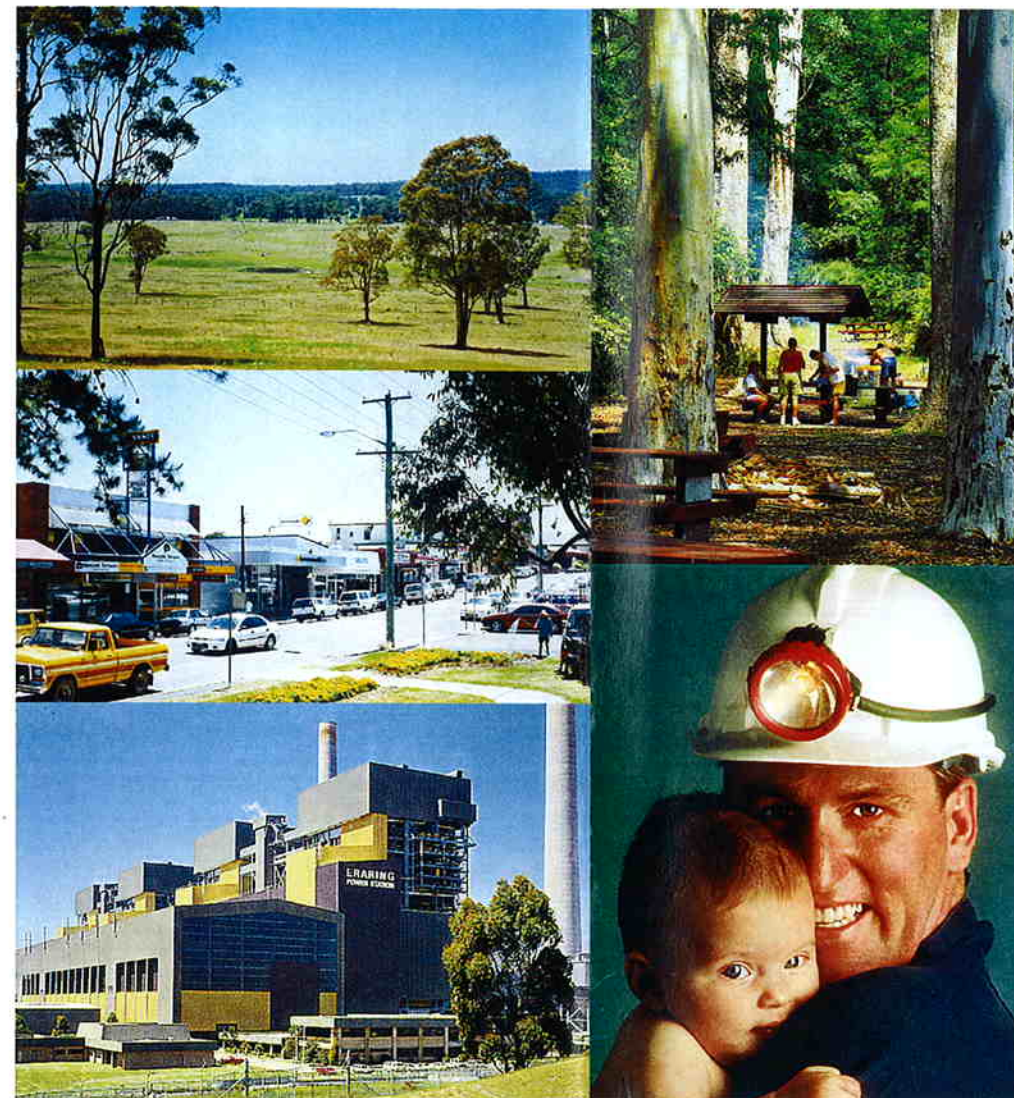


COORANBONG COLLIERY LIFE EXTENSION PROJECT

ENVIRONMENTAL IMPACT STATEMENT

VOLUME 2

FIGURES



Umwelt (Australia) Pty Limited
Environmental and Catchment Management Consultants

November 1997

COORANBONG COLLIERY LIFE EXTENSION PROJECT

ENVIRONMENTAL IMPACT STATEMENT

LIST OF FIGURES

SECTION 1

- 1.1 Locality Plan
- 1.2 Colliery Holdings

SECTION 2

- 2.1 Key Project Components
- 2.2 Geological Features
- 2.3 Typical Geological Stratigraphy
- 2.4 Proposed Mining Areas
- 2.5 Conceptual Mining Sequence
- 2.6a Mine Access Site - Conceptual Layout
- 2.6b Perspective Views of Mine Access Site
- 2.7 Cooranbong Colliery and Existing Surface Water Management
- 2.8 Proposed Modifications to Cooranbong Colliery
- 2.9a Coal Handling Plant Conveyor Elevations
- 2.9b Coal Handling Plant Conveyor Elevations
- 2.10 Proposed Haul Route and Reject Emplacement Area

SECTION 3

- 3.1 Topography - Proposed Mining Lease Area
- 3.2 Slope Analysis for Cooranbong Colliery Life Extension Project
- 3.3 Surface Geology
- 3.4 Typical Alluvium Characteristics - Southwest - Northeast Cross Section
- 3.5 Soil Distribution - Proposed Mining Lease Area
- 3.6 Wind Speed and Direction
- 3.7a Surface Hydrology - 1 in 1 Year Rainfall Event
- 3.7b Surface Hydrology - 1 in 100 Year Rainfall Event
- 3.8 Land Ownership and Monitoring Sites
- 3.9a Vegetation Communities in Proposed Mining Lease Area
- 3.9b Fauna Survey and Threatened Species Locations in Proposed Mining Lease Area

- 3.10a Vegetation Communities on the Mine Access Site
- 3.10b Fauna Survey and Threatened Fauna Locations on the Mine Access Site
- 3.11a Threatened Plant Locations on Cooranbong Colliery Site and Proposed Haul Road Alignment
- 3.11b Fauna Survey and Threatened Fauna Locations on Cooranbong Colliery Site and Proposed Haul Road Alignment
- 3.12a Agricultural Suitability
- 3.12b Land Capability
- 3.13 Land Use
- 3.14 Public Utility Infrastructure
- 3.15 Heritage

SECTION 4

- 4.1 Predicted Subsidence for Mining Areas Based on Preferred Mine Plan
- 4.2 Indicative Post Mining Landform - Mandalong Valley Based on Preferred Mine Plan
- 4.3a Post Mining Surface Hydrology - Mandalong Valley Based on Preferred Mine Plan for 1 in 1 Year Rainfall Event
- 4.3b Post Mining Surface Hydrology - Mandalong Valley Based on Preferred Mine Plan for 1 in 100 Year Rainfall Event
- 4.4 Predicted Pre and Post Mining Hydrographs for Stockton Creek Downstream of F3 Freeway
- 4.5a Mine Access Site - Noise Contours - Neutral Conditions
- 4.5b Mine Access Site - Noise Contours - 1.5 m/s NW Wind
- 4.5c Mine Access Site - Noise Contours - 3°C/100 m Temperature Inversion
- 4.6a Mine Access Site - Air Quality - Dust Concentration
- 4.6b Mine Access Site - Air Quality - Dust Deposition
- 4.7a Cooranbong Colliery Site - Noise Contours - Neutral Conditions
- 4.7b Cooranbong Colliery Site - Noise Contours - 1.5 m/s NW Wind
- 4.7c Cooranbong Colliery Site - Noise Contours - 3°C/100 m Temperature Inversion
- 4.8a Cooranbong Colliery Site - Air Quality - Dust Deposition
- 4.8b Cooranbong Colliery Site - Air Quality - Dust Concentration

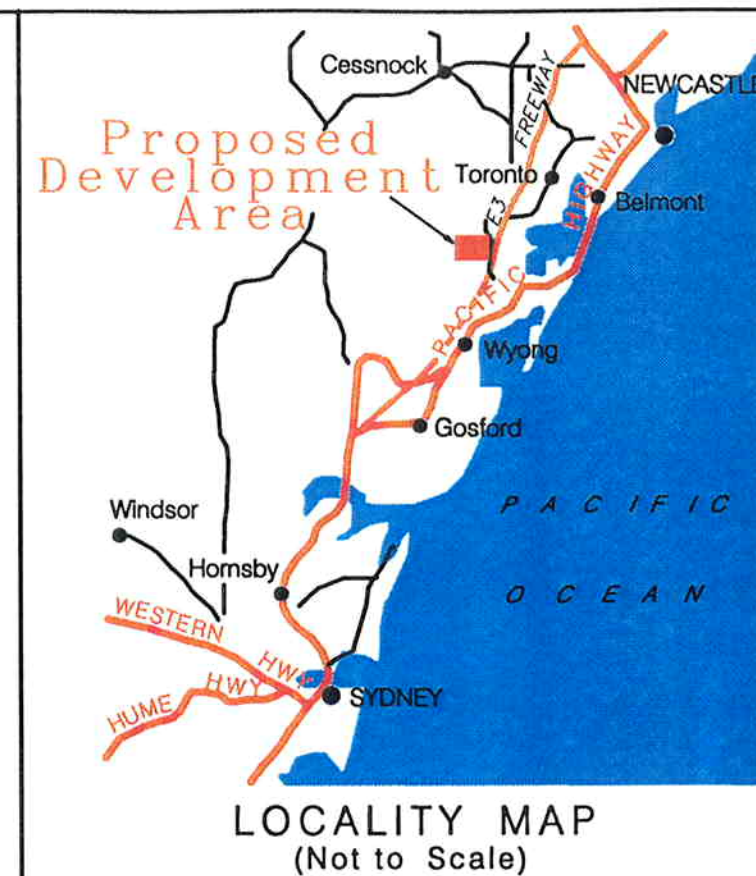
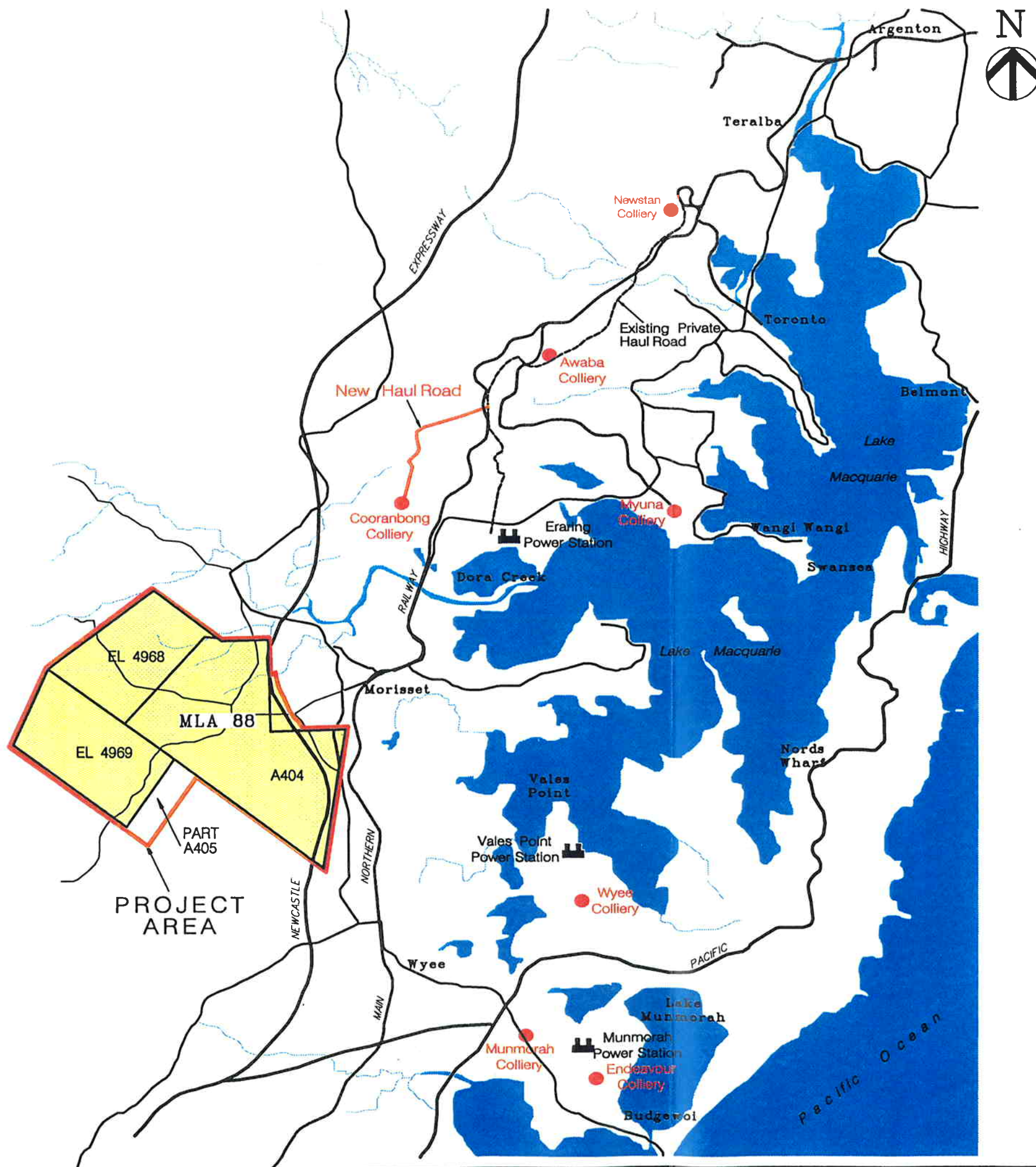
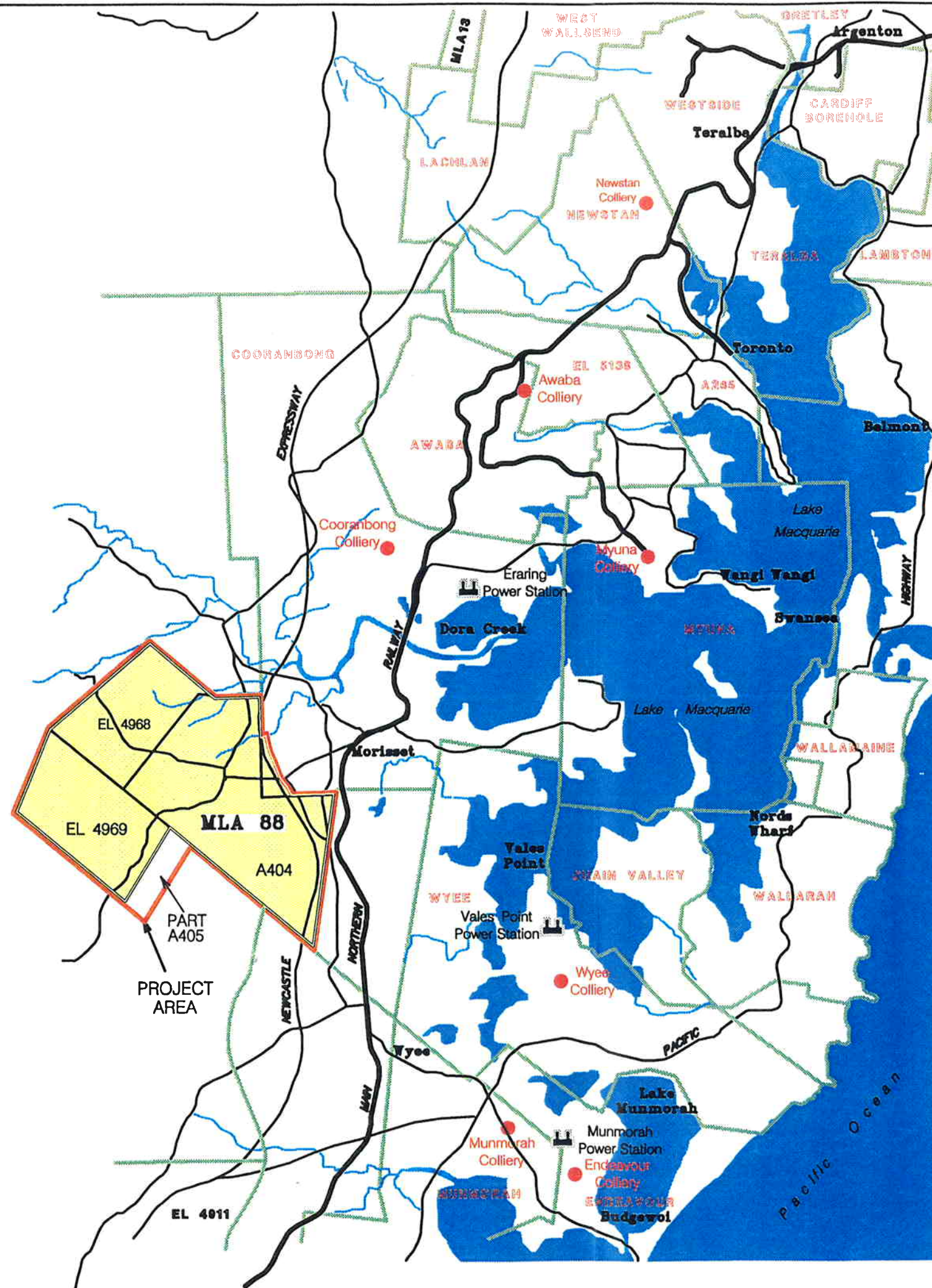


FIGURE 1.1
Locality Plan

Scale 1:150 000

Date: September 1997



LEGEND:

- COLLIERY HOLDING, AUTHORISATION OR EL BOUNDARY
- PROJECT AREA

FIGURE 1.2
Colliery Holdings

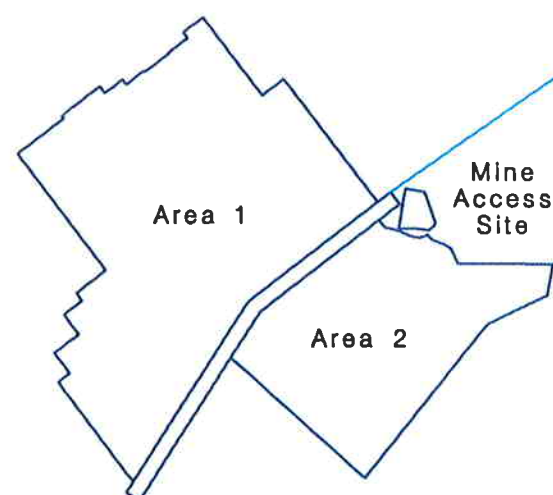
Scale 1:150 000

Date: September 1997

COAL MINE OPERATION

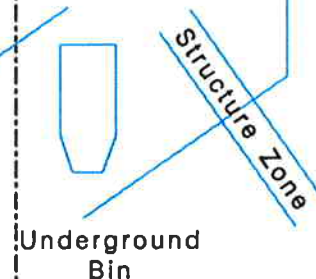
Underground Mining using:

- Longwall in Area 1 to produce approximately 3 million tonnes per year.
- Bord and Pillar and Panel Extraction in Area 2 to produce approximately 0.5 million tonnes per year
- Mine Access Site for materials and personnel only.
- No Production Coal handling at this site.



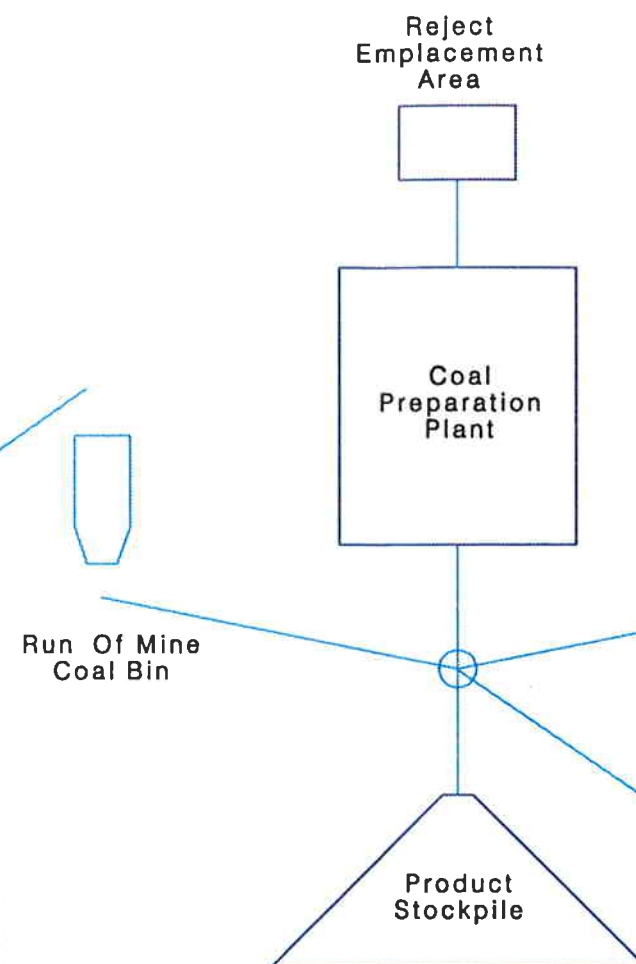
COAL CLEARANCE

Coal transported underground to Cooranbong Colliery utilising existing conveyor system.



COAL PREPARATION

Cooranbong Colliery Site at Dora Creek to be utilised. Infrastructure upgraded to include a Coal Preparation Plant and additional R.O.M. and Product Coal Stockpiles.



COAL DISPATCH

Approximately 1.5 to 2.0 million tonnes of export coal will be transported by Private Haul Road to the existing Rail Loop at Newstan Colliery. An additional 1.5 to 2.0 million tonnes of domestic coal will be transported via the existing Pacific Power conveyor to Eraring Power Station.

