

3.1 BACKGROUND

To ensure that quarrying activities and urban development can take place on the Estate concurrently, a detailed Extraction and Rehabilitation Plan (ERP) has been prepared and accompanies this Precinct Plan.

The following information on the proposed quarry operations is based on the ERP.

3.2 OBJECTIVES OF THE EXTRACTION & REHABILITATION PLAN

The objectives of the Extraction and Rehabilitation Plan are to:

- ❖ develop a final landform with minimal necessary earthworks suitable for land uses identified in SEPP 59;
- ❖ extract resources in an optimal manner that achieves the final landform;
- ❖ produce quarry faces and benches that provide a safe final land form with long term stability, and low future maintenance requirements;
- ❖ adopt appropriate staging of quarry development to minimise noise, blasting and vibration impacts on residential and employment development;
- ❖ develop a quarry plan that is flexible in implementation to the uncertainties of sales in both quarry products and real estate; and
- ❖ ensure safety of quarry redevelopment, and bench and landform stability through compliance with the *NSW Mines Inspection Act 1901*, and its 1998 amendments.

3.3 QUARRY RESOURCES

Future quarry operations have been divided into 9 zones. The zone areas are based on geology and/or stabilisation requirements. *Figure 6* shows the zones and fill areas discussed in the ERP. Quarry resources and the extraction and rehabilitation process within the nine zones are as follows:

Zone 1 (South-Eastern Quarry Benches):

Extraction within this area will be limited to the removal of Greystanes gravel and boulderised dolerite during stabilisation work of the quarry benches. The development of a mid bench will be required at relative level (RL) 100 metres.

Zone 2 (North-Eastern Quarry Benches):

Development of this area involves the removal of Greystanes gravel during stabilisation work above the RL 80 metres bench. Extraction of picrite will occur on lower faces, resulting in straightening of the faces above the proposed final landform levels.

Zone 3 (Northern Quarry Benches adjacent to the Stockpile Area):

Located at the northern end of the quarry, limited extraction of olivine dolerite, picrite and shale will occur in this area. Filling of the final benches and creation of battered slopes will enable this area to be linked with the elevated topography north of the quarry.

Zone 4 (Former CSR Plant Area):

Extraction within this area will include the removal of shale/overburden and extraction of dolerite to the proposed final landform.

Zone 5 (North-Western Quarry Benches):

Development of this area involves the removal of Greystanes gravel and fill in order to link the Boral and

former CSR quarry sites at the northern end of the site.

Zone 6 (Boral Plant Area, including the north-south road corridor):

Extraction of dolerite, olivine dolerite and picrite will occur within this area to the proposed final landform level. Overburden and shale will be removed from the area and will be accommodated in the quarry to produce the final landform.

Zone 7 (Western Slopes):

