM, screening views of the DCM from the majority of The Bucketts Way.
- Elevated valley floor to the north of the DCM (approximately 300 m AHD) – central to valley located approximately 3 km to the north of the DCM. Elevated topography screens views of the DCM from Wards River.
- Ridgeline to the south of the DCM (approximately 200 m AHD) – is located approximately 2 km to the south of the DCM. This ridgeline screens views of the DCM from Stroud Road.
- Tributaries – Mammy Johnsons River is the major watercourse in the valley that extends in an approximately north-south direction to the east of the DCM, before it joins the Karuah River at a confluence located approximately 4 km south of the DCM. Coal Shaft Creek, a tributary of the Mammy Johnsons River, is located within the DCM.

The visual settings (e.g. local, sub-regional and regional) are based on distance from the DCM landforms as follows (Figure 1):

- regional setting – greater than approximately 5 km from the DCM landforms;
- sub-regional setting – approximately 1 to 5 km from the DCM landforms; and
- local setting – up to approximately 1 km from the DCM landforms.



DURALIE OPEN PIT MODIFICATION

FIGURE 3a

Relevant Land Ownership Plan
(Refer Figure 3b for Details)

DURALIECOAL

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Reference	Land Owner
19	Yancoal Australia Limited
74	D. L. & D. W. Melmeth
83	Cemetery
84	A.W. & C.M. Hart
86	J. Andersen
87	Pacific Property Investments Ltd
88	V. S. Edwards
89	D. J. Robertson
90	W. A. & J. A.Thomson
91	Hunter Water Corporation
92	Sejon No 4 Pty Ltd
93	K. V. & P. M. Howard
94	B. V. & P. O. Howard
95	D. J. Smith & S. Ransley
96	H. T. & M. B. Turnbull
97	S. W. Davis
98	I. D. Partelle & M. M. Ramsay
99	K. MacFarlane
100	K. S. Richards
101	K. M. & D. B. Holloway
102	W. R. Kerslake
103	G. L. Macedo
105	R. M. Edwards
106	R. A. James
107	P. G. Spencer
108	A. G. & M. A. Tersteeg
109	R. J. Bathgate & M. L. Levey
110	G. W. Lewis & A. J. Moore
111	T. J. Somerville & C. D. Martin
112	S. R. Hogeveen
113	C. W. & J. I. Edwards
114	H. Paliokas
115	P. W. M. & B. D. & G. O. & M. J. Moylan & S. C. M. Newton
116	G. R. Weismantel
117	E. D. Holmes and L. M. Holmes
118	P. W. M. Moylan
119	Great Lakes Council
120	M. J. & C. A. Mahony
122	S. White
123	J. L. Oleksiuk & K. P. Carmody
126	H. L. & M. R. Hamann - Pixalu Pty Limited
127	A. J. Fisher-Webster
128	D. R. & B. Hare-Scott
131	W. L. Relton
132	A. T. Gorton
133	R. J. Gorton
134	Duzmen Pty Ltd
135	P. J. Ayliffe
136	D. P. Pickles
137	T. J. Lord
138	P. W. M. Moylan, B. D. Moylan, G. O. Moylan, S. C. M. Newton & M. J. Moylan
140	D. C. Bennett & D. M. Stark
142	P. G. Madden
144	D. J. Wielgosinski
145	C.W. & J. I. Edwards
146	M. A. Bragg
147	S. Edwards
148	D. J. McAndrew
150	R. N. & T. E. Rumbel
152	D. M. Lowrey
153	L. & R. K. Paul
154	J. R. Morgan
155	M. & R. Guberina
156	T. R. J. & B. Hope
157	C. N. & S. D. Stephenson
158	B. Gilbert
159	T. R. Waterer
160	P. & M. E. Kenney
161	D. G. Hutchison
162	L. Partridge
163	M. A. & C. H. Hockings & C. H. Willcox
164	Gorton Timber Co. Limited
165	ESOR Nominees Pty Limited
166	A. J. & A. L. Daniel
167	M. & S. M. Ravagnani
168	V. R. & E. K. Schultz
169	R. D. K. & N. L. Williams
170	I. K. & M. J. Schultz
172	S. J. & J. E. Lyall
173	S. M. Trigg, J. M. Trigg, M. J. Holland, B. J. Holland, M. Trigg & S. C. Trigg
174	D. C. Carroll
175	S. G. Thomas
176	J. D. Thompson
177	W. J. Thompson
178	N. E. Hitchcock & E. E. Coldham
179	I. Mellar
180	K. J. Dennis
181	G. J. Thompson
183	M. H. & E. V. Elfick
184	B. J. & M. C. Gay
185	A. W. Raine & T. Hilleard
186	K. B. & J. N. Farnham
188	T. E. Rumbel
189	H. J. Gillard
190	B. Clayton
191	A. M. Mokeeff
192	S. & A. F. Vajda
193	N. & C. M. Smith
194	J. & C. L. Kellehear
195	Shulgin Investments Pty Ltd
196	E. D. Sanders
197	H. R. & D. A. Moorehouse
198	Aspenview Enterprises Pty Limited
200	G. J .& S. G.Trappel
201	I. G. Wilson
204	M. C. Jones
205	J. S. & K. L. Bratfield
206	M. A. Watkins
207	P. Trenchev
208	C. A. Bowden
209	D. M. Chapman
210	Heatscape Pty Limited
211	B. & B. I. Irwin
212	P. & N. V. Makaroff
213	E. A. & P. Hillard
214	K. G. Sneddon
215	Monkerai Holdings Pty Limited
216	D. M. Matcham
218	D. K. & J. A. Holdings Pty. Limited
219	C. A. Olsen
220	T. G. Lindfield and Associates Pty. Limited
223	F., E., R., D. M. & G. Ferraro
232	I. G. Wilson
233	R. G. Wilson
235	M. J. Bratfield
238	H. R. Kerr
242	M. M. Gorton
244	R. R. & M. J. Lawrence
245	N. Curtis
246	P. & S. A. Margery
247	N. J. Alexander & T. L. Sauerbier
248	R. B. & J. M. Eastoe
249	P. Margery
250	Midcoast County Council
251	B. R. Warner
252	D. K. Pritchard
253	E. & J. A. Allan
254	D. N. & D. T. Young
255	G. W. Bevan & C. A. Bevan
256	M. I. Butler
257	H. Butler
258	G. K. & A. G. Brown
259	C. A. Bowen
260	D. & J. Roberts
264	K. Pepper & S. M. Lyall
267	D. L. & T. L. Fordham
268	Hudrow Pty Limited
269	The Minister for Forestry

