
Sydney Construction Materials

Newnes Junction Sand and Kaolin Extraction Proposal

Supplementary Visual Impacts Assessment

December 2004

Executive Summary

Sydney Construction Materials is seeking approval for the development of a construction sand, specialty sand, and kaolin extraction operation at Newnes Junction, near Lithgow.

Section 5.5 of the Sydney Construction Materials EIS (2004) dealt with the visual implications of the proposed development. This paper is a supplement to that section of the EIS, following a review of the government agency and public submissions to the EIS.

Measures taken to mitigate the potential visual impact in relation to this development include:

- the use of environmentally consistent colour schemes for all visible infrastructure (site office, water treatment facility, conveyor, and train loading system),
- the use of progressive clearing, minimising the total area of land cleared at any given time,
- the use of progressive rehabilitation, further minimising the total area of land cleared at any given time,
- the use of terraced landscaping, which will ensure that there will be no more than 3 vertical metres of exposed rock wall at any given time, and
- a final landform design inspired by a nearby natural feature, known as "Gooches Crater".

These design features will allow the development to be rapidly integrated into the surrounding landscape both during and after operations.

Sydney Construction Materials engaged MineConsult to prepare visual transects of the proposed development from the areas identified in Section 5.5 of the EIS (see Appendix 1 and Figure 5 below). These transects provide an understanding of how the development will look at the end of operations from nearby selected vantage points. They demonstrate that the visual impact from those locations will be minimal.

A review of formed bushwalking tracks in the area was also conducted. It revealed that there are no formed bushwalking tracks with a clear view of the development within 5km, indicating that the chance of a recreational bushwalker being visually impacted by the development is minimal.

Due to the mining and rehabilitation methods proposed to be employed by Sydney Construction Materials, the visual impact from the Newnes Junction development will be minimal at all times.

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1 Introduction

Sydney Construction Materials is currently seeking approval for the development of a multi-commodity friable sandstone resource on the Newnes Plateau, approximately 10km East of Lithgow.

The proposal will assist in the provision of sand and other construction materials for Sydney's construction industry, eventually supplying over 1 million tonnes per annum (tpa) to feed the city's 7 million tpa appetite. The proposal will also supply specialty sands including silica flour, fine silica flour, glass sand (flint and amber grade), and filter and drainage sand, as well as a range of high quality recreational and landscaping sands. The most valuable component of the resource, however, is kaolin, although only comprising 8.5% of the resource by weight. Products using kaolin include bricks, pavers, ceramics, refractories, pozzolans (concrete strength enhancer), and high-value calcined kaolin, used for paper coating, paper fillers, paint and plastics fillers, and adhesive fillers.

The Newnes Junction project will necessitate the progressive clearing of approximately 25ha of sparsely populated regrowth situated on Crown Land. Sydney Construction Materials will utilise innovative progressive rehabilitation techniques throughout the life of the development that will mitigate the visual impact that may otherwise arise from such a project.

This paper provides information in addition to that in the EIS (2004) regarding the nature and degree of visual impact in relation to this development.

2 Purpose

Government agency and public submissions were tendered during the display period of the DA/EIS process for the Sydney Construction Materials Newnes Junction Sand and Kaolin Extraction Proposal. Some of these submissions raised concern that the development would result in significant visual impacts to users of the National Park and other surrounding areas. This report is tendered as a response to those submissions, and is provided as a supplement to the Visual Implications Section (section 5.5) of the EIS (Sydney Construction Materials, 2004). It discusses the areas of visual impact identified in the EIS, provides views and visual transects from locations surrounding the proposed development, and outlines the mitigating measures, progressive clearing and progressive rehabilitation with terraced landscaping, which will minimise any visual impact relating to this development. A brief review of established bushwalking tracks is also provided so as to give an understanding of potential visitor activity in the area.

3 Visibility of the proposed development

During operations at the development site, infrastructure associated with the development will be visible. This includes the site access road, site office, water treatment plant, and the conveyor and train loading facility. All of these will be designed to have minimal visual impact, and will be coloured an environmental green, to lessen their visibility.

Other operations in the area, when extracting sand, quarry through the resource, leaving bare rock walls, often with little or no attempt to ameliorate the visual impact that results. The Sydney Construction Materials development differs significantly to existing sand extraction operations in that it will employ the innovative technique of progressive rehabilitation using terraced landscaping (discussed in section 5.2 below). The result of this technique is that no more than 3 vertical metres of rock wall will be visible at any stage of the extraction process, as can be seen in Figure 1 below. This minimises visual impact during operations, both near to and at a distance from the site. Further, it allows for a more rapid integration of the site into the surrounding landscape at the conclusion of operations.



Figure 1: Terraced landscaping on the Somersby Plateau (Mark Burns, Global Soil Systems)

The proposed final landform is a free-draining wetland. The initial design was for a water body to occupy the site once operations had concluded, but following consultation with local environmental groups, and public feedback on the EIS, the decision was made to modify the final landform to result in a feature more consistent with the surrounding landscape. Figure 2 below shows a 3D perspective of the intended final landform.

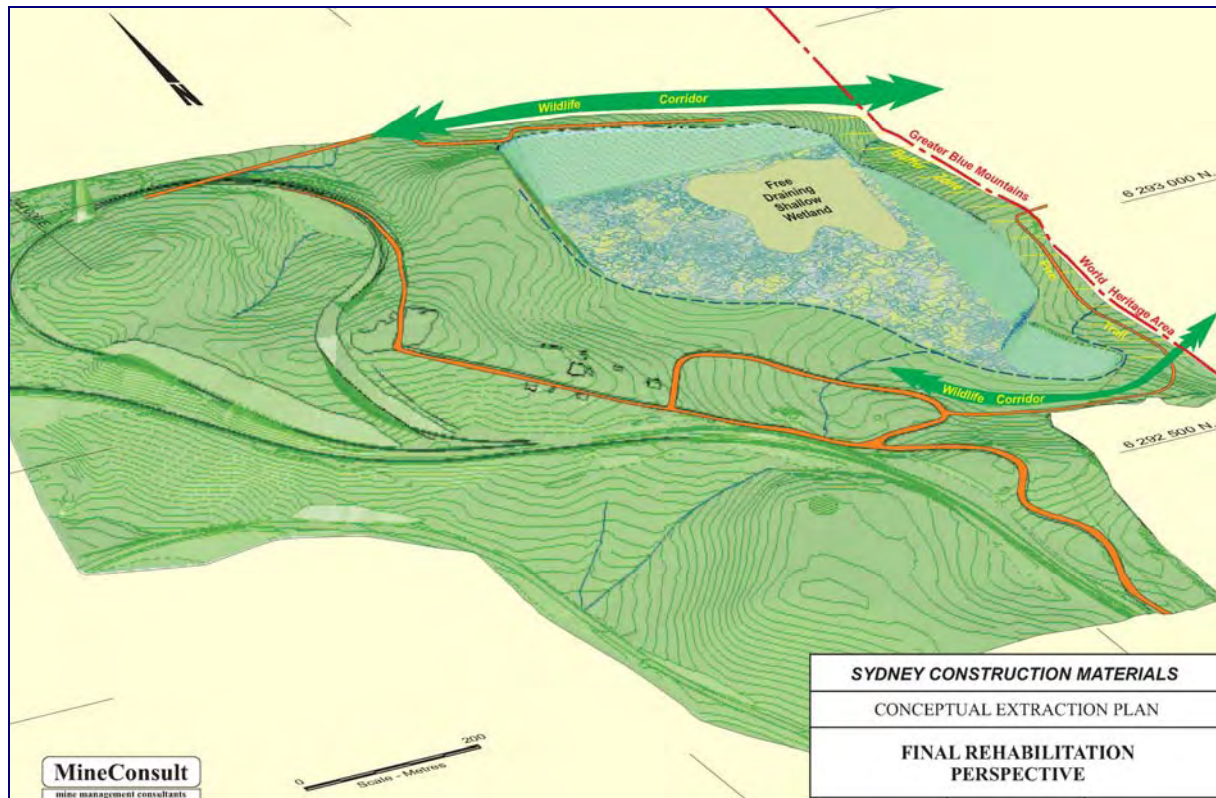


Figure 2: 3D perspective of final rehabilitated landform

Figure 3 below shows a plan view of the intended final landform.