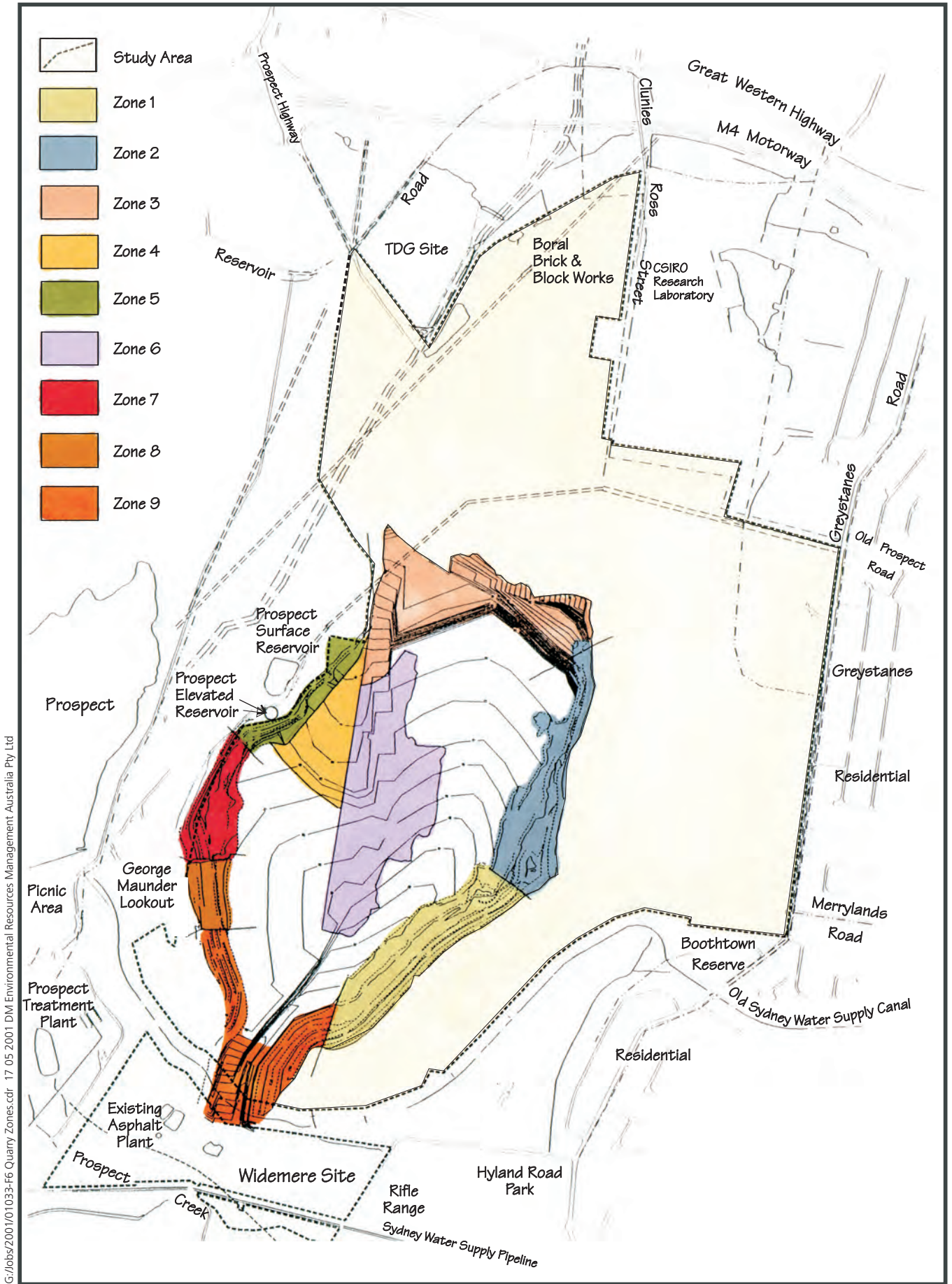
This area comprises overall slopes approximating 23 degrees. These slopes have naturally revegetated over the 25 years since quarrying ceased in the area.

Zone 8 (South-western High Walls):

Shale will be removed from this area in order to achieve a final stabilised landform.

Zone 9 (Southern Cut):

Development within this area will include the creation of a 100 metre wide road and drainage corridor through the southern end of the quarry. During bench development and stabilisation work, overburden and shale will be generated. Extraction of picrite below the existing quarry floor will be undertaken within this area in order to allow the site to drain freely towards the south.



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Figure 6 Quarry Zones

ERM  0 250m
Approximate only

3.4 PROPOSED STAGING/PROGRAM

Conceptual quarry planning for the Greystanes Estate, presented in the indicative staging plans, assumes that continued production from the quarry will average 1.1 million tonnes per annum. This will include 600,000 tonnes of picrite/olivine dolerite and 500,000 tonnes of dolerite, making it necessary to work different areas of the quarry simultaneously.

These extraction quantities are expected on average to meet the demand for quarry products in the existing construction material markets. Overburden material currently stockpiled on the site and overburden removed during proposed quarry stabilisation work will be accommodated within the quarry as compacted fill.

Quarry development will commence at the northern end and contract towards the south over the quarry's remaining life. During future urban development, extraction will be concentrated around the existing Boral plant, and in the southern section of the quarry.

Noise and blasting impacts have been considered in formulating the staging, and are detailed in the Extraction and Rehabilitation Plan.

Quarry development anticipated for each year of the staging plan is discussed below. These stagings are notional and may be altered if market conditions or other factors change.

Current Year

Quarry operations during the current year will initially involve trimming of the existing eastern and northern faces (zones 2 and 3) in readiness for landform development.

Overburden material totalling 1.22 million cubic metres (m³) to be used in the landform development, will be sourced from the following areas;

- ❖ upper eastern face stabilisation (zones 1 and 2) (250,000 m³);

- ❖ eastern overburden stockpile (800,000 m³); and
- ❖ northern overburden stockpile (170,000 m³).