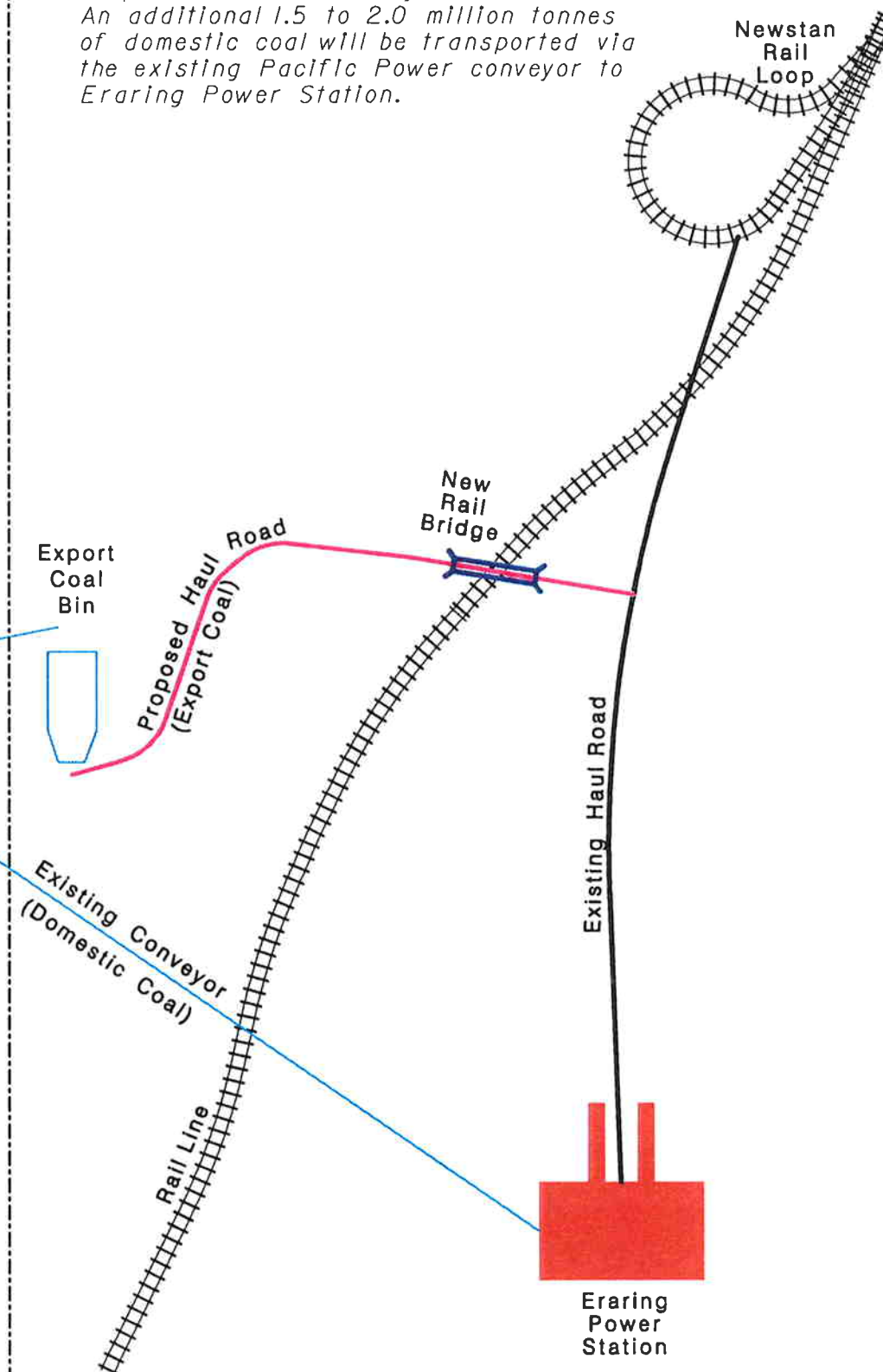
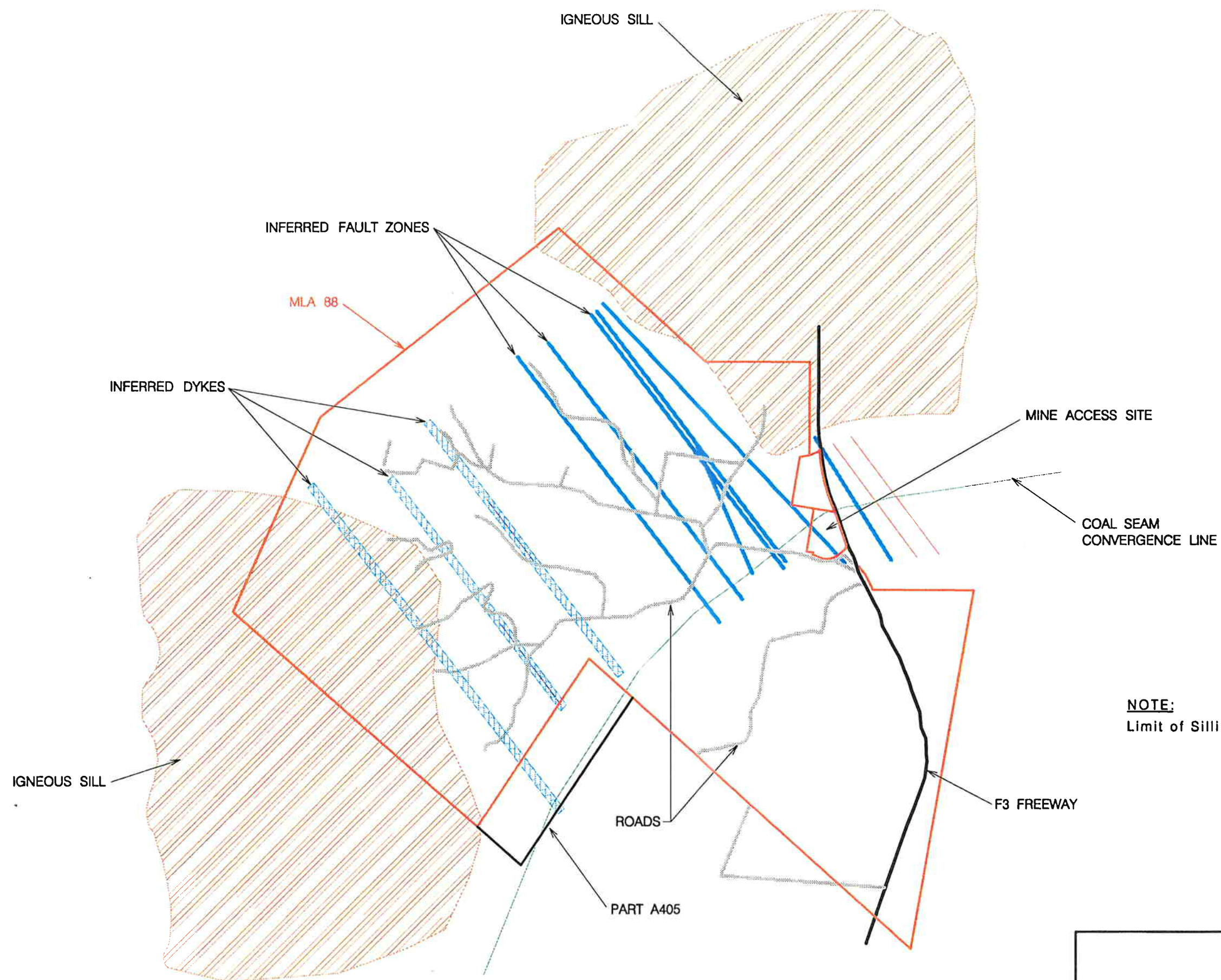


FIGURE 2.1
Key Project Components



NOTE:
Limit of Silling Inferred from Boreholes

FIGURE 2.2
Geological Features

LEGEND Lithology Reference

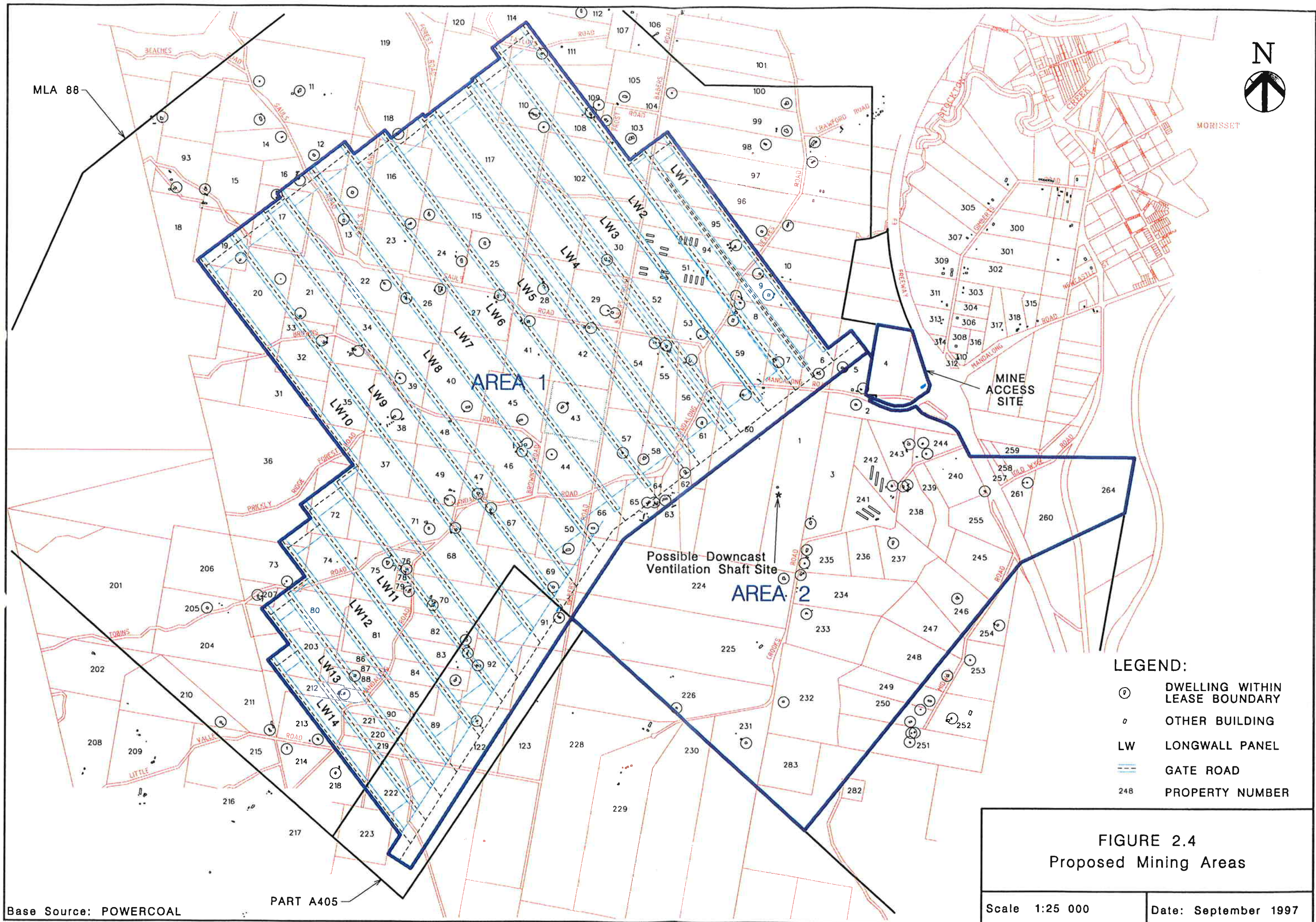
- SOIL
- ALLUVIUM
- SANDSTONE
- SILTSTONE
- CONGLOMERATE
- SHALE
- MUDSTONE
- COAL
- CARBONACEOUS SHALE
- CLAYSTONE
- COAL - shaly
- CARBONACEOUS MUDSTONE
- CORE LOSS

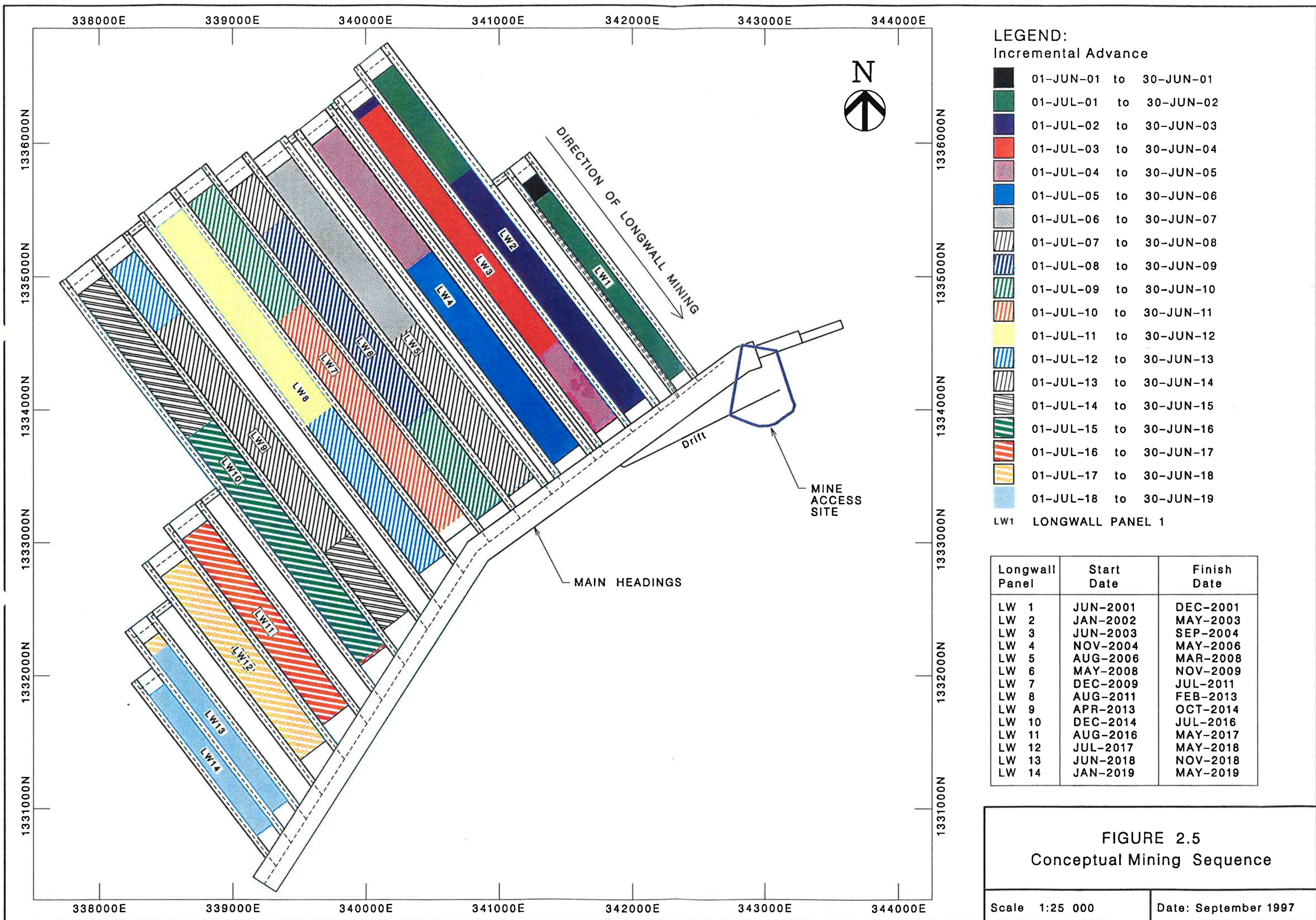
WALLARAH
GREAT NORTHERN A
GREAT NORTHERN B
AWABA TUFF
FASSIFERN A
FASSIFERN B
FASSIFERN C
FASSIFERN D
FASSIFERN E

LEGEND: Seam Expansion Reference

- | | | |
|-----|---|------------------|
| WAL | — | Wallarah |
| GNA | — | Great Northern A |
| GNB | — | Great Northern B |
| AT | — | Awaba Tuff |
| FA | — | Fassifern A |
| FB | — | Fassifern B |
| FC | — | Fassifern C |
| FD | — | Fassifern D |
| FE | — | Fassifern E |

FIGURE 2.3
Typical Geological Stratigraphy







LEGEND:



VEGETATED AREAS
(comprising grass, shrubs and trees)

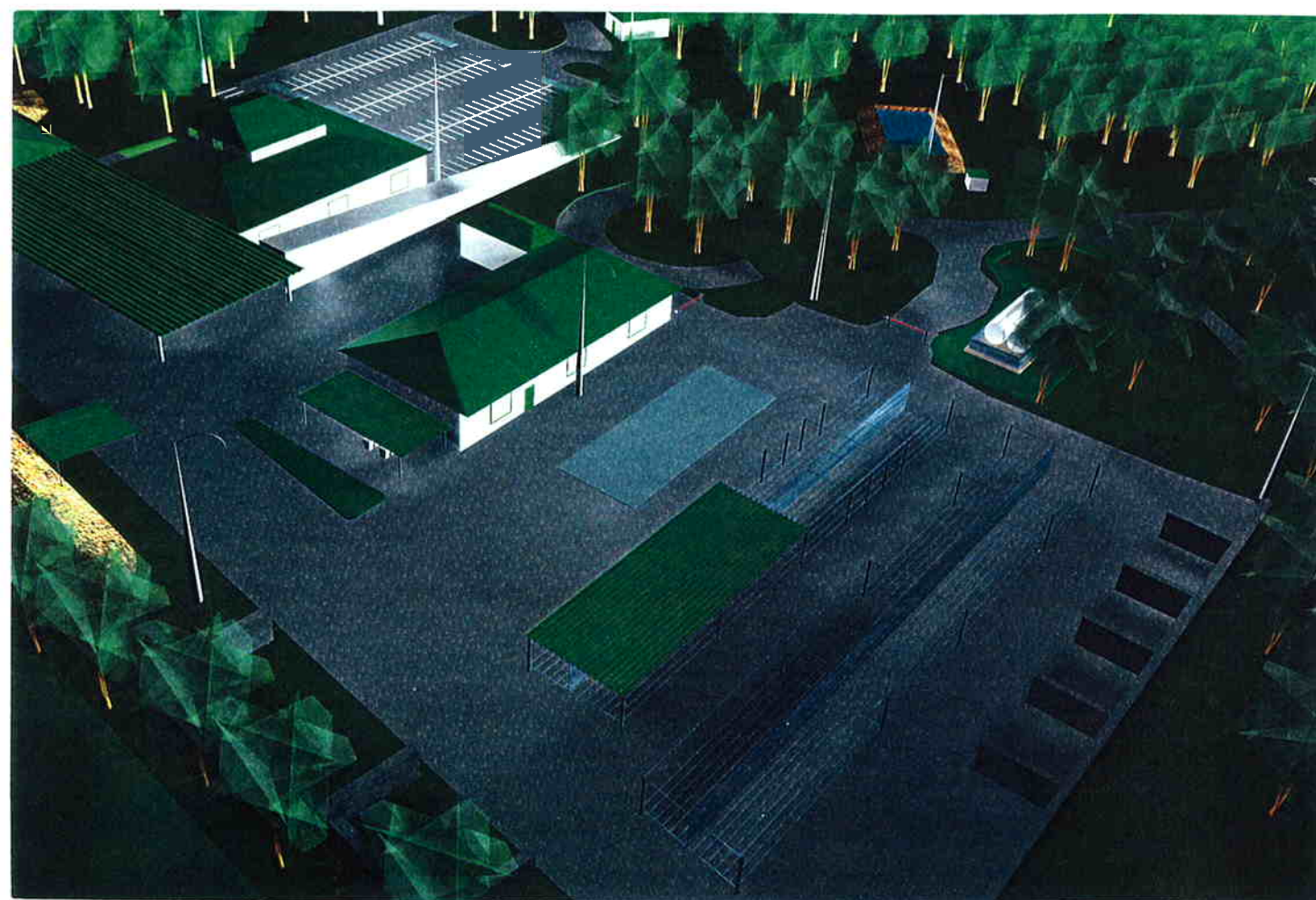
FIGURE 2.6a
Mine Access Site
Conceptual Layout