Source: DCPL (2014) and Department of Lands (2009)

DURALIE OPEN PIT MODIFICATION

FIGURE 3b

Relevant Land Ownership List

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Regional Setting (> 5 km)

The regional setting of the DCM has attributes of moderate to high scenic quality due to the presence of the geographical features within the region such as Monkerai Mountain (350 m AHD), Brogden's Pinnacles (400 m AHD) and Lawlers Range (626 m AHD), as well as the Gloucester Basin (Resource Strategies, 2009). The Gloucester Basin is a linear valley which extends approximately 37 km in length and is 10 km in width (DCPL, 1998). The Bucketts Range (546 m AHD) and Mograni Range (480 m AHD) flank the western and eastern sides, respectively, of the township of Gloucester. The majority of the valley is rural in nature and has been cleared as a result of historic land use practices. The valley is a strongly defined landform that is visually enclosed and displays an attractive landscape resulting from a combination of natural features and rural land uses. Remnant vegetation generally occurs along ridgelines that define the valley, along watercourses and in isolated patches within the cleared landscape.

A number of reserved areas are also located in the vicinity of the DCM, including the Myall River State Forest (located approximately 5 km to the south-east), Monkerai Nature Reserve (located approximately 7 km to the south-west), The Glen Nature Reserve (located approximately 11 km to the north-east), Ghin-doo-ee National Park (located approximately 11 km to the east) and Barrington Tops National Park (located approximately 20 km to the west) (Cenwest Environmental Services and Resource Strategies, 2009). In addition, the DCM offset area is located to the immediate south-east and west of the DCM.

Townships within the DCM regional setting include Stratford, Stroud and Gloucester.

Sub-regional Setting (1 to 5 km)

The sub-regional setting comprises similar features to that found within the regional and local settings. These features include elements of low to high scenic quality such as cleared pastoral land, undulating topography and scattered remnant vegetation (Resource Strategies, 2009). Peach Tree Mountain and Peppers Mountain occupy elevated topographic positions.

To the east and south-east of the Mammy Johnsons River, Buckley's Range is the highest topographical feature in close proximity to the DCM. To the west of the DCM is the Linger and Die Ridge (located approximately 4 km to the west), which extends to the south of Lawler's Range.

The small villages of Wards River and Stroud Road are located within the sub-regional setting approximately 4.5 km north and 2.5 km south of the DCM, respectively.

Local Setting (<1 km)

The DCM is situated mostly within the Coal Shaft Creek valley floor, originally ranging from elevation of approximately 50 m AHD to 170 m AHD. The valley of Coal Shaft Creek is characterised by undulating hills, cleared open grassland and scattered native vegetation remnants. Coal Shaft Creek originally traversed a large proportion of the DCM deposit, but has since been diverted around the open pit workings.

The Mammy Johnsons River is located to the east of the DCM and runs in an approximately north-south direction.

Elevations within the DCM area and surrounds generally range from approximately 50 m AHD along the river flats of the Mammy Johnsons River to 170 m AHD on the ridgetops to the west of the DCM.

3.2 SITE TOPOGRAPHY AND VEGETATION

The local topography is dominated by the valley of Coal Shaft Creek and the Tombstone Hill landform, a locally elevated elongated feature in the north-eastern part of the DCM that screens the current southern section of the DCM mining area from the north-east. The hill rises to an elevation of approximately 130 m AHD and forms a part of the approved waste rock emplacement. A second ridgeline to the west of the DCM effectively screens the DCM along sections of The Bucketts Way to the south-west and west of the DCM.

The development of the DCM and its associated open pits and waste rock emplacement has resulted in alteration to the site's pre-mining topography.

In general, views of the DCM from the surrounding area are effectively screened by topography and vegetation, except for some areas to the east and north. In these areas, the number of privately owned dwellings with potential views of the DCM mine landforms and infrastructure is restricted by DCPL ownership of the majority of land. Views of the DCM are available from sections of public roads (e.g. The Bucketts Way) to the north and east of the DCM. DCPL has constructed a visual screen adjacent to The Bucketts Way to minimise potential visual impacts from The Bucketts Way (Section 2).

The majority of the DCM area has been cleared as part of past rural land use practices. The vegetation community patches in the DCM area are mostly regrowth woodland and forest formations. Tree regeneration is typically in forest-formation density, with the estimated age of regrowth tress varying between 10 to 50 years (Cenwest Environmental Services and Resource Strategies, 2009).