Fill and overburden material will be transported to a fill site in the north eastern area of the quarry. The fill will be placed and compacted to within 4 metres of the final level.

The former CSR plant was decommissioned in 2000. Overburden and shale will be removed and placed as compacted fill in the western section of the quarry adjacent to the plant.

Approximately 500,000 tonnes of dolerite will be extracted from zone 4 for production.

Year 1

Extraction during this period will be concentrated in the southern and south-eastern areas of the quarry. The majority of rock for production will be generated from bench development during stabilisation work along the upper eastern benches (zone 1) and within the southern cut area (zone 9).

Up to 445,000 m³ of overburden removed during this development will be placed as compacted fill into the western area of the quarry. The remaining 800,000 m³ of overburden from the eastern stockpile will also be placed in this area.

Year 2

During year 2, extraction beneath the former CSR plant area (zone 4) will be completed. Continued extraction will also occur at the southern end of the quarry (zone 9).

Stabilisation work will be concentrated on the western walls adjacent to the CSR plant area. Approximately 122,000 m³ of overburden will be removed and placed in the western area of the quarry.

Year 3

During this period, extraction will be concentrated south of

the plant area (zone 6), and at the southern end of the quarry (zone 9).

Overburden will be removed from the northern end of the quarry. This material will be placed and compacted east of the existing Boral plant.

Quarry product stockpiles and the stabilisation plant will be relocated to the platform formed in the current year at the northern end of the quarry.

Years 4 to 7

Extraction during this four year period will be concentrated south of the plant area (zone 6), and at the southern end of the quarry (zone 9). Extraction will occur down to the lowest landform level.

There will be no overburden extraction or platform development during this period.

Year 8

At the commencement of year 8, the Boral crushing plant will be decommissioned and overburden will be removed and placed as compacted fill. This will result in the raising of the platform level by approximately one metre across the quarry.

Stabilisation work will be undertaken in the south-western area of the quarry. Shale removed within this area will be used to finalise the landform levels within the quarry.

There will be at least one mobile plant commissioned at the site to continue to meet the market demands for quarry products.

Extraction during year 8 will occur within the Boral plant area (zone 6), and at the southern end of the quarry (zone 9).

Year 9

Extraction during year 9 will continue within the plant area (zone 6) and at the southern end of the quarry (zone 9).

Year 10

Limited extraction at the southern end of the quarry, will occur during year 10 in order to finalise the quarry landform.

Detention basins will have been established at Widemere before year 10 to allow the catchment of water run-off from the site.

3.5 RELOCATION OF EXISTING QUARRY AND ASSOCIATED ACTIVITIES

Current Boral operations on the site will need to be relocated to allow construction to begin on the residential area. It is intended that Boral administration move to the initial stages of the employment area.

As previously stated in Chapter 2, the recycling plant will be moved during initial stages of the development.

The crushing plant, currently located within the quarry, is planned to be decommissioned during year 8 of the staging plan.

3.6 FINAL LANDFORM

Figure 7 shows the existing quarry landform, while *Figure 8* shows the final landform of quarry pit upon completion of development.

The quarry walls will be stabilised and rehabilitated by Boral on completion of the quarry works and in conjunction with the development works being carried out. Section 4.12.6 outlines measures for ongoing management of the walls.