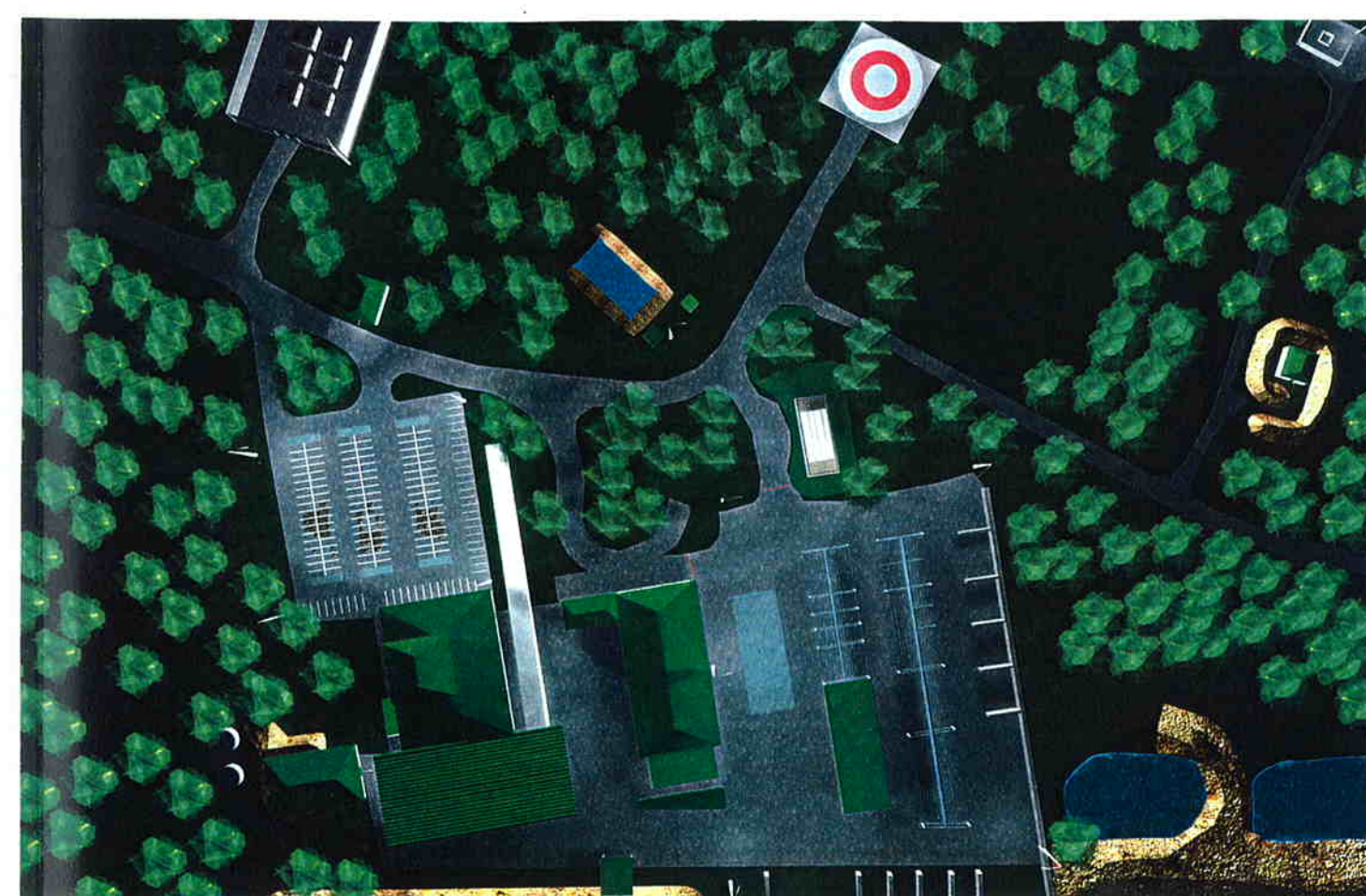
SITE ENTRY VIEW



WESTERN VIEW

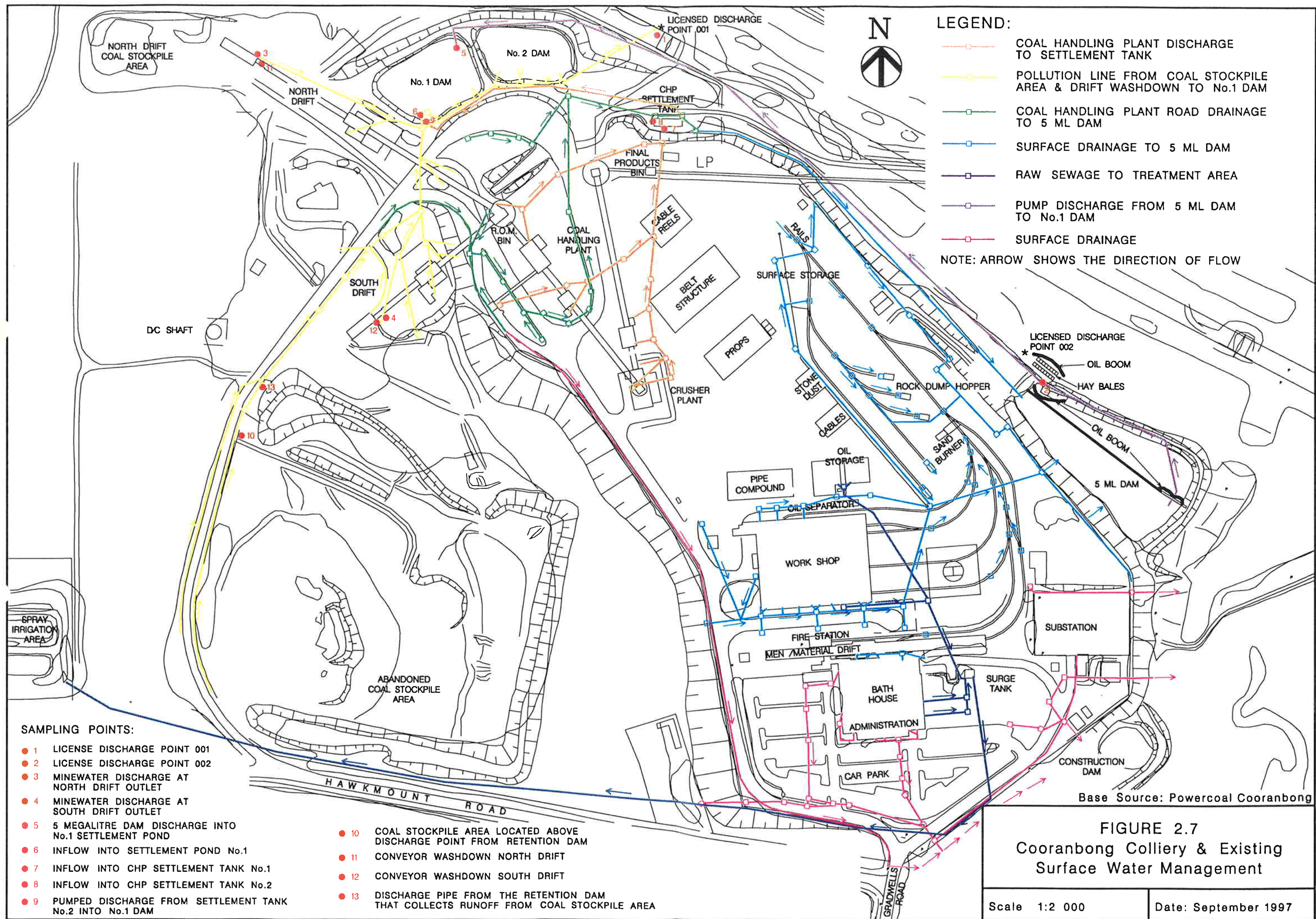


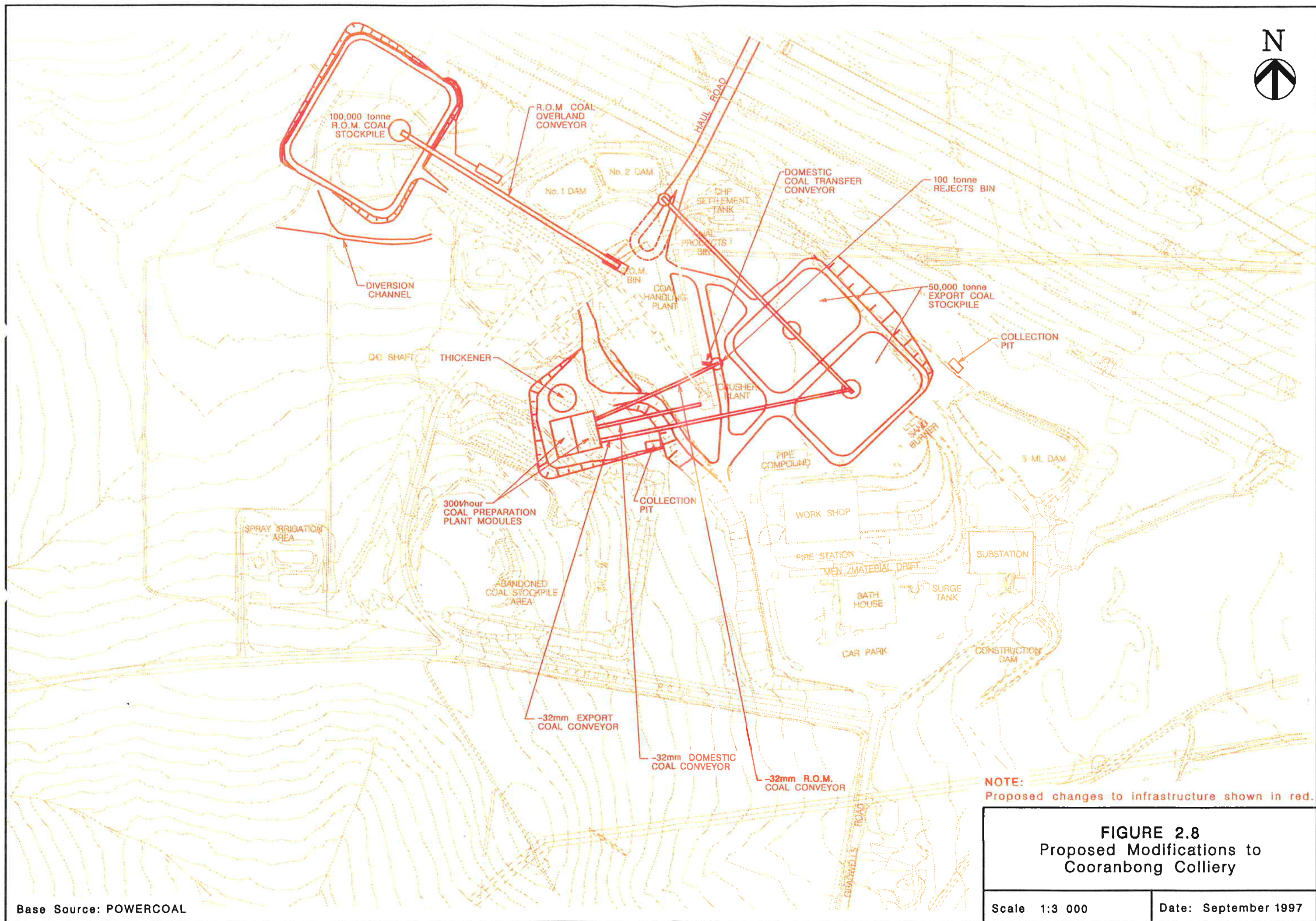
STORAGE BAYS VIEW

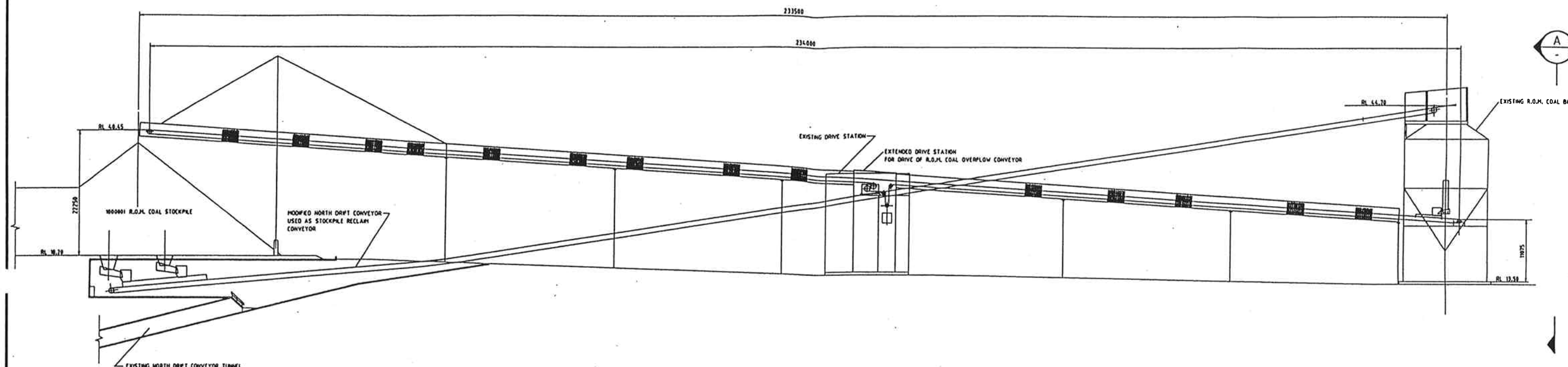


PLAN VIEW

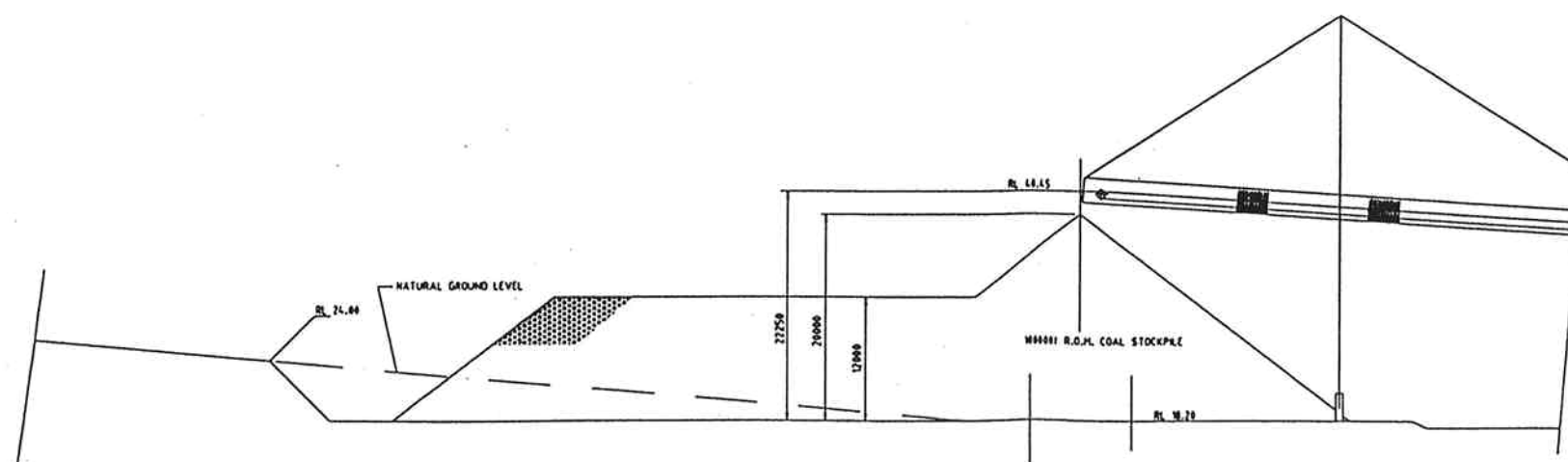
FIGURE 2.6b - PERSPECTIVE VIEWS OF MINE ACCESS SITE



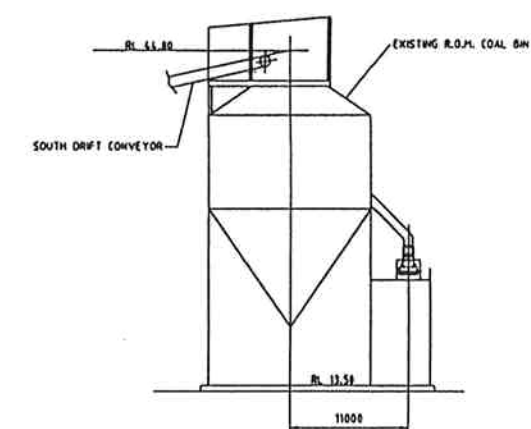




2000 t/h R.O.M. COAL OVERFLOW CONVEYOR
NORTH DRIFT CONVEYOR MODIFIED TO STOCKPILE RECLAIM CONVEYOR

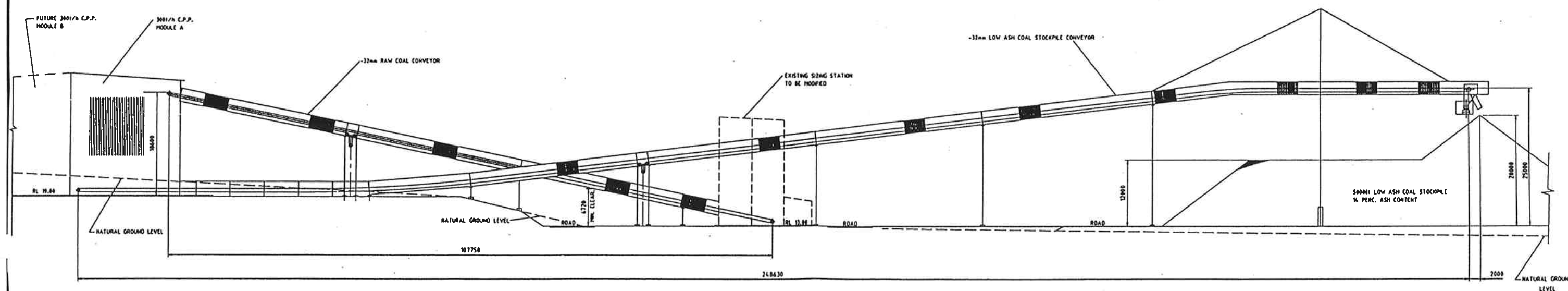


R.O.M. STOCKPILE CROSS - SECTION



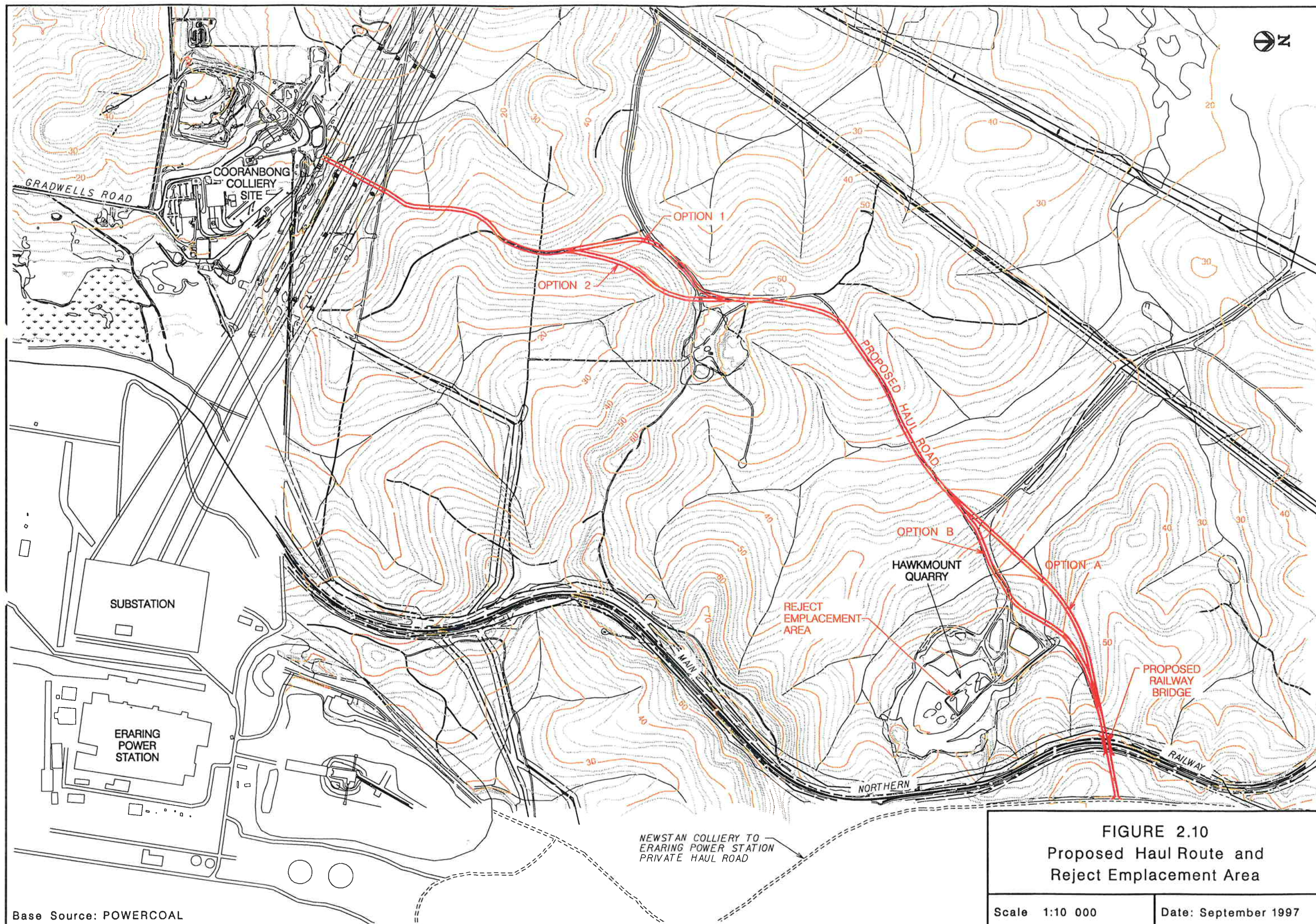
SECTION A
SCALE 1:1000

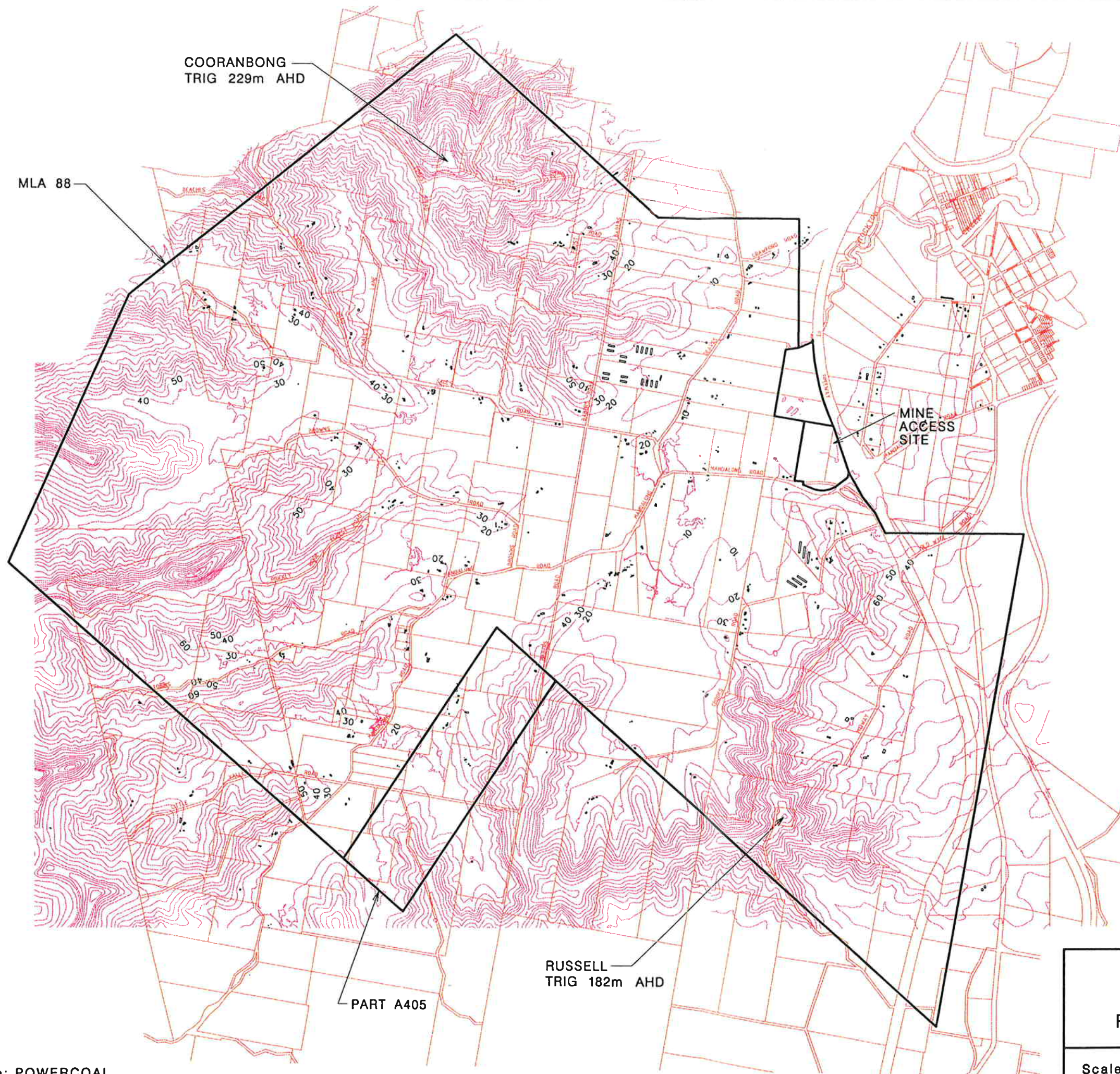
FIGURE 2.9a
Coal Handling Plant
Conveyor Elevations



LOW ASH COAL STOCKPILE CONVEYOR & RAW COAL CONVEYOR

FIGURE 2.9b
Coal Handling Plant
Conveyor Elevations





LEGEND:

- BUILDING
- 10m CONTOURS

FIGURE 3.1
Topography
Proposed Mining Lease Area



LEGEND

Slope

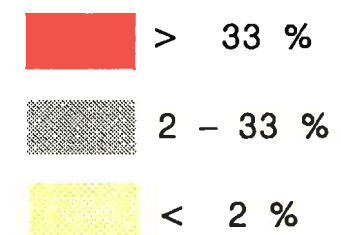
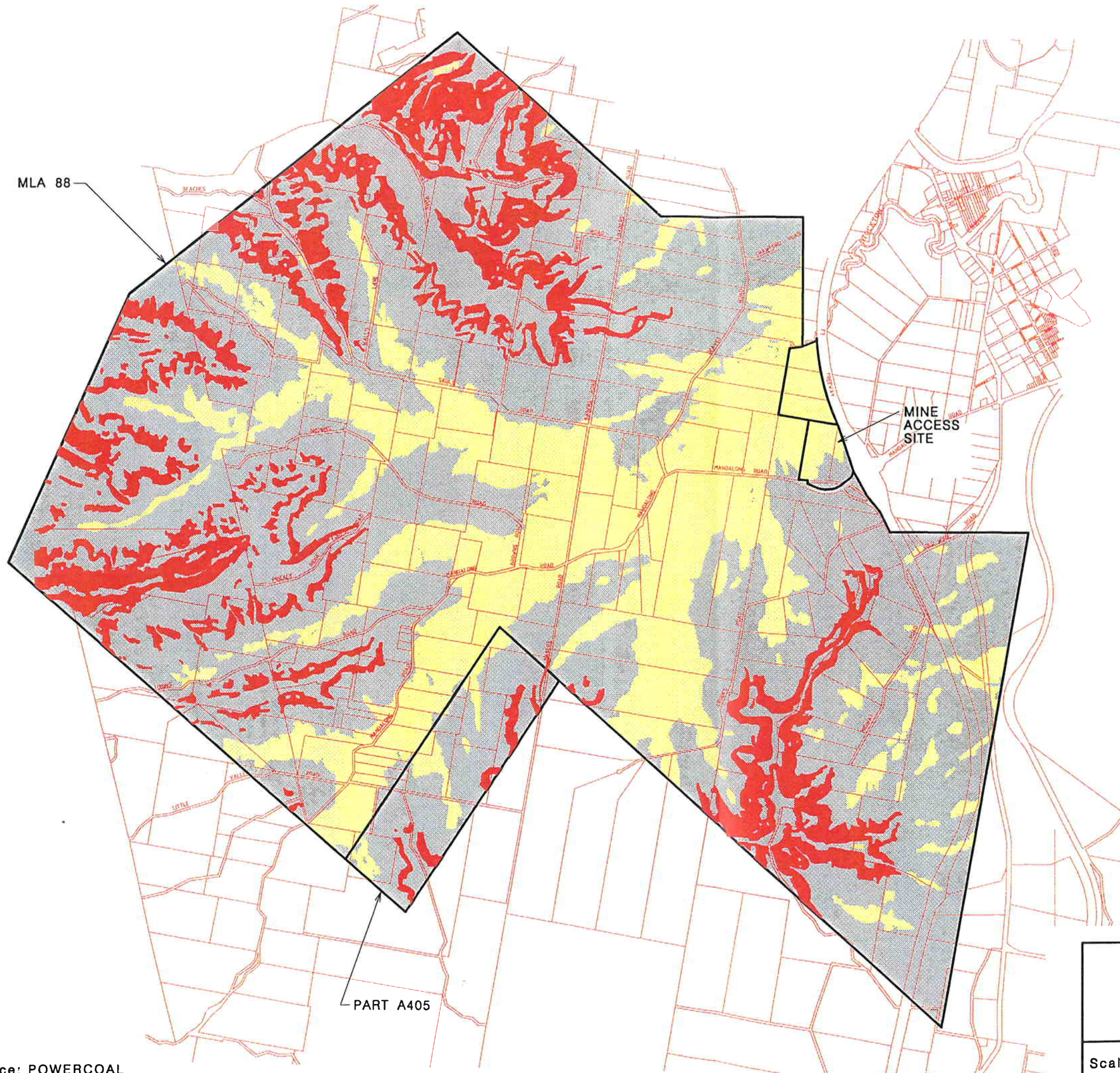