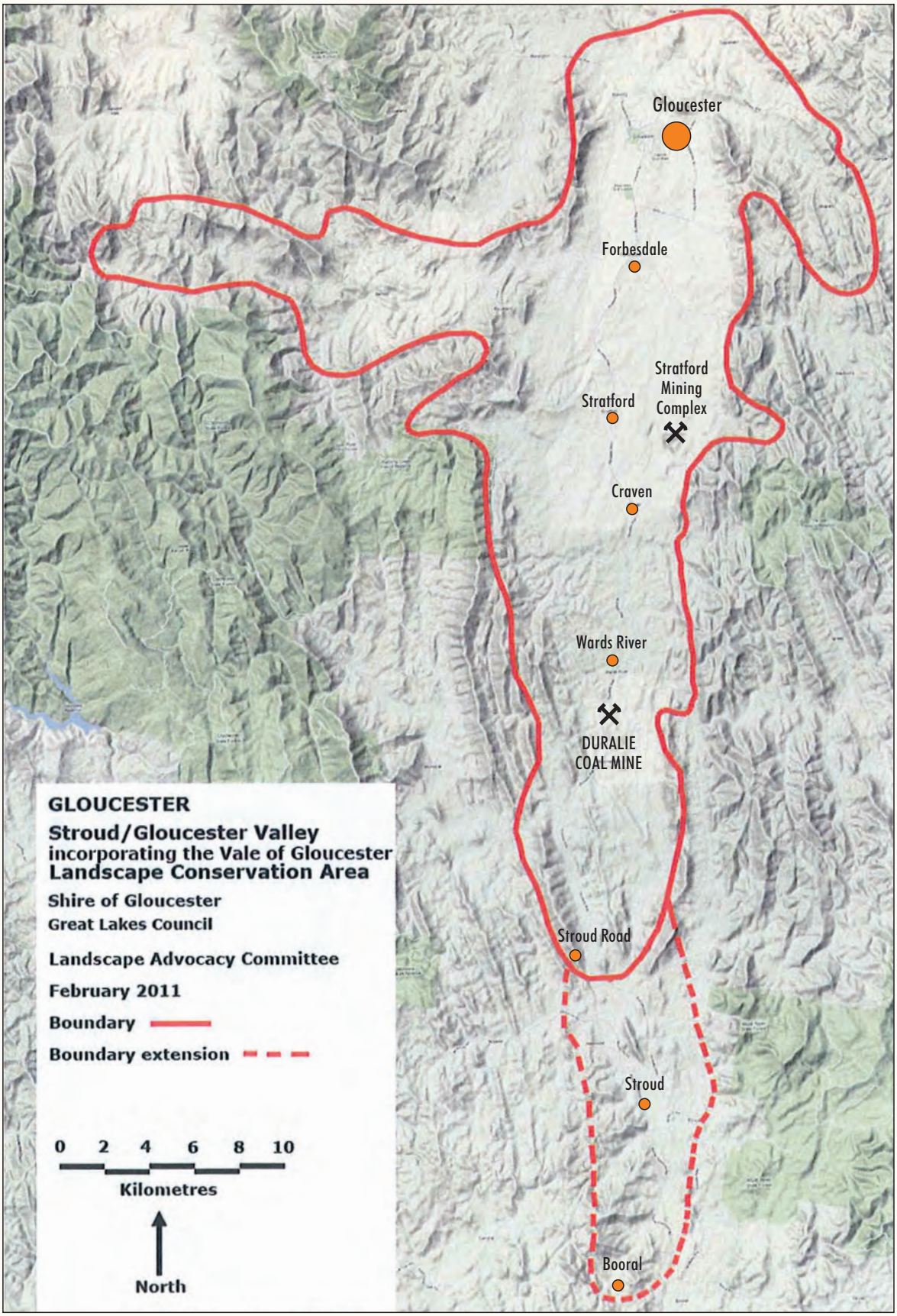
3.3 LANDSCAPE CHARACTER SIGNIFICANCE

A review of the significance of the landscape character proximal to the DCM was undertaken based on searches for heritage listings on the NSW Heritage Branch website (i.e. NSW Heritage Council) database and the Commonwealth National Heritage Database. No listings of heritage significance were identified.

The DCM is located within the Vale of Gloucester Landscape Conservation Area which was registered by the National Trust of Australia (NSW) in 1976 for its historical and scenic values (National Trust of Australia [NSW], 1976). The listing was revised and extended by the Landscape Conservation Committee of the National Trust of Australia (NSW) in 1981. The original listing proposal recommended that the Vale of Gloucester *be the subject of a detailed Rural Lands Environmental Study, with a view to protection under a Regional or Local Environmental Plan*. Despite the recommendation, the Vale of Gloucester Landscape Conservation Area has not been listed in either the Gloucester or Great Lakes Local Environmental Plans or any other regional plan.

The listing for the Vale of Gloucester Landscape Conservation Area was revised and extended again by the Landscape Conservation Committee of the National Trust of Australia (NSW) as the 'Stroud Gloucester Valley Incorporating the Vale of Gloucester' in March 2011. The revised and retitled register citation now extends the area further to the south and includes some additional information, photographs and the registration (National Trust of Australia [NSW], 2011). The Trust's Register is intended to perform an advisory and educational role. The listing of a place in the Register, known as 'classification', has no statutory weight, and has not been replicated in the Gloucester or Great Lakes Local Environmental Plans. Neither the Gloucester nor the Great Lakes Local Environmental Plans recognise the listing. The Stroud Gloucester Valley Incorporating the Vale of Gloucester covers an area of approximately 53,000 ha and is shown on Figure 4.

This visual assessment has included consideration of the potential visual impacts of the Modification on the Stroud Gloucester Valley Incorporating the Vale of Gloucester (Section 5.5).



Source: Adapted from National Trust of Australia (NSW) (2011)

DURALIE OPEN PIT MODIFICATION

FIGURE 4
Stroud Gloucester Valley Incorporating the Vale of Gloucester

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4 MODIFICATION DESCRIPTION – VISUAL CHARACTER

The Modification has a number of components that would have varying impacts on the existing landscape (e.g. modification to the generally undulating topography). A description of the visual character of the Modification follows.

4.1 OVERVIEW

A detailed description of the Modification is provided in Section 3 in the Main Report of the EA. The general arrangement of the Modification during 2015 and 2018 and post-mining is shown on Figures 5 to 7.

The major aspects of the Modification considered to have the potential to impact on the visual landscape include:

- minor additional surface development/vegetation clearance;
- modification of topographic features including an increase in the maximum height of the central portion of the waste emplacement; and
- minor changes to the approved Weismantel and Clareval open pit surface development extents.

The following sub-sections provide a more detailed description of the major aspects of the Modification that could potentially impact the visual landscape.