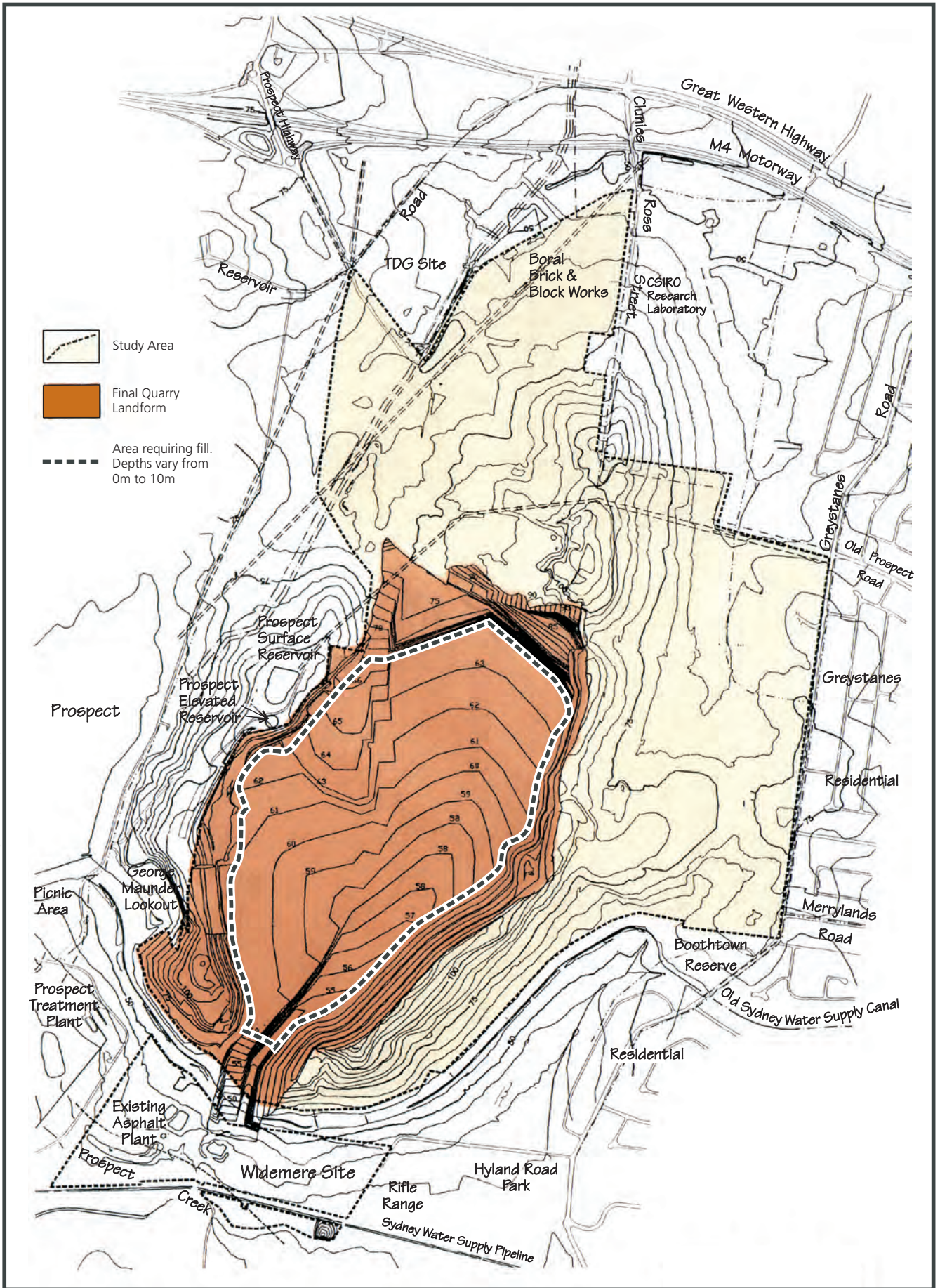


Figure 8 Final Landform



0 250m
Approximate only

3.7 REHABILITATION PLAN

The aim of rehabilitation is to provide a reshaped landform to allow subdivision and the provision of infrastructure services, and to aid in stabilising the quarry slopes and benches.

Earthworks, involving cut and fill, will be required to shape and rehabilitate the landform for subdivision and infrastructure services. The proposed landform in the Southern Employment Lands will be graded at an average of 1%-2% towards the quarry perimeter and the site quarried to provide a linkage through to the south. There is expected to be a balance of cut and fill across the site and therefore, it is considered unlikely that fill would need to be imported to the site. Section 7.4 sets out the earthworks procedures that are required to be followed.

The majority of the walls will be terraced with 10 to 20 metre high lifts and benches ranging in widths from 10 to 30 metres. The benches will provide a variety of functions including:

- ❖ vehicular access for maintenance, including removal of talus;
- ❖ stormwater runoff collection; and
- ❖ mounding to the development platform at base of walls and to the lower benches will provide protection from falling rocks/talus, as well as providing additional height to vegetation planted on mound. Suitable vegetation will be selected to help stabilise the mounds. Due to the large bench area requiring rehabilitation and the harsh microclimatic conditions, tubestock or hydroseeding is the preferred revegetation method.