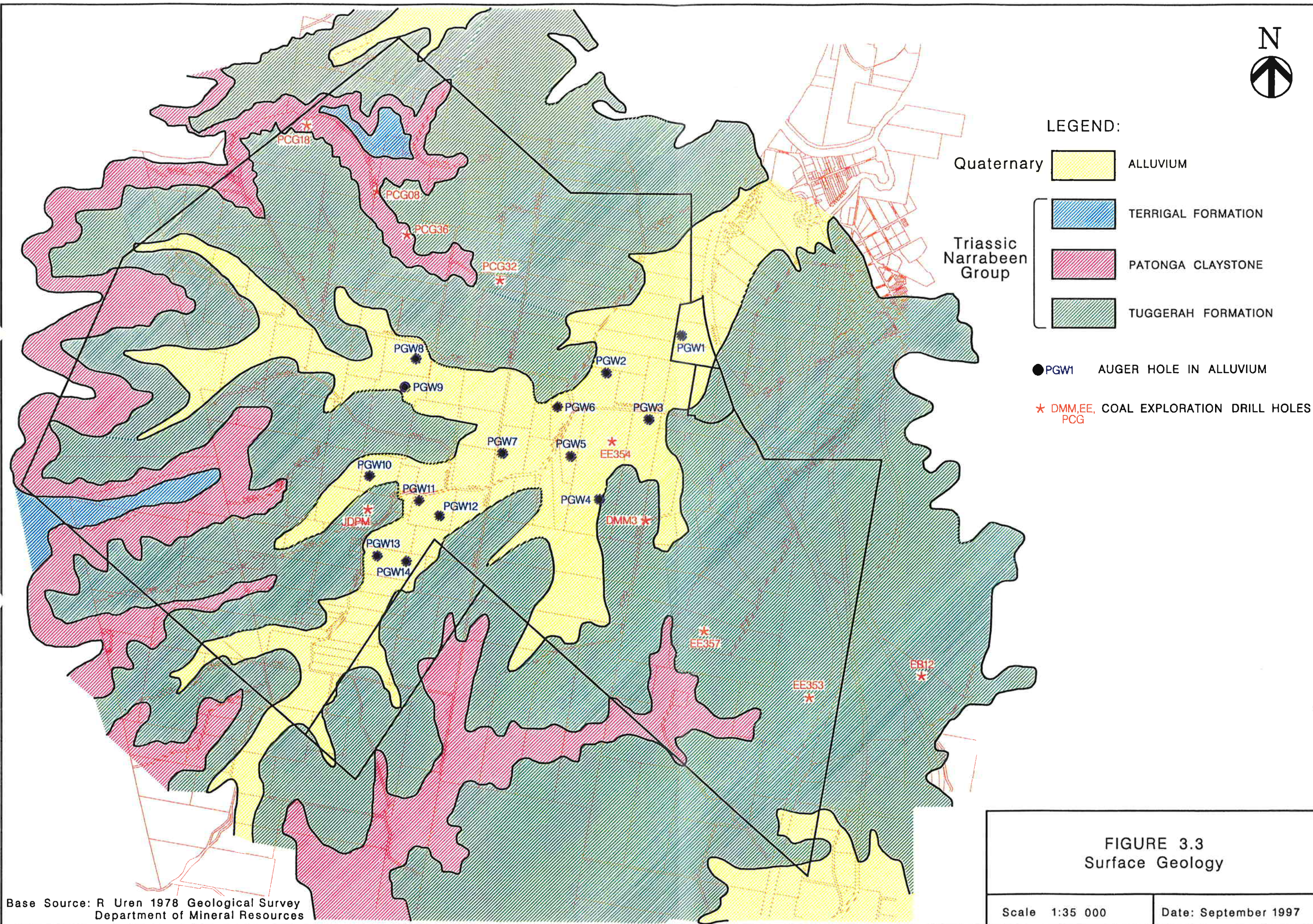
FIGURE 3.2
Slope Analysis For
Cooranbong Colliery Life
Extension Project

Scale 1:35 000

Date: October 1997

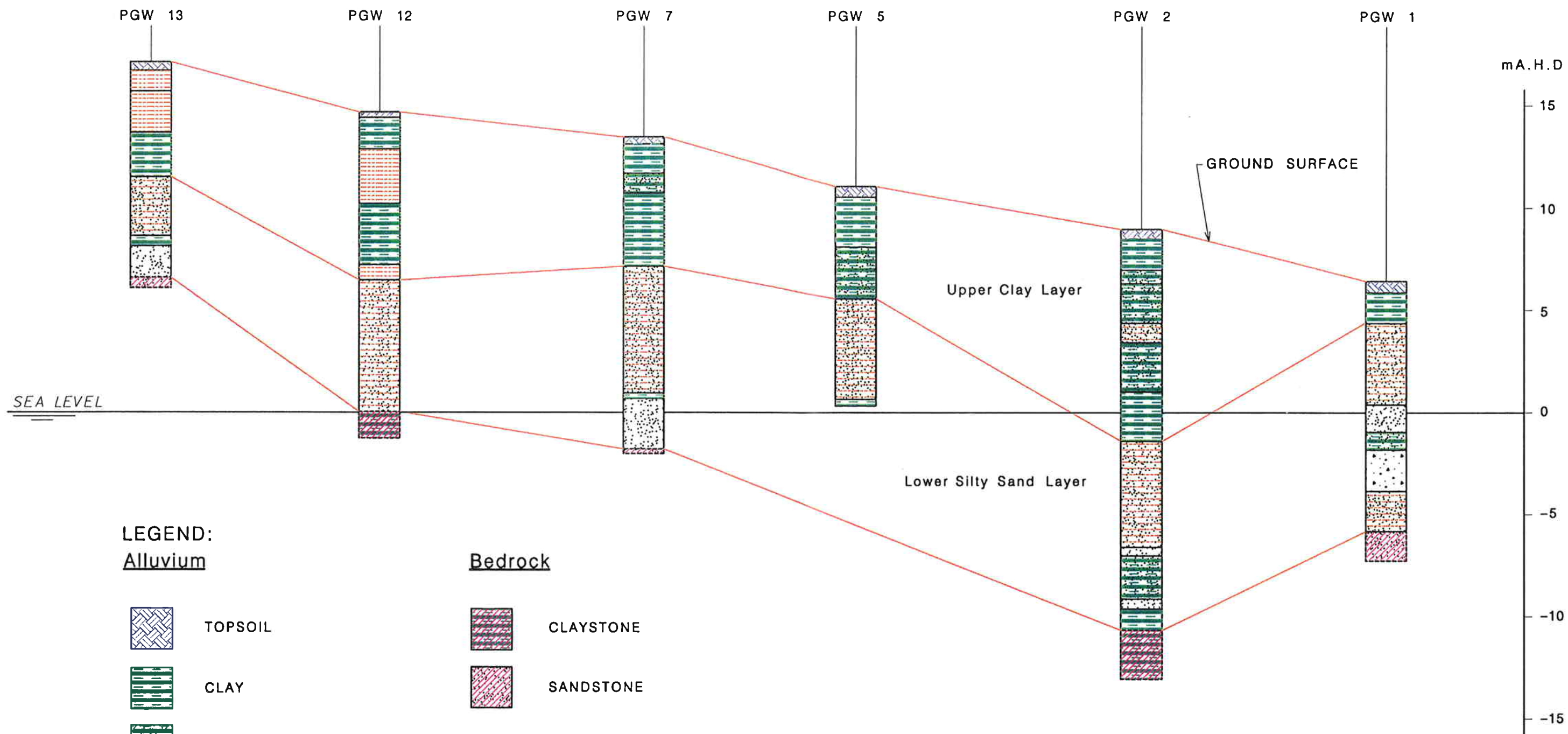
Base Source: POWERCOAL





SOUTHWEST

NORTHEAST



LEGEND:
Alluvium

-  TOPSOIL
-  CLAY
-  CLAY/SAND
-  SILT
-  SILT/SAND
-  SAND
-  PEBBLY SAND

Bedrock

-  CLAYSTONE
-  SANDSTONE

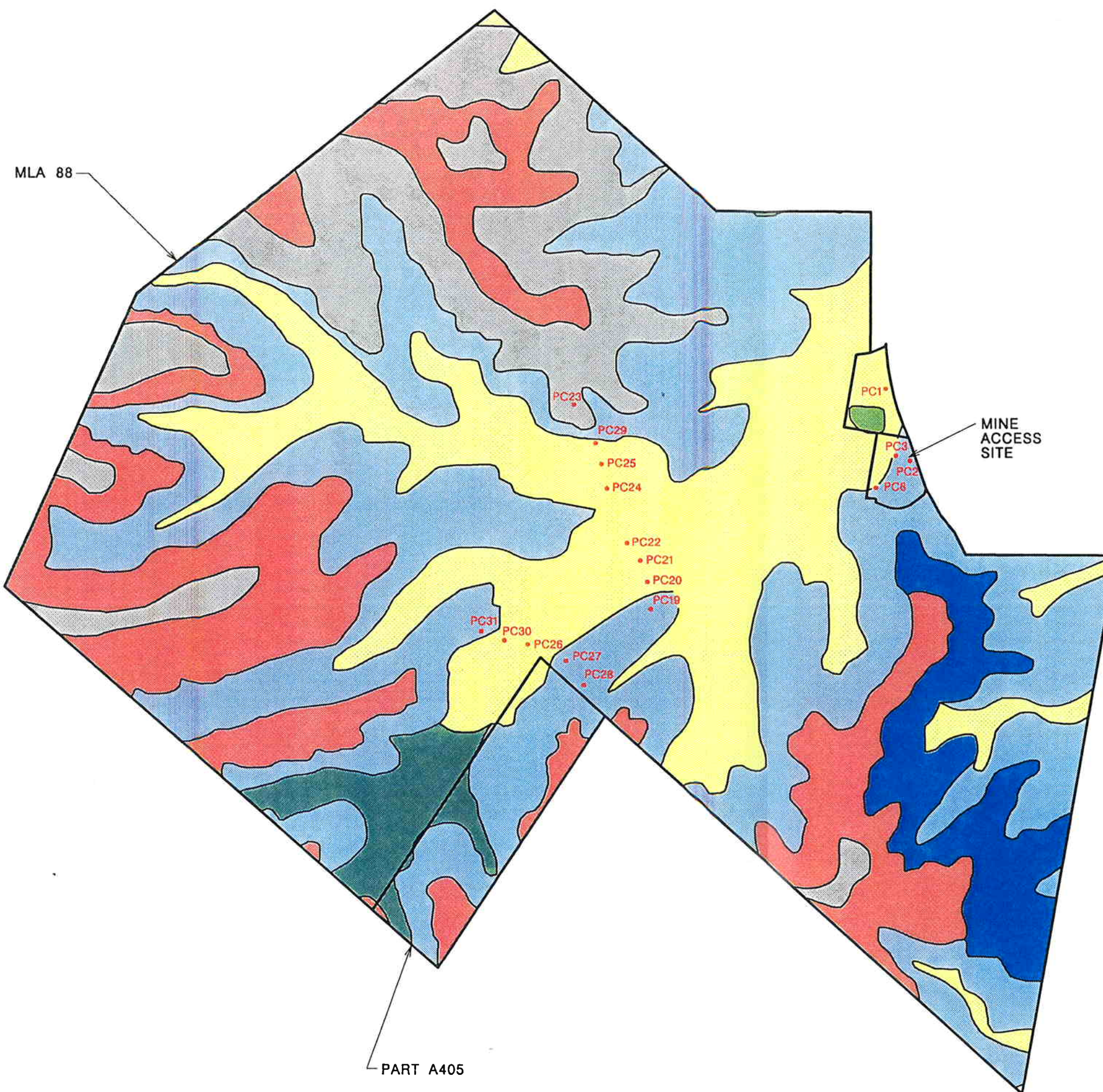
NOTE:

FOR BORE LOCATIONS SEE FIGURE 3.3

FIGURE 3.4
Typical Alluvium Characteristics
Southwest – Northeast Cross Section

Scale: H = 1:10 000
V = 1:200

Date: September 1997



LEGEND:
SOIL LANDSCAPES

- DOYALSON
- WYONG
- YARRAMALONG
- GOROKAN
- MANDALONG
- WATAGAN
- WOODBURY'S BRIDGE
- DISTURBED TERRAIN
- PC25 - SOIL SAMPLING POINT

FIGURE 3.5
Soil Distribution
Proposed Mining Lease Area

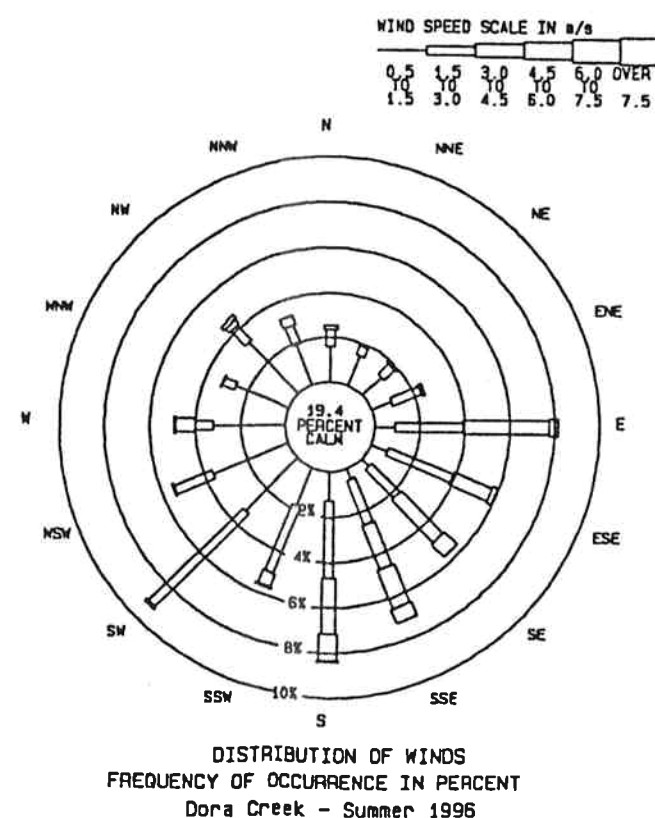
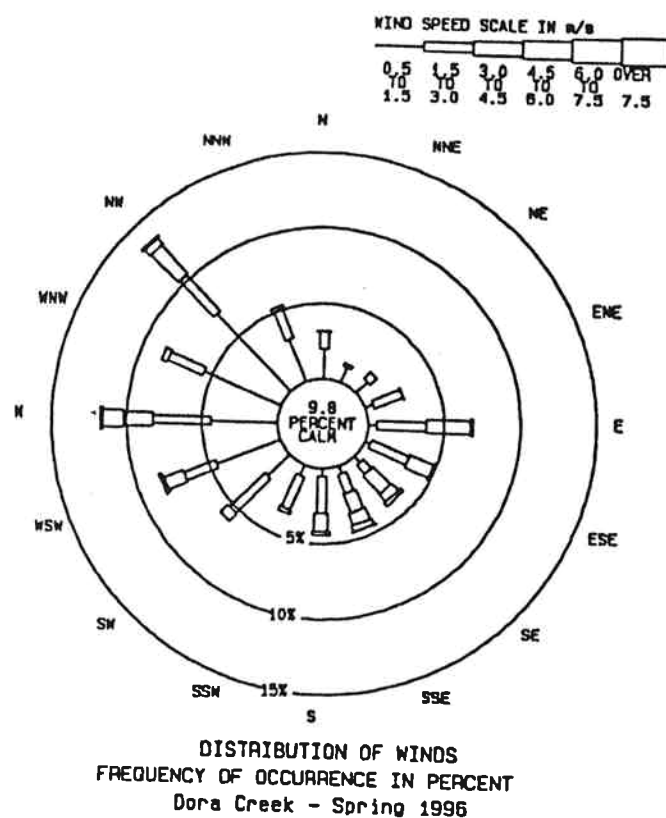
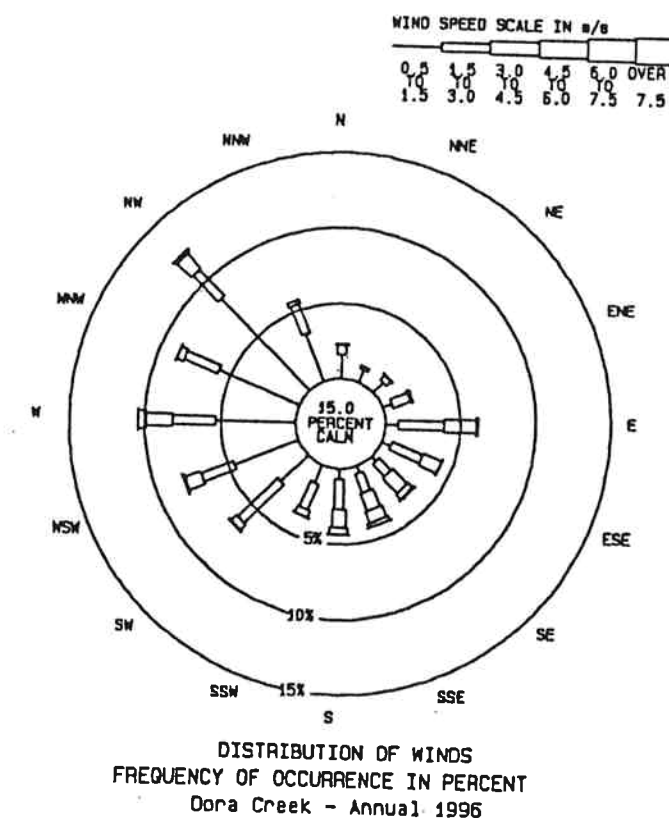
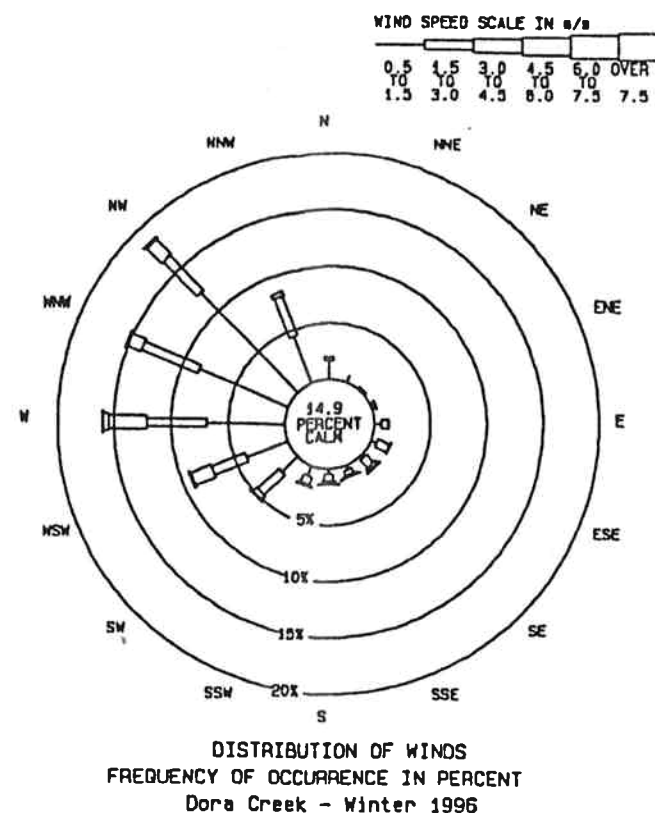
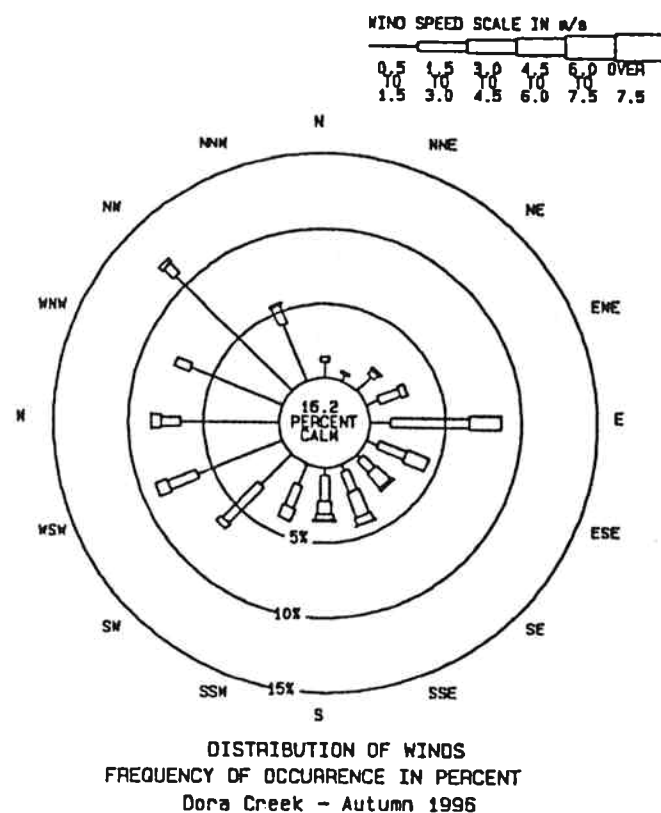
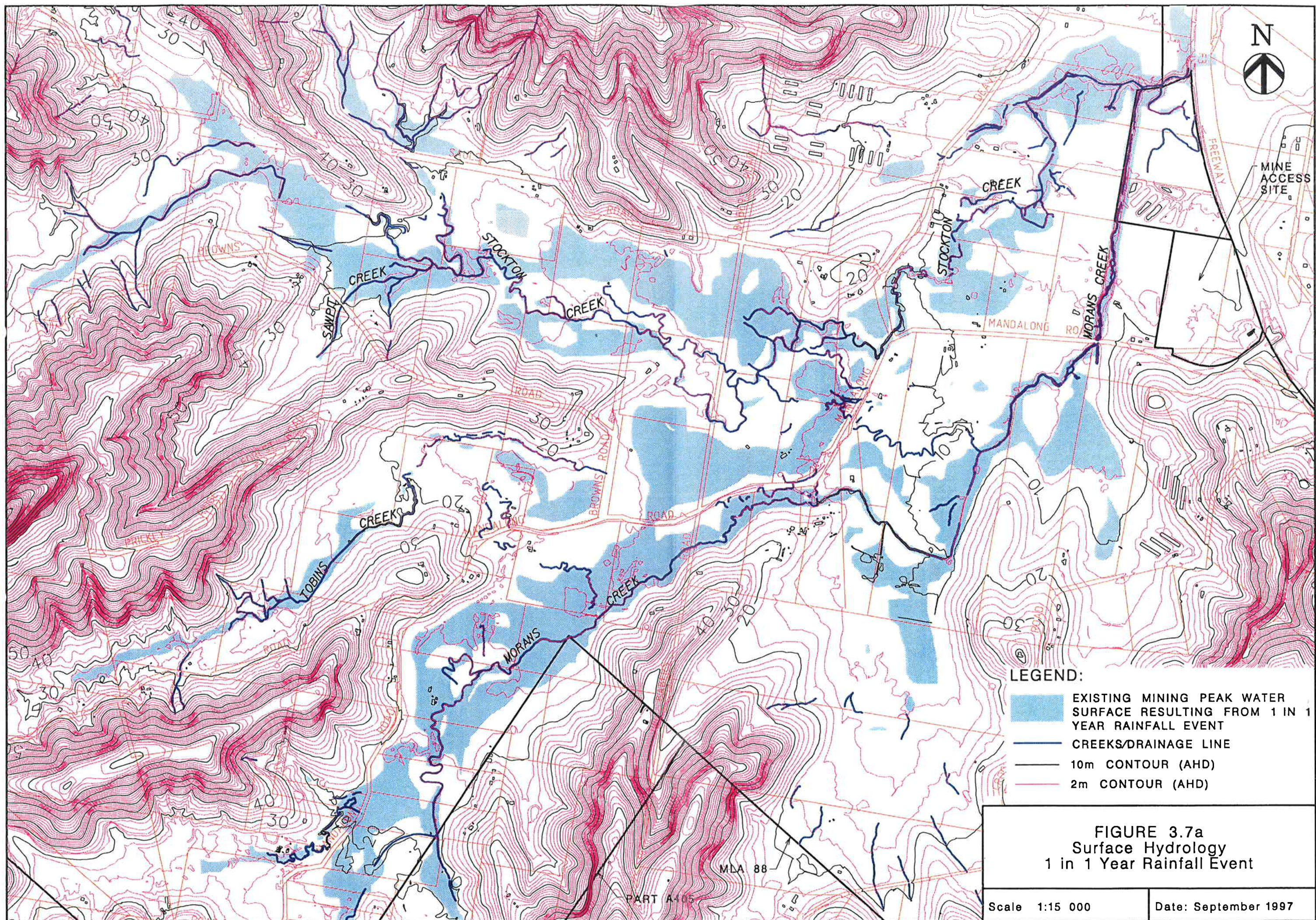
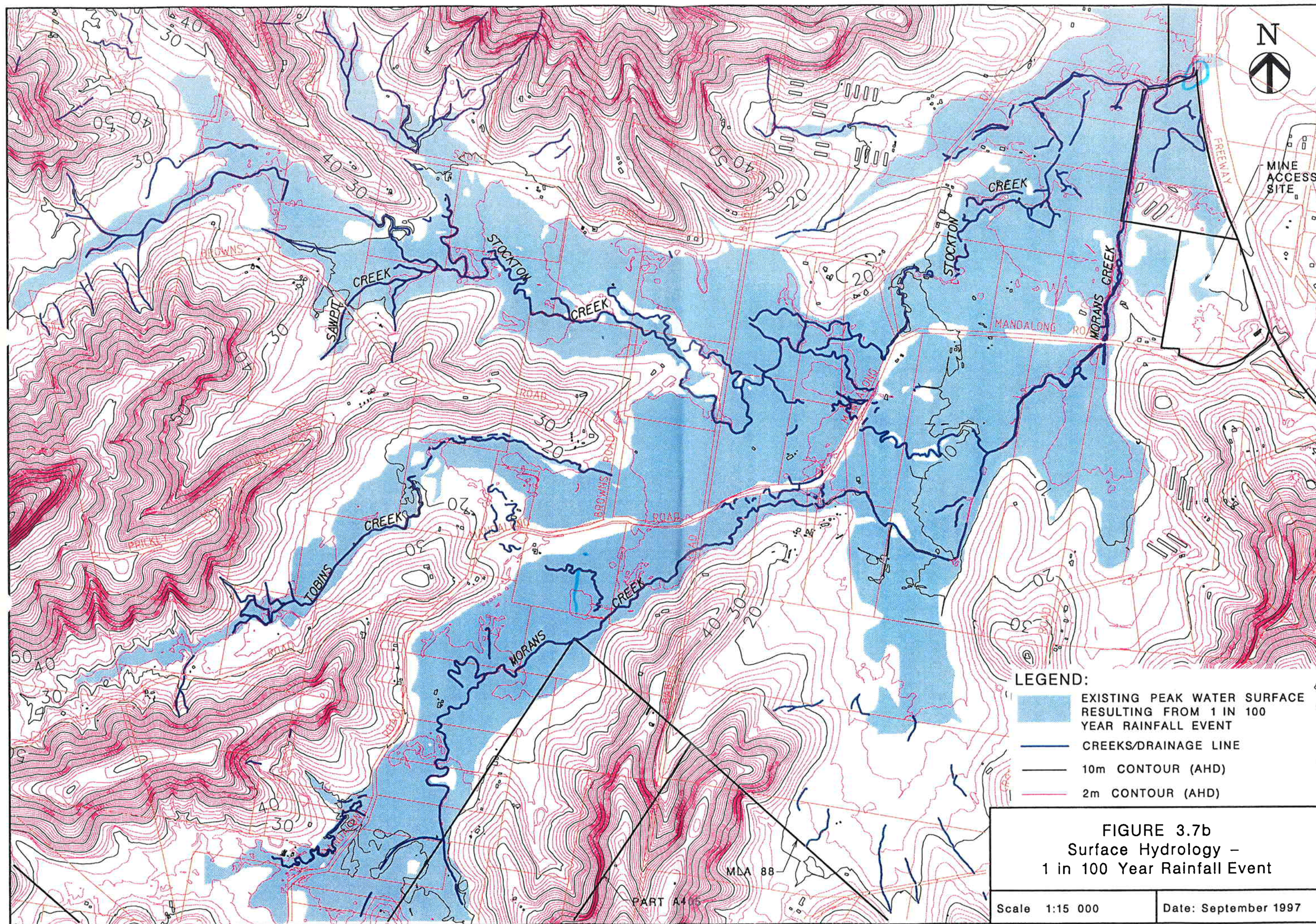