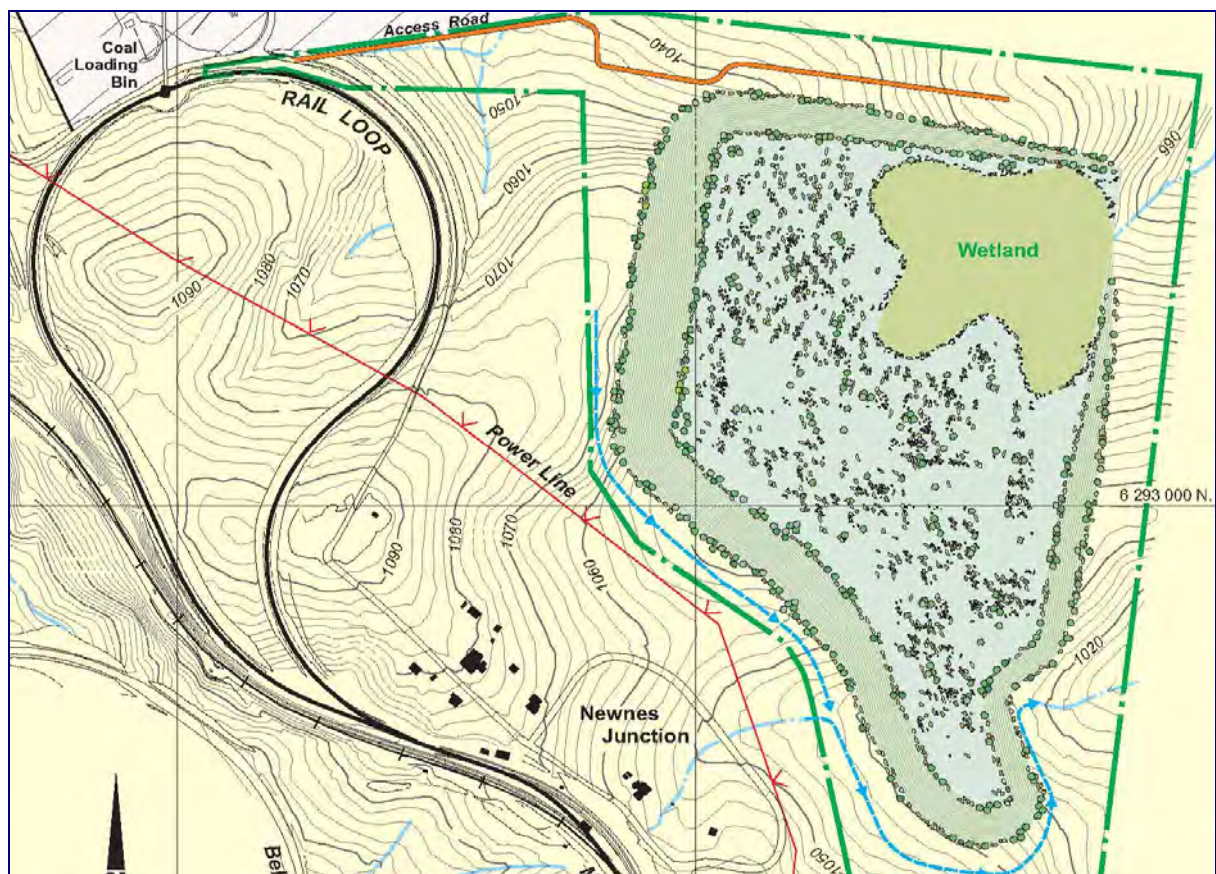


Figure 3: Plan view of final rehabilitated landform

Figure 4 below shows the nearby natural landform known as Gooches Crater. This nearby natural feature provided inspiration for the intended final landform shown in Figure 2 and Figure 3 above. It shows a free-draining wetland area located just outside of the Blue Mountains National Park, a few kilometres north-east of the proposed development site.



Figure 4: The final rehabilitated landform is inspired by nearby Gooches Crater

4 Viewing points

4.1 Previous study – Sydney Construction Materials EIS

Section 5.5 of the Sydney Construction Materials EIS (2004) dealt with the visual implications of the proposed Newnes Junction Sand & Kaolin Extraction development. Figure 5.2 in the EIS was used to display those surrounding areas that belong to high, medium, or low visual catchments. A modified version of Figure 5.2 has been reproduced in Figure 5 below, showing the areas identified in the EIS.

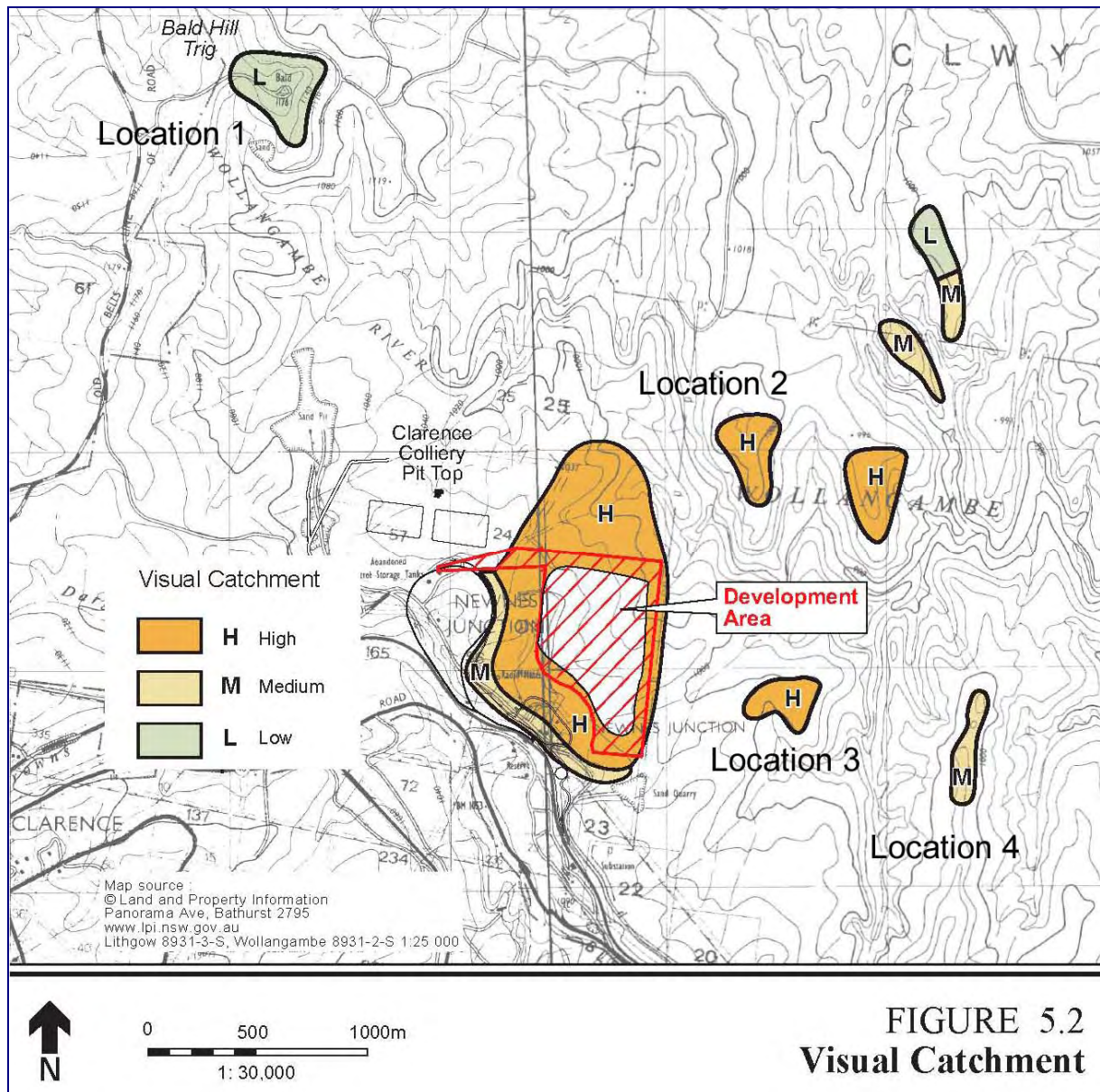


Figure 5: Modified Figure 5.2 (Visual Catchment) from the Sydney Construction Materials EIS (2004), referencing Locations 1-4 (discussed below)

4.2 New study – MineConsult visual transects

Following public feedback on the EIS, Sydney Construction Materials commissioned MineConsult to produce images depicting the visual impact of the development from the locations identified in the EIS. Figure 6 below identifies the locations of and directions from which the views in sections 4.4.1 to 4.4.4 were obtained.

