RIO TINTO
COAL AUSTRALIA

clermont

CLERMONT COAL MINE PROJECT ENVIRONMENTAL IMPACT STATEMENT

January 2005

SUPPLEMENTARY REPORT

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1. Introduction

Purpose of Supplementary Report

This Supplementary Report responds to issues raised in submissions from agencies and the public on the Environmental Impact Statement (EIS) for the Clermont Coal Mine Project (the Project). It also describes changes that have been made to the Project since the EIS was prepared in August 2004. This Supplementary Report should be read in conjunction with the EIS.

The EIS was placed on public display on 2 August 2004 and was available for comment until 13 September 2004. A total of 28 submissions were received, including 11 from private individuals and 17 from Government departments, local authorities and private organisations.

The matters raised by each respondent are summarised in **Table 1-1**, with the more significant issues and project changes referred to in **Sections 2 – 5**. **Section 2** identifies changes to the original project description, **Section 3** provides revised information on air quality issues, particularly dust emissions, **Section 4** considers revisions to noise and vibration forecasts stemming from project changes, and **Section 5** provides an update on progress with the Cultural Heritage Management Plan. **Section 6** contains a Response Table specifically addressing the issues raised in each submission. A revised Draft EMOS for the Project is included in **Section 7**.

The comments made by the Department of the Environment and Heritage, as shown in **Section 6** are restricted to the adequacy of the information provided in the EIS and do not encompass DEH's assessment of the impacts of the action.

Additional information that supports the responses made by the Proponent is provided in Appendices A to K at the end of the Supplementary Report. This includes a revised list of Project Commitments in Appendix H.

Table 1-1 Key Issues Raised by Respondents

	EIS Response Category																												
Respondent	Air Quality / Greenhouse Gases	Approvals	Aquatic Biology	Noise / Blasting / Vibration	Community Consultation	Community Services	Cultural Heritage	Economic Impacts	Employment & Training	Flooding	Flora & Fauna	Groundwater	Hazard & Risk	Health Services & Facilities	Housing & Accommodation	Industrial Relations	Land Rehabilitation / Decommissioning	Water Quality Monitoring	Property Values	Rail & Infrastructure Operations	Resource Utilisation	Road Infrastructure	Stock Route	Surface Water	Tenure	Traffic & Transport	Visual Amenity	Waste Management	Community Infrastructure
Agency/Organisation																													
AgForce	✓				✓							✓							✓										
Belyando Shire Council						✓			✓						✓														
Clermont Youth and Housing Association						✓									✓														
Commonwealth Department of the Environment & Heritage											✓																		
Department of Aboriginal and Torres Strait Islander Policy							✓		✓																				
Department of Emergency Services													✓	✓															
Department of Employment and Training									✓																				
Department of Housing						✓								✓	✓														
Department of Industrial Relations																✓													

	EIS Response Category																												
Respondent	Air Quality / Greenhouse Gases	Approvals	Aquatic Biology	Noise / Blasting / Vibration	Community Consultation	Community Services	Cultural Heritage	Economic Impacts	Employment & Training	Flooding	Flora & Fauna	Groundwater	Hazard & Risk	Health Services & Facilities	Housing & Accommodation	Industrial Relations	Land Rehabilitation / Decommissioning	Water Quality Monitoring	Property Values	Rail & Infrastructure Operations	Resource Utilisation	Road Infrastructure	Stock Route	Surface Water	Tenure	Traffic & Transport	Visual Amenity	Waste Management	Community Infrastructure
Department of Main Roads	✓	✓			✓																	✓				✓			
Department of Natural Resources and Mines		✓	✓		✓		✓				✓	✓					✓	✓	✓		✓			✓				✓	✓
Department of Primary Industries and Fisheries			✓									✓												✓					
Environmental Protection Agency	✓			✓			✓				✓	✓					✓							✓				✓	
Queensland Health	✓	✓											✓	✓	✓														✓
Queensland Rail																				✓									
Queensland Transport		✓																		✓					✓	✓			
Queensland Treasury								✓																					

	EIS Response Category																												
Respondent	Air Quality / Greenhouse Gases	Approvals	Aquatic Biology	Noise / Blasting / Vibration	Community Consultation	Community Services	Cultural Heritage	Economic Impacts	Employment & Training	Flooding	Flora & Fauna	Groundwater	Hazard & Risk	Health Services & Facilities	Housing & Accommodation	Industrial Relations	Land Rehabilitation / Decommissioning	Water Quality Monitoring	Property Values	Rail & Infrastructure Operations	Resource Utilisation	Road Infrastructure	Stock Route	Surface Water	Tenure	Traffic & Transport	Visual Amenity	Waste Management	Community Infrastructure
Individuals																													
D Bridgeman "Morbridge"					✓							✓										✓							
P J & M A Corbett, C Kelly and C Sypher										✓		✓												✓					
T & C Dennis "Kurrajong"	✓											✓																	
W D Fraser and R D Cross "Fleurs"	✓	✓		✓			✓			✓		✓							✓				✓	✓			✓		
W D Fraser "Langfield" & "Fleurs"	✓	✓								✓		✓							✓										
G H & P Hurrey "Crillee"	✓	✓		✓						✓		✓							✓								✓		
S Mills "East Kurrajong"	✓									✓		✓							✓										
P & S McLean "Kinsale"												✓																	
R & E Otto "Homelea Downs"	✓	✓		✓								✓							✓			✓					✓		