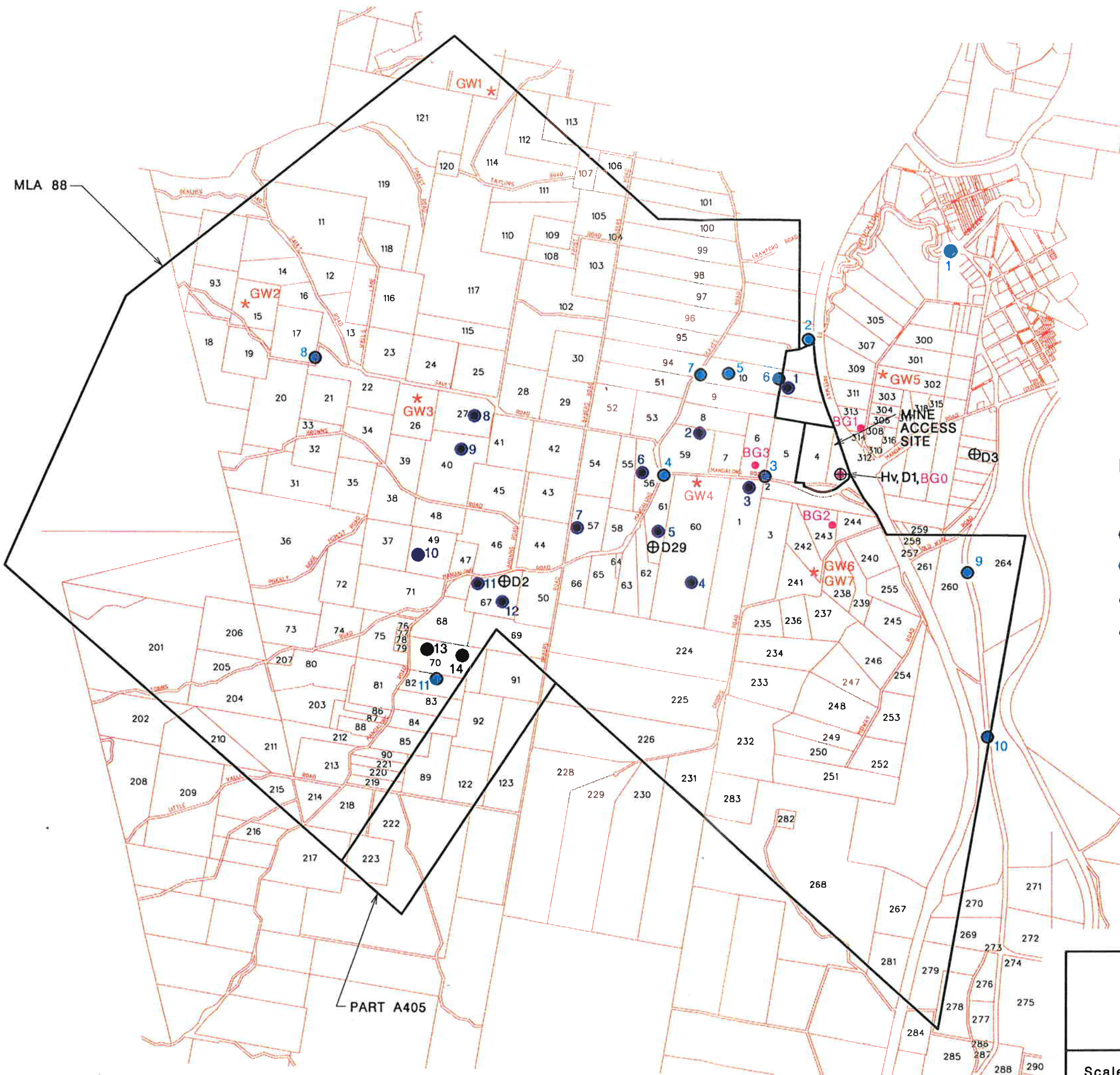
FIGURE 3.6
Wind Speed & Direction

Scale - Not to Scale

Date: September 1997







LEGEND:

- 301 LAND OWNERSHIP
- 1 GROUNDWATER MONITORING SITES
- 1 SURFACE WATER MONITORING SITES
- ⊕ D1 STATIC DUST DEPOSITION GAUGE
- ⊕ Hv HIGH VOLUME AIR SAMPLER
- BG NOISE MONITORING SITE
- ★ GW LICENCED GROUNDWATER BORE

FIGURE 3.8
Land Ownership &
Monitoring Sites

Scale 1:35 000

Date: September 1997



LEGEND:

-  MODERATELY TO HIGHLY DISTURBED
+/- some remnant tree cover. Tree species include
Eucalyptus amplifolia, *Eucalyptus robusta* and
occasional *Eucalyptus tereticornis*.
-  FLOODPLAIN
Eucalyptus amplifolia, *Eucalyptus robusta* emergents
with *Melaleuca* spp. and *Leptospermum* spp.
-  WETLAND
Baumea sp., *Eleocharis* sp., *Juncus* sp.,
Philydrum sp., *Typha* sp.
-  OPEN FOREST/FOREST
Corymbia maculata, *Eucalyptus punctata*, *Eucalyptus paniculata*,
Eucalyptus pilularis, *Eucalyptus saligna*
-  FOREST/RIPARIAN FOREST
Eucalyptus acmenoides, *Eucalyptus paniculata*,
Eucalyptus pilularis, *Eucalyptus microcorys*, *Eucalyptus saligna*
-  FOREST (+/- CLOSED FOREST)
Archontophoenix cunninghamiana, *Syncarpia glomulifera*,
Pittosprum spp., *Backhousia* sp. with emergents
Eucalyptus saligna, *Eucalyptus pilularis*
-  OPEN FOREST/FOREST
Eucalyptus umbra, *Angophora costata*, *Syncarpia*
glomulifera, *Eucalyptus piperita*, *Corymbia gummifera*
-  OPEN FOREST/WOODLAND
Corymbia gummifera, *Angophora costata*, *Eucalyptus*
haemastoma, +/- *Eucalyptus capitellata*
-  OUTSIDE PROPOSED MINING AREA
-  SEALED AND UNSEALED ROAD

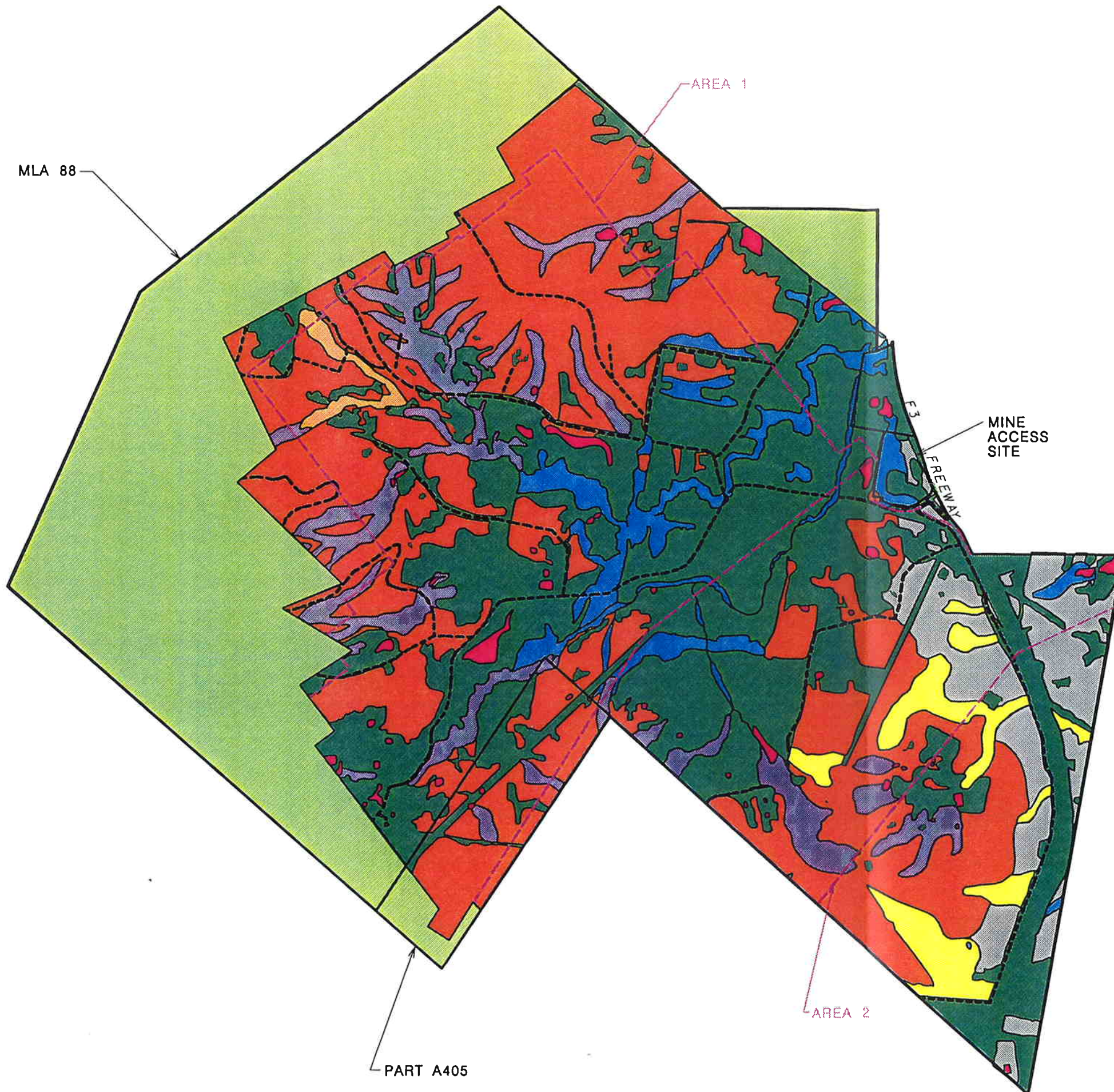


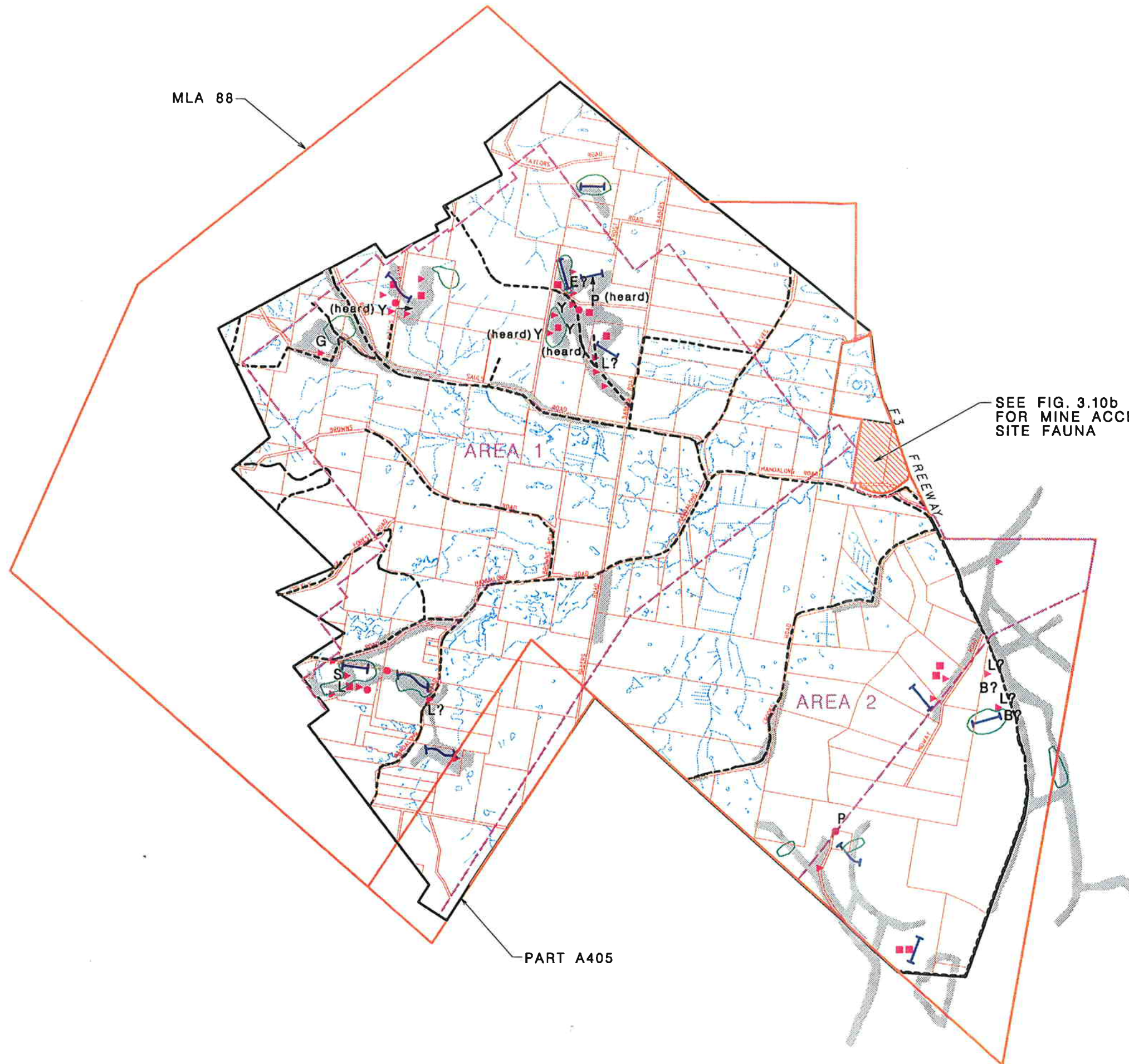
FIGURE 3.9a
Vegetation Communities in
Proposed Mining Lease Area

Scale 1:35 000

Date: September 1997



MLA 88



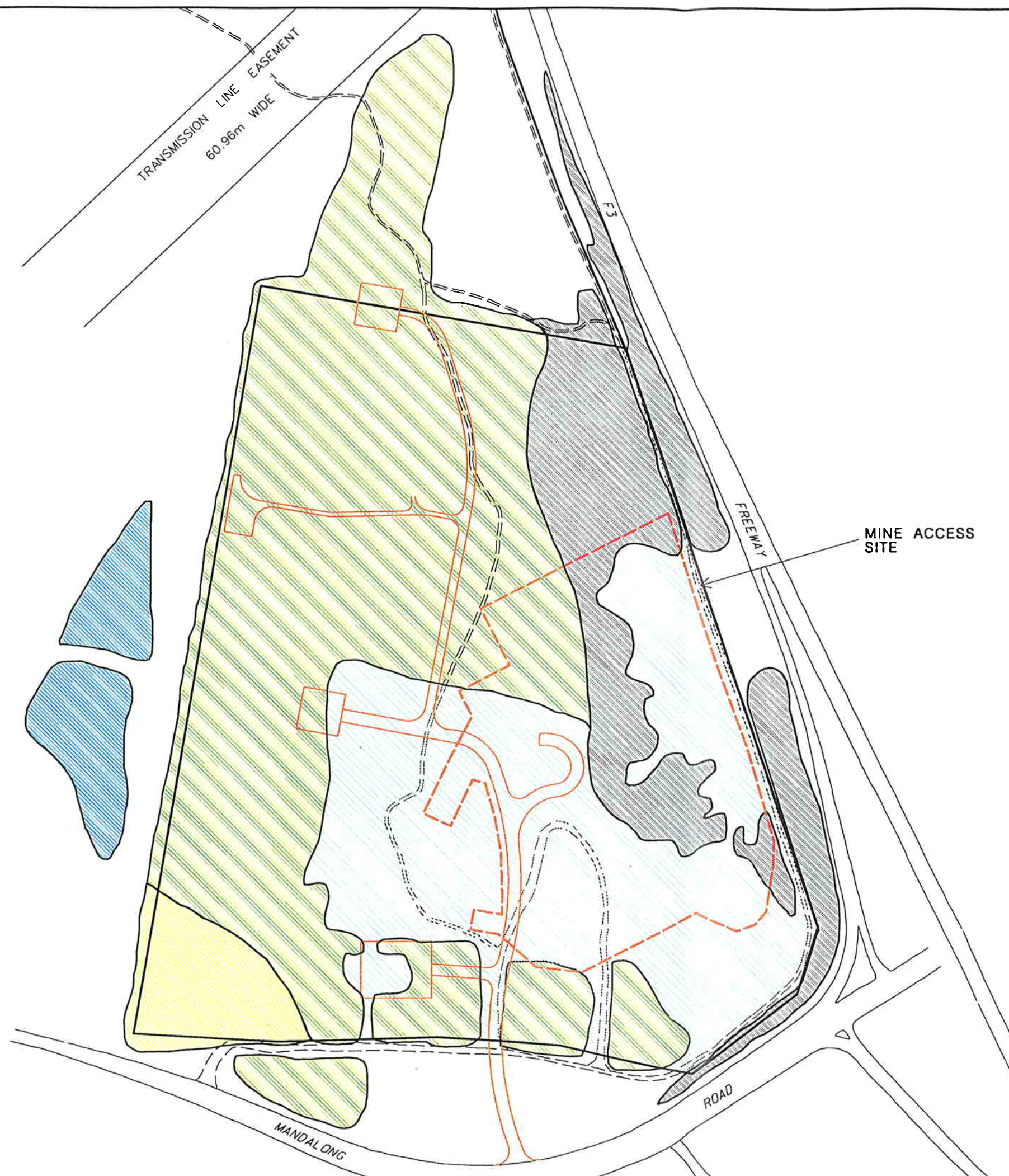
LEGEND:

- Spotlighting Area
- Anabat II Bat Detector
- Harp Trap
- Owl Call Playback
- Trapline
- Boundary of Specific Herpetofauna Search
- Road
- Creek
- Boundary of Study Area
- S Squirrel Glider
- Y Yellow-Bellied Glider
- G Giant Barred Frog
- P Powerful Owl
- L Little Bent-Wing Bat
- B Large Bent-Wing Bat
- E Eastern Freetail Bat
- N Greater Broad-Nosed Bat
- ? Tentative Recording
- Direction from which call was heard

FIGURE 3.9b
Fauna Survey &
Threatened Species Locations
in Proposed Mining Lease Area

Scale 1:35 000

Date: September 1997



LEGEND:

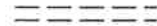
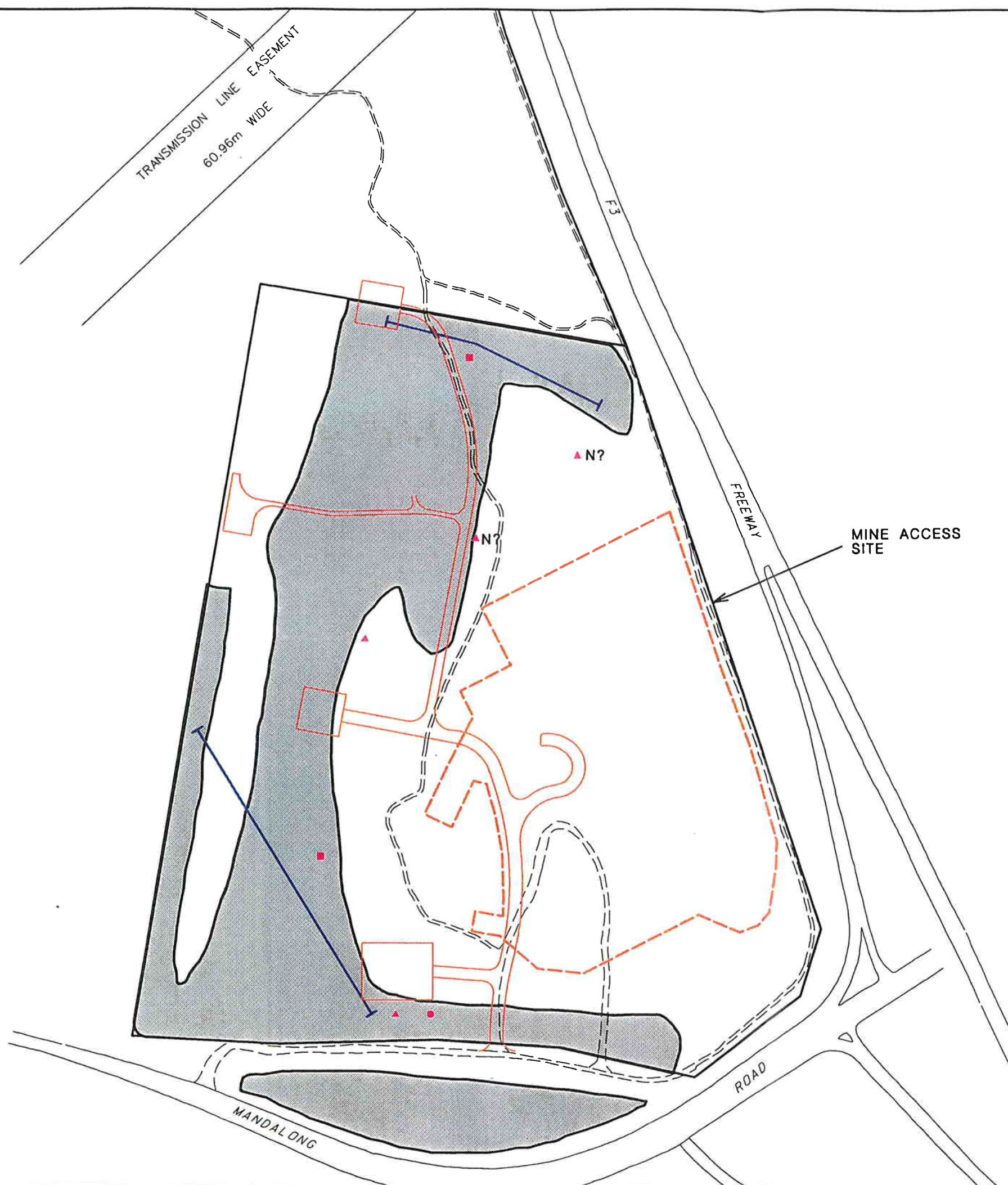
-  FLOODPLAIN VEGETATION
-  OPEN-FOREST/FOREST
-  OPEN-FOREST/WOODLAND
-  CLEARED OR DISTURBED AREA
-  DAM
-  BOUNDARY OF PROPOSED DEVELOPMENT
-  EXISTING TRACKS/ROADS
-  PROPOSED ROADS