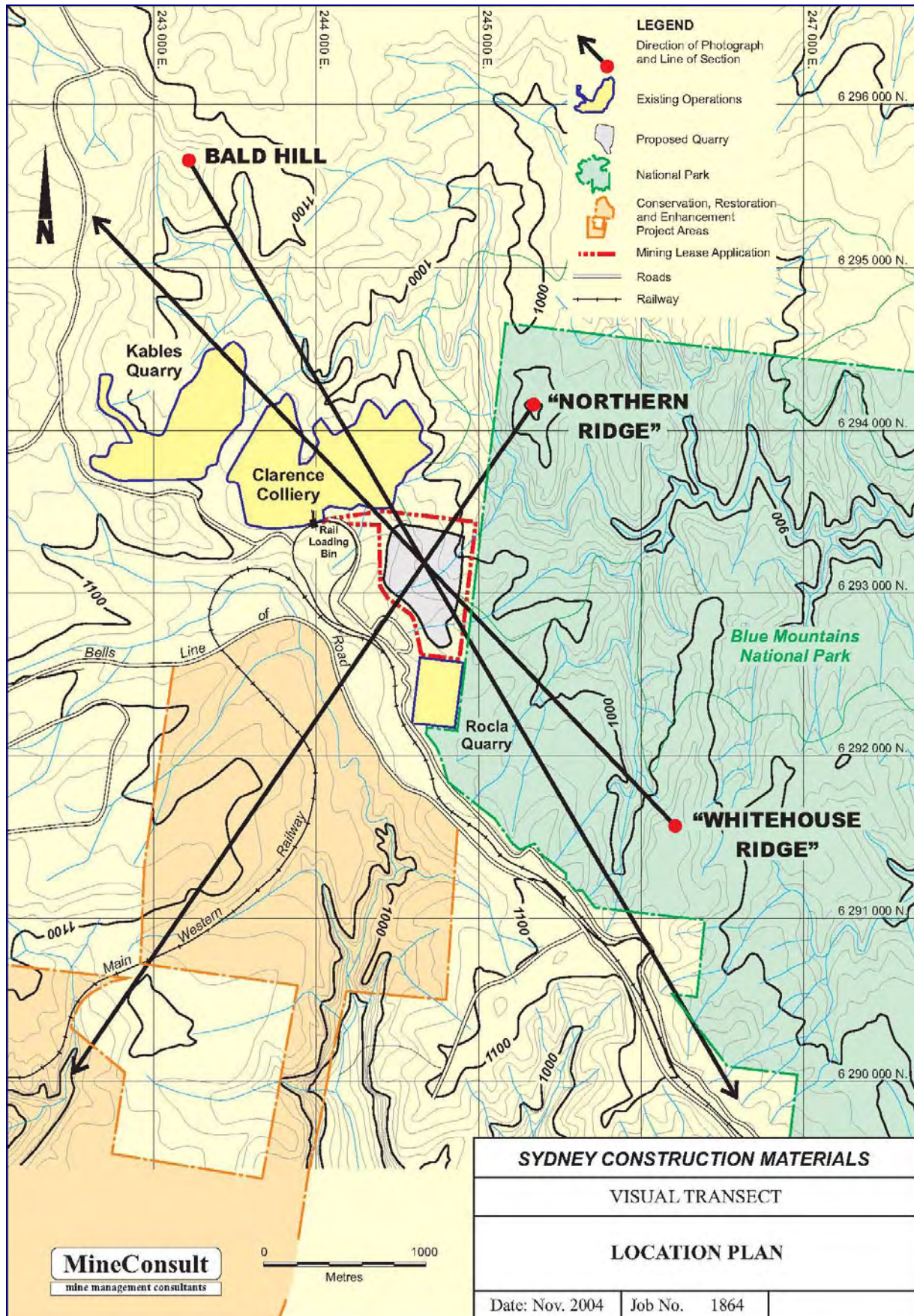


Figure 6: Location map showing location of proposed Sand & Kaolin operation, other existing operations, Blue Mountains National Park, and Visual Transect Lines.

4.3 Methodology

This Visual Impacts Supplement was undertaken from four locations with potential views of the proposed development. Selection of these viewing points was based on an assessment of the topography in proximity to the proposed development. The areas chosen as viewing points (as shown in Figure 5 above) are:

1. Location 1 – Bald Hill Trig Station
2. Location 2 – “Northern Ridge”
3. Location 3 – “Eastern Ridge”
4. Location 4 – “Whitehouse Ridge”

Photographs were taken from each viewing point in the direction of the project in order to understand the visual quality of the area. The locations from which these photographs were taken were recorded using the Global Positioning Satellite (GPS) system. A 3-dimensional model of the development, which incorporates a digital representation of the surrounding topography, was then manipulated to produce a view of the development from each photograph location. This was then super-imposed over photographs from Locations 1, 2, and 4 (Location 3 is discussed in section 4.4.3 below), and finally overlaid with vegetation to represent the results of the terraced landscaping.

The construction of visual transects using topographic maps overlain with the conceptual plans for the proposed development was also completed for Locations 1,2, and 4.

The following sections describe the views of the project at the conclusion of operations.

4.4 Viewing locations

4.4.1 Location 1 – Bald Hill Trig Station

As discussed in section 5.5 of the Sydney Construction Materials EIS (2004) (see Appendix 1), the Bald Hill Trig Station north-west of the proposed development provides the best view of the site due to its proximity to the development, height, and well-maintained access road (which provides ready access to the trig station). The visual impact from this area was described as “Low” in the EIS.

Figure 7 below shows the view from Bald Hill Trig Station. In the foreground, the Kables Quarry and Clarence Colliery can be clearly seen. To the left of the colliery in the background, the outline of the proposed Sydney Construction Materials development is visible. The lack of any established vegetation higher than grasses means there would be no amelioration of the development from this location

Taken in isolation from existing neighbouring extractive and transport activities and without progressive rehabilitation, the Sydney Construction Materials proposal would have resulted in some small visual impact from the Bald Hill Trig Station. This is consistent with the findings of the Visual Impacts assessment in the EIS.

When viewed in the context of existing neighbouring developments, however, with the progressive rehabilitation that will be employed at the site during operations, the visual impact of the development from the Bald Hill Trig Station will be insignificant.

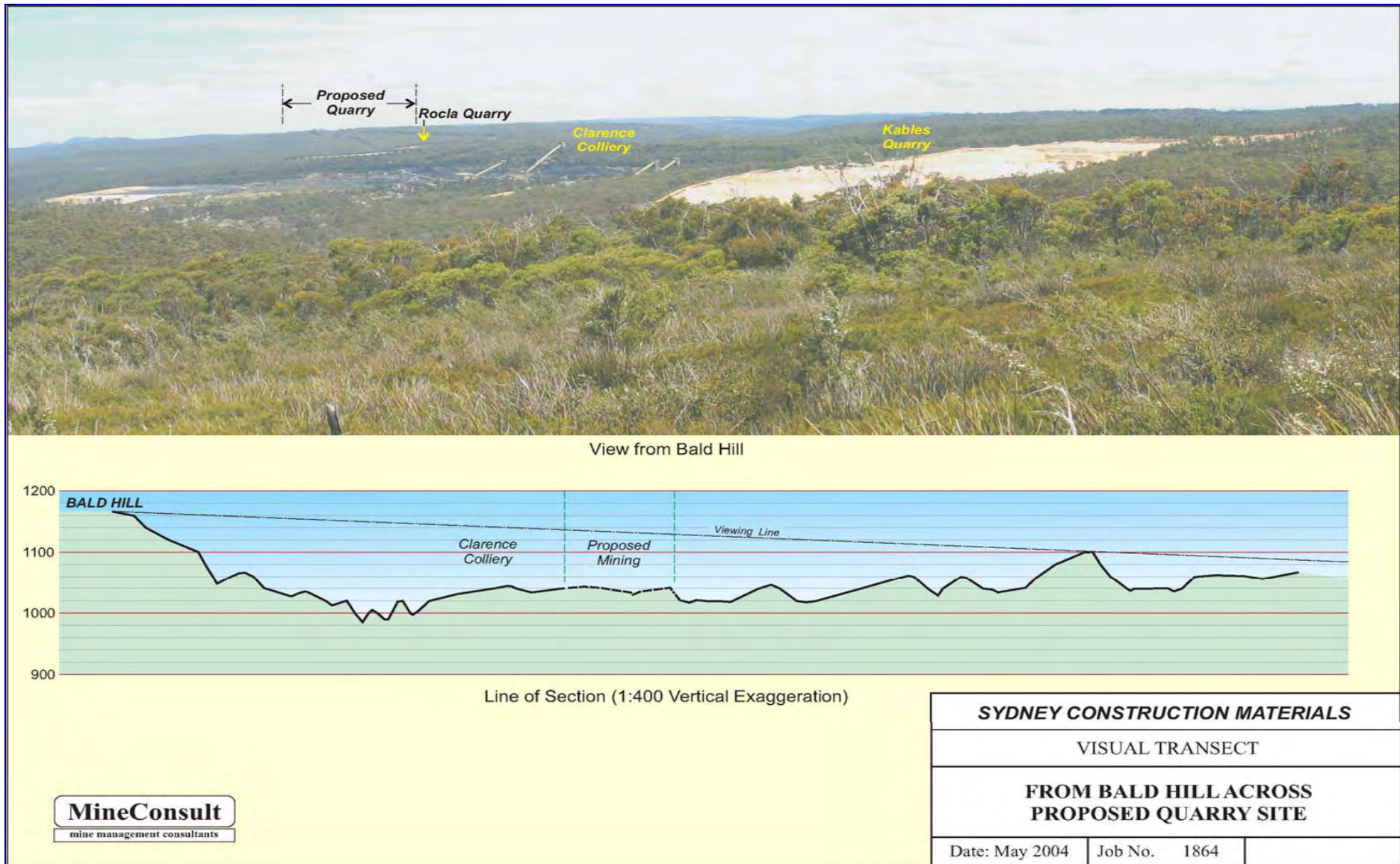


Figure 7: Visual transect from the Bald Hill Trig Station towards the proposed development