	EIS Response Category																												
Respondent	Air Quality / Greenhouse Gases	Approvals	Aquatic Biology	Noise / Blasting / Vibration	Community Consultation	Community Services	Cultural Heritage	Economic Impacts	Employment & Training	Flooding	Flora & Fauna	Groundwater	Hazard & Risk	Health Services & Facilities	Housing & Accommodation	Industrial Relations	Land Rehabilitation / Decommissioning	Water Quality Monitoring	Property Values	Rail & Infrastructure Operations	Resource Utilisation	Road Infrastructure	Stock Route	Surface Water	Tenure	Traffic & Transport	Visual Amenity	Waste Management	Community Infrastructure
S K & M J Perrin "Araluen"	✓	✓		✓						✓		✓							✓			✓					✓		
P & D Thompson “Upson Downs”												✓																	

2. Project Description

Since the EIS was prepared in August 2004, the Proponent has undertaken additional mine feasibility studies. As a result of these studies, the following options are under consideration for adoption in the final design of the Project:

- use of an In-Pit Crushing and Conveying (IPCC) system for the removal of part of the overburden; and
- modification of the intersection of the Peak Downs Highway and the Gregory Developmental Road to the north-west of the mining lease.

The potential impacts that would be associated with adoption of these options are assessed in this Supplementary Report.

In addition, further engineering studies have resulted in the following changes to the Project:

- changes to the mine water management system, through rationalisation of dam sizing and location;
- changes to the vertical alignment and configuration of the overland conveyor between the Project and the Blair Athol Mine (BAM); and
- changes to the location of the Explosives Facility and other miscellaneous changes.

The impacts associated with these changes are assessed in this Supplementary Report.

The environmental impact assessment in the Project described in the EIS and here in the Supplementary Report is based on a conceptual Project layout. Certain changes may occur to the layout of facilities, infrastructure, the pit and waste rock dumps as detailed design is undertaken and as the mine develops.

2.1 In Pit Crushing and Conveying (IPCC) Option

The Proponent is undertaking extensive investigations into the feasibility of an IPCC system to replace truck and shovel removal of the top 45 m of overburden. A decision regarding the use of the IPCC option will be made by the Proponent in early 2005, after consideration of the results of a test crushing program.

The purpose of the IPCC system is to provide a more cost effective system for the removal of surface overburden, by allowing a reduction in the number of waste haul trucks and excavators required for the Project. The IPCC option would require nine fewer operational trucks, one less grader and less machine time for dozers and haul road watering. The number of trucks required to move coal would be the same, and the footprint and final configuration of the dumps and pit would be basically the same.

The IPCC system is designed to operate at a maximum of 12 000 tonnes of waste rock per hour (average of 10 000 tonnes per hour). For the purposes of this assessment, the conveying system is assumed to continuously operate at its maximum rate of 12 000 tonnes per hour.

If implemented the IPCC system would be used for the life of the mine.

The following is a description of the major components of the IPCC system:

- mobile in-pit crushing station (**Figure 2-1**): the crushing station receives excavated overburden (waste) material from either trucks or hydraulic excavator and crushes the material to a size (350 mm to 450 mm) that is suitable for movement by a conveying system. After crushing this material is discharged on to the in-pit conveyor;

- the in-pit conveyor (**Figure 2-2**) is located within the pit and receives crushed material from the mobile in-pit crushing station. The conveyor is located on and runs the length of a bench adjacent to the area that is currently being excavated. The mobile in-pit crushing station moves along the length of the in-pit conveyor following the face that is being excavated. The in-pit conveyor discharges to the ramp conveyor;
- the ramp conveyor (**Figure 2-3**) receives waste from the in-pit conveyor and transports it out of the pit to the end of the dump conveyor;
- the dump conveyor (**Figure 2-4**) is located outside the pit and receives waste from the ramp conveyor. The dump conveyor moves the material to its dump location where it is discharged (dumped) using an overburden spreader;
- the overburden spreader (**Figure 2-4**) is located on the dump conveyor and is used to spread the waste material at its final dump location. The spreader moves along the dump conveyor as required to allow dumping of the waste material and progressive development of the waste dump.