FIGURE 3.10a
Vegetation Communities on the
Mine Access Site

Scale 1:3 000

Date: September 1997



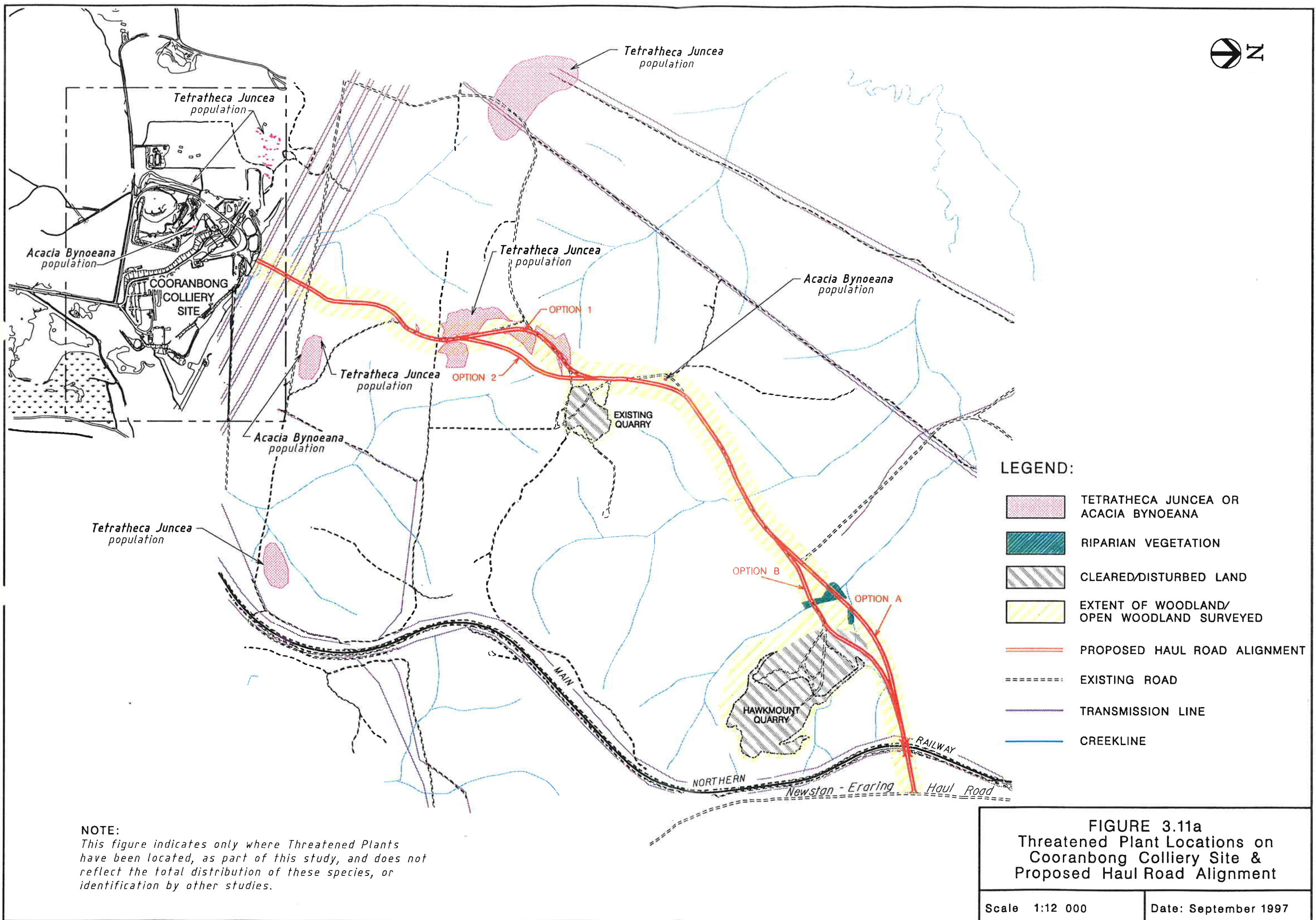
LEGEND:

-  Spotlighting Area
-  Anabat II Bat Detector
-  Harp Trap
-  Owl Call Playback
-  Trapline
-  Tentative Recording of the Greater Broad-Nosed Bat
-  Boundary of Subject Site
-  Boundary of Proposed Development
-  Existing Tracks/Roads
-  Proposed Roads

FIGURE 3.10b
Fauna Survey &
Threatened Fauna Locations
on the Mine Access Site

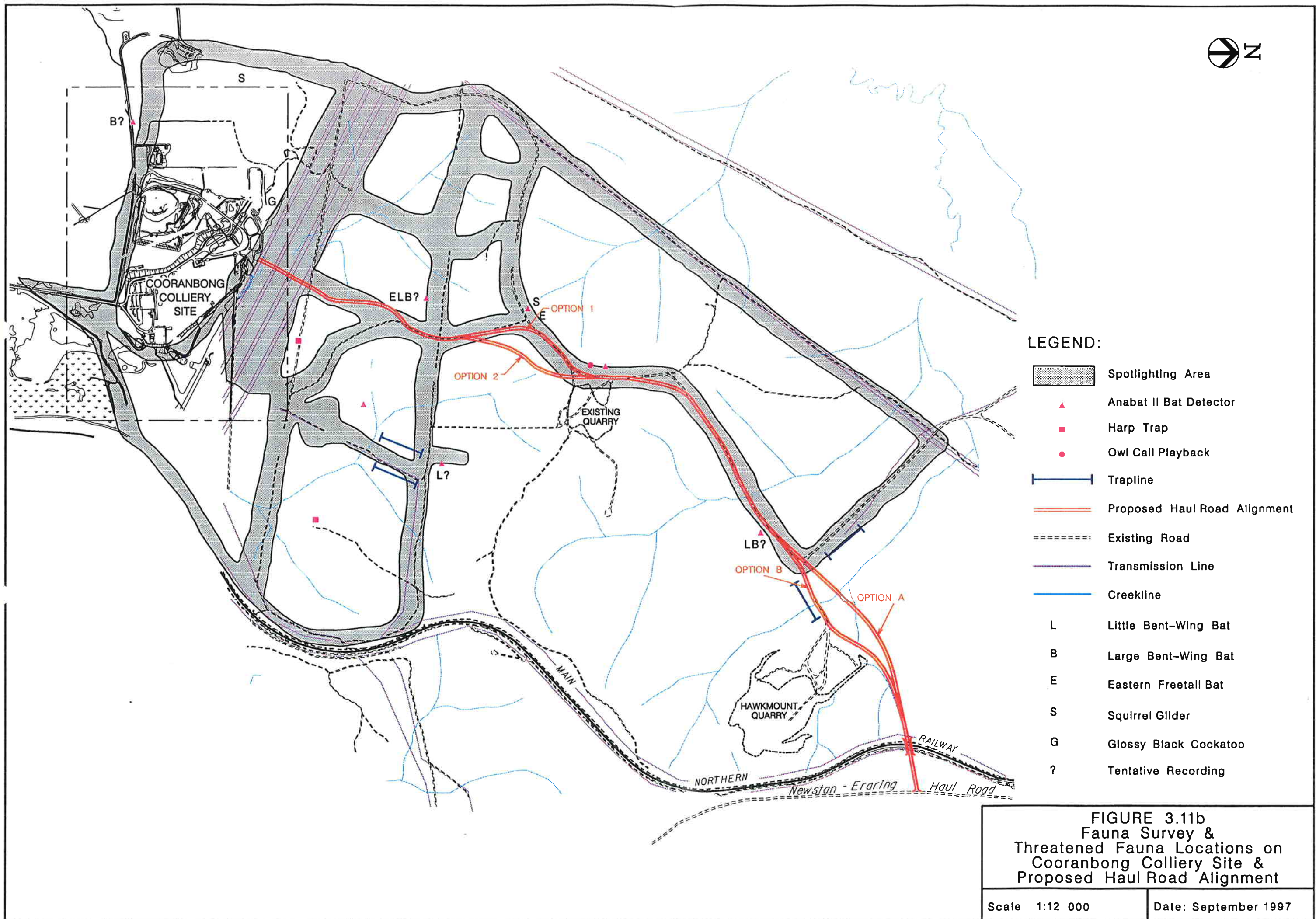
Scale 1:3 000

Date: September 1997



NOTE:
 This figure indicates only where Threatened Plants have been located, as part of this study, and does not reflect the total distribution of these species, or identification by other studies.

FIGURE 3.11a
 Threatened Plant Locations on
 Cooranbong Colliery Site &
 Proposed Haul Road Alignment





MLA 88

MINE
ACCESS
SITE

LEGEND:

AGRICULTURAL SUITABILITY CLASSES

CLASS 3.

Grazing land or land well suited to pasture improvement. It may be cultivated or cropped in rotation with pasture. The overall level of production is moderate as a result of edaphic or environmental constraints. Erosion hazard or soil structural breakdown limit the frequency of ground disturbance, and conservation or drainage works may be required.

CLASS 4.

Land suitable for grazing but not for cultivation. Agriculture is based on native pastures or improved pastures established using minimum tillage techniques. Production may be high seasonally but the overall level of production is low as a result of a number of major constraints, both environmental and edaphic.

CLASS 5

Land unsuitable for agriculture or at best suited only to light grazing. Agricultural production is very low or zero as a result of severe constraints, including economic factors, which preclude improvement.

Contour Interval 10m

FIGURE 3.12a
Agriculture Suitability

Scale 1:35 000

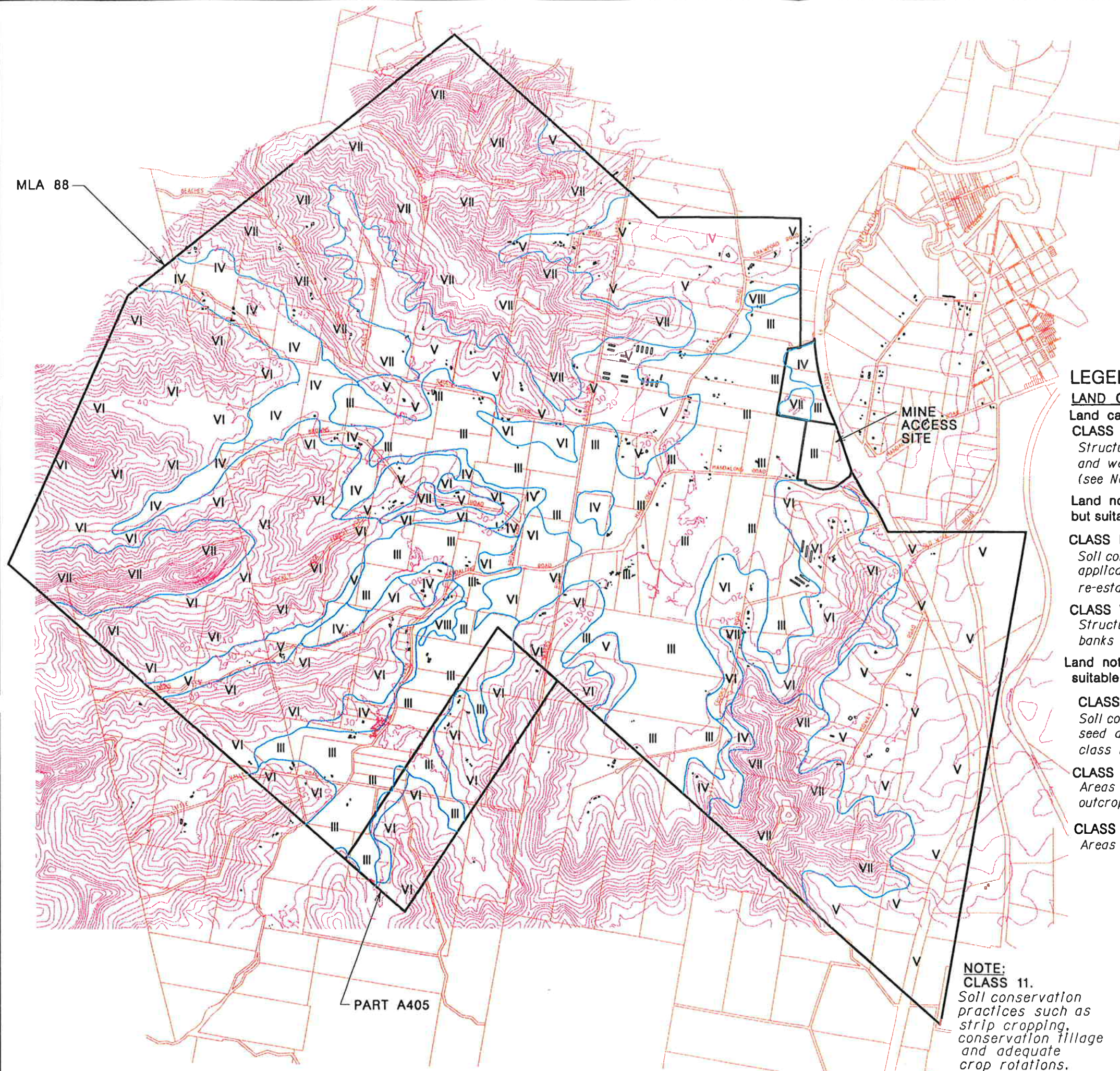
Date: September 1997

Base Source: AAM Topographic Survey

PART A405



MLA 88



LEGEND:

LAND CAPABILITY CLASSES

Land capable of being regularly cultivated
CLASS III.

Structural soil conservation works such as diversion banks, graded banks and waterways, together with soil conservation practices as in Class II. (see Note)

Land not capable of being regularly cultivated
but suitable for grazing with occasional cultivation

CLASS IV.

Soil conservation practices such as pasture improvement, stock control, application of fertiliser and minimal cultivation for the establishment or re-establishment of permanent pasture.

CLASS V.

Structural soil conservation works such as absorption banks, diversion banks and contour ripping, together with the practices as in Class IV.

Land not capable of being cultivated but
suitable for grazing

CLASS VI.

Soil conservation practices including limitation of stock, broadcasting of seed and fertiliser, prevention of fire and destruction of vermin. This class may require some structural works.

CLASS VII.

Areas that are generally steep sloping, have shallow soils or rock outcrops and are best protected by green timber.

CLASS VIII.

Areas unsuitable for agricultural or pastoral purposes.

NOTE:

CLASS II.

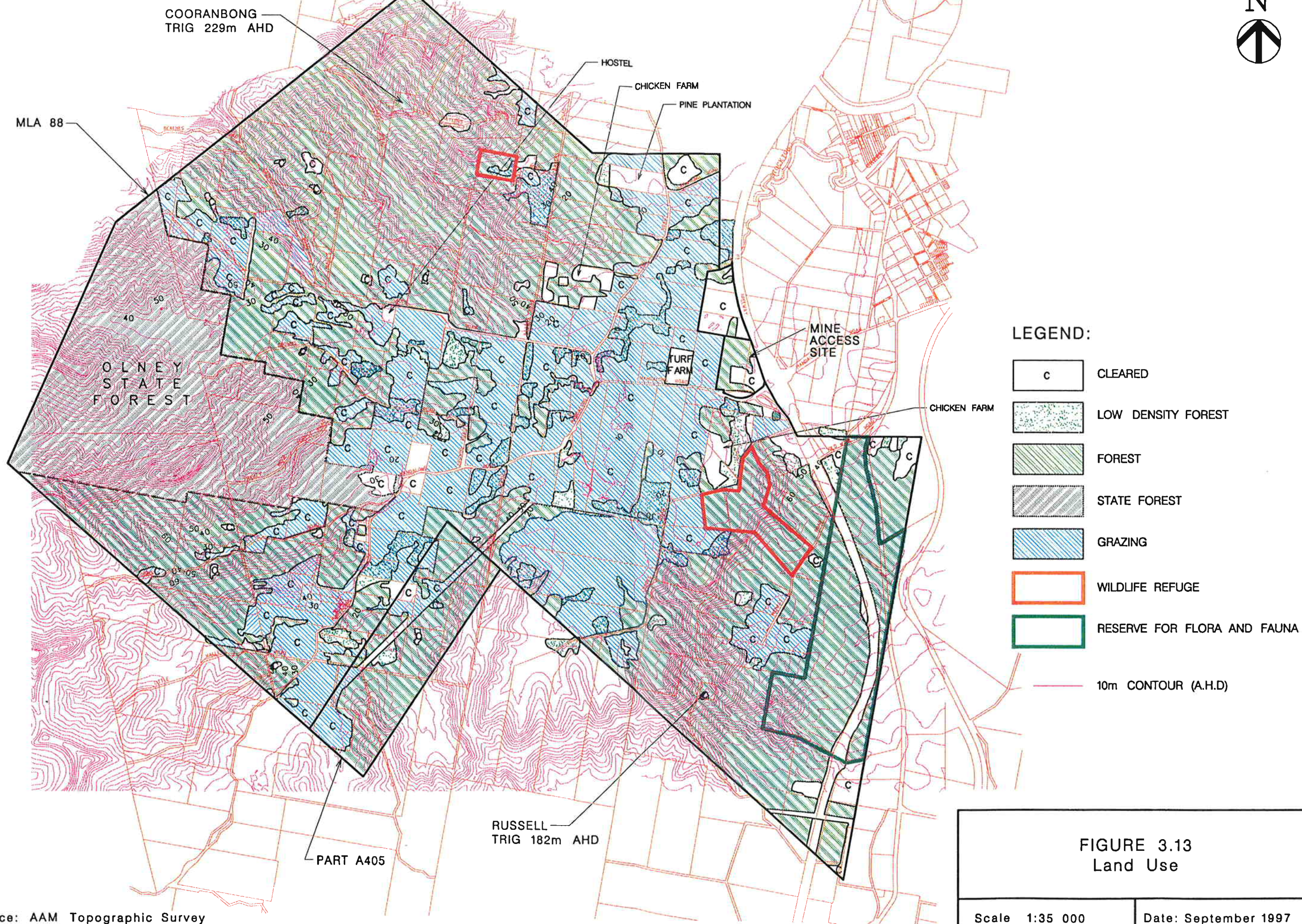
Soil conservation practices such as strip cropping, conservation tillage and adequate crop rotations.

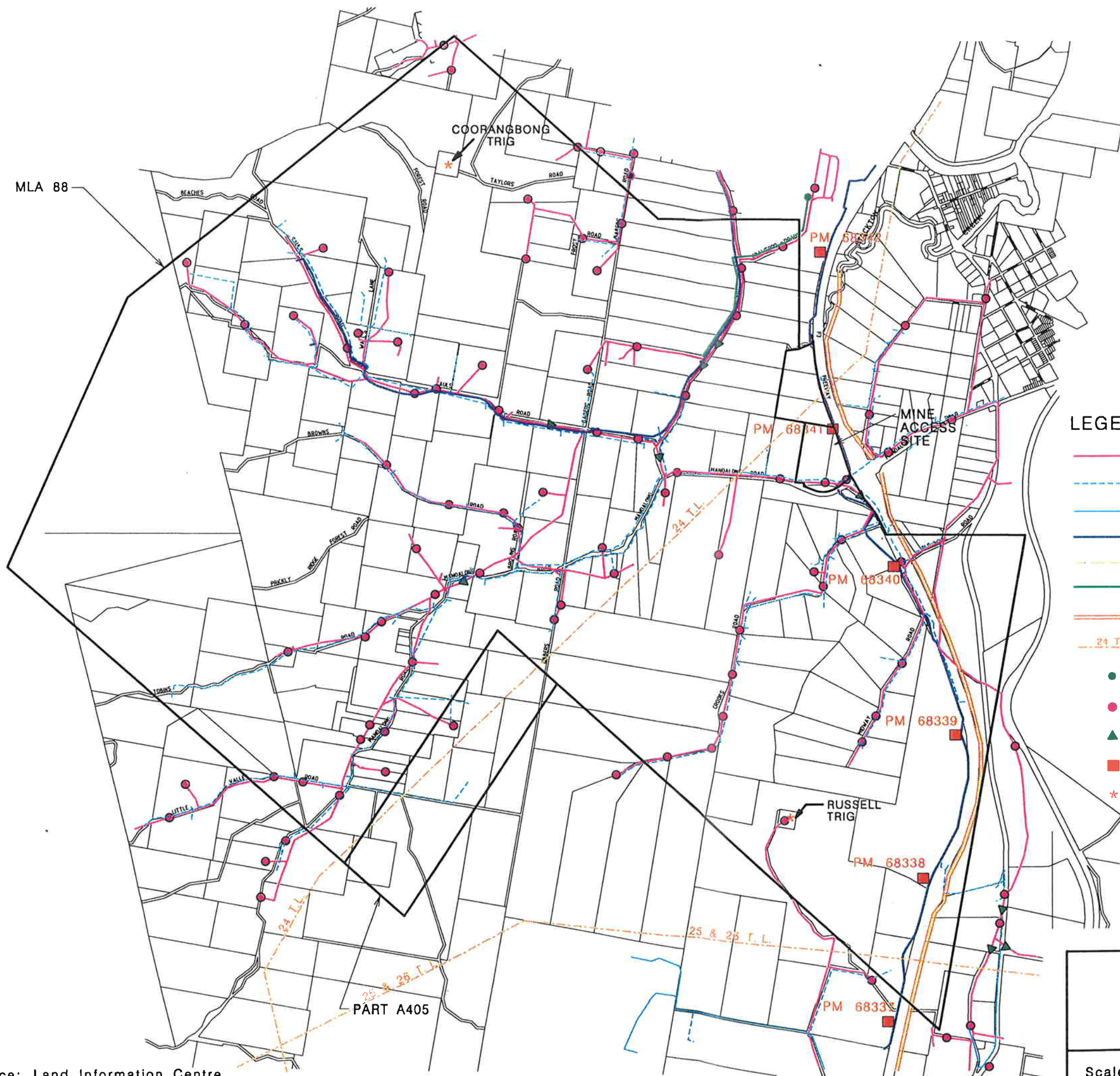
Contour Interval 10m

FIGURE 3.12b
Land Capability

Scale 1:35 000

Date: November 1997





- LEGEND:
- ELECTRICITY LINES (up to 11 000 volts)
 - TELSTRA BURIED CABLE
 - TELSTRA POLE MOUNTED CABLE
 - TELSTRA OPTICAL FIBRE CABLE
 - OPTUS OPTICAL FIBRE CABLE
 - PRIVATE WATER SUPPLY PIPE
 - GAS PIPELINE EASEMENT
 - 330 K.V. TRANSMISSION LINES
 - HUNTER WATER CORP. WATER MAIN
 - SUBSTATION
 - SWITCH
 - PERMANENT MARK
 - TRIG STATION

FIGURE 3.14
Public Utility Infrastructure

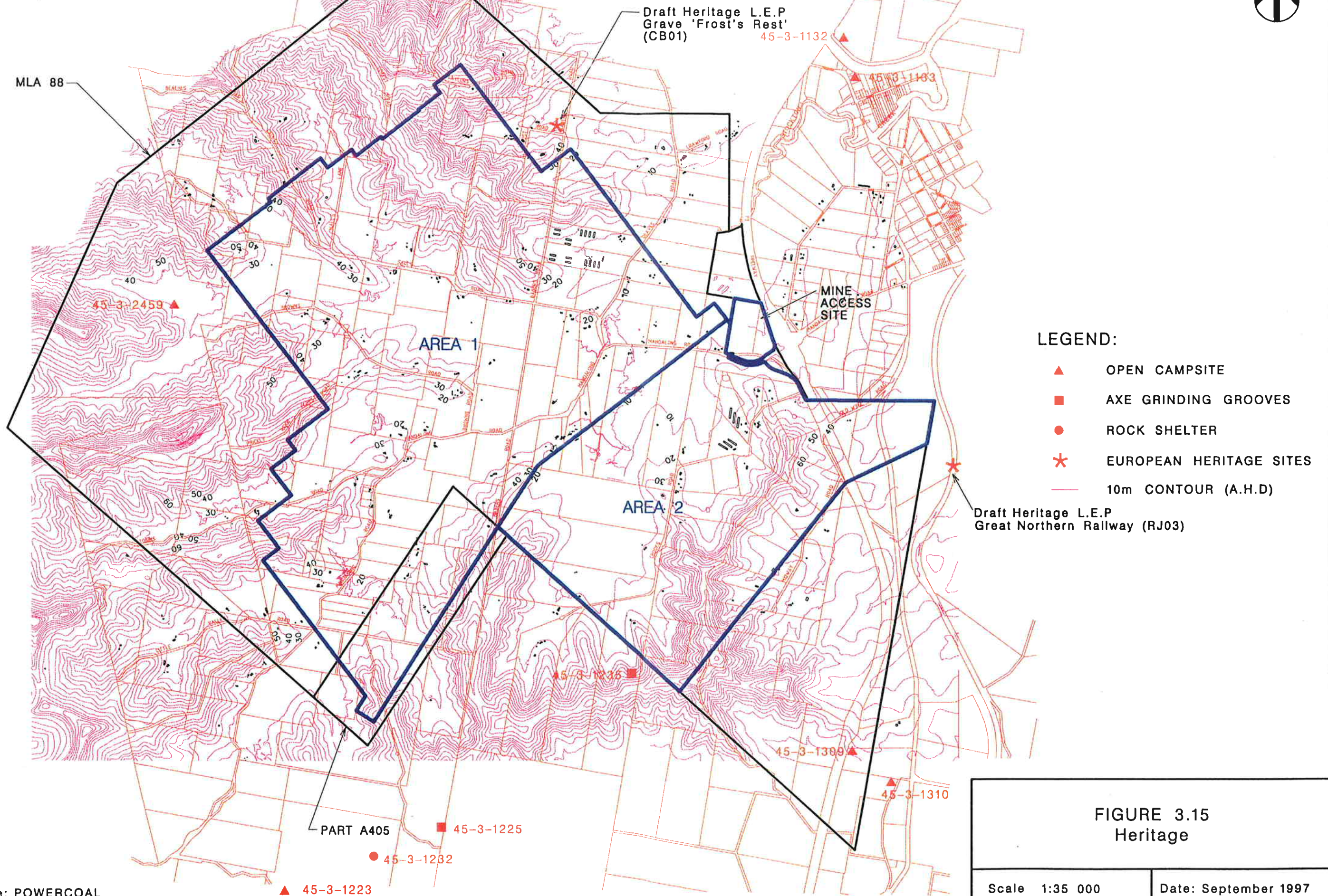
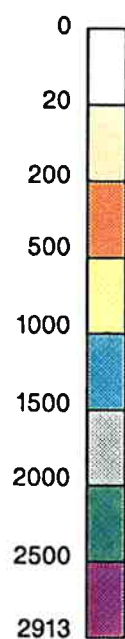