4.4.2 Location 2 – “Northern Ridge”

In the Sydney Construction Materials EIS (2004) (Appendix 1), the area now designated as the “Northern Ridge” was classified as belonging to a “High” visual catchment, given its proximity to the proposed development, and its height. The sparse, shrub vegetation at the site is like to provide no visual screening of the development, as shown in Figure 8 below. In Figure 8, the Clarence Colliery and Kables Quarry can be seen to the right of the picture, as can the pagoda formations, from which unobscured views of the development site would also be possible. On the left hand or southern side of Figure 8, the Rocla quarry is visible. Directly adjacent to it is the proposed development site.

The aspect from the “Northern Ridge” will also include some minimal views of the floor of the development. At the conclusion of operations, the floor will be rehabilitated to resemble Gooches Crater, seen in Figure 4 above.

If the proposed development were observed in isolation to the other extractive operations, and without progressive rehabilitation, the visual impact from the “Northern Ridge” would be high, an assessment that would accord with the original EIS position.

However, as is the case with the view from Figure 7 above, the Sydney Construction Materials development cannot be seen in isolation from existing development on the Newnes Plateau, nor should it be viewed without the progressive clearing and progressive rehabilitation. As seen in Figure 1 above, the terraced landscaping technique will mean that only 3 vertical metres of rock wall, at most, will be visible at any stage during development. Because of the mitigative actions to be taken during operations, and adopted following submissions on the EIS, the visual impact from the “Northern Ridge” will be significantly ameliorated.

Figure 5 above from the EIS also showed 3 other areas belonging to “High”, “Medium”, and “Low” visual catchments. The area directly to the east of the “Northern Ridge” is slightly lower than and reasonably close to the “Northern Ridge”. As such, the visual impact from this location would be virtually identical to, if not less than, that of the “Northern Ridge”.

The “Medium” and “Medium/Low” areas to the north-east of Location 2 are further away than, and lower than, the “Northern Ridge”, and so the visual impact from these sites would be lower still than that at the “Northern Ridge”.

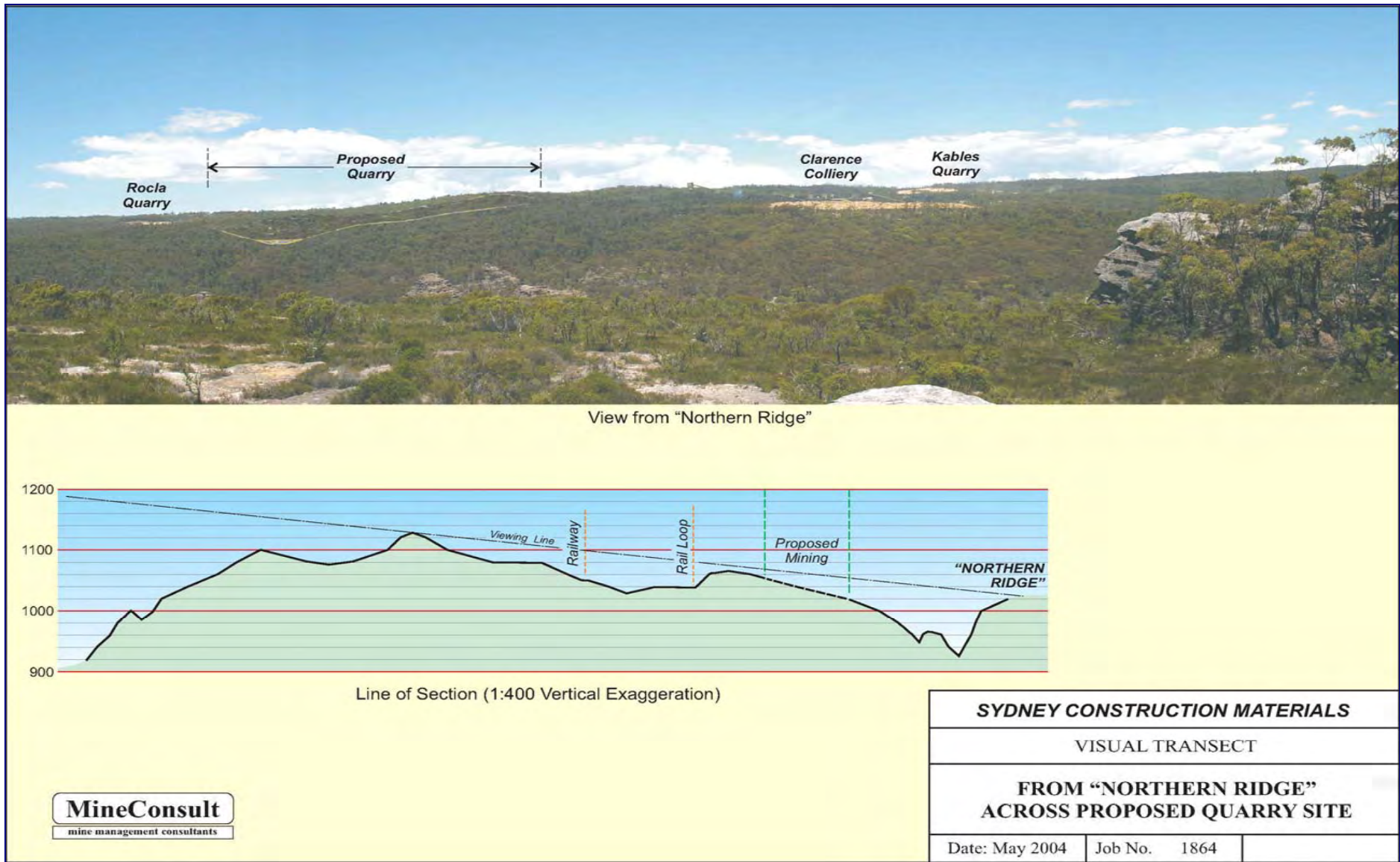


Figure 8: Visual transect from "Northern Ridge" towards the proposed development

4.4.3 Location 3 – “Eastern Ridge”

The view from the “Eastern Ridge” towards the development is significantly restricted due to the relatively flat local topography and the presence of established vegetation, as shown in Figure 9 below. Detailed ground searches may reveal a spot near this location that will allow glimpses of the development, but as the development site will be progressively rehabilitated, the visual impact from any such location will be negligible. Further, as access to this location is difficult due to its distance from roads and bushwalking tracks (see section 5.3 below), the likelihood of recreational bushwalkers seeing the development from the “Eastern Ridge” is very low.



Figure 9: View looking west towards proposed development site from "Eastern Ridge"

4.4.4 Location 4 – “Whitehouse Ridge”

Section 5.5 of the EIS (2004) described the “Whitehouse Ridge” (so named after the owner of the land through which access is obtained) as belonging to a “Medium” visual catchment. Figure 10 below shows that from this location, the waste emplacement zone of the Clarence Colliery is clearly visible. The Clarence rail loading bin, adjacent to which the Sydney Construction Materials rail loading bin will be located, is also visible.

If the proposed development were observed in isolation to the other extractive operations, and without progressive rehabilitation, the visual impact from the “Whitehouse Ridge” would be “Medium” to “Low”, an assessment that would accord with the original EIS position.

However, its distance from the proposed development (over 1km), viewing angle, and the on-site progressive rehabilitation mean that there will be very little visual impact from this location. This is evidenced by the view in Figure 10 below.