4.2 DCM LANDFORMS

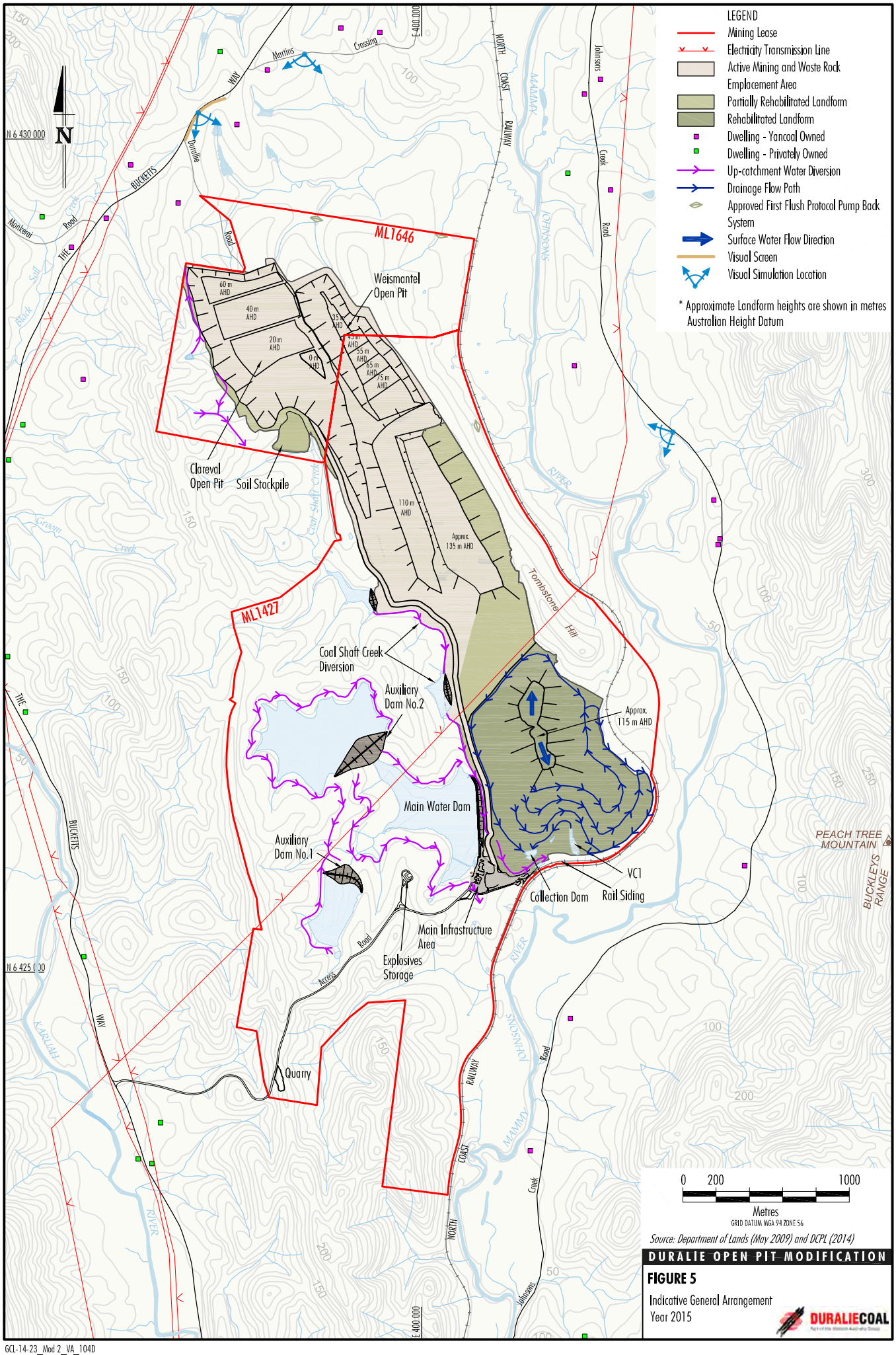
As per approved DCM operations, the Modification would involve progressive backfilling of the open pits with waste rock as mining develops. The backfilled waste rock emplacement would be shaped by dozer prior to commencement of rehabilitation activities (i.e. re-contouring, topsoiling and revegetation).

The Modification would include an increase in the maximum height of the central portion of the waste emplacement from the currently approved elevation of approximately 110 m AHD to approximately 135 m AHD.

The Modification would involve minor changes to the approved Weismantel and Clareval open pit surface development extents. This would result in an increase in the surface development area (by approximately 2.5 ha) and visibility of the open pit workings to viewpoints in close proximity to the DCM. The area of the final void (which would partially fill with water post-mining) would also increase.

4.3 VEGETATION CLEARANCE

The Modification would involve the clearance of approximately an additional 2.5 ha of native vegetation. As a result, the Modification may modify existing views available from nearby public roads to the north of the DCM (e.g. Martins Crossing Road).



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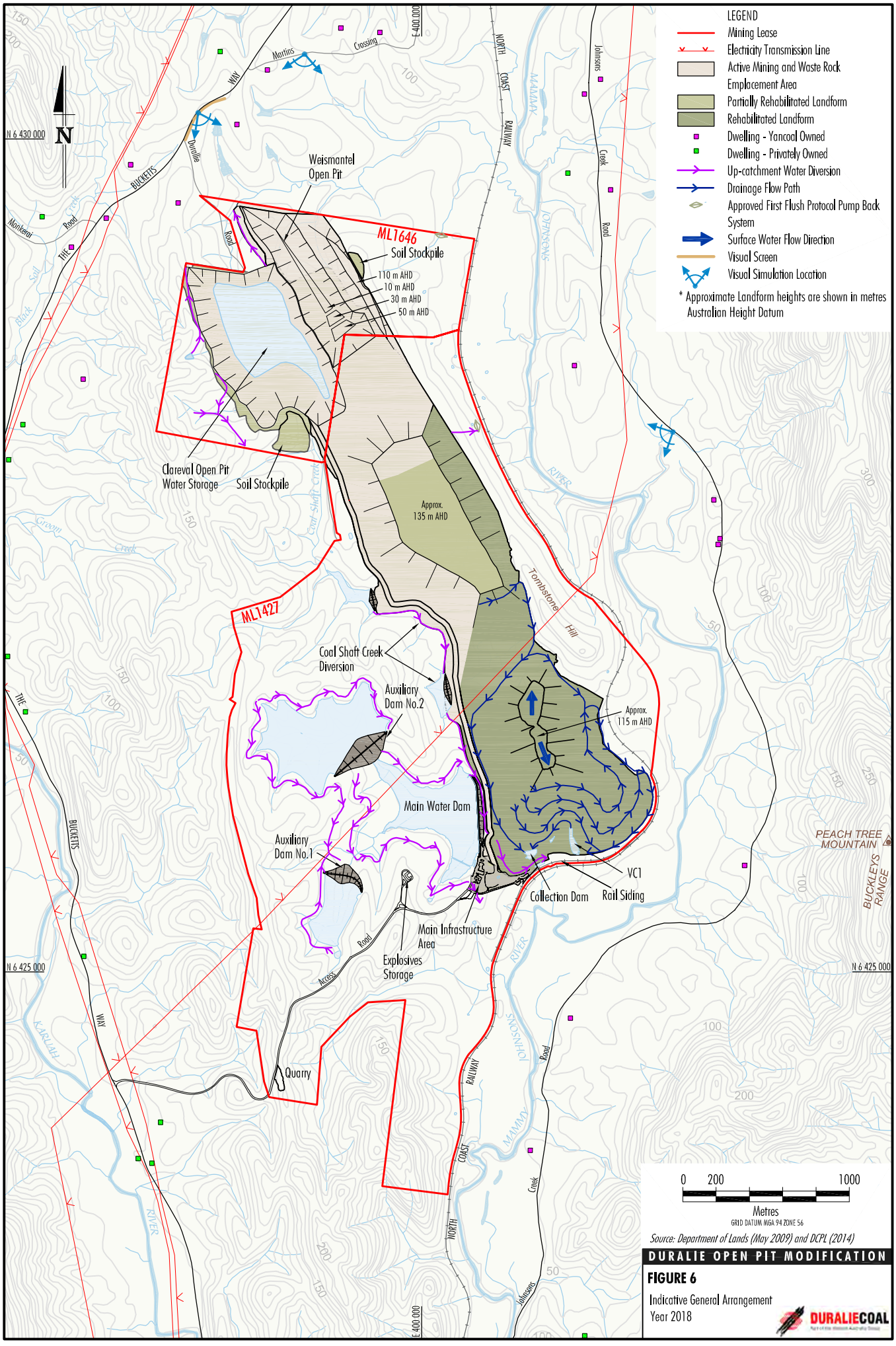