FIGURE 3.15
Heritage

LEGEND:
Predicted Subsidence (mm)



LW1 - LONGWALL PANEL 1

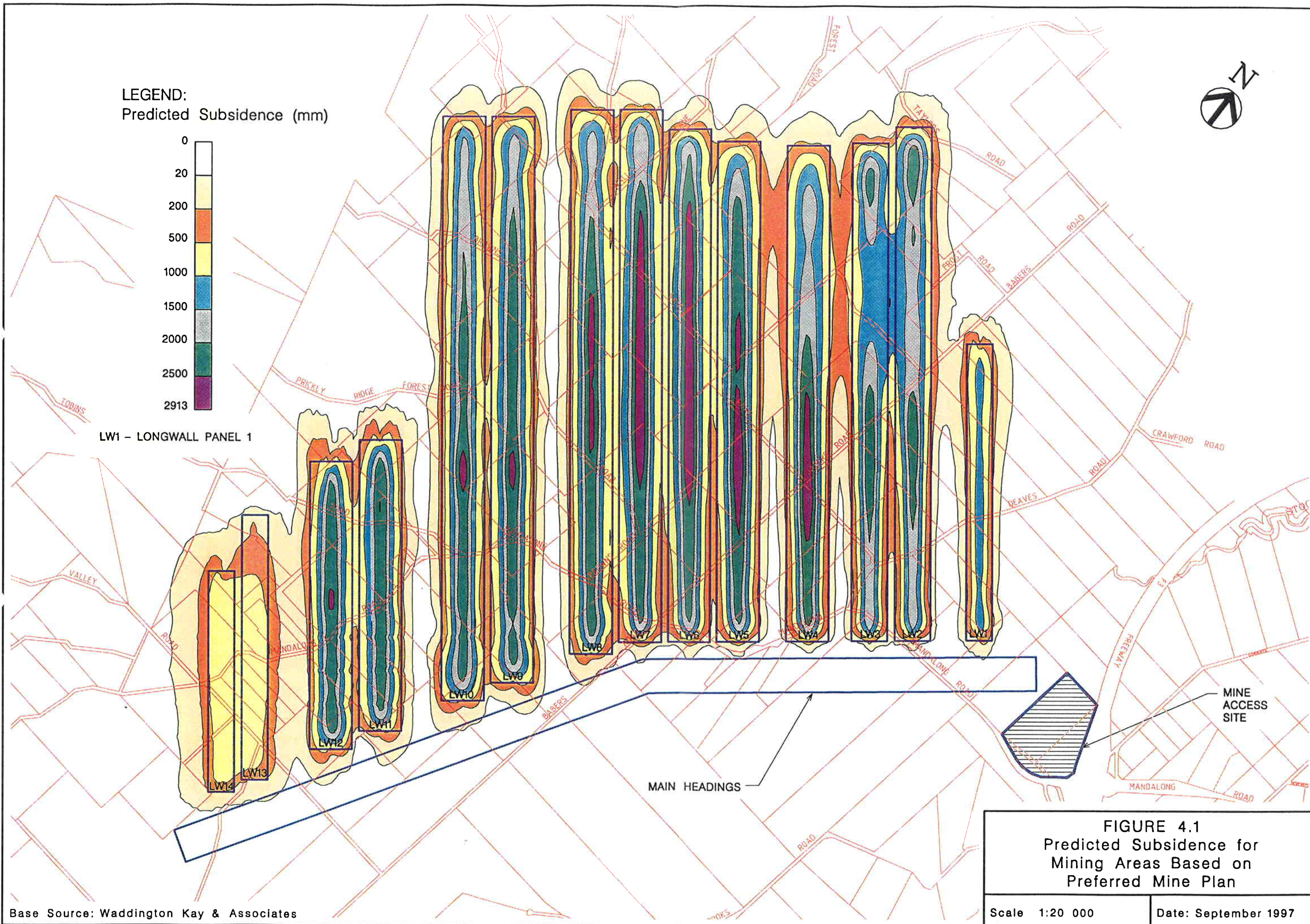
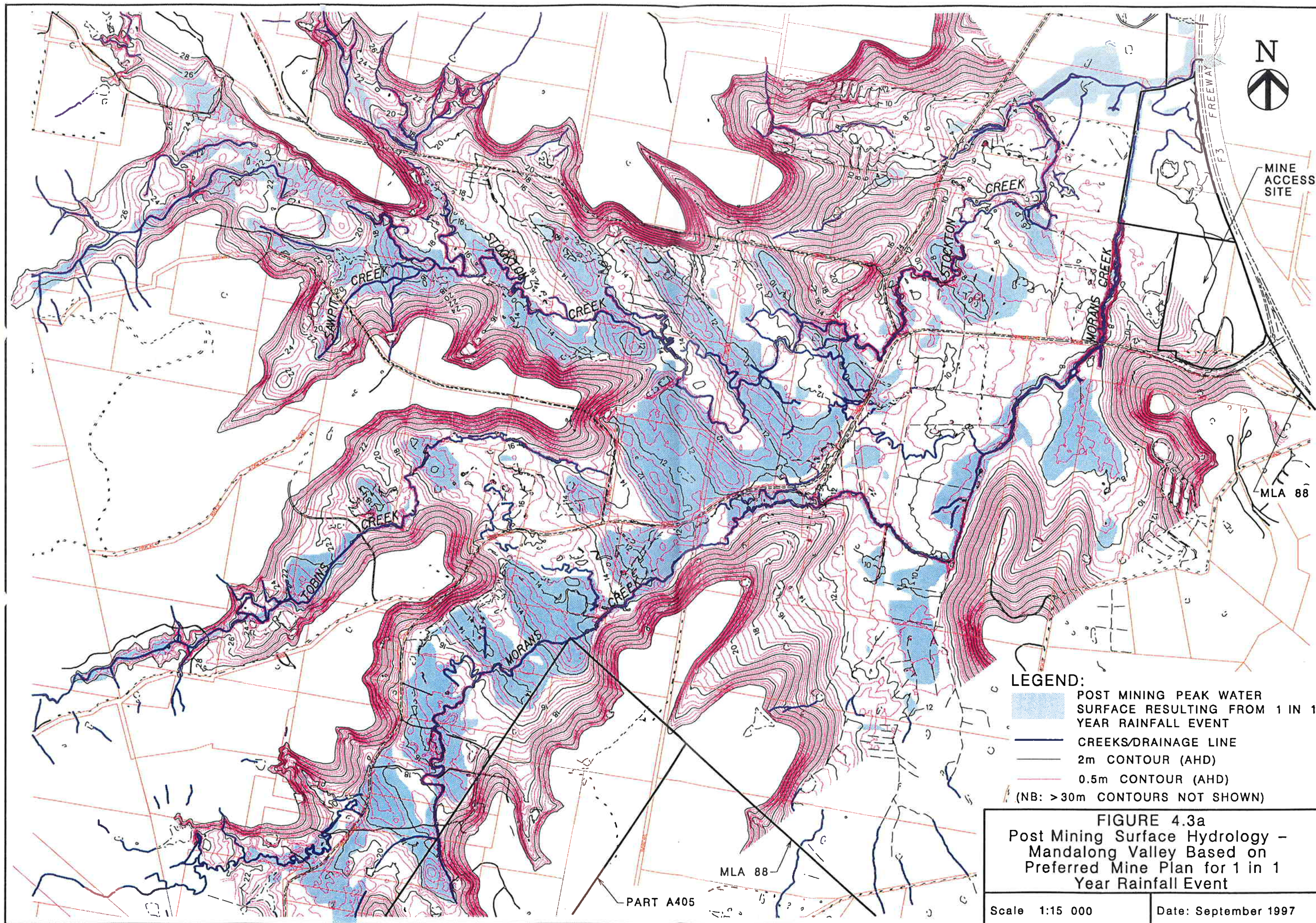


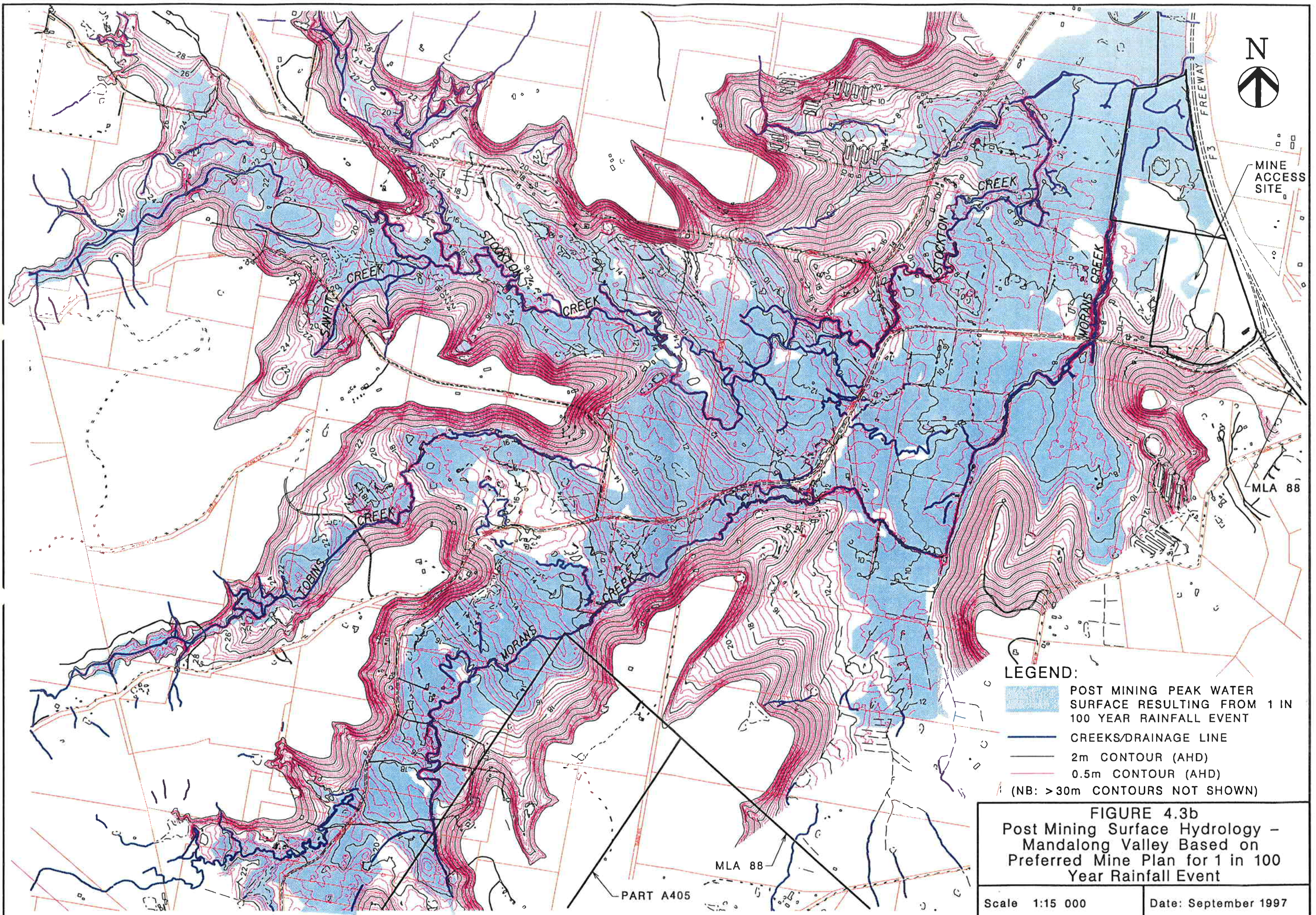
FIGURE 4.1
Predicted Subsidence for
Mining Areas Based on
Preferred Mine Plan

Scale 1:20 000

Date: September 1997

Base Source: Waddington Kay & Associates





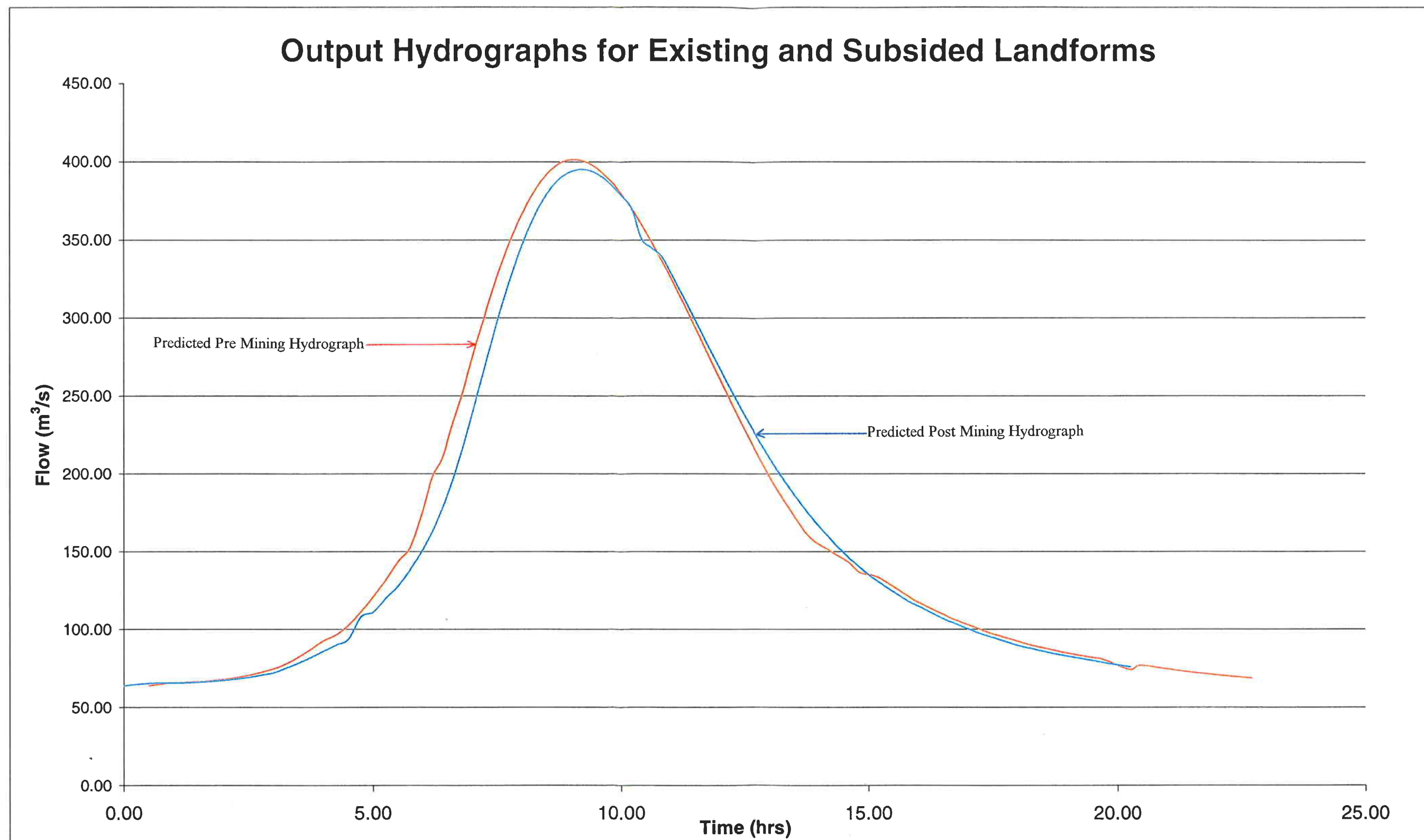
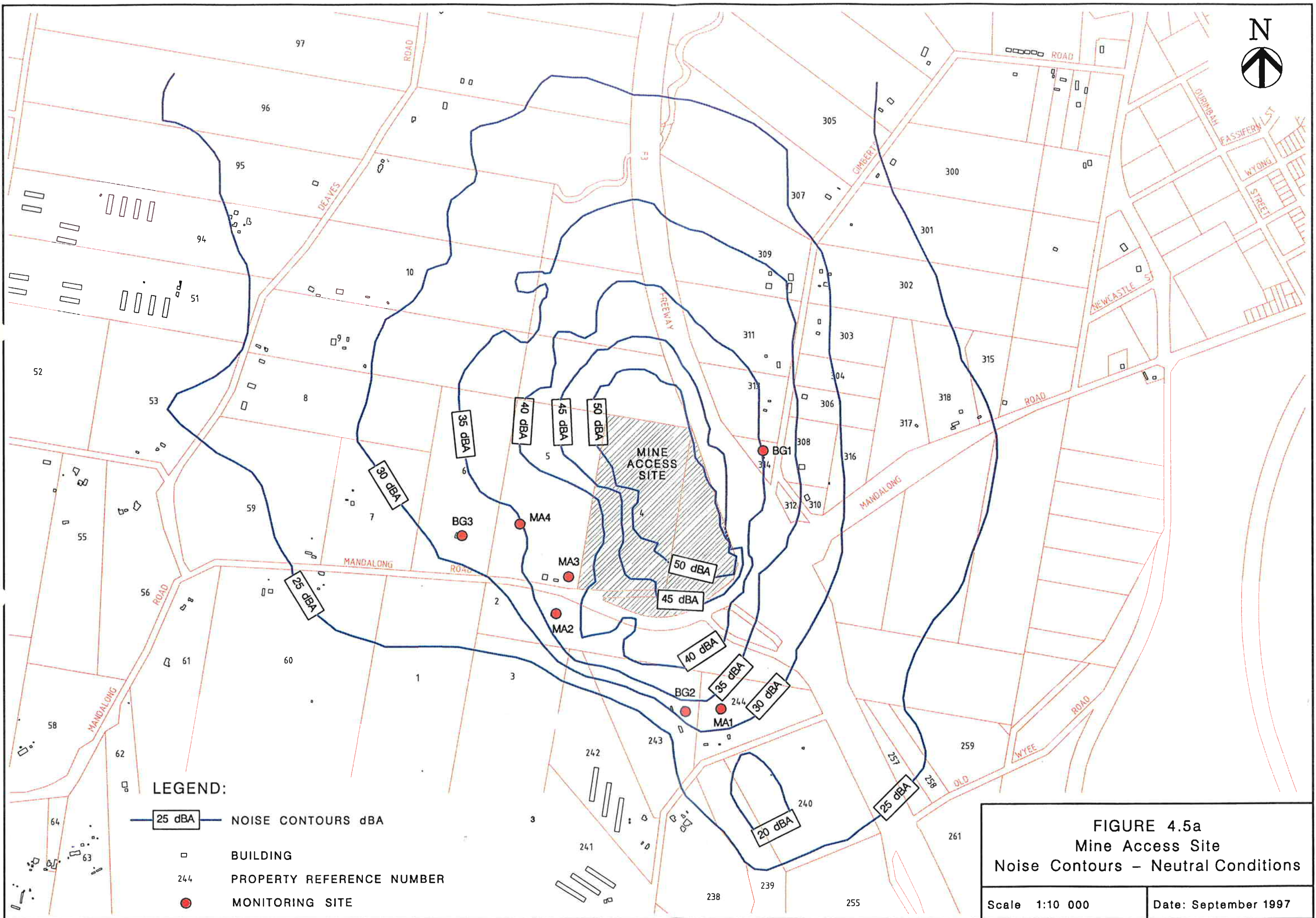
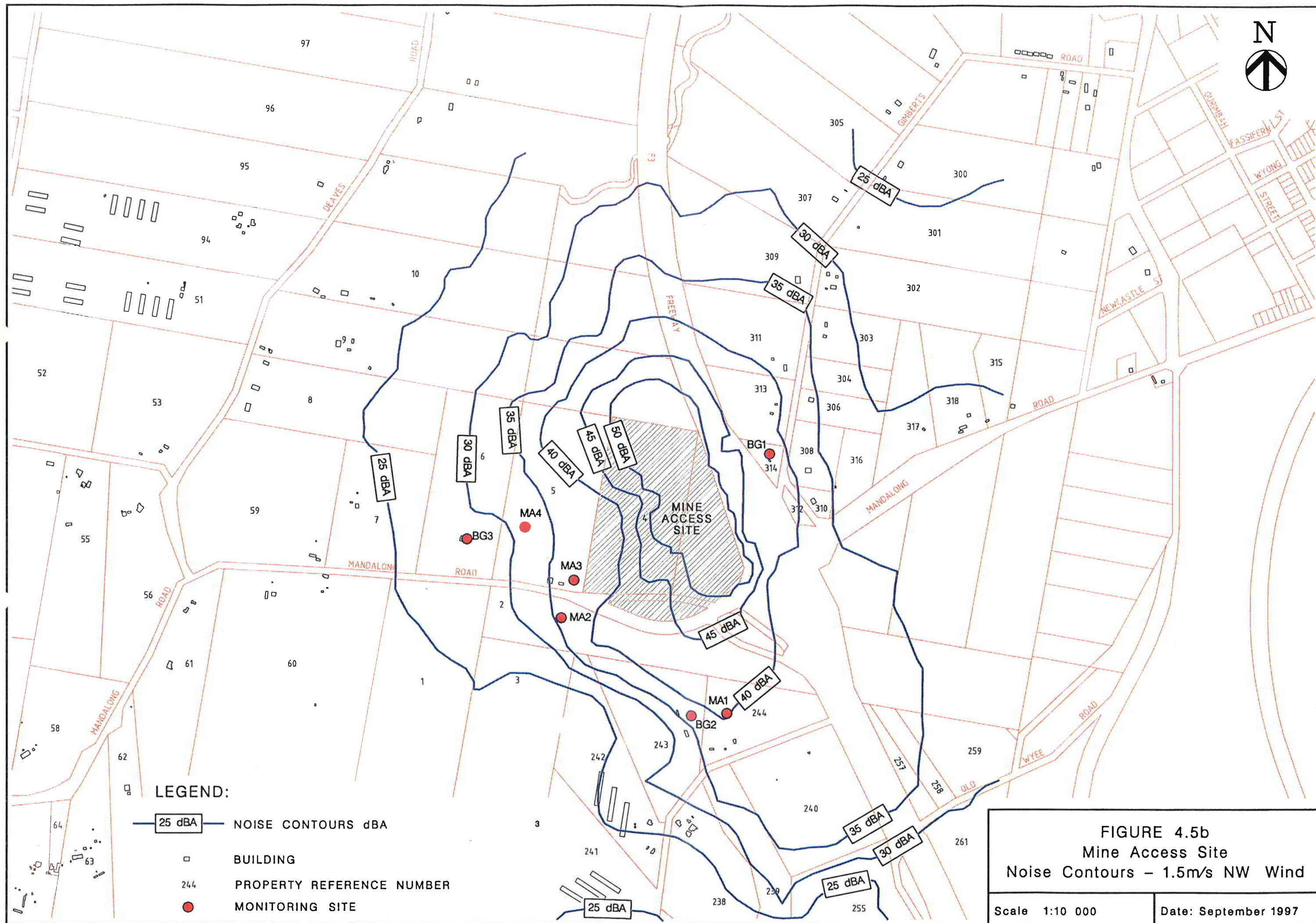
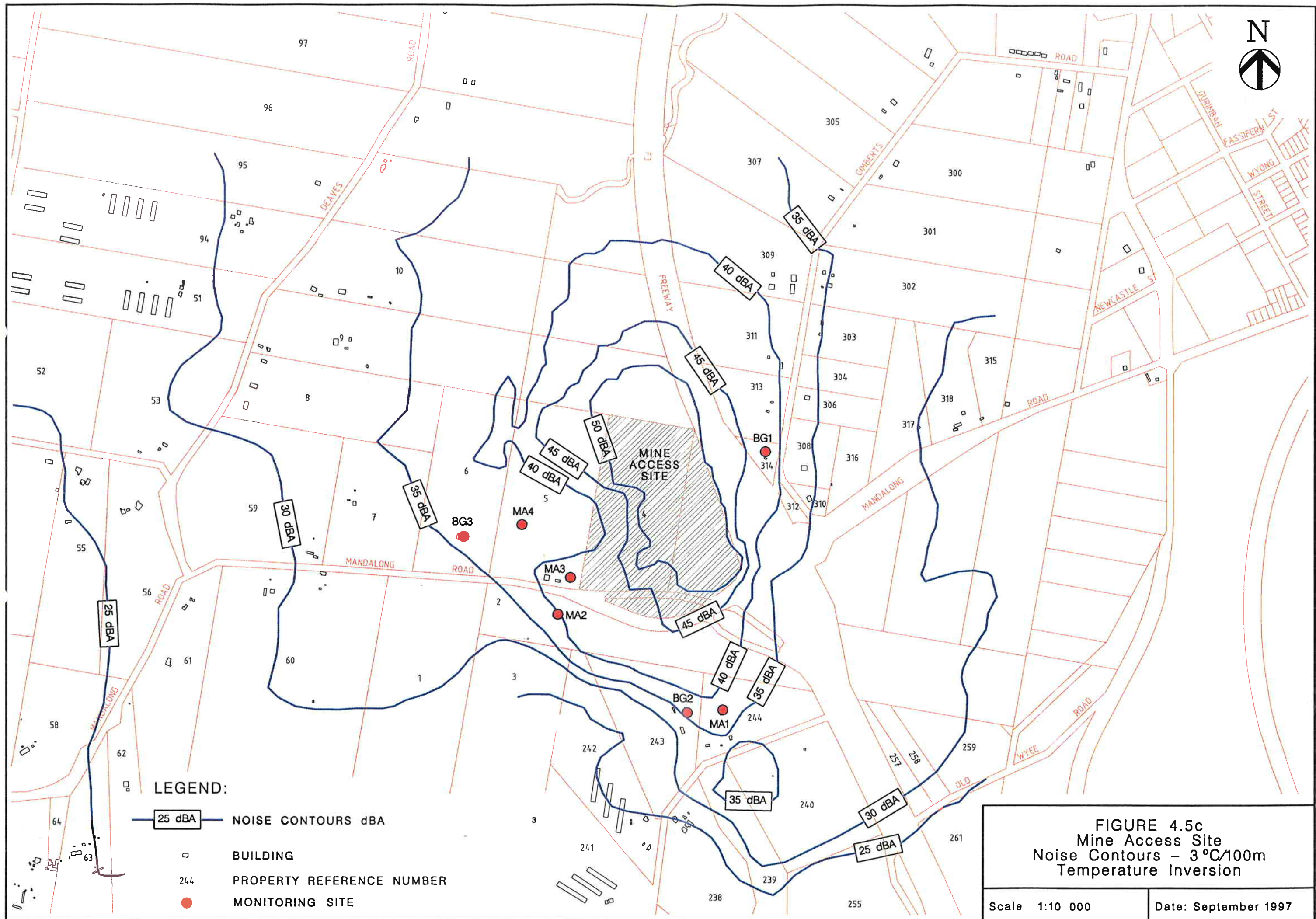