Further, as access to this location is restricted due to the need to cross private property (freehold land), the possibility of recreational bushwalkers traversing this ridge, and seeing the development is negligible.

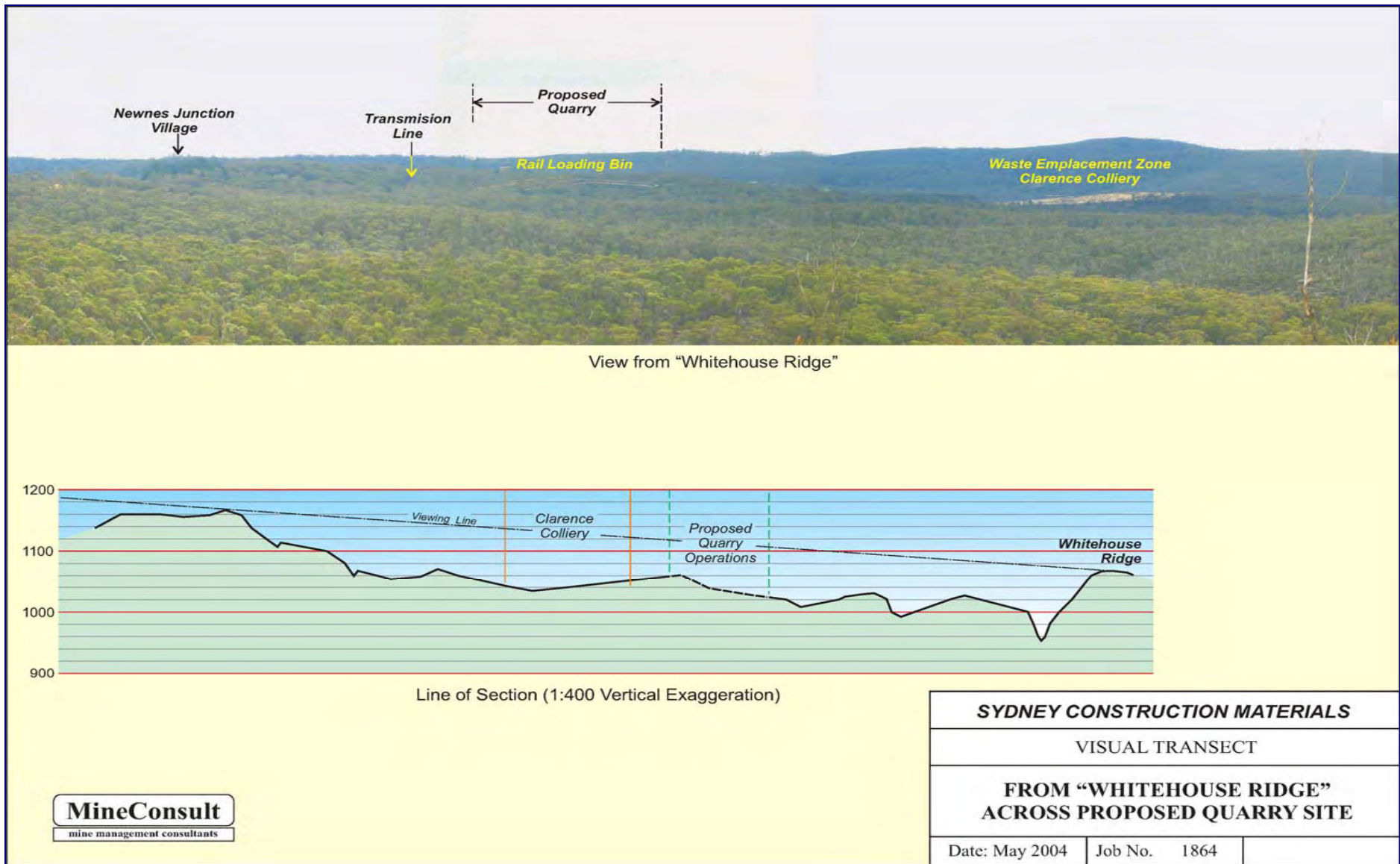


Figure 10: Visual transect from "Whitehouse Ridge" towards the proposed development

5 Mitigating measures

The descriptions of the above viewing locations all refer to the mitigating measures that will be employed onsite during operation of the proposed development. This section addresses the key activities – progressive clearing, and progressive rehabilitation – in further detail. The lack of formal bushwalker access to the area is also discussed below.

5.1 Progressive clearing

The Sydney Construction Materials Newnes Junction Project will require the clearing of land for the extraction of friable sandstone. Although the total area of land cleared at the end of the development will be approximately 25ha, clearing will take place in a staged manner in order to minimise the visual impact of the development throughout its life. Figure 11 below displays in graphical form the proportion of the site to be cleared at various stages of the development. Table 1 below outlines this numerically.

End of Year	Incremental Area Cleared	Total Area Cleared
1	2.04ha	2.04ha
2	1.48ha	3.52ha
3	2.64ha	6.16ha
4	2.07ha	8.23ha
5	2.90ha	11.13ha
10	8.87ha	20.00ha
15	3.85ha	23.85ha
20	1.16ha	25.01ha

Table 1: Area of site affected in staged development

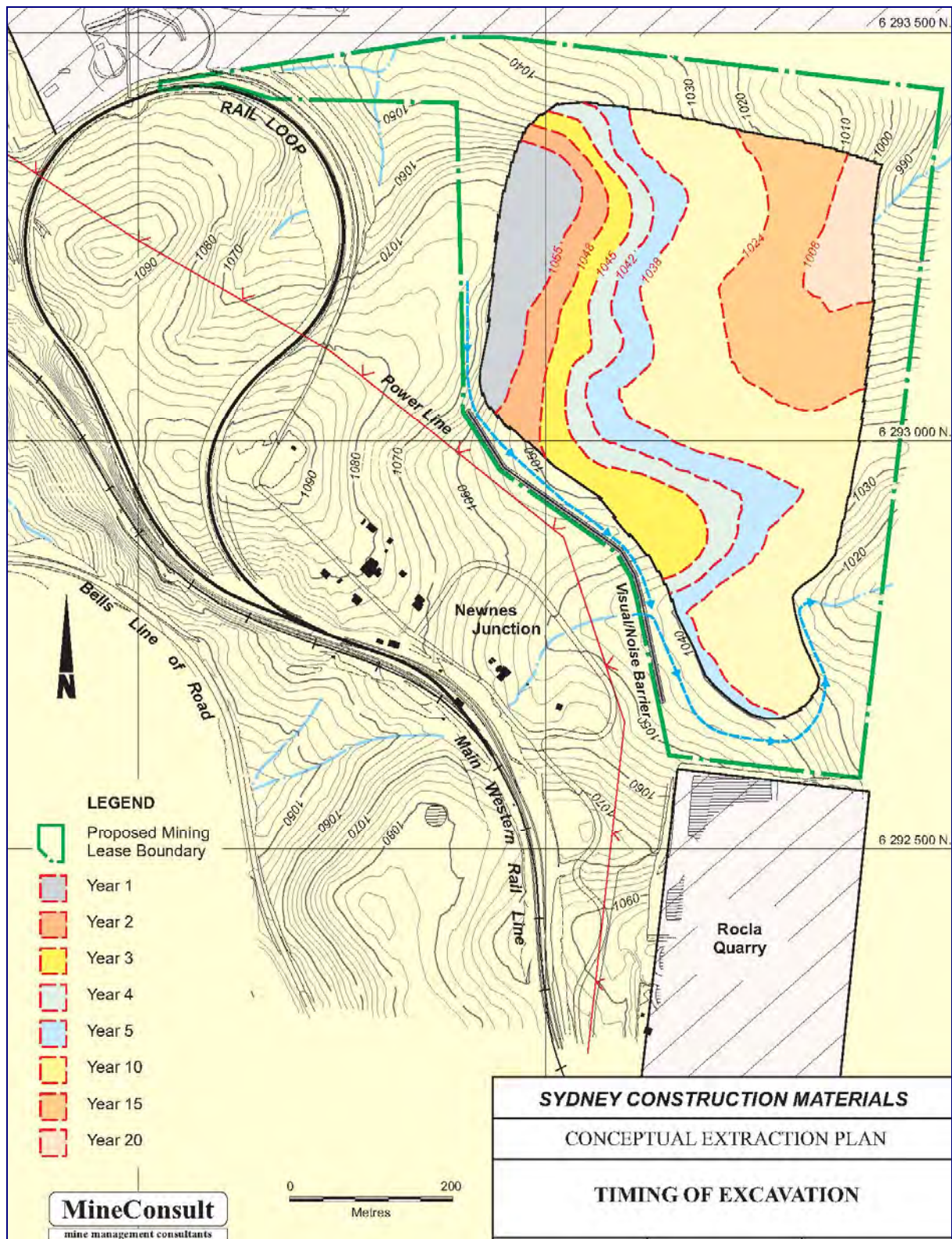


Figure 11: Staged timing of excavation

5.2 Terraced landscaping

The principal difference between the Sydney Construction Materials proposal and other existing operations in the surrounding area is that in conjunction with progressive clearing, this project will incorporate progressive rehabilitation using terraced landscaping. Following is a description of how this technique works.

As the surface miner progresses through the resource, 2-metre-wide benches will be formed at every 3 metres of depth to provide a platform on which native flora species will be planted. Irrigation for the benches will be provided from mine seepage water and any accumulated rainfall runoff. Figure 12 below shows an overview cross-section sketch of how the rehabilitated site will look at the end of the development's life. It identifies the terraced landscaping that will be utilised on the walls of the development, and indicates the area of free-draining wetland that will be created at the bottom of the site at the end of the development's life.

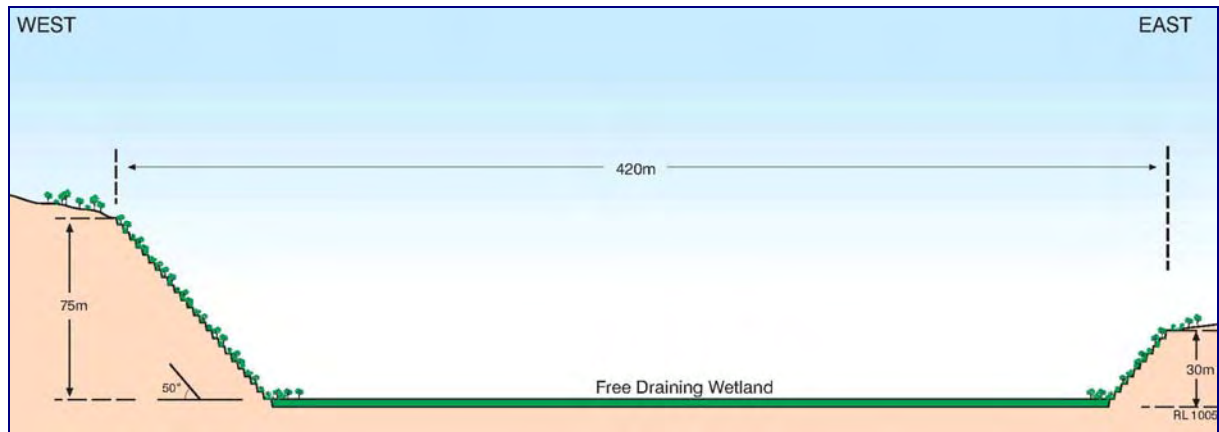


Figure 12: Conceptual design for progressive rehabilitation – overview.

Figure 13 below shows a detailed cross-section of the intended terraced landscaping, indicating batter angles, bench widths, and bench heights.

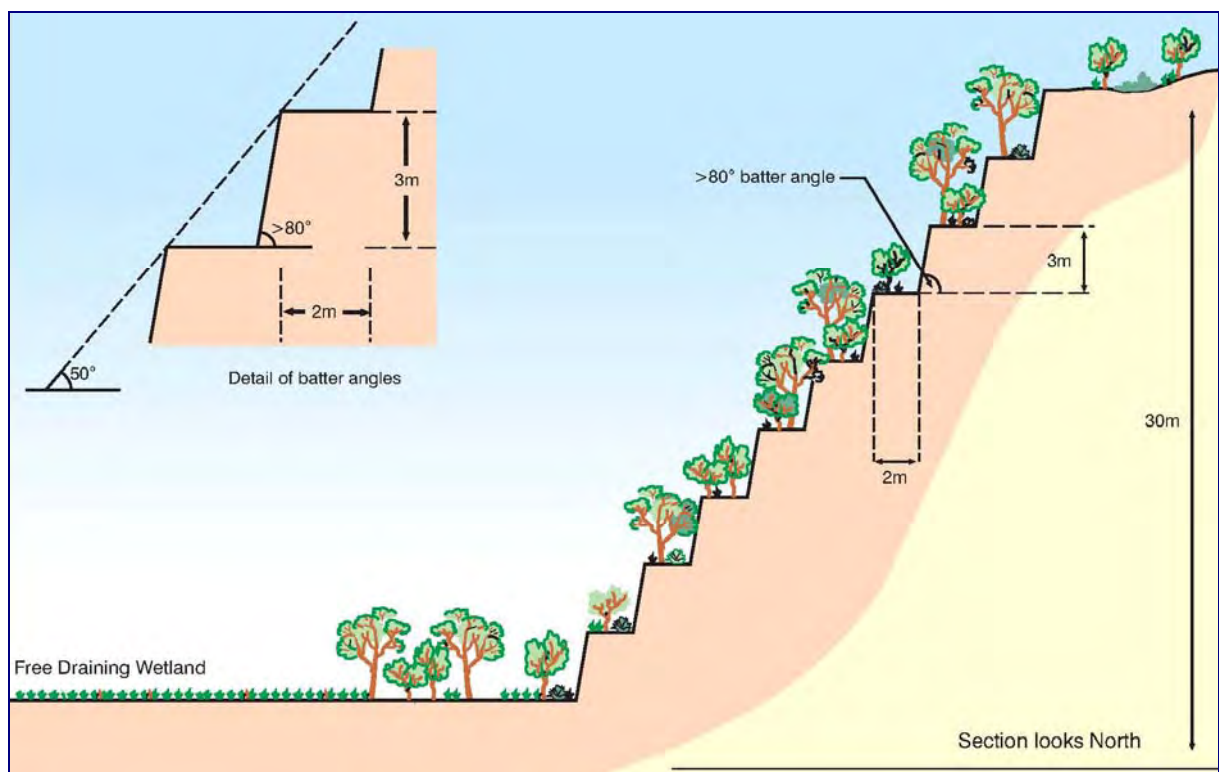


Figure 13: Conceptual design for progressive rehabilitation – detailed cross-section.

Figure 14 and Figure 15 below show how successful this rehabilitation technique has been in the past at other locations. It shows a quarry extracting friable sandstone at Somersby on the NSW Central Coast that is very similar to the Banks Wall

Sandstone at Newnes Junction. The photos show what the proposed quarry walls at Newnes Junction will look like after the program of progressive rehabilitation. The top row of vegetation is about 3 years old and the bottom row about 6 months old.



Figure 14: Progressive rehabilitation – top bench: 3 yrs old, bottom bench: 6 months old (Mark Burns, Global Soil Systems)



Figure 15: Native tree & shrub seeding on sand quarry benches (2 yrs old) (Mark Burns, Global Soil Systems)

These figures provide evidence of the fact that terraced landscaping is a tried and proven method of land rehabilitation. They demonstrate that significant levels of visual mitigation can be obtained very quickly with a high degree of success. Moreover, Figure 15 above demonstrates that significant levels of visual mitigation can be obtained at close proximity to the development, and within a short timeframe after mining at a given location has occurred. It is quite clear that once a bench has been formed, rehabilitation can commence immediately, resulting in a very short period of time that any one section of wall will be exposed. As the clearing of land will also occur in a staged manner (see section 3 above), the overall impact at any given time during and following operations will be minimal.

5.3 Bushwalker access in the area

Attached at Appendix 2 is a Sydney Construction Materials file note regarding investigations into bushwalker access to the area surrounding the proposed development.

The investigations involved on-site, and an intensive literature, search on walking tracks, campsites and picnic areas located on and around the Newnes Plateau. It found that the main focus for walking activities is well to the north of the Newnes Junction project area and is accessed by the Glow-worm Tunnel Road. The main attractions of the area – Deep Pass, Galah Mountain, Glow Worm Tunnel, and Bungleboori Picnic Area – are 10-30kms from the proposed development site.

There are no formed tracks within a 5km radius of the proposed development site. The Dargan's Creek Canyon south of the Bells Line of Road is probably the closest locality used by bushwalkers and canyoneers and is located several kilometres south of the project area.

The file note concludes that it is unlikely that the area within a 2km radius of the proposed development will attract any recreational bushwalking activities. Consequently, the number of people on a recreational bushwalk in the area that might see any of the visually-mitigated development is very low.

6 Conclusion

The proposed Sydney Construction Materials development at Newnes Junction will result in the progressive clearing of approximately 25ha of vacant Crown Land. The progressive rehabilitation techniques to be employed will mitigate any visual impacts, through the provision of a well vegetated quarry wall throughout the life of the development. Conventional quarrying methods would result in an un-rehabilitated rock wall, clearly visible from the surrounding area – the Sydney Construction Materials proposal is clearly very different.

Visual transects from neighbouring vantage points, some as close as a few hundred metres to the development, indicate that due to the geographical location and rehabilitation techniques to be employed, the visual impact of this development will be very low. Moreover, the visual transects clearly demonstrate that there will be minimal addition to the cumulative impact of the industrial activity on the Newnes Plateau by the Sydney Construction Materials development.

Furthermore, the investigation carried out into the presence of formed bushwalking tracks in the area did not identify any within 5km of the proposed development. The likelihood of any bushwalkers being visually impacted by the development is, therefore, negligible, even without regard to the visual impact mitigation measures to be implemented.

Appendix 1

Section 5.5 from Sydney Construction Materials EIS, 2004 – “Visual Implications”

5.5 Visual Implications

The visual assessment was carried out on the basis of fieldwork and the study of the stereoscopic aerial photographs. Recommended amelioration treatments have been proposed to minimise the visual impacts associated with the works.

5.5.1 Visual Catchment

The visual catchment of the proposed mine site extends around the site to varying distances as shown on **Figure 5.2**. The best views of the site that are readily accessed are available from Bald Trig, located in the Newnes State Forest, some 2 km to the north-west of the site. This site is the highest point in the area and has views of the National Park, Clarence Colliery, Kables Sands and the Rocla Quarry.

Views from the east are limited, since the area is covered by National Park with few permanent, formed tracks that would allow public access to gain views of the site. The site can be viewed from short sections of the unformed track leading to Gooches Crater, a feature known to bushwalkers, but cannot be seen from the feature itself. Views of Clarence Colliery pit top, the two existing quarries, access roads and railway infrastructure are also visible from this location.

Clear views of the kaolin mine would be available from rock pagodas located immediately opposite the site and on the edge of the National Park. Access to the top of these pagodas is extremely difficult and requires rock-climbing equipment. From this site, clear views of other industrial and residential activities on the western side of the National Park are available.

The site will be visible from residents at Newnes Junction, particularly on the northern side of the road. Although the quarry benches will not be visible in the early stages of the development, the removal of trees will be noticeable and may also open up views to Clarence Colliery.

5.5.2 Existing Landscape Elements

In general terms, the visual catchments in the study area contain a number of major landscape elements, including:

- slopes vegetated with native species of trees and shrubs including the site itself and the adjacent Blue Mountains National Park to the east;
- exposed high points and slopes from which the site may be readily seen (if the topography permits);
- industrial elements including coal mining infrastructure and reject emplacement to the north of the site and sand quarries to the south and north east of the site;
- dirt access roads to industrial sites and the Newnes Junction township;
- small village residences within the township of Newnes Junction; and
- transportation elements including road and rail infrastructure.

Each of the units found within the study landscape is briefly described to provide an indication of the existing landscape characteristics of the proposed kaolin mine.

Vegetated Slopes – many of the slopes within the area are vegetated with native species including much of the adjacent National park. The slopes have a low visual diversity due to the consistency of form and colour.

Exposed high points and slopes – exposed high points and slopes, including cliffs, pagodas, slot canyons and smaller escarpments characteristic of the sandstone landscape of the Newnes Plateau occur adjacent to the Wollangambe River to the east of the site. These sites occur at high elevations within the landscape or in areas where vegetation is low or non-existent. No such sites occur within the proposed mining lease.

Industrial elements – within the existing landscape a number of industrial developments occur, and visual elements associated with these developments include coal reject emplacement areas at Clarence Colliery, coal handling infrastructure and stockpiles, rail loading bin, conveyors and buildings, and sand quarries associated with Kables and Rocla.

Dirt roads – dirt roads providing access to the various industrial operations in the area (Kable Sands, Clarence Colliery and Rocla Quarry) and the Newnes Junction township are located to the west of the site.

Village residences – there are half a dozen dwellings in the village of Newnes Junction that are stand alone houses constructed primarily of wood and/or brick. Some of these dwellings are currently being renovated and there is the potential for other blocks to have dwellings constructed on them in the future. There is a buffer of some 200 m from the residences to the proposed mine site and until recently this entire area was vegetated with open woodland eucalyptus species. Recently some of this area has been cleared and a large dirt road has been constructed, providing access for public vehicles to the east. A minimum of 100 m of vegetation will remain between the residences and the ultimate pit limits.

Transportation elements – within the landscape, major roads and railways occur, creating linear visual elements within the landscape consisting of ribbons of clearing the transportation routes within them. The highway surface is asphalt and generally consists of 2 lanes. There are no views of the proposed mine site from the Bells Line of Road.

5.5.3 Assessment Criteria

In assessing the visual impacts of the proposed line, the visual catchment around the corridor was mapped according to the visual sensitivity of the areas within the catchment (refer **Figure 5.2**). The visual effect of the proposed mine site is the result of a complex combination of factors including:

- the existing visual environment;
- progressive and final visual characteristics of the proposed mine;

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- distance;
 - topography;
 - vegetation cover;
 - visual contrast generated;
 - number of viewers;
 - duration of view;
 - angle of view; and
 - visual sensitivity.

Existing visual elements - the nature of existing visual characteristics of the landscape is an important element in considering the impacts of the proposed mine.

Given the existing industrial elements within the landscape, including the sand quarries, which contrast with the dark green vegetation of the State Forests and National Park, the proposed mine will not introduce a new visual element into the landscape. The impacts of the proposed development are therefore related to increasing an existing visual element within the landscape.

Visually, the most significant impacts occur at sites closest to the proposed mine and from vantage points which directly overlook the site.

Where the site is not visible from surrounding areas there will be no visual impact. Where the mine is visible from elevated vantage points with uninterrupted views, the impacts will be greater, particularly, if these vantage points are frequented by residents or visitors to the area or users of the National Park.

Where areas of timber interrupt a view of the site, visual impacts will be less than if the screening effects of the timber were not present and such visual impacts diminish quickly with distance. Since clearing of the native vegetation will be required, the visual impacts become higher since the visual contrasts generated as a result are generally stark and highly noticeable over longer distances.

Other issues include the characteristics of backdrop surrounding the mine, and the degree to which the operation can be blended into the landscape. The prominence of the mine within the landscape also plays a role with the site being more visible from ridges located in the adjacent National Park than from sites closer to the mine.

Visual characteristics of the proposed mine - The characteristics of the physical components of the proposed kaolin mine, when compared with the existing landscape elements, contribute to the visual impact of the development.

The visual characteristics of the proposed mine will primarily consist of areas cleared of native vegetation with infrastructure and roads or mine benches located in them. The cleared areas will be light in colour, consisting of fresh sandstone which is white, yellow and light brown. In the early stages of the mine, cleared areas will be limited to the area of the access road and infrastructure and the initial mine stage. As the mine develops further, it will include larger cleared areas and rehabilitating vegetation at the edge of existing benches.

Distance - In terms of the visual impact, areas closest to a mine are generally subject to the highest degree of visual impact, where the mine is clearly visible from such areas.

In general terms, the further the mine is located from a point, the lower the visual impact will be. Within the visual catchment view lengths have been divided into foreground (0-0.5 km), within which the mine site would form a prominent feature in the landscape, middleground (0.5-2 km), within which the mine site can be readily seen but would not be as highly prominent, and background (2-5 km), within which the mine site can be readily detected within the landscape but is not visually dominant.

Topography - The topography of the viewer will have a significant effect on the visual impact of the proposed mine activities.

High elevations and cleared outcrops - Where the mine is viewed from areas of high elevation or cleared outcrops, it can be silhouetted against the darker surrounding vegetation and will consequently have a high visual impact.

Mid-slopes - when the mine site is viewed from mid-slope areas, the visual impacts are generally lower, due to the view of the site being partially screened by intervening vegetation, making it more difficult to see.

Valley floors – where the site of the viewer is within a gully, it is unlikely that the mine site will be visible since it will be screened from view by the surrounding valley sides and ridges.

Vegetation cover - the amount and nature of existing vegetation in the intervening landscape is very important when determining the visual impact of a mine site. If the landscape between the mine and the viewer is cleared, the mine can be visible for considerable distances. The visual impacts will be highest close to the mine but will still lessen with distance.

Where scattered vegetation occurs, the impacts are generally lower, since scattered vegetation can screen the high contrast areas within the mine site.

Since clearing is required for the mine site in an area of existing vegetation, the visual impacts in terms of vegetative cover will be higher, as a result of the enlargement of a highly contrasting element (ie. cleared areas of exposed sandstone) into the landscape.

Number of viewers affected - when determining the visual impacts of a mine site the number of viewers is taken into consideration. Visual impacts are regarded as higher when a greater number of people are affected by the mine.

Duration of view - the duration of viewing also contributes to the visual impacts of a mine site. Static views (i.e. from residences, recreational areas and tourist lookouts) are regarded as more important than transitory views (i.e. from roads).

Angle of view - Visual impacts also depend on the locations and angles from which the mine is viewed. The greater proportion of given vista the mine site occupies the

greater the impact. This is determined by the angle of view and the distance of the mine from the viewer.

Visual Sensitivity - visual sensitivity is a measure of the perceived visual impacts on the visual environment, or the ability of an area to absorb the visual impacts of a development.

5.5.4 Visual Assessment

The following categories of visual impact were established for the visual assessment, based on the assessment criteria outlined above.

- high visual impact;
- moderate visual impact;
- low visual impact; and
- negligible visual impact.

The categories above have been used in **Table 5.1** to determine the general visual impacts of the proposed mine site on the environment. The existing nature of the environment (including the topography and the presence of otherwise similar industrial elements within the landscape), the distance from which the mine is viewed and the vegetation cover of the area are clearly shown in the table. Other criteria considered for the assessment include the duration and angle of view (road views will be intermittent and of short duration), visual sensitivity and the number of viewers. While these criteria are not all shown in the tables, they were taken into consideration when determining the mapping of the visual impacts.

Table 5.1 - Visual Impacts of Proposed Mine Site

Landscape Element From which mine will be Viewed	Foreground Views 0-500 m			Distance Mid ground Views 500-2000 m			Background Views 2000-5000 m		
	Intervening Vegetation			Intervening Vegetation			Intervening Vegetation		
	None	Scattered	Dense	None	Scattered	Dense	None	Scattered	Dense
Exposed sites	H	M	n/a	H	M	n/a	L	L	n/a
Vegetated slopes	H	M	N	M	L	N	n/a	N	N
Industrial areas	M	L	N	L	L	N	N	N	N
Dirt Roads	H	M	L	M	L	N	L	L	N
Village residences	n/a	M	L	n/a	n/a	n/a	n/a	n/a	n/a
Main Transport elements	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

H - High visual impact

M - Moderate visual impact

L - Low visual impact

N - negligible visual impact

n/a – mine site not visible from such an area

5.5.5 Visual Impacts

The fact that the existing landscape is dominated by industrial elements to both the north and south of the site has been a major consideration in this visual assessment. Given the existing impacts of industrial developments in the landscape, the visual impacts of the proposed mine have been assessed on the basis of incremental impacts in areas from which existing developments are visible.

The impacts will include visual changes in the landscape associated with clearing of vegetation on site, exposure of the underlying sandstone material and construction of infrastructure required in the mining operations.

Specific visual impacts occurring in relation to the proposed mine are discussed below.

Newnes Junction Residences

In the early stages of mining, the operation will not be visible from any residential dwelling. However, in later stages of mining the reduced intervening timber will be noticed and in final stages of mining it may be possible for residences to view sections of the quarry faces. These views will be mitigated with additional tree planting within the buffer between the quarry and the residences as well as early rehabilitation of completed quarry faces, which will assist in screening the quarry faces.

Blue Mountains National Park

The mine will be located adjacent to the Blue Mountains National Park, with the topography sloping down from the mine site to the park boundary. A minimum 50 m buffer will be left on NKPL land. Only the operating pit will be fenced. An area will be dedicated for walking access from Newnes Junction to the National Park.

The area is currently vegetated with eucalypt woodland, and will therefore offer a substantial vegetation buffer. There are no permanent formed roads in the adjacent portion of the National Park, and public access to any areas within the park from which the mine may be viewed would be restricted to hikers.

The site can be viewed from the unformed track leading to Gooches Crater, a feature known to bushwalkers, but cannot be seen from the feature itself. Views of Clarence Colliery pit top, the two existing quarries, access roads and railway infrastructure are also visible from this location.

Clear views of the kaolin mine would be available from rock pagodas located immediately opposite the site and on the edge of the National Park. Access to the top of these pagodas is extremely difficult and requires rock-climbing equipment. From this site, clear views of other industrial and residential development on the western side of the National Park are available.

Adjacent Industrial Sites

The kaolin mine cannot be viewed easily from any existing industrial sites since each has a small but effective vegetative buffer. The mine could be partially viewed from the Clarence Colliery Coal Preparation Plant and Rail Loading Bin as well as elevated sites within the coal reject emplacement.

Key Transportation Routes

The mine cannot be viewed from Bells Line of Road or Main Western Railway line but could be viewed from the Clarence Rail Loop. The mine will not be visible from the proposed extension to the Zig Zag Railway which will link to Newnes Junction Station, nor from the station itself.

Dirt Roads

The mine will be visible from a section of the access road leading around the Clarence Rail Loop. Residents of Newnes Junction use this road that also passes the Clarence Colliery Pit Top, overlooks the coal stockpiling area and passes beneath the conveyor leading to the main rail-loading bin.

Vegetated Slopes

The proposed buffer between the mine and the National Park is considered sufficient to screen views from lower vantage points heading towards the site. Even at the boundary of the National Park looking west towards the mine, no views will be available due to the dense intervening vegetation.

5.5.6 Mitigation Measures

To reduce the visual impacts of the proposed mine site on the landscape, a number of techniques will be employed. These will include the following:

- maintaining a minimum 50 m vegetated buffer between the site and the adjacent National Park to minimise visual impacts of the mine site on the park areas immediately bordering the lease boundary;
- maintaining the remaining vegetation occurring between the residences in Newnes Junction and the proposed mine limits to screen the effects of the mine as much as possible;
- designing the mine with shallow benches some 3 m high and rehabilitating these benches with native vegetation as soon as practicable to screen the high wall with vegetation. Rehabilitating the edges of the shallow benches will improve views directly into the mine site from the National Park where the mine is visually prominent in the landscape;
- colouring the stockpile enclosure environmental green, to make it blend into the existing landscape as much as possible;
- colouring conveyor covers and other constructions on site environmental green where this is practical so that these elements blend into the existing landscape;

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- ❑ minimising vegetation removal during construction and mine operation. This will ensure that visual impacts associated with the development are minimised; and
 - ❑ infill vegetation planting to further screen the site from local residents if required.

5.5.7 Conclusion

The main visual impacts will occur from elevated vantage points surrounding the mine. This is the case for all industrial activities in the region, which can be invariably seen from higher, or overlooking vantage points. In this case however, views of the site can, with some difficulty, be seen from elevated points within the National Park. These locations are not easily accessible and when located, other industrial sites are equally visible. This is also true along other sections of the park boundary, which abut residential areas, agricultural land, industrial activities and major public infrastructure.

Views of the quarry from residential receptors in Newnes Junction will be mitigated by intervening vegetation that will be maintained during the quarry, and augmented as necessary. Although the project will result in some visual impacts, the net effects are considered acceptable.

Appendix 2

Sydney Construction Materials file note – “Bushwalking tracks in the vicinity of the Newnes Junction development application area”



File Note

To: Atkins Acoustics
ATTN: Carl Fokkema

Date: 16th April 2004

Re: Bushwalking tracks in the vicinity of the Newnes Junction development application area

An intensive literature search on popular walking tracks, campsites and picnic areas located on and around the Newnes Plateau, which include the Blue Mountains National Park, the Wollemi National Park, Gardens of Stone National Park and the Newnes State Forest, was carried out.

The main focus for walking activities is well to the north of the Newnes Junction project area and is accessed by the Glow-worm Tunnel Road. The main attractions of the area; Deep Pass, Galah Mountain, Glow Worm Tunnel and Bungleboori Picnic Area, are in a range of 10 to 30kms from the proposed development site.

There are no formed tracks, for bushwalking purposes identified from any of the references in the attached list and no tracks have been identified by National Parks and Wildlife Services Personnel within a 5km radius of the proposed development site. The Dargan's Creek Canyon south of the Bells Line of Road is probably the closest locality used by bushwalkers and canyoners and is located several kilometres south of the project area.

A research programme on the sedimentary history of the Newnes Plateau sandstones carried out jointly by the Company (R. Goldbery) and John Whitehouse from the NSW Department of Mineral Resources has required detailed traversing of the area surrounding the proposed development site at Newnes Junction. During these surveys, no bushwalking tracks have been found on any of the ridges or drainage networks of the area. It is therefore considered extremely unlikely that the area within a 2km radius of the DA proposal will attract any recreational bushwalking activities.

R. Goldbery
(Project Manager)

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