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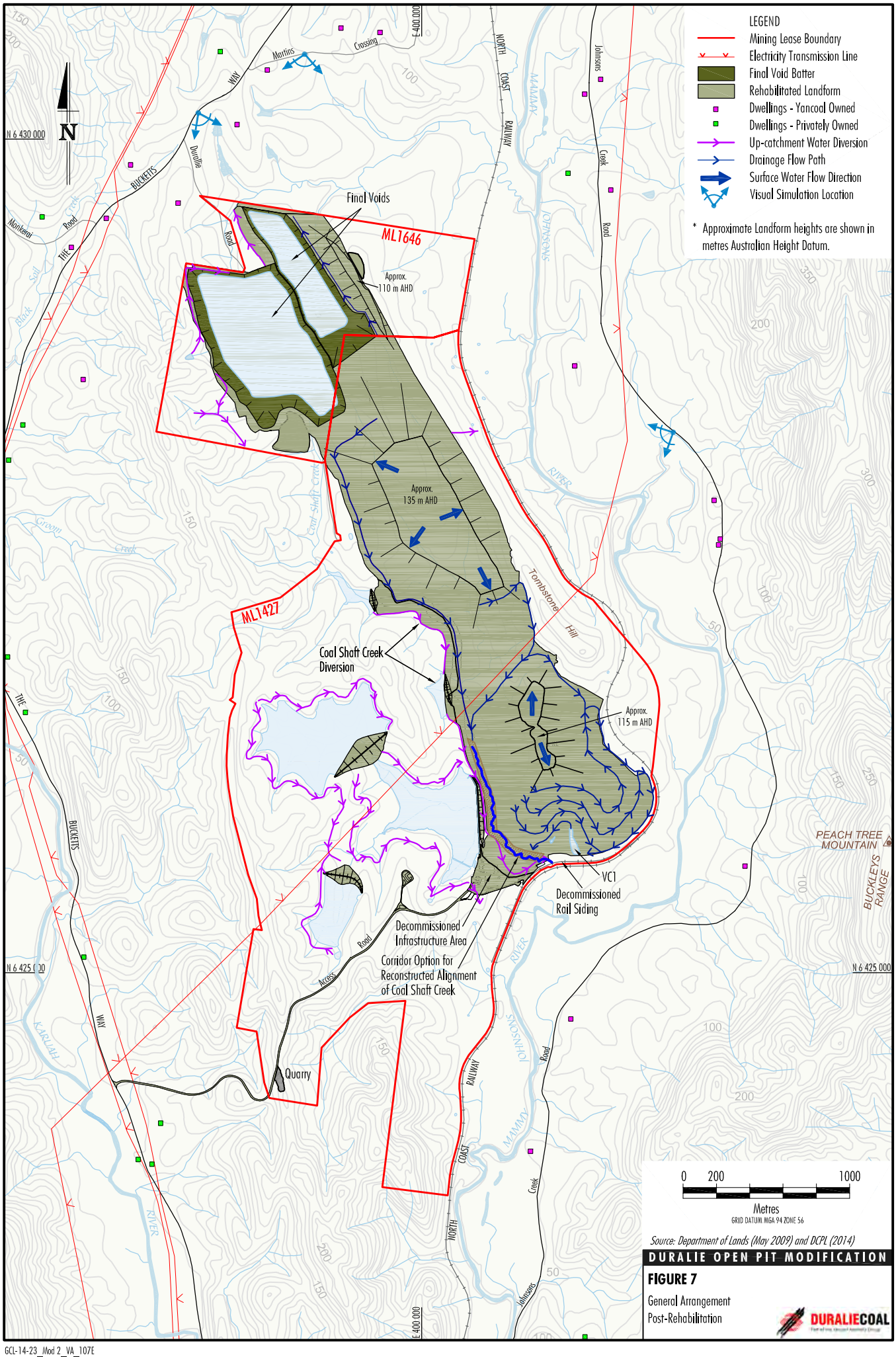

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4.4 REHABILITATION

Consistent with the existing DCM, the rehabilitation of the waste rock emplacement would be undertaken on a progressive basis in order to amongst other things improve integration of the DCM landforms with the surrounding environment and mitigate potential visual impacts.

The backfilled areas of the open pits would, over time, vary in appearance from freshly placed waste rock to rehabilitated landforms, complete with topsoil and vegetation (i.e. either pasture or woodland). As such, the level of visual modification created by the waste rock emplacement would change, reducing as vegetation becomes established and matures.

The post-mining landforms would be revegetated in accordance with the DCM Rehabilitation Management Plan (DCPL, 2013).

4.5 NIGHT-LIGHTING

Night-lighting at the DCM is currently emitted from the following sources:

- overhead lighting of the process plant area and administration area;
- uni-directional lighting on active open pit mining and waste rock emplacement areas; and
- mobile equipment and work vehicle-mounted lights.

The scale and intensity of night-lighting for the Modification would be similar in intensity to the existing night-lighting at the DCM. The potential impacts of night-lighting associated with the Modification are discussed in Section 5.4.

5 ASSESSMENT OF POTENTIAL VISUAL IMPACTS

The following sub-sections present a visual assessment of the potential impacts associated with the Modification.

5.1 METHODOLOGY

The potential visual impact was assessed by evaluating the level of visual modification of the development in the context of the visual sensitivity of relevant surrounding land use areas (i.e. those areas from which the proposed development may be visible) (EDAW Australia, 2006). Levels of visual impact resulting from visual modification and sensitivity are illustrated in Table 1.

Table 1
Visual Impact Matrix

Visual Modification \ Viewer Sensitivity	H	M	L
H	H	H	M
M	H	M	L
L	M	L	L
VL	L	VL	VL

VL = Very Low
L = Low
M = Moderate
H = High

Source: EDAW Australia (2006).

5.1.1 Visual Modification

The degree of visual modification of a proposed development can be measured as a function of the contrast between the development and the existing visual landscape (including the approved mine landforms of the DCM). Throughout the visual catchment, the level of visual modification generally decreases as the distance from the development to various viewpoint locations increases, and is categorised as follows (EDAW Australia, 2006):

- Negligible (or very low) level of visual modification – where the development is distant and/or relates to a small proportion of the overall viewscape.
- Low level of visual modification – where there is minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the landscape. In this situation the development may be noticeable, but does not markedly contrast with the existing modified landscape.
- Moderate level of visual modification – where a component of the development is visible and contrasts with the landscape, while at the same time achieving a level of integration. This occurs where surrounding topography, vegetation or existing modified landscape provide some measure of visual integration or screening.
- High level of visual modification – where the major components of the development contrast strongly with the existing landscape.

5.1.2 Visual Sensitivity

Visual (viewer) sensitivity is a measure of how critically a change to the existing landscape would be viewed from various use areas, where different activities are considered to have different sensitivity levels. Visual sensitivity can therefore be described as a function of both land use and duration of exposure (EDAW Australia, 2006). For example, individuals would generally view changes to the visual setting of their residence more critically than changes to the visual setting of the broader setting in which they travel or work (EDAW Australia, 2006). Another factor to consider is the extent to which the viewer has become accustomed to significant modifications to the landscape and existing industrialisation in the region (EDAW Australia, 2006).

The visual sensitivity of the development depends on a range of viewer characteristics. The primary characteristics used in this visual assessment are land use, the distance to the DCM and associated landforms. These characteristics were assessed from the perspective of the viewer and visibility from critical viewpoints.

The extent to which the viewer has become accustomed to the DCM which is an existing modification to the landscape has also been considered.

Typical visual (viewer) sensitivity levels are defined in Table 2.

Table 2
Typical Visual (Viewer) Sensitivity Levels

Use Area	Foreground (Local Setting)		Middleground (Sub-Regional Setting)		Background (Regional Setting)
	0 - 0.5 km	0.5 - 1 km	1 - 2.5 km	2.5 - 5 km	> 5 km
Natural Area - Recreation	H	H	H	M	L
Residential - Rural	H	H	H	M	L
Residential - Township	H	H	H	M	L
Tourist Roads	H	M	M	L	L
Other Main Roads	M	L	L	L	L
Local Roads	L	L	L	L	L
Industrial Areas	L	L	L	L	L

Source: EDAW Australia (2006).

Note; H - High, M – Moderate, L – Low.

For the purposes of this visual assessment, land use areas in the vicinity of the DCM were characterised in terms of low, moderate or high visual sensitivity, as follows:

- Low visual sensitivity – areas of rural, industrial and mining land use (e.g. agricultural land and coal mines) and minor roads (e.g. Johnsons Creek Road).
- Moderate visual sensitivity – major or arterial roads (e.g. The Bucketts Way).
- High visual sensitivity – privately owned rural residential dwellings.

5.2 IDENTIFICATION OF SENSITIVE VISUAL SETTINGS

Locations with potential views of the Modification landforms are limited to those that already have views of the DCM. Potential views of the Modification landforms may be available from the following locations:

- privately owned residences;
- ridgelines to the east and west of the DCM;
- sections of the North Coast Railway looking west towards the DCM;
- sections of Johnsons Creek Road located to the east of the DCM and Mammy Johnsons River;
- sections of Martins Crossing Road located to the north of the DCM; and
- portions of The Bucketts Way (e.g. between the intersections of Martins Crossing and Durallie Roads) with views to the south towards the DCM.

Privately Owned Residences

An assessment of the potential visual impacts associated with the currently approved DCM landforms concluded that impacts at the closest privately owned residences (i.e. greatest visual impact would be expected at these residences) would be very low to low after rehabilitation of the DCM (Resource Strategies, 2009). These residences are now either owned by DCPL or DCPL has a compensation agreement with the landholder. It is considered that other privately owned residences located further away from the DCM (Figures 3a and 3b) would experience the same or lower visual impact to the residences previously assessed (i.e. very low to low) as views available from these privately owned residences of the modified DCM landforms would be distant (i.e. the Modification would comprise a low proportion of the viewscape) or be partly screened by intervening vegetation.

Views of the DCM would not be available from the villages of Wards River, Stroud or Stroud Road.

As such, no further assessment for privately owned residences is considered to be required.

Ridgelines

While it is acknowledged that the ridgelines located to the west and east of the DCM overlook the mining operations, the potential views available from these locations are considered to be negligible given they are:

- heavily wooded with potential views restricted by vegetation; and
- not readily accessible to the public and not routinely assessed by the public.

As such, no further assessment for these locations is considered to be required.

North Coast Railway

Views of the Modification waste rock emplacement would be available from some sections of the North Coast Railway (Figure 2), where vegetation and topography permit. The potential views available from the North Coast Railway are considered to be negligible however, given that:

- the railway line is situated at a relatively low elevation with intervening vegetation screening potential views of the waste rock emplacement;
- the railway line is used only intermittently by passenger trains and the passengers' views would momentary; and

- a low degree of visual modification would be experienced by train users given the existing views of the DCM waste rock emplacement available from the North Coast Railway.

As such, no further assessment for this location is considered to be required.

Roads

Durallie Road would continue to provide access to a private property. Views towards the DCM from Durallie Road would be screened by existing vegetation that would be retained. As such, no further assessment of potential visual impacts for Durallie Road is considered to be required.

Views of the DCM would be available from Johnsons Creek Road, Martins Crossing Road and The Bucketts Way. Johnsons Creek Road and Martins Crossing Road are local roads and The Bucketts Way is Main Road 90 (HalcrowMWT, 2009). Visual simulations have been created for these locations (Section 5.3).

5.3 IMPACT ASSESSMENT

This section assesses potential visual impacts that are expected to arise as a result of the Modification based on the methodology described in Section 5.1. The level of potential visual impact is assessed for the Modification prior to any amelioration being undertaken (i.e. vegetation screening). The final category considers some maturation of vegetation/tree planting works (i.e. five to 10 years).

Visual simulations (Figures 8 to 10) have been created for the locations identified in Table 3 and shown on Figure 3a.

Table 3
Locations of Visual Simulations

Visual Simulation Location	Potential View of DCM Landforms	Simulation Figure
Road – Johnsons Creek Road	West over partially cleared agricultural land and riparian vegetation to the waste rock emplacement.	Figure 8
Road – Martins Crossing Road	South over cleared agricultural land to the open pit wall and waste rock emplacement.	Figure 9
Road – The Bucketts Way	South-east over cleared agricultural land to the open pit wall and waste rock emplacement.	Figure 10

Visual simulations (Figures 8 to 10) were prepared to show the existing views as well as simulations of the modified DCM landforms during 2018. This is when the landforms would be at their maximum heights with the greatest area of surface development, and therefore generally representing the greatest potential for visual impact. A post-rehabilitation simulation was also developed to illustrate the conceptual landform following completion of mining and rehabilitation activities. The post-rehabilitation simulations have been prepared with consideration of the DCM Rehabilitation Management Plan (DCPL, 2013).

Existing View

Year 2018 Simulation

Post-Rehabilitation Simulation

Source: Marc & Co (2014)

DURALIE OPEN PIT MODIFICATION

FIGURE 8
Existing View and
Visual Simulations -
Johnsons Creek Road

DURALIECOAL

GCL-14-23_Mod2_VA_003A

Existing View

Year 2018 Simulation

Post-Rehabilitation Simulation

Source: Marc & Co (2014)

DURALIE OPEN PIT MODIFICATION

FIGURE 9
Existing View and
Visual Simulations -
Martins Crossing Road

DURALIECOAL

GCL-14-23_Mod2_VA_004A

Existing View

Year 2018 Simulation

Post-Rehabilitation Simulation

Source: Marc & Co (2014)

DURALIE OPEN PIT MODIFICATION

FIGURE 10
Existing View and
Visual Simulations -
The Bucketts Way

DURALIECOAL

GCL-14-23_Mod2_VA_005A

A summary of the visual assessment locations analysed in the following sub-sections is provided in Table 4.

Table 4
Summary of Visual Assessment

Location	Visual Sensitivity	Visual Modification Level	Potential Impact*	Potential Impact After Rehabilitation
Johnsons Creek Road	L	M	L	VL
Martins Crossing Road	L	L	L	VL
The Bucketts Way	M	L	L	L

* Methodology described in Section 5.1.

H – High, M – Moderate, L – Low, VL – Very Low.

5.3.1 Visual Impacts – Regional Setting (> 5km)

Due to undulating topography and vegetation, no viewpoints identified in the regional setting would have significant views of the modified DCM. In addition, any incremental visual impacts at these locations as a result of the Modification would be negligible. The potential visual impact of the Modification on the regional setting is considered to be low.

5.3.2 Visual Impacts – Sub-Regional Setting (1 to 5 km)

Due to undulating topography and vegetation, no viewpoints identified in the sub-regional setting would have significant views of the modified DCM. In addition, any incremental visual impacts at these locations as a result of the Modification would be negligible. The potential visual impact of the Modification on the sub-regional setting is considered to be low.

5.3.3 Visual Impacts – Local Setting (< 1 km)

A number of viewing locations are located within the local setting (Table 4). The potential visual impacts of the Modification on the local setting are described below and visual simulations are shown on Figures 8 to 10.

Johnsons Creek Road

Level of Visual Modification

Views of the modified waste rock emplacement would be available from sections of Johnsons Creek Road (Figure 2), where roadside vegetation and topography permit. The potential visual impact on users of Johnsons Creek Road would result from changes in topography associated with the increased height of the waste rock emplacement and the contrast in colour and texture between the surrounding undisturbed natural areas and the disturbed waste rock emplacement. The modified landform would contribute to a moderate level of visual modification as the Tombstone Hill landform screens a significant section of the waste rock emplacement.

Viewer Sensitivity

Within the local setting, the visual sensitivity of users of Johnsons Creek Road (a local road – Section 5.2) would also be low. This is largely due to the changing temporal and directional views experienced by users of Johnsons Creek Road, in which the exposure to the modified views is confined to a relatively short period of time and a limited number of users.

Visual Impact

For users of Johnsons Creek Road, the moderate level of visual modification coupled with the low level of visual sensitivity indicates a low level of potential visual impact would be expected. Following progressive and final rehabilitation, the level of potential visual impact associated with the Modification at Johnsons Creek Road would reduce to very low.

This predicted level of visual impact is consistent with the visual assessment conducted for the currently approved DCM landform (Resource Strategies, 2009). The Modification would therefore not change the assessed level of visual impact on Johnsons Creek Road.

Martins Crossing Road

Level of Visual Modification

Views of the modified waste rock emplacement would be available from sections of Martins Crossing Road (Figure 2), where roadside vegetation and topography permit. The potential visual impact on users of Johnsons Creek Road would result from the contrast in colour and texture between the surrounding undisturbed natural areas and the disturbed waste rock emplacement. Given the low proportion of the overall viewscape that the modified landforms would contribute to (due largely to the screening effects of the Tombstone Hill landform), the level of visual modification would be low.

Viewer Sensitivity

Within the local setting, the visual sensitivity of users of Martins Crossing Road (a local road – Section 5.2) would also be low. This is largely due to the changing temporal and directional views experienced by users of Martins Crossing Road, in which the exposure to the modified views is confined to a relatively short period of time and a limited number of users.

Visual Impact

For users of Martins Crossing Road, the low level of visual modification coupled with the low level of visual sensitivity indicates a low level of potential visual impact would be expected. Following final rehabilitation, the level of potential visual impact associated with the Modification at Martins Crossing Road would reduce to very low.

It is anticipated that this level of visual impact associated with the Modification would be similar to the currently approved DCM as the DCM landforms visible from Martins Crossing Road (i.e. Clareval open pit and northern extent of the waste rock emplacement) have not changed significantly.

The Bucketts Way

Level of Visual Modification

Views would be available from The Bucketts Way looking south towards the DCM. The section of The Bucketts Way with the greatest potential for views of the DCM is between the intersection of Martins Crossing Road and Durallie Road. This location has therefore been selected for a visual simulation consistent with the visual assessment (Resource Strategies, 2009) prepared for the Duralie Extension Project.

Views from this location have been limited by a visual screen constructed adjacent to The Bucketts Way (Figures 5, 6 and 10) by DCPL in accordance with Condition 51, Schedule 3 of Project Approval (08_0203).

The potential visual impact on users of The Bucketts Way would result from the clearance of vegetation and the contrast in colour and texture between the surrounding undisturbed natural areas and the disturbed open pit and waste rock emplacement. The potential visual impact at this location of The Bucketts Way would occur during the latter years of the DCM, when the DCM disturbance area is greatest and a portion of the DCM landform would be visible from The Bucketts Way (Figure 10).

There would be a low level of visual modification along this section of The Bucketts Way.

Viewer Sensitivity

Within the local setting, the visual sensitivity of users on The Bucketts Way (a main road – Section 5.2) would be moderate. This is largely due to the changing temporal and directional views experienced by users of The Bucketts Way, in which the exposure to the modified views is confined to a relatively short period of time.

Visual Impact

For users of The Bucketts Way, the low level of visual modification coupled with the moderate level of visual sensitivity indicates a low level of potential visual impact would be expected. It is therefore considered that the existing visual screen does not need to be modified as a result of the Modification.

Following final rehabilitation, the level of potential visual impact associated with the Modification at The Bucketts Way would remain low. It is expected that following final rehabilitation, the visual screen located adjacent The Bucketts Way would be removed. Without the visual screen, the visual impact associated with the Modification would remain low as the DCM landforms would be rehabilitated.

This predicted level of visual impact is consistent with the visual assessment conducted for the currently approved DCM landform (Resource Strategies, 2009). The Modification would therefore not change the assessed level of visual impact on The Bucketts Way.

5.4 NIGHT-LIGHTING

The glow produced by night-lighting at the DCM is visible at nearby residences and along transport routes (i.e. rail and road), while direct views of mobile machinery lights and operational lighting are available from some locations. The night-glow is generally similar to that associated with existing towns in the Gloucester Valley.

As discussed in Section 4.5, the scale and intensity of night-lighting for the Modification would be of a similar intensity when compared to the existing night-lighting at the approved DCM. Mitigation measures to reduce the potential impacts of night-lighting from the Modification are described in Section 6.3.

5.5 STROUD GLOUCESTER VALLEY INCORPORATING THE VALE OF GLOUCESTER

As described in Section 3.3, the Stroud Gloucester Valley Incorporating the Vale of Gloucester covers an area of approximately 53,000 ha. The Modification would increase the DCM surface development area by approximately 2.5 ha which represents less than 0.1% of the Stroud Gloucester Valley Incorporating the Vale of Gloucester area (Figure 4).

Consistent with the existing DCM, the rehabilitation of the waste rock emplacement would be undertaken on a progressive basis in order to improve integration of the DCM landforms with the surrounding environment (e.g. incorporating relief in the waste rock emplacement) and mitigate potential visual impacts. The DCM landforms, once revegetated, would also look similar to the surrounding un-mined lands and therefore the Modification is not considered likely to significantly impact the scenic values described in the National Heritage Trust of Australia (NSW) listing.

As described in Section 5 in the Main Report of the EA, areas of the rehabilitated DCM site would also be retained for agricultural purposes and as a result, the Modification would not detract from the essentially rural nature of the Stroud Gloucester Valley Incorporating the Vale of Gloucester.

5.6 CUMULATIVE IMPACTS

The assessment of cumulative visual impacts has considered the combined effects of the Modification with the effects of other existing or approved developments in the region. The primary development activity in the visual catchment of the DCM is agriculture. The combined disturbance areas of the Stratford Coal Mine (located approximately 20 km to the north of the DCM) and the modified DCM represent a very small proportion of the Gloucester Valley and cumulatively would not detract from the region's essentially rural nature. Cumulative visual impacts as a result of the Modification are therefore considered to be negligible. On a regional scale, the scale and intensity of night-lighting for the modified DCM would be of a similar intensity when compared to the existing night-lighting at the approved DCM and as such, would not result in significant cumulative night-lighting impacts.

5.7 SUMMARY OF IMPACTS

Overall the Modification is expected to result in very low to low visual impacts at relevant sensitive receivers (Section 5). This is the same level of impact assessed for the Duralie Extension Project (i.e. the Modification would not result in any significant change to visual impacts associated with the DCM).

6 MITIGATION MEASURES AND MANAGEMENT

6.1 PROGRESSIVE REHABILITATION AND REVEGETATION

Progressive rehabilitation of the waste rock emplacement would be undertaken in order to reduce the contrast between the DCM landforms and the surrounding environment. This would include progressive rehabilitation with selected tree and pasture species (endemic where practicable). Pasture seed utilised would consist of a mix based on previous sowings and seasonal availability.

The waste rock emplacement has been designed to integrate where practicable with the adjoining natural landforms (i.e. the Tombstone Hill landform).

6.2 VISUAL SCREENING

Existing remnant vegetation along the Tombstone Hill landform would continue to be maintained to screen views from the North Coast Railway.

As described in Section 2, DCPL has constructed a visual screen adjacent The Bucketts Way to screen potential views of the DCM in accordance with Condition 51, Schedule 3 of Project Approval (08_0203). DCPL would maintain the visual screen for the Modification.

A perimeter bund would be constructed at the north-west extent of the Weismantel open pit to restrict access and reduce views of the active open pit development areas (and ultimately the final void) from The Bucketts Way and Martins Crossing Road. The bund would be approximately 3 to 5 m in height and would be progressively vegetated with shrubs and trees to further screen views of the open pit.

Condition 50, Schedule 3 of Project Approval (08_0203) provides for additional visual amenity mitigation measures (e.g. landscaping treatments or perimeter bunding in consultation with the owner) to privately owned residences (upon request) that have, or would have, significant direct views of the DCM. These measures would be directed toward minimising the visibility of the DCM from the residence on the land. Notwithstanding the above, no privately owned residences are expected to have significant views of the modified DCM (Section 5.2).

6.3 NIGHT-LIGHTING CONTROLS

In accordance with Condition 49, Schedule 3 of Project Approval (08_0203), DCPL would:

- minimise visual impacts, and particularly the off-site lighting impacts; and
- operate all external lighting in accordance with Australian Standard 4282 (INT) 1995 - *Control of Obtrusive Effects of Outdoor Lighting*.

7 REFERENCES

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