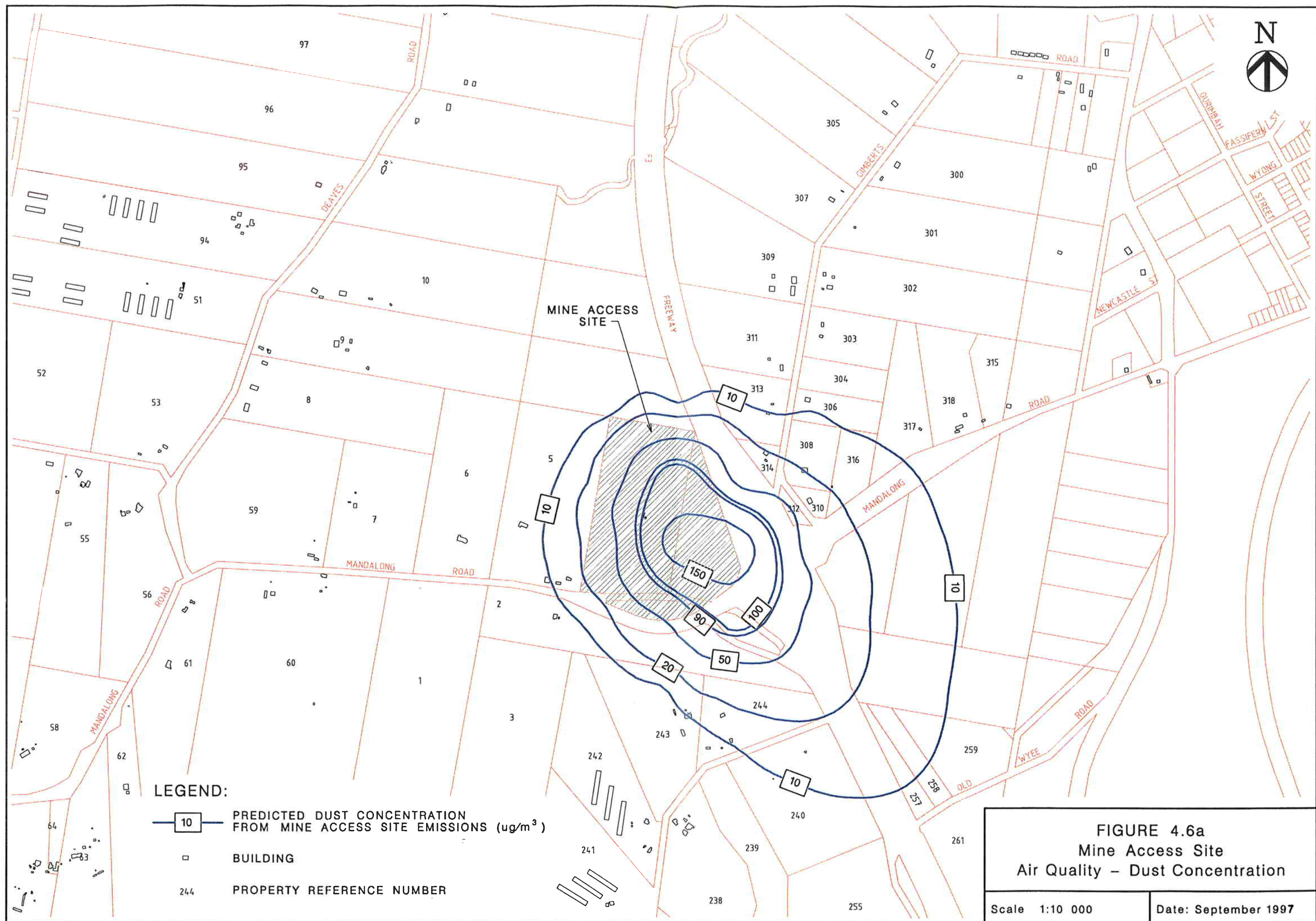
FIGURE 4.4

**Predicted Pre and Post Mining
Hydrographs for Stockton Creek
Downstream of F3 Freeway**







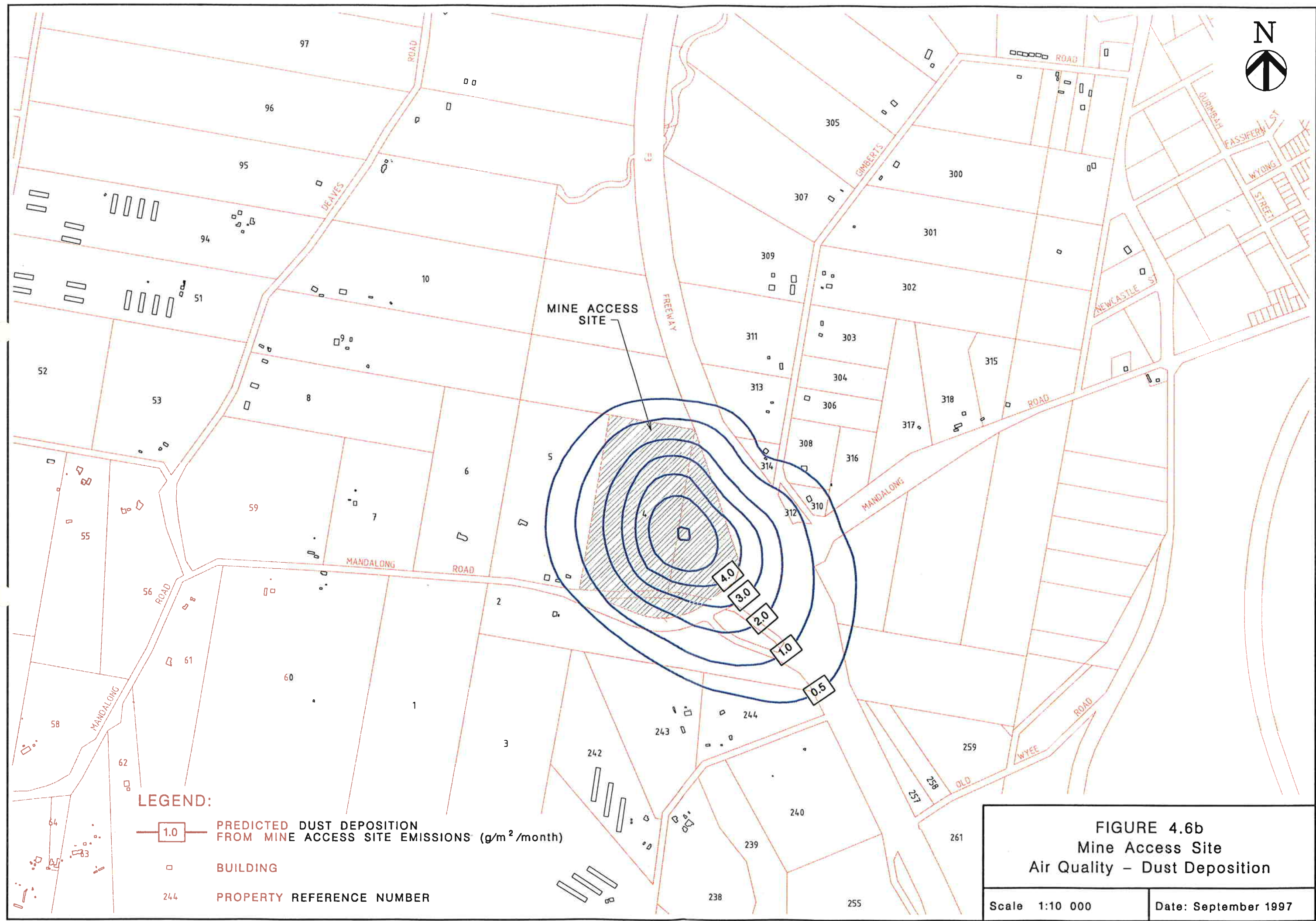


LEGEND:

- 10 — PREDICTED DUST CONCENTRATION FROM MINE ACCESS SITE EMISSIONS ($\mu\text{g}/\text{m}^3$)
- BUILDING
- 244 PROPERTY REFERENCE NUMBER

FIGURE 4.6a
Mine Access Site
Air Quality – Dust Concentration

Scale 1:10 000	Date: September 1997
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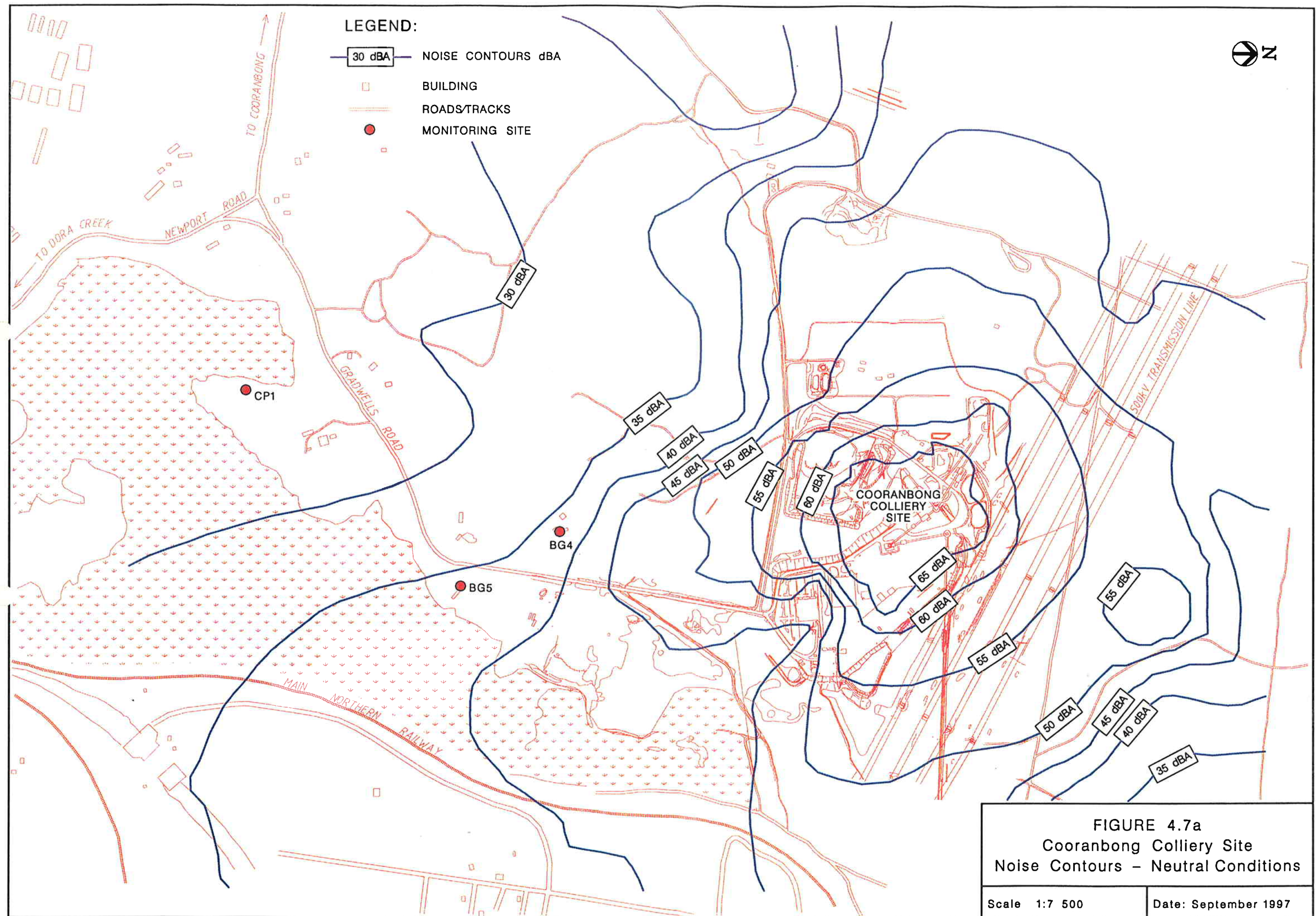


LEGEND:

- 1.0 PREDICTED DUST DEPOSITION FROM MINE ACCESS SITE EMISSIONS ($g/m^2/month$)
- BUILDING
- 244 PROPERTY REFERENCE NUMBER

FIGURE 4.6b
Mine Access Site
Air Quality - Dust Deposition

Scale 1:10 000	Date: September 1997
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LEGEND:

-  PREDICTED DUST DEPOSITION FROM COORANBONG COLLIERY EMISSIONS ($\text{g/m}^2/\text{month}$)
-  BUILDINGS
-  ROADS/TRACKS
-  D4 STATIC DUST DEPOSITION GAUGE
-  Hv2 HIGH VOLUME AIR SAMPLER

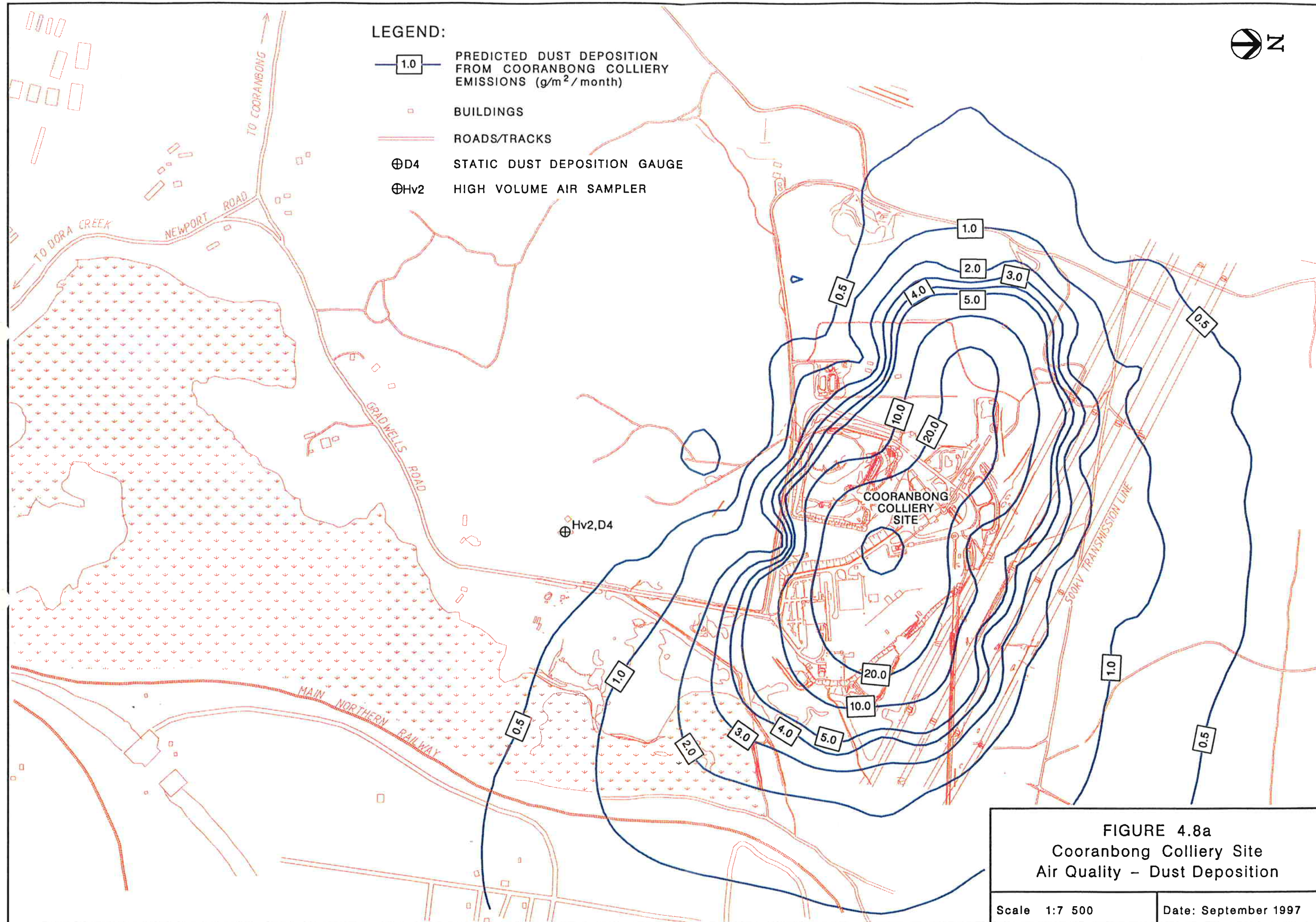


FIGURE 4.8a
Cooranbong Colliery Site
Air Quality - Dust Deposition

Scale 1:7 500

Date: September 1997

LEGEND:

— 10 — PREDICTED DUST CONCENTRATION
FROM COORANBONG COLLIERY
EMISSIONS ($\mu\text{g}/\text{m}^3$)

□ BUILDINGS

— ROADS/TRACKS

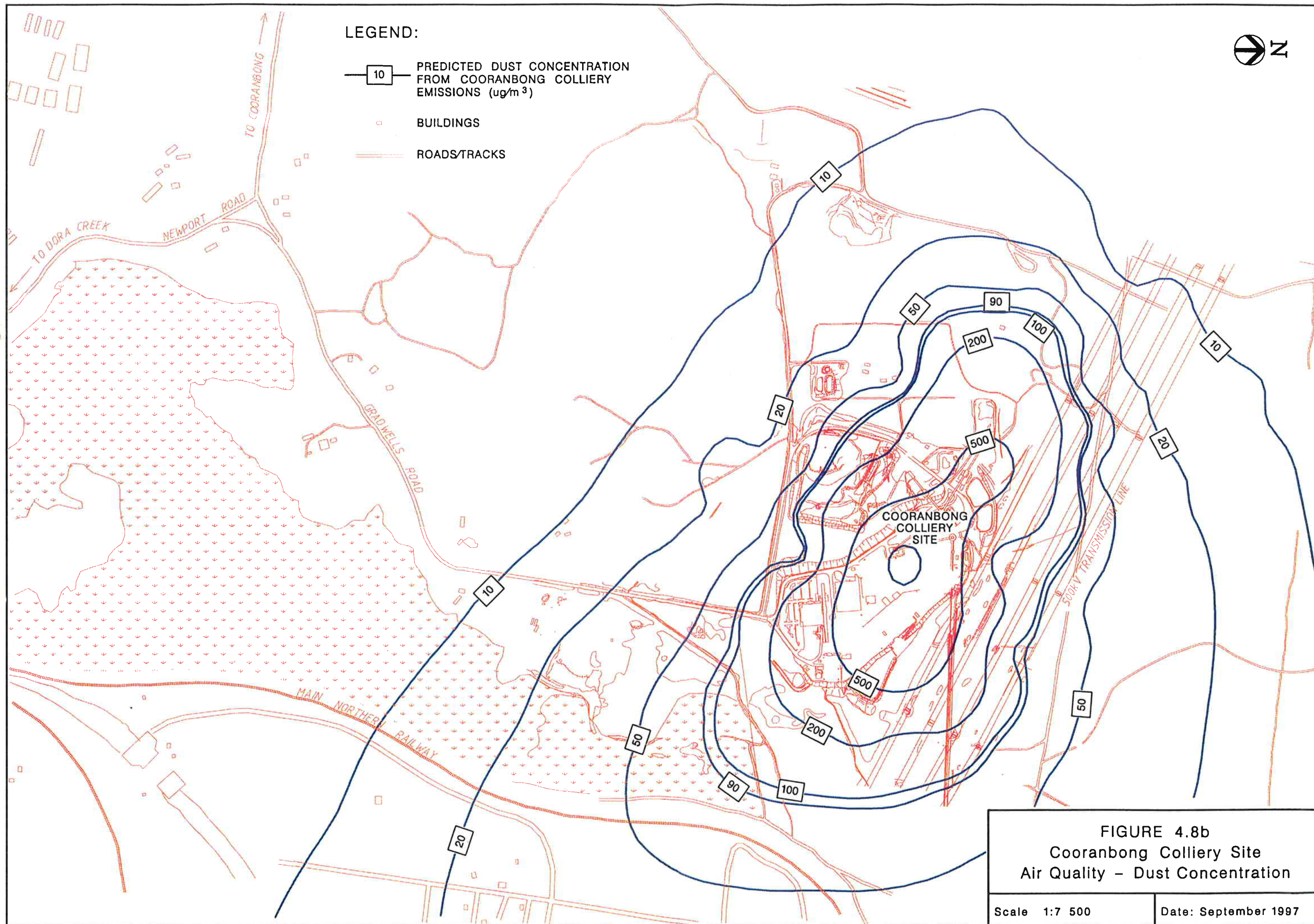


FIGURE 4.8b
Cooranbong Colliery Site
Air Quality – Dust Concentration

Scale 1:7 500

Date: September 1997