Figure 2-1 Mobile in-pit crushing station

Figure 2-2 In-pit conveyor

Figure 2-3 Ramp conveyor

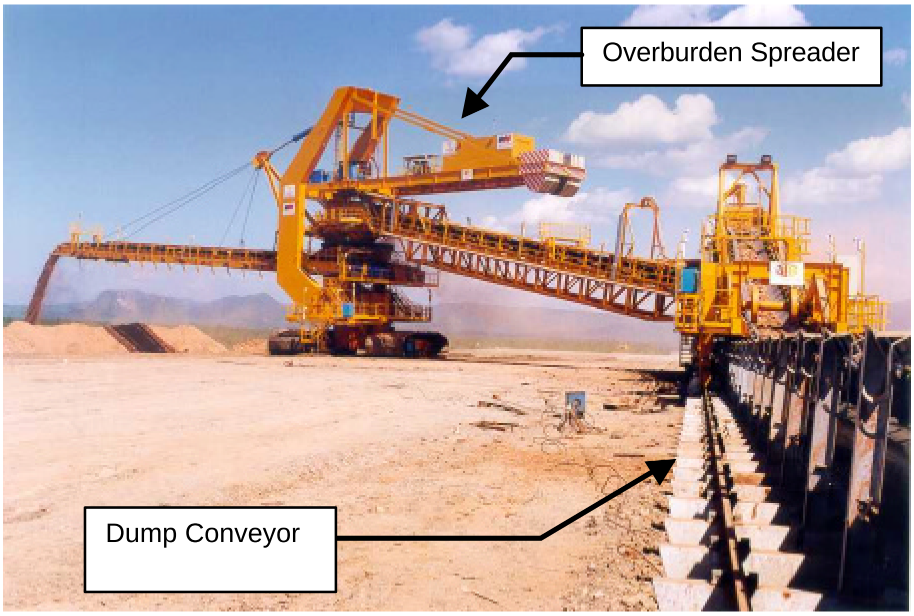


Figure 2-4 Overburden spreader

The IPCC system would be developed in two stages with a slightly different mode of operation being used in each stage:

- Stage 1 - box cut development - in Production Years 1 to 3; and
- Stage 2 - pre-stripping and overburden dumping following initial box cut development – Production Year 4 onwards.

Each of these stages is summarised below.

2.1.1 Stage 1

Stage 1 covers the development of the box cut. A schematic showing the location of the major components is shown in **Figure 2-5**.

The following is a description of the configuration of the major components:

- the mobile in-pit crushing station will be located at the northern end of the box cut, over the in-pit conveyor in a semi-fixed position under a temporary hopper. Waste trucks will dump excavated waste material into the mobile crushing station via the temporary hopper. This material will be crushed and discharged to the in-pit conveyor. During this stage the mobile crushing station will only be moved once. As excavation proceeds in the later stage the mobile crushing station, and the in-pit conveyor, will be relocated to the southern end of the box cut;
- the in-pit conveyor will be initially located in the north east corner of the box cut;
- the in-pit conveyor will convey the material out of the pit and discharge it onto the ramp conveyor. During this stage the in-pit conveyor will remain in the same location;
- the ramp conveyor will move the waste to the end of the dump conveyor and will not be moved during this stage;
- the dump conveyor will move the material to the overburden spreader for discharging to the waste dump. The dump conveyor will be relocated progressively in an-anti clockwise direction pivoting above its connection with the ramp conveyor as the waste dump develops; and

- the overburden spreader will move along the dump conveyor to allow the development of the waste dump. When a strip has been filled to the required level, the dump conveyor will be relocated as mentioned above and the process will continue.

This method of operation will continue for the development of the NW waste dump up to the point where the southern toe of the NW waste dump reaches the northern crest of the pit. Up to this point all waste material will be dumped on or above natural ground level outside the pit crest limits.

Once the southern toe of the NW waste dump reaches the northern edge of the pit crest it will be possible to commence dumping waste into the pit. At this stage there will be a change to the configuration and method of operation of the IPCC system as described in Stage 2.

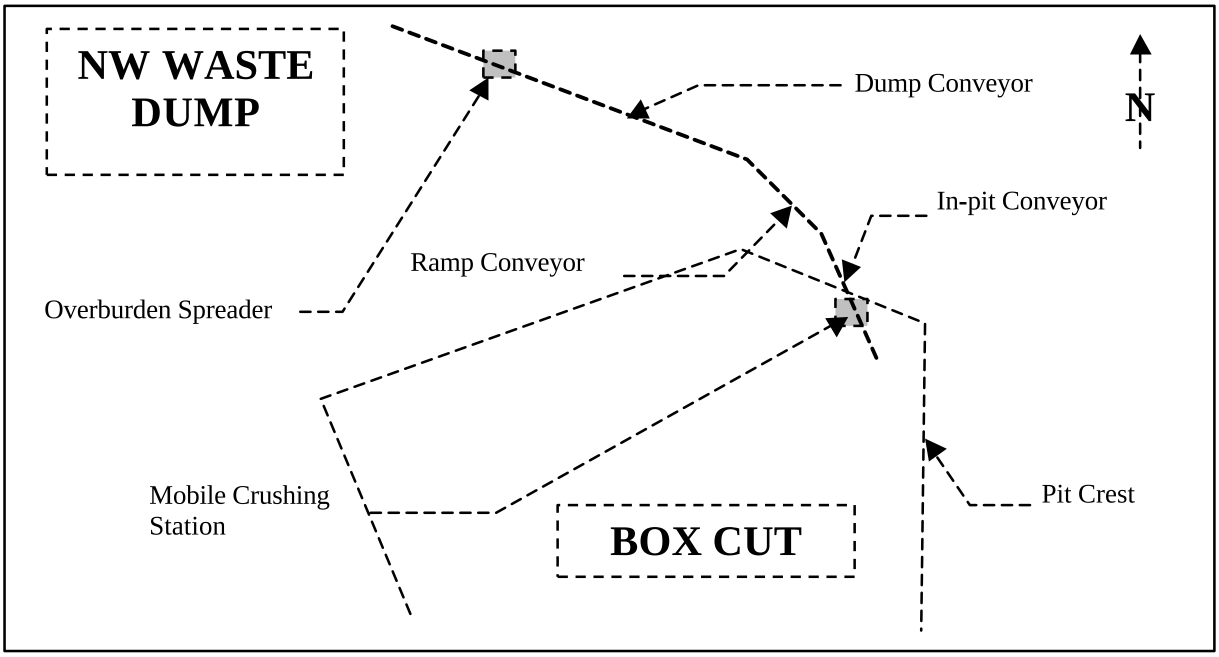


Figure 2-5 Schematic of Stage 1 IPCC

2.1.2 Stage 2

Stage 2 of the IPCC will commence when the southern toe of the NW waste dump reaches the northern edge of the pit crest and space for in-pit dumping is available. A schematic of the configuration of the IPCC at this stage is shown in **Figure 2-6** and **Figure 2-7**. This configuration will be used from the end of the box-cut to the end of the life of the mine.

The following is a description of the configuration of the major components:

- the in-pit conveyor will be relocated to the south of the main pit and will generally run in an east-west direction perpendicular to the ramp conveyor. As the mine continues to develop, the in-pit conveyor will be relocated to the south at regular intervals, in line with the advancing pit;
- the mobile crushing station will be located over the in-pit conveyor and will move progressively along the conveyor. The temporary hopper will no longer be in use and the mobile crushing station will be fed directly by the hydraulic shovel excavating the overburden rather than by trucks as was the case for Stage 1. This material will be crushed and discharged to the in-pit conveyor;

- the in-pit conveyor will discharge on to the ramp conveyor at ground level on the eastern side of the pit;
- the ramp conveyor will be relocated after Stage 1 to the eastern side of the pit. It will continue to receive waste from the in-pit conveyor and carry it to the dump conveyor. The tail (southern) end of the ramp conveyor will initially extend south of the discharge point of the in-pit conveyor. This will allow relocation of the in-pit conveyor to the south (as the pit develops) without a requirement for regular movement of the ramp conveyor. However during Stage 2 it will be necessary to extend the ramp conveyor to the south at intervals; this will be accomplished by removing sections of the conveyor from the head end (northern end) and installing them at the tail end (southern end) as the dump conveyor is relocated to the south;
- the dump conveyor will be relocated to generally run east-west and perpendicular to the ramp conveyor. As with the in-pit conveyor, the dump conveyor will progressively move to the south, in line with the advancing waste dump. The conveyor will continue to be used to move the material to the overburden spreader for discharging to the waste dump; and
- the overburden spreader will move along the dump conveyor to allow the development of the waste dump. As the material is now being dumped in-pit (both above and below existing ground level), the volume of material to be dumped at each site of the dump conveyor is greater than for Stage 1.

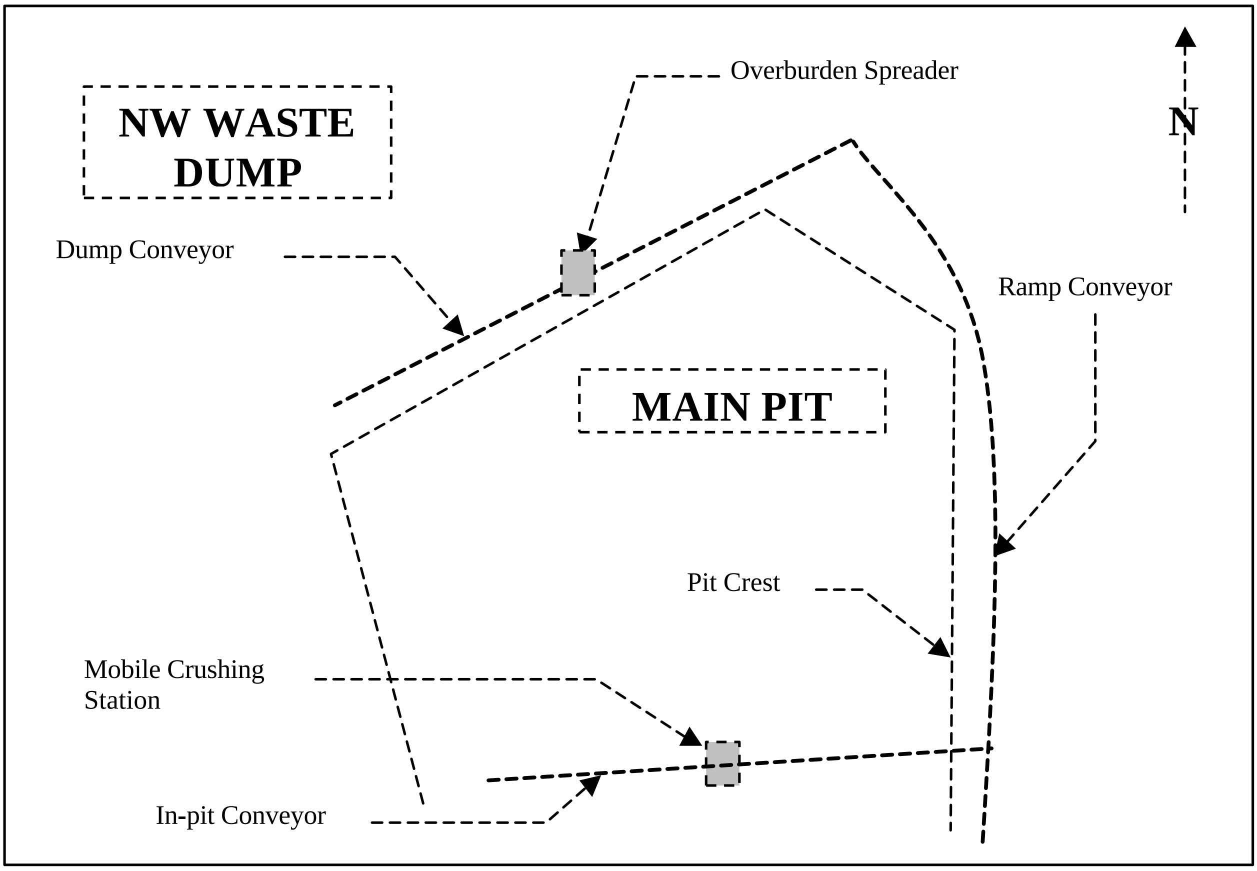


Figure 2-6 Schematic of Stage 2 IPCC

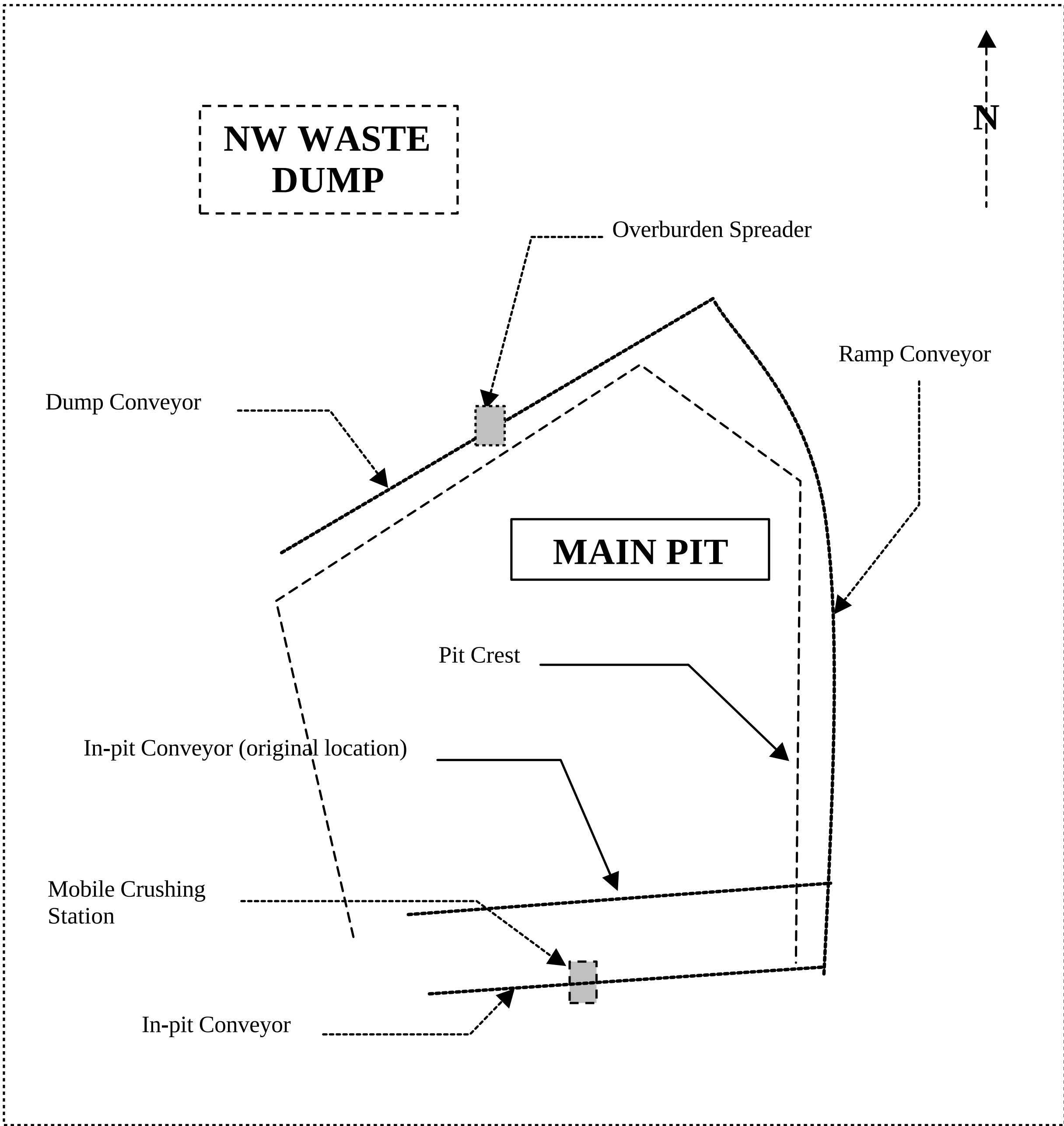


Figure 2-7 Schematic of Stage 2 IPCC – In-pit Conveyor Relocated

2.2 Mine Layout Changes

Since the EIS was prepared, the layout of the Project has been modified and includes the following changes:

- greater disturbance assumed between the eastern edge of north-west waste dump and the Gowrie Creek levee by roads, power lines, bores and other infrastructure;
- expansion of the footprint of the south-west waste rock dump due to height restriction (as a result of proximity to airport);
- provision for an alternative Highway intersection adjacent to the north-west corner of the Mining Leases;
- relocation of the Advanced Dewatering Dam;
- consolidation of the Pit Water Dam into the Mine Water Dam;
- relocation of the Mine Water Dam; and
- relocation of Gowrie Creek diversion further east;
- removal of the eastern levee of the Gowrie Creek diversion; and
- expansion in area for topsoil stockpiles.

Revised **Figure 2-5** to **Figure 2-10** in **Appendix D** illustrate the new mine layout, during the life of the Project.

Revised **Figure 5-4** in **Appendix D** shows the mine footprint in relation to vegetation communities. As a result of these changes to the mine layout, the area of vegetation to be cleared has increased by 235 ha to a total of 937 ha. The area of each regional ecosystem to be cleared is shown in **Table 2-1**.

Communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* will be affected by the revised mine layout. These communities are:

- Dawson gum woodland with brigalow (11.4.8 Association 1, 2 and 3); and
- grassland dominated by Queensland bluegrass (11.8.11).

The area of the Queensland bluegrass community to be cleared will increase from 35 ha to 44 ha. Approximately 73 ha of this community will remain undisturbed on the Mining Leases. The area of Dawson gum woodland with brigalow community that will be cleared will increase from 188 ha to 234 ha. Approximately 130 ha of this community will remain undisturbed on the Mining Leases.

There is approximately 188 484 ha of bluegrass grassland RE 11.8.11 remaining within the Brigalow Belt of Central Queensland (Bruce Wilson, Queensland EPA, pers. comm. Derived from Queensland Herbarium regional ecosystem mapping, draft version 4.0, August 9, 2003). The area of bluegrass grassland RE 11.8.11 to be cleared for the Project remains approximately 0.02% of that total area, which is unchanged from the EIS.

Approximately 81 158 ha of Dawson gum woodland (RE 11.4.8) remains in the Brigalow Belt of Central Queensland (Bruce Wilson, Queensland EPA, pers. comm. Derived from Queensland Herbarium regional ecosystem mapping, draft version 4.0, August 9, 2003). The total area of Dawson gum woodland community that may be cleared for the Project comprises approximately 0.29% of the currently mapped area of RE 11.4.8 in the Brigalow Belt.

The Proponent will implement off-set strategies for the unavoidable loss of 44 ha of the bluegrass community by compensatory establishment of 44 ha of bluegrass on *in-situ* black soil. This replanting is likely to be adjacent to remnant bluegrass in the highway reserve in the north-east of ML 1884.

The seed mix used in the mine rehabilitation program will include key dominant and understorey species from RE 11.3.3, RE 11.4.8, RE 11.5.3 and RE 11.11.1. These species will be selected for use on areas where suitable soil types have been replaced.

Table 2-1 Areas of regional ecosystems to be cleared

Regional Ecosystem	Description	EIS area to be cleared (ha)	Revised area to be cleared (ha)	Difference (ha)
11.11.1	Narrow-leaved ironbark (*Eucalyptus crebra*) woodland with a moderate to dense understorey of rosewood (*Acacia rhodoxylon*)	89	154	65
11.11.2	Lancewood (*Acacia shirleyi)* low open forest with narrow-leaved ironbark (*Eucalyptus crebra*) emergents	3	3	0
11.3.3	Coolibah (*Eucalyptus coolabah*) woodland with a grassy understorey	176	236	60
11.3.3a	Black tea-tree (*Melaleuca bracteata*) woodland with a grassy understorey	1	1	0
11.5.3	Silver-leaved ironbark (*Eucalyptus melanophloia*) open woodland with scattered poplar box (*Eucalyptus populnea*)	192	245	53
11.8.5	Mountain coolibah (*Eucalyptus orgadophila*) and gum-topped bloodwood (*Corymbia erythrophloia*) open woodland with a grassy understorey	15	17	2
11.4.8 Ass 1*	Dawson gum (*Eucalyptus cambageana*) woodland with brigalow (*Acacia harpophylla*)	53	89	36
11.4.8 Ass 2*	Dawson gum woodland (*Eucalyptus cambageana*) with scattered brigalow (*Acacia harpophylla*)	123	125	2
11.4.8 Ass 3*	Dawson gum (*Eucalyptus cambageana*) woodland with shrubby understorey	12	20	8
11.4.9*	Brigalow (*Acacia harpophylla*) and yellowwood (*Terminalia oblongata*) woodland	3	3	0
11.8.11*	Grassland dominated by Queensland bluegrass (*Dichanthium sericeum*) with no significant flora species	3	8	5
11.8.11*	Grassland dominated by Queensland bluegrass with King Bluegrass (*Dichanthium queenslandicum*)	31	35	4
11.8.11*	Grassland dominated by Queensland bluegrass with King Bluegrass and Belyando Cobblers Pegs (*Trioncinia refroflexa*)	1	1	0
Total		**702**	**937**	**235**

* EPBC Listed Community

2.3 Highway Alignment

The preferred alignment for the diversion of the Peak Downs Highway, the Gregory Developmental Road, and the intersection of these roads was described in Section 2.16.11 and 2.16.12 of the EIS.

In summary, it was proposed to divert the Peak Downs Highway along the northern boundary of the Clermont MLs, to an intersection with the Gregory Developmental Road near the north-west boundary of the site. The Gregory Highway was to be diverted along the western boundary of the Clermont MLs, where it would join the existing highway at the southern boundary of the site.

In the EIS, the preferred arrangement included a T-intersection of the Peak Downs Highway with the Gregory Developmental Road, with the Peak Downs Highway carrying the through traffic.

Since the EIS was prepared, the Proponent has continued discussions with the Department of Main Roads (DMR) on the detail of the highway alignment and intersection arrangements.

The intersection arrangement preferred by DMR gives priority to traffic on the Gregory Developmental Road, which carries Type 2 Road Trains and a higher volume of heavy vehicles than the Peak Downs Highway. This arrangement is considered by DMR to be a safer intersection between the two highways, compared to the intersection in the EIS.

Figure 2-8 shows the intersection arrangement preferred by DMR. This arrangement is currently being discussed between the Proponent and DMR.

Figure 2-9 shows the original arrangement for the intersection of the Peak Downs Highway and the Gregory Developmental Road, as described in the EIS.

Should the alternate arrangement be adopted, it would be constructed on a parcel of land bounded by the Gregory Developmental Road, Ken Logan Road and the western boundary of the Clermont MLs.

This land is not owned by the Proponent, however discussions are being held with the owner.

The real property description of the parcel is Lot 83 on CLM 806555. The tenure of the land is a grazing homestead pastoral lease. Native title does not exist in this parcel.

The impacts of this alternate intersection arrangement compared to the arrangement shown in the EIS are:

- land outside the mining lease boundary would need to be acquired for the intersection;
- an additional area of 0.8 ha would need to be cleared of ecosystem 11.4.8 (Eucalyptus cambageana woodland with Acacia harpophylla), an endangered ecological community listed under the *Environment Protection and Biodiversity Conservation Act 1999* and the *Vegetation Management Act 1999;*
- a reduction in clearing of 0.1 ha of ecosystem 11.8.11 (grassland dominated by Queensland bluegrass*),* an endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999* and an “of concern” community under the *Vegetation Management Act 1999*;
- improved road safety at the intersection; and
- the need to create a new section of road reserve and stock route for the new alignment and intersection.

The alternate intersection would require the clearing of 33.8 ha of mapped remnant vegetation, compared with an area of 14.8 ha for the original intersection, an increase of 19 ha. **Table 2-2** lists the vegetation communities that would be affected and the status of the communities, along with the areas to be cleared and difference in clearing for the two intersections.

The vegetation community to be cleared to the greatest extent is the Narrow-leaved ironbark woodland with an understorey of rosewood (RE 11.11.1). This community is not listed under the *Environment Protection and Biodiversity Conservation Act 1999*. Its status under the *Vegetation Management Act 1999* is “not of concern” at present.

Table 2-2 Impacts of highway intersection on vegetation communities

Regional Ecosystem	Status EPBC status[1] VMA status[2]	Area to be affected (ha) EIS Intersection	 Alternate Intersection	Difference (ha)
11.4.8a Dawson gum woodland with brigalow	endangered endangered	4.0	4.8	+ 0.8
11.8.5 Mountain coolabah & gum-topped bloodwood open woodland with grassy understorey	not listed no concern at present	0	0.7	+ 0.7
11.8.11 Grassland dominated by Queensland bluegrass	endangered of concern	2.6	2.5	- 0.1
11.11.1 Narrow-leaved ironbark woodland with an understorey of rosewood	not listed no concern at present	8.2	25.2	+ 17.0
11.11.2 Lancewood low open forest with narrow-leaved ironbark emergents	not listed no concern at present	0	0.6	+ 0.6
Total		**14.8**	**33.8**	**19.0**

1 status under the *Environment Protection and Biodiversity Conservation Act 1999*

2 status under the *Vegetation Management Act 1999*

2.4 Site Water Management

The management of water on the site has been revised since the EIS was prepared. A refinement of the water balance has led to changes in dam configuration and a reduction in the estimate of surplus groundwater to be released. The northern section of the Gowrie Creek diversion channel was moved eastward. The height of the proposed Gowrie Creek western levee has been increased and the eastern levee has been removed as further modelling showed it had a marginal impact of flood flows.

2.4.1 Water Balance Model

The site water balance was updated to reflect the latest mine design and an increase in the estimated demand for water for haul road watering, which increased from 750 ML/year to 2400 ML/year. The demand was increased based on revised haul road lengths and information on the usage of water for haul road dust suppression at the nearby BAM site.

The impact of this change was that more water from the advanced dewatering borefield was required to meet normal operating demands, and therefore the volume of surplus groundwater requiring storage prior to release declined (see **Section 2.4.2**), and as a result the size of the Advanced Dewatering Dam could be reduced.

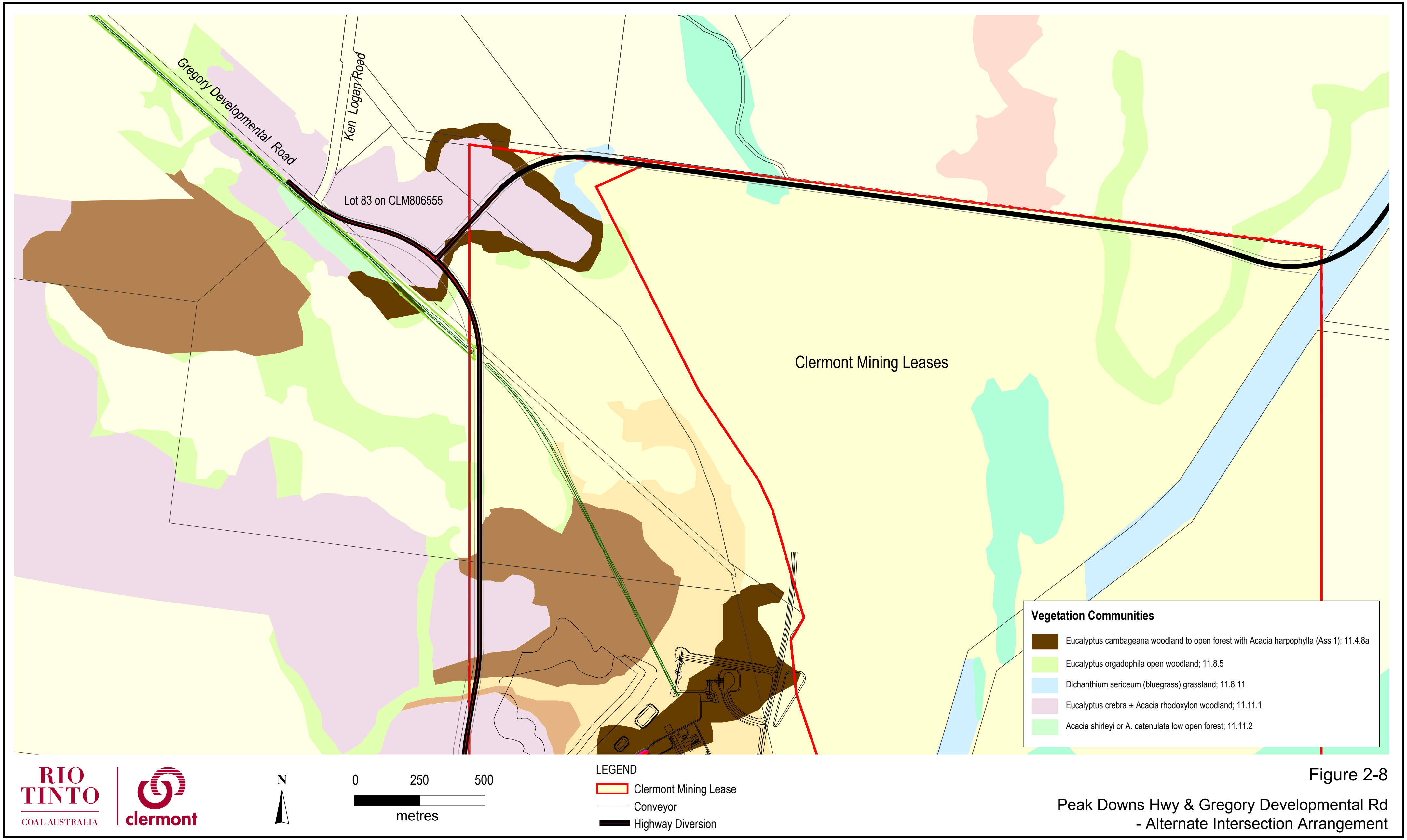
The need for the Pit Water Dam was removed through a revision of site water management. The purpose of the Pit Water Dam was to store water that had accumulated in the pit (storm runoff and groundwater seepage) before it was pumped either to the Process Water Dam (for reuse in the Coal Preparation Plant) or to the Mine Water Dam. Water that accumulates in the pit can be pumped directly to the Mine Water Dam or used directly for haul road watering, eliminating the need for an intermediate storage. The Mine Water Dam is a “turkey’s nest” dam, and will be operated at a level that provides a buffer storage allowance of approximately 500 ML (to accommodate pit water generated through accumulation of storm water runoff). Water from the Mine Water Dam can be pumped to the Process Water Dam for reuse. Subject to meeting target water quality criteria (see EMOS Section 16.3.4.7), water may be released from the Mine Water Dam through two 600 mm diameter pipes when there are natural flows in Gowrie Creek or Wolfang Creek. Peak release would be 2.4 m^3/s. The location of the Mine Water Dam has been changed to move it farther away from the final pit crest. This was done to maximise the geotechnical stability of the pit wall.

The modelled releases have the following characteristics:

- the peak release (once in the lifetime of the mine) is modelled at 205 ML/day;
- on average the release rate is 106 ML/day when releasing;
- the average annual release