

SECTION 2

DESCRIPTION OF THE PROPOSAL

2.1 INTRODUCTION

2.1.1 Objectives

WCM's objectives for the development and operation of the Canyon extension to the Whitehaven Open Cut Coal Mine are to:

- (i) develop and operate the extension in a safe manner and one which provides a source of low ash, low sulphur, low phosphorous, high energy coal to replace that currently mined from the existing mine;
- (ii) enable a smooth transition between operations at the existing mine and the Canyon extension, thereby providing ongoing employment for the mine's direct and indirect employees and enabling WCM to continue to service its existing customers. Although WCM and/or associated companies have a number of likely mine developments subject to various forms, and in various stages, of assessment activity, it is uncertain as to whether one or more would be sufficiently advanced to guarantee continuity of supply in the event that the Canyon extension was not to proceed. To achieve a smooth transition in terms of equipment and manpower utilization and materials management; retain WCM's existing customer base and obtain new customers, approval three months prior to the cessation of mining within the existing approved area is required;
- (iii) maximize resource recovery. Resource maximization, though principally targeting the recovery of the coal reserves within the Whitehaven leases and thereby maximizing the economic life of the mine, would also include the recovery of gravel materials identified within the proposed areas of disturbance which may be suitable for road construction / civil purposes. Quality, easily accessible gravel materials are not readily available within the local area;
- (iv) develop and operate the total Whitehaven Mine, ie existing approved mine and Canyon extension, in a manner that complies with all statutory requirements, undertaking all activities in an environmentally responsible manner and employing a level of environmental controls and safeguards which ensures compliance with appropriate criteria or reasonable community expectations at all times; and
- (v) achieve the above objectives in a cost-efficient manner and thereby maintain WCM's profitability.

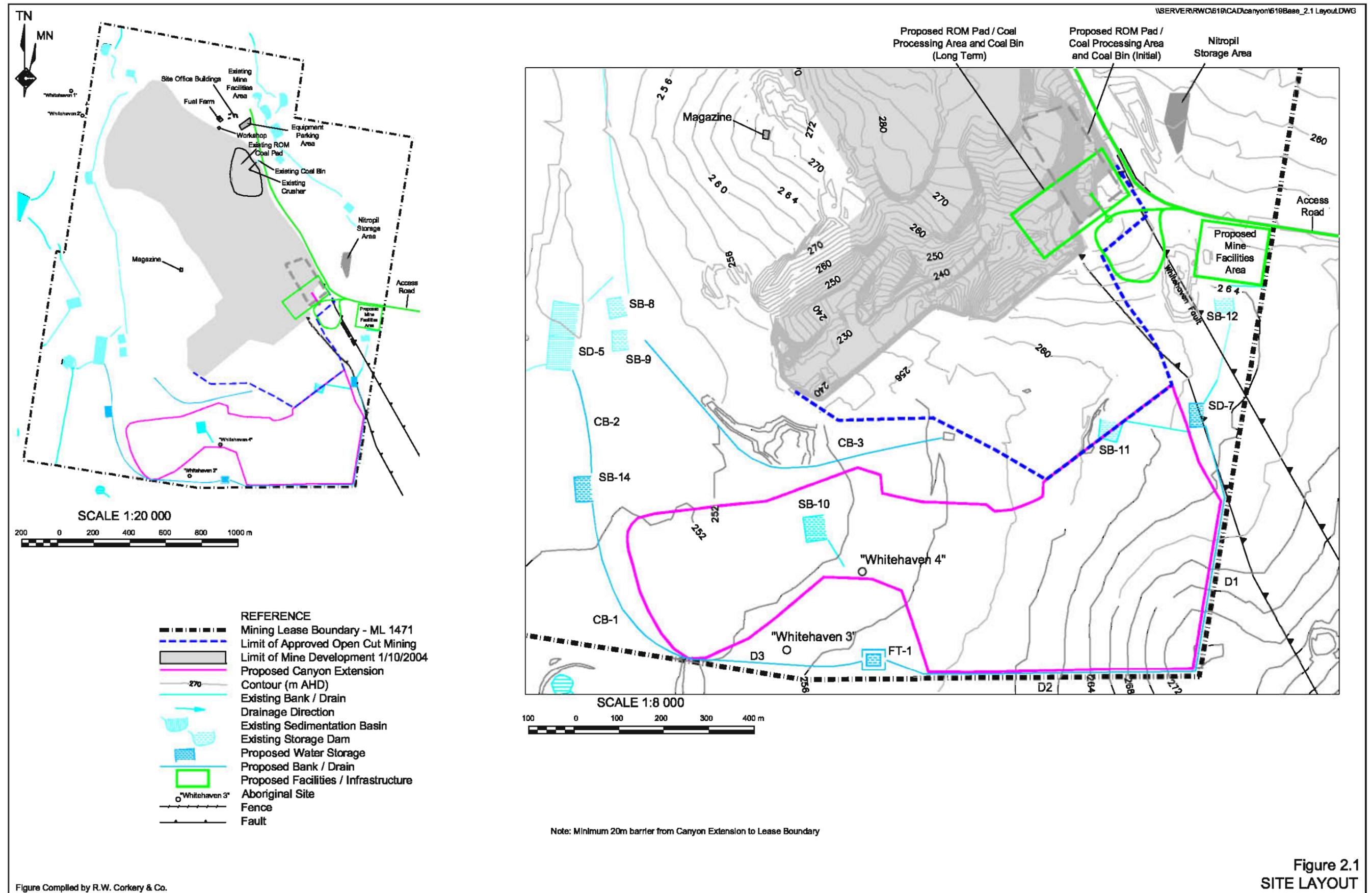
2.1.2 Outline

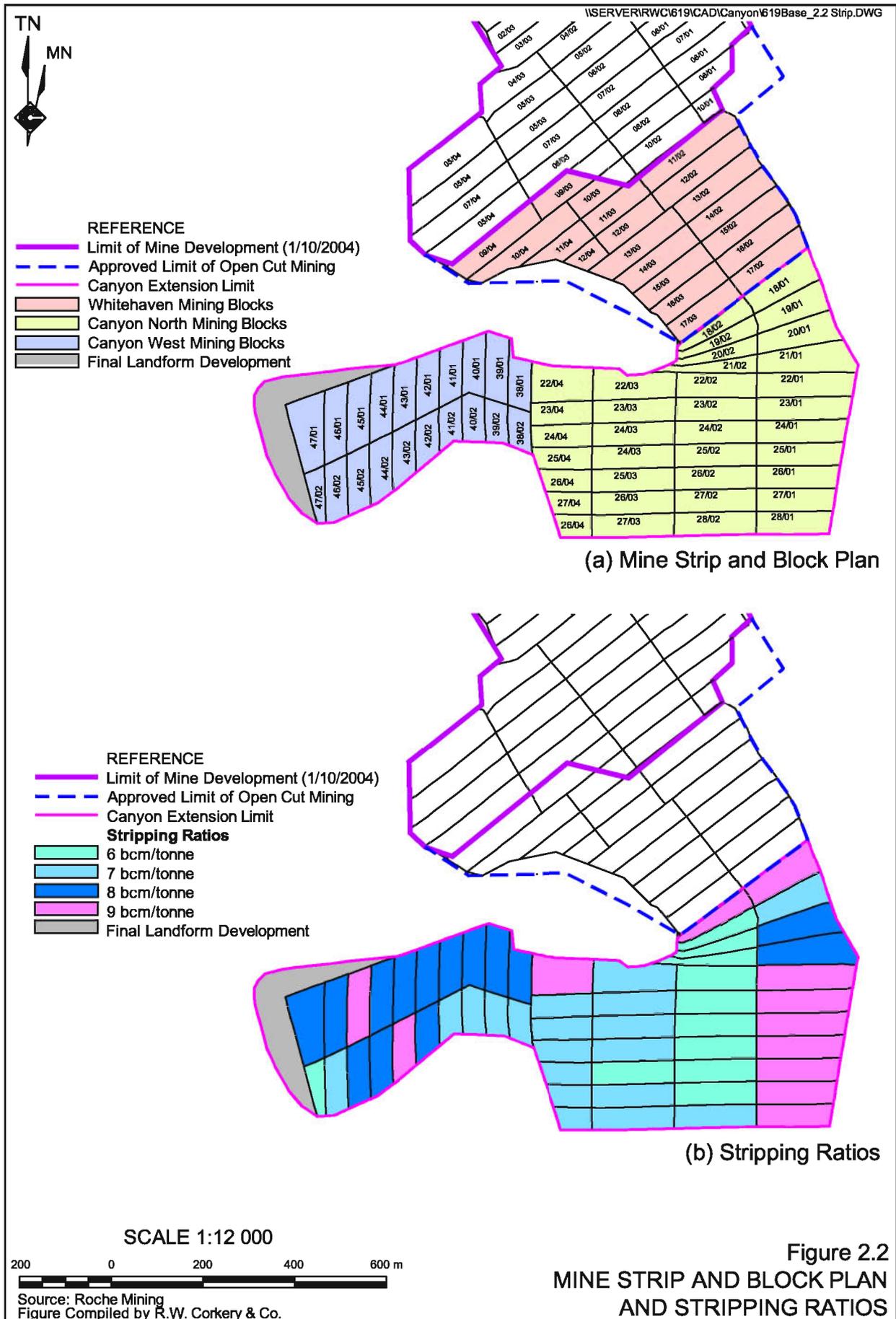
WCM's proposed Canyon extension to the Whitehaven Mine, if approved, would involve the following activities.

- (i) Coal mining by open cut methods over an area of approximately 44ha identified as the "Proposed Canyon Extension" on **Figure 2.1**. The area has been identified by surface drilling following a review of economic, geological and environmental considerations as described in Sections 2.3.1, 2.3.2 and 2.3.3. An additional 2ha would be disturbed to enable the creation of the planned post-mining landform and up to 4ha would be disturbed to permit the relocation of existing site facilities (see (viii) below).

- (ii) As is the case with the existing mine, open cut mining would employ conventional haulback methods involving the sequential removal of vegetation, soil and overburden / interburden (parting) materials above and within the coal seam, coal removal and progressive backfilling and rehabilitation of the mined-out areas.
- (iii) Development of the Canyon as a series of strips extending from the existing approved limit of mining, progressing in a south-easterly then southerly direction through the Canyon North Area (**Figure 2.2(a)**) and finally, a westerly direction through the Canyon West Area (**Figure 2.2(a)**). Each strip would include a series of mine blocks to allow the progression of the various mining activities whilst minimizing the area of disturbance at any one time (**Figure 2.2(a)**). Annual coal production would range up to 1.25 Mtpa, that is, remain unchanged from that approved for the existing Whitehaven Coal Mine.
- (iv) Programmed disposal of overburden and interburden materials within and over the former open cut. Gravel overburden materials suitable for road construction purposes would be stockpiled on site pending utilization by others.
- (v) Programmed disposal of coarse reject from the Whitehaven CHPP within the former open cut void.
- (vi) Relocation of the ROM coal stockpile area, size reduction plant and coal bin approximately 900 m south-east of their current positions (**Figures 2.1(a)** and **(b)**). Initially the ROM coal stockpile area would be oriented north-west / south-east, with a subsequent re-orientation to a north-east / south-west alignment as shown on **Figure 2.1(b)**.
- (vii) On-site size reduction (crushing / breaking) of the mined coal. The sized coal would be placed into an overhead coal bin and then transported by road registered trucks to the Whitehaven CHPP for preparation (washing) and/or despatch primarily by rail to WCM's customers. Coal handling, washing, transportation and train loading operations at Gunnedah are the subject of separate Development Consents, leases and licences.
- (viii) Relocation of the majority of existing site facilities, ie transportable offices, a toilet and shower building, first aid room and crib room together with the associated generators, employee and truck park-up areas, to a new site adjacent to the private mine access road (**Figure 2.1(b)**).
- (ix) Ongoing use of the existing maintenance workshop, fuel farm, nitropril storage area, magazines and other existing mine related facilities and structures as shown on **Figure 2.1(a)**.
- (x) Extension of the existing comprehensive ground and surface water, soil, erosion and sediment control, noise, blasting, air quality, flora and fauna, rehabilitation, bushfire, visibility and cultural heritage management systems.
- (xi) Progressive shaping and rehabilitation of all areas of disturbance, integrated with similar activities associated with the Stage 2 mine.

Notwithstanding the extended area of the mining activities and the amended location of some facilities, all features, activities and management systems associated with the Canyon extension are currently in place or undertaken at the existing approved Whitehaven Coal Mine.





Figures 2.1(a) and (b) present the general layout of the proposed Canyon extension area in the context of the existing Whitehaven Coal Mine.

2.1.3 Approvals Required

The following approvals are or may be required to enable the proposed Canyon extension to the Whitehaven Coal Mine to proceed.

(i) **Development Consent – Minister for Infrastructure, Planning and Natural Resources**

Development Consent is required under the Environmental Planning and Assessment Act for all activities associated with the development and operation of the extension. The Department has advised that the Development Application is to be considered under Part 2 of Schedule 3 of the EP&A Regulation 2000. A justification for this approach, is presented in Section 4.

(ii) **Environment Protection Licence – Department of Environment and Conservation (EPA)**

The EPA has advised that although WCM holds an existing Environment Protection Licence (No 10094) for “coal mines”, “coal works” and “crushing, grinding or separating works” and that the premises details remain unchanged, an amendment to the existing licence may be required to account for likely requirements for additional conditions which reflect the activities within the Canyon, in particular the extraction of the gravel resource.

(iii) **Water Licence – Department of Infrastructure, Planning and Natural Resources**

A licence is required under Section 116 of the Water Act 1912 to permit the extraction of groundwater during mining activities.

No permit under Part 3A of the Rivers and Foreshores Improvement Act 1948 or licence under Section 10 of the Water Act would be required as no local watercourses traverse the area to be disturbed during the life of the Canyon extension and no dams are proposed solely for the harvesting of “clean” water. Additional structures would, however, be constructed primarily for the purpose of “dirty” water and/or clarified dirty water collection (see Section 3.3).

2.2 Resource Assessment

2.2.1 Exploration

Considerable exploration work has been undertaken within the area of the “Whitehaven” coal deposit, including the Canyon area, by Namoi Valley Coal Pty Ltd (which previously held Exploration Licence EL 4699) and, post 1998, WCM. The work undertaken and/or data obtained includes:

- (i) stratigraphic data collected from a total of 83 drill holes undertaken on behalf of Namoi Valley Coal Pty Ltd in 1994 and 1997;
- (ii) seven holes drilled by WCM in 1999 to define the depth of overburden and assist quality assessment;
- (iii) 45 holes drilled by WCM in 2002 to define the limit of oxidation and provide additional coal quality data;
- (iv) ground magnetic surveys undertaken by WCM in 1998 and 2003; and
- (v) 13 holes drilled by WCM in 2004 to define the proposed pit limits and to provide additional coal quality data.

2.2.2 Resources / Reserves

A Statement of Resources prepared in accordance with the JORC Code in June 2002 identified an inferred resource of 6.21 Mt in the Canyon area within the boundary of ML 1471.

The geological model was subsequently updated after the 2004 exploration drilling identified in Section 2.2.1 (v) above.

On the basis of the revised geological model, the coal reserve, the economically mineable part of the resource within the Canyon extension, has been defined as 2.4 Mt ROM coal. Of this 2.4 Mt, 1.7 Mt at a stripping ratio of 7.46:1 occurs within the area nominally described as Canyon North (**Figure 2.2(a)**) and 0.7 Mt at a stripping ratio of 8.24:1 occurs in the areas described as Canyon West (**Figure 2.2(a)**).

2.2.3 Coal Quality

Table 2.1 presents the key raw coal quality parameters for the Whitehaven Seam plies, compiled from core samples within the proposed Canyon extension. In general, there is a deterioration in coal quality in each coal ply from the top to the bottom of the Whitehaven Seam, and from north to south within the existing approved mine and Canyon area.

As has been the case to date, WCM considers that with appropriate care, the WAG and parts of the WAF / WAE coal plies within the Canyon extension could be mined with minimal dilution and provide a coal product in the 8 to 10 per cent ash range without a requirement for washing.

Table 2.1
Whitehaven Seam Raw Coal Quality Ranges

| PLY | Proximate analysis (% air dried) | | | | Specific Energy (MJ/kg, adb) | Total Sulphur (% adb) | Swelling Number |
|---------|----------------------------------|-------------|-------------|-------------|------------------------------|-----------------------|-----------------|
| | Moisture | Ash | Volatiles | Fixed C | | | |
| WAG | 1.0 - 5.0 | 5.0 - 7.4 | 37.2 - 40.7 | 50.4 - 52.7 | 30.3 - 31.5 | 0.31 - 0.95 | 2.0 - 4.0 |
| WAF | 2.6 - 5.9 | 4.4 - 12.7 | 40.0 - 41.1 | 43.0 - 50.8 | 26.9 - 31.1 | 0.27 - 0.48 | 3.0 - 4.5 |
| WAE | 2.6 - 4.9 | 6.7 - 15.1 | 38.2 - 40.8 | 45.5 - 49.1 | 28.5 - 29.3 | 0.31 - 0.54 | 2.0 - 4.0 |
| WAD/WAC | 1.6 - 5.6 | 8.3 - 18.8 | 33.1 - 38.2 | 41.9 - 50.5 | 27.2 - 29.2 | 0.34 - 0.75 | 1.0 - 2.5 |
| WAB | 2.4 - 4.5 | 10.6 - 24.7 | | | 26.0 | 0.41 - 0.57 | 1.0 |
| WAA | 1.6 - 3.8 | 15.1 - 31.7 | | | 26.0 | 0.15 - 54 | 1.0 |

2.3 Mine Planning Considerations

2.3.1 Economic

As has been the case at the Whitehaven Coal Mine to-date, the extent of open cut mining undertaken within the Canyon extension would ultimately be determined by economic aspects such as coal price and mining costs at the time, with both coal price and mining costs determining the limit of the economic stripping ratio, ie the volume of overburden and interburden above and between the various coal plies which must be removed to access each tonne of coal. This, in turn, is determined by coal seam thickness and the depth of cover. Based on current market prices for Whitehaven coal, mining practices and costs, and experiences within the existing mine area, the stripping ratio within the proposed Canyon extension would range from approximately 6:1 to 10:1 (see **Figure 2.2(b)**), averaging approximately 7.7:1.

2.3.2 Geological

The drilling and ground magnetic survey programmes described in Section 2.2.1 have identified the following geological factors which have, in turn, influenced the extent and design of the proposed Canyon extension mining activities within ML 1471.

- A major fault which extends in a south-easterly direction from the south-eastern limit of existing approved mining (Figure 2.1). This fault, which runs sub-parallel to the Whitehaven fault, exhibits a displacement of 15 m to 20 m and confines the eastern extent of the Canyon North area.
- The coal seam sub-crop beyond which the coal seam has been weathered. Along the northern margin of the Canyon West area, the depth of weathering approximates 30 m to 40 m.
- The thickness of the interburden between the WAF and WAE seams which, in turn, has necessitated a minor modification to the mining method to be utilized, particularly with respect to overburden movement (see Section 2.4.3).
- The coal deposit, though open to south-west of the Canyon West area and to the south of the Canyon North area, lies within an area currently held by Namoi Valley Coal Pty Ltd.

2.3.3 Environmental

Although the limits of the proposed Canyon extension have been set primarily by economic and geological considerations, the following environmental considerations have also been recognised in the overall planning process.

Archaeological Site “Whitehaven 3”

Site “Whitehaven 3” (**Figure 2.1**) a scarred Grey Box tree identified during the survey work undertaken as part of DA 72-03-2000, has been identified by Red Chief Local Aboriginal Land Council as a site to be protected.

Ecological Considerations

Although the proposed extension would not impact on any Threatened flora species or vegetation community nor would be likely to have a significant impact on any Threatened fauna species or their habitat, WCM recognises that past agricultural clearing activities have significantly affected the aerial extent and the degree of fragmentation of woodland and other native vegetation communities.

This recognition is reflected in WCM’s commitment to the re-establishment of native bushland on areas of the existing mine which, prior to mining comprised an exotic vegetation cover; the general exclusion of grazing from areas of native vegetation within its mining lease and the proposals to mitigate impacts on native vegetation as a consequence of the Canyon extension. Further details on the flora and fauna in and around the Canyon area, the planned safeguards and the assessed impacts are provided in Sections 3.7 and 3.8.

2.4 MINING OPERATION

2.4.1 Introduction

With the exception of the method of overburden and WAF to WAE ply interburden movement, all aspects of the mining activities within the Canyon extension will remain essentially unchanged from those undertaken within the existing mine and described in Section 1.6.

The following sub-sections describe the sequence of mining to be employed within the Canyon extension and then concentrate on those aspects of the operation which may, to an observer, differ from those currently undertaken.

Those aspects of the proposed extension which would remain essentially unchanged are identified in **Table 2.2**, together with the appropriate cross-reference to Section 1.6 and any relevant comments.

2.4.2 Sequence

Figure 2.2(a) identifies the nominal mine strip and block plan and **Figure 2.3 (a)** the projected development of the Canyon area by financial year. **Figures 2.3 (b), (c) and (d)** show the projected status of the mine in Q3, 2006, Q3, 2007, ie at the southernmost limit of the Canyon North area development, and Q3, 2008, ie nearing completion of Canyon West area

\\SERVER\RWC\619\CAD\Canyon\619Base_2.3 Development.DWG

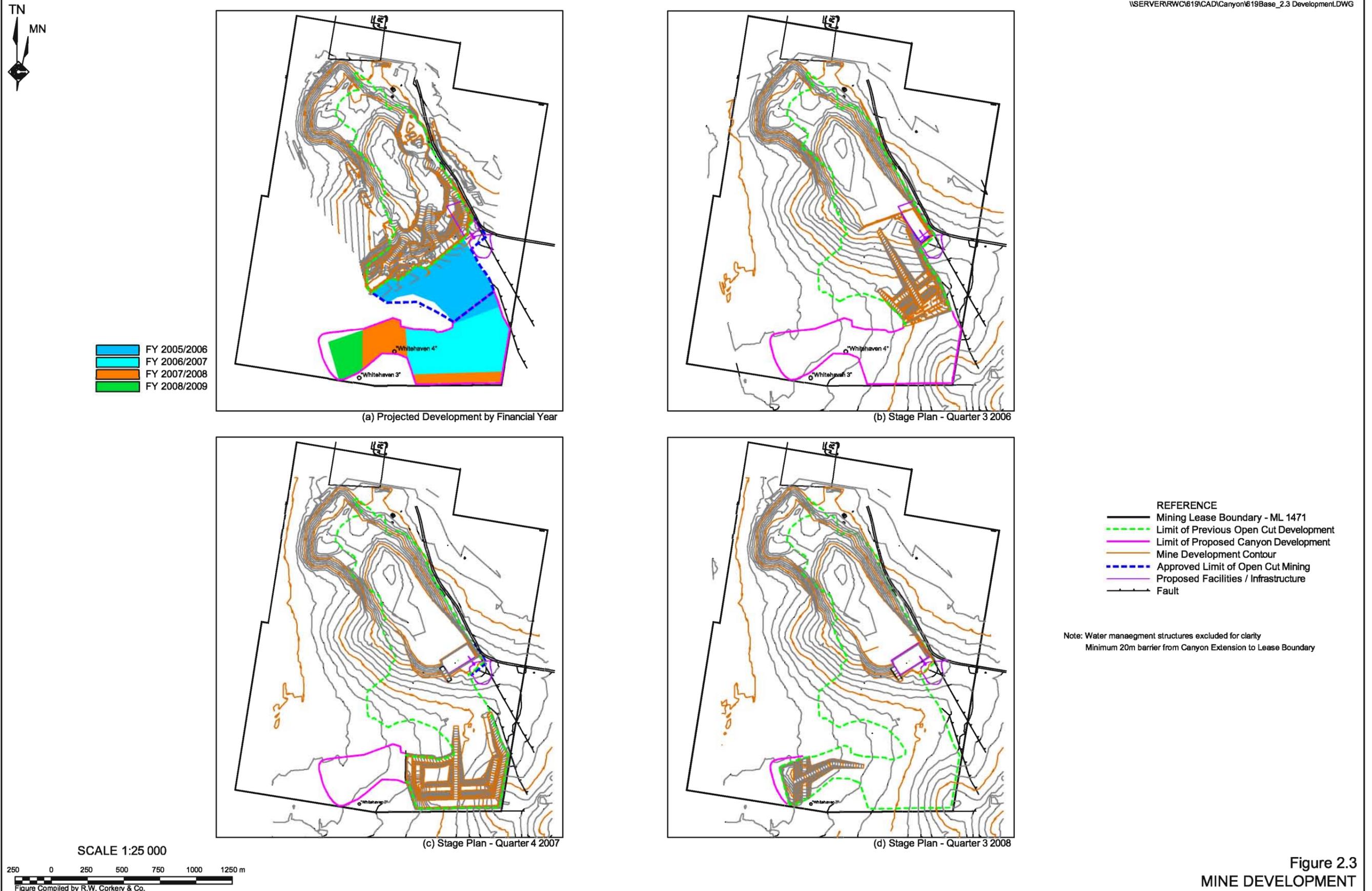


Figure 2.3
MINE DEVELOPMENT

development respectively. **Figure 2.3 (a)** shows that substantial mining activities, ie overburden removal within the Canyon extension, is projected to commence in about Q3, 2005, that is, presuming a ROM coal production level marginally greater than 1 Mtpa.

Clearing of all areas required through until about March 2006 would be undertaken immediately on receipt of Development Approval and the completion of the pre-clearing fauna inspection and any required fauna relocation activities. Soil removal activities would commence approximately one month before bulk earthworks.

Figure 2.2(a) shows that the initial four strips (eight mine blocks) within the Canyon extension would be developed in a general south-westerly direction but be progressively rotated to enable the efficient progression of mining in the Canyon North area towards the southern boundary of ML 1471. The mine strips within the Canyon West area would be oriented north-south.

Although overburden and interburden materials from the advancing excavation would, in general be progressively placed within areas where the coal extraction activities have been completed to enable post-mining final landform creation, this would not be the case for the western component of blocks 22/4, 23/4, 24/4 and 25/4 (**Figure 2.2(a)**). In these areas, a void and ramp would be retained to enable the initial development of the Canyon West area.

As with the existing mine, the various steps within the mining sequence would be undertaken sequentially, but also concurrently on a series of adjacent blocks.

Table 2.2
Canyon Extension Mining Activities

| Activity | Section Reference | Comment |
|---|-------------------|---|
| Drainage Installation | 1.6.2.1 (i) | Also see Section 3.4. |
| Vegetation Removal | 1.6.2.1 (ii) | Also see Sections 3.7 and 3.8. |
| Soil (and friable overburden) Stripping | 1.6.2.1 (iii) | Also see Section 3.6. Soil stripping depths within the Canyon extension are to be defined in the updated MOP. |
| Upper Coal Ply Excavation | 1.6.2.1 (vi) | |
| Lower Coal Ply Excavation | 1.6.2.1 (viii) | |
| Final Landform Shaping and Preparation | 1.6.2.1 (ix) | Also see Sections 1.7 and 1.8. |
| Final Landform Revegetation | 1.6.2.1 (x) | All areas to be returned to native vegetation. Also see Section 2.4.7. |

2.4.3 Overburden and Interburden Removal

2.4.3.1 Introduction

The progressive increase in interburden thickness between the WAF and WAE coal plies within the Canyon extension would generally preclude interburden removal by dozer ripping and excavation and necessitate refinements to the overburden drilling and blasting; overburden removal, and interburden excavation removal activities as described in 1.6.2.1 (iv), (v) and (vii).

The refinements to each of these activities are described below.

Development of the Canyon extension as proposed would necessitate the removal of approximately 21 million bcm overburden and interburden.

2.4.3.2 Overburden Drilling, Blasting and Removal

The method of overburden removal within the existing Whitehaven Mine, ie throwblasting into mined out areas (approximately 20%), dozer push (approximately 20%) and haul truck removal (approximately 60%) is possible because the interburden layer(s) are less than 2 m in thickness. However, within the Canyon extension where the WAF to WAE interburden thickness increases to approximately 15 m, overburden throwblasting and dozer push, and interburden ripping, are neither practical nor economical options.

Within the Canyon area, stand up blasting techniques will be used to heave vertically and fracture the overburden prior to its subsequent removal and transportation to worked out areas of the open cut using an excavator and haul trucks. Overburden blasting would be undertaken approximately once per fortnight, with each blast initiated over an area averaging 120 m x 50 m. The average overburden blast hole depth will approximate 38m.

Any gravel overburden materials suitable for road making purposes encountered during the overburden removal activities would be stockpiled for subsequent use in the local area, eg by WCM on its freehold or leasehold properties or by Council for road construction and maintenance activities. The gravel stockpiles would be positioned in existing clearings external to the open cut or within dedicated areas of the former open cut where the post-mining landform projects above the natural surface. Stockpiling these materials in these locations would enable ready access both during and following mining. Any gravel stockpiles would be rehabilitated prior to lease relinquishment.

On completion of overburden removal from each mine block, the WAG coal ply would be removed in the manner described in Section 1.6.2.1 (vi).

2.4.3.3 WAF to WAE Interburden Removal

Removal of the WAF to WAE interburden would be undertaken in the same manner as the overburden removal within the existing mine and described in Section 1.6.2.1 (v), that is, though a combination of throwblasting, dozer push and excavator loading into haultrucks for placement in mined out areas. As with the overburden, interburden blasting would also be undertaken approximately fortnightly over a similar area as the overburden blast, but with an average drillhole depth of 15 m.

Overburden and interburden removal as described in Sections 2.4.3.2 and 2.4.3.3 would result in a stepped development profile across blocks within a strip and between strips as shown on **Figures 2.3(b), (c) and (d)**, with soil removal, drilling overburden or interburden, overburden excavation, interburden dozer pushing or excavation, and coal extraction being undertaken at any one time to enable continuity of coal production.

2.4.4 Equipment, Employment and Hours of Operation

2.4.4.1 Equipment

With the exception of the number of CAT 777 trucks in use hauling coal, the mining equipment on-site and in use at the existing Whitehaven Mine as listed in **Table 1.4**, or similar capacity replacement items, would be adequate for the proposed mining activities within the Canyon extension: Roche Mining, WCM's mining contractor have indicated that despite the relocation of the ROM coal pad and coal processing area, there may be a requirement to periodically use three CAT 777 trucks hauling coal due to the distance from the area of active mining in the western section of the Canyon West area. Use of three haul trucks has been incorporated in the noise modelling as described in Section 3.11.4.

2.4.4.2 Employment and Hours of Operation

At the existing Whitehaven Mine, WCM's mining contractor is able to maintain budgeted production utilizing the equipment identified in **Table 1.4** over the hours identified in **Table 1.5** and with a production and support workforce of 30 full-time persons. However, with the progression of the mine into the Canyon extension, the increased volume of overburden and interburden to be removed and the constrained nature of the mine, extension of the hours of operation for some activities, albeit within those previously approved, may be required. The extension of the hours of operation would be achieved by splitting the existing workforce to introduce a dedicated afternoon / night shift. No additional full-time personnel are likely to be required to achieve the two shift arrangement.

2.4.5 Waste Production and Management

The nature and management of the wastes produced at, or in association with the Canyon extension would remain unchanged from those described in Section 1.6.5. Relocation of the demountable buildings as described in Section 2.4.6 would, however, necessitate the installation of a new Council-approved septic system which would be pumped out on an as-needs basis. The existing system would be retained as is or relocated to service the maintenance personnel.

2.4.6 Infrastructure and Services

The proposed Canyon extension would utilize the same infrastructure and services as provided to the existing Whitehaven Mine as described in Section 1.6.9. However in order to provide some facilities closer to the work place, reduce ROM coal haulage distances and enable the rehabilitation of the majority of disturbed areas within the “Whitehaven” property, WCM proposes to:

- relocate the existing transportable offices, a toilet and shower building, first aid room and crib room, together with the associated generators, employee and truck park-up areas to an area adjacent to the mine access road as shown conceptually on **Figure 2.1(b)**. Location of these buildings adjacent to the mine access road would also reduce the extent of light vehicle movements on unsealed roads and yield security and safety advantages by eliminating non-essential vehicle movements into areas of mining related activity;
- relocate the ROM coal stockpile area, size reduction plant and coal bin approximately 900 m south-east of their current location. During the initial period of Canyon extension operations, the ROM coal pad would be oriented as shown on **Figure 2.3(b)**. However, with the progressive development of the mine towards the configuration identified in **Figure 2.3(c)**, the ROM coal pad would be rotated approximately 90°, thereby reducing the coal haulage distance between the active mine face and the coal pad and providing additional acoustic and visual shielding to the east. Positioning of these facilities generally as shown on **Figure 2.1(b)** would:
 - reduce the ROM coal haulage distance and hence the potential for wheel-generated dust;
 - provide topographical screening of the coal loading operation;
 - enable the installation of minimum 5 m high acoustic bunding to the east, ie in the direction of the nearest neighbours. 5 m high bunding would act as an effective acoustic barrier to the size reduction plant and mobile equipment operating on the ROM coal pad;
 - provide increased visual screening of the coal bin to the east and north-east through a combination of topography and retained native vegetation;
 - reduce the movement of product coal trucks on unsealed roads;
 - if necessary, enable increased supervision and monitoring of coal transport contractor performance, eg with respect to load coverage; and
 - enable the rehabilitation of the 6 ha comprising the existing ROM coal pad and adjacent batter slopes. Rehabilitation of these areas would further reduce any visual impacts of the ongoing mining activities.

It should be noted that relocation of infrastructure, services and coal stockpiling, processing and loading activities to potentially more exposed areas to the north of the proposed location than those currently proposed was approved as part of DA 72-03-2000.

2.4.7 Final Landform and Rehabilitation

Figure 2.4 presents the conceptual final landform following the integration of the existing approved and Canyon extension to the Whitehaven Coal Mine, with the major features consistent with those identified in DA 72-03-2000, Mod 8-2-2003-1 and the various MOPs previously ratified by the former Department of Mineral Resources.

The major features of the final landform would include:

an elevated knoll within the centre of the existing mine rising to approximately 286 m AHD with peripheral slopes ranging from 1:5(V:H) to less than 1:50(V:H) and grading to:

- the natural surface;
- to an elevated terrace with irregularities in the upper surface. The development of a final landform with irregularities to the upper surface creates a more aesthetically pleasing landform, with depressions to encourage water accumulation and infiltration and variations in the longer-term vegetation assemblages; and
- mined areas which emulate the pre-mining landform. Based on current projections and historical overburden bulking effects, it is envisaged that the majority of the land disturbed within the “Womboola” property would be similar in elevation and gradient to that prior to mining;

a water holding depression approximately 30 m deep in the area of the former open cut final void. Slopes within the final void would range from less than 1:10(V:H) in the east to 1:4(V:H) adjacent the former northern, southern and western margins of strips 44 to 47 (**Figure 2.4**), with the slopes of 1:4(V:H) created through a combination of final wall blasting and dozer pushing.

Following mining, the void would accumulate water through a combination of surface runoff from the re-established pre-mining drainage to the east, water redirected from former clean and dirty water management structures and minor groundwater inflows.

As with those areas of disturbance rehabilitated to date, the final landform would also incorporate contour / graded banks and rock lined waterways as recommended and constructed by Soil Services.

Other former project-related features of the final landform would include storage dams, sediment basins and associated banks and drains and, subject to the requirements of Narrabri Shire Council, the sealed mine access road.

Rehabilitation activities to achieve the post mining final landform situation as shown on **Figure 2.4** would include:

- progressive shaping, soil application to and revegetation of areas of mining disturbance as discussed in Sections 1.6.2.1 (ix) and (x) and the existing approved Flora and Fauna and Soil Stripping Management Plans. Any gravel remaining stockpiled would be rehabilitated in the same manner as other areas of disturbance;
- the removal of all offices, amenities and facilities,
- removal and/or ripping of hardstand areas and haul roads;

- installation of any additional drainage controls as recommended by Soil Services in order to prevent erosion and sedimentation; and
- application of soil and/or revegetation of all remaining areas of disturbance.

The projected post-mining vegetation assemblage and its integration with existing areas of native vegetation on WCM's landholding which are to remain undisturbed by the proposed activities and free of grazing pressures, and areas of proposed enrichment plantings, are also shown on **Figure 2.4**. However, based on the initial observations from vegetation monitoring in Quadrat 3 (**Figure 1.3**), native vegetation regeneration is occurring in areas in the absence of grazing pressure, that is, without a formal enrichment planting programme.

2.4.8 Vegetation / Compensation / Offset Strategy

Figure 2.4 presents WCM's proposals in order to compensate for the removal of approximately 37 ha open woodland which would be required to enable the development of the proposed Canyon extension.

The compensation or offset strategy within areas affected by mining would be principally implemented on the "Womboola" property and take two principal forms.

- (i) Grazing exclusion (134 ha).
- (ii) Enrichment plantings (56 ha).

The 134 ha assigned for grazing exclusion would comprise:

- 30 ha existing woodland areas where positive changes in vegetation composition have already been observed since WCM's acquisition of the "Womboola" property; and
- 48 ha grassland not programmed for enrichment planting. However, as noted in Section 2.4.7, regeneration of native tree species has been observed in grassland areas in the absence of grazing.

WCM also proposes to undertake an enrichment planting programme over an area of approximately 56 ha open grassland on "Womboola" in order to accelerate the extension of native bushland communities and the re-establishment and/or extension of vegetation corridors between existing patches of remnant vegetation, areas rehabilitated to native bushland and Vickery State Forest. The establishment of a total of 132 ha native bushland on the rehabilitated post-mining landform on "Whitehaven", "Merton" and "Womboola" over the life of the Whitehaven Coal Mine would also assist to compensate for the 80 ha native bushland cleared to enable the development of the total project, ie the existing mine plus the Canyon extension.

The programme would involve planting seedlings preferentially propagated from seed of locally collected trees and shrubs, with the species planted in individual areas determined in consultation with WCM's flora consultant on the basis of topographic and edaphic variations

\\SERVER\RW\19\CAD\Canyon\19Base_2.4 Final Landform.DWG

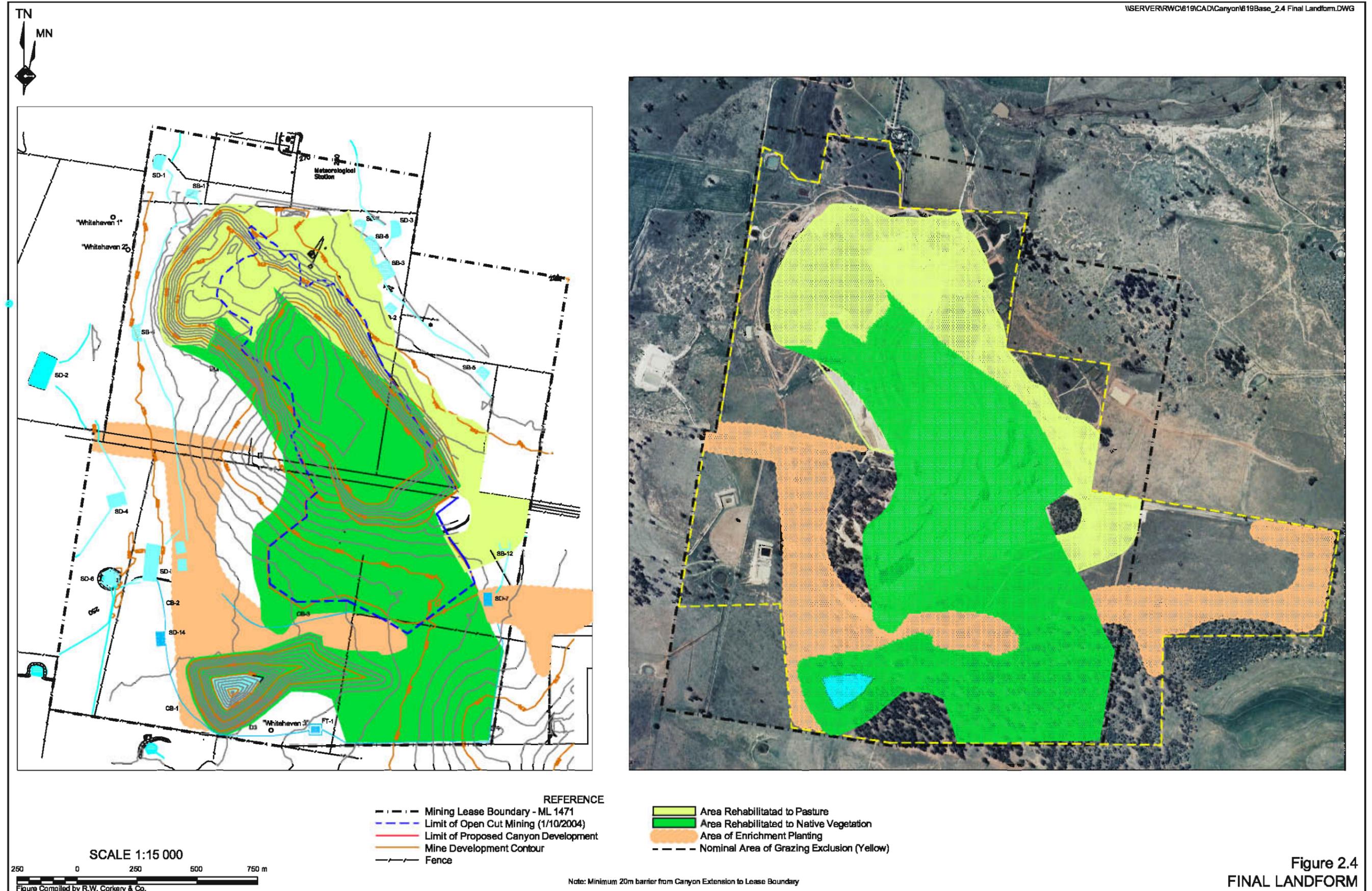


Figure 2.4
FINAL LANDFORM

observed in the local vegetation assemblage. Seedlings would be planted on riplines which would be established several months in advance of planting. A herbicide consistent with the proposed planting timetable would be applied following ripline establishment to reduce initial competition to the planted seedlings.

The positioning of the enrichment planting areas adjacent to areas of existing native vegetation or small clumps of trees, together with the pre-planting preparatory works, would also encourage the colonization of the planted areas with tree, shrub and groundcover species from the adjacent seed sources.

WCM would enter into a voluntary conservation agreement for the areas covered by the proposed vegetation offset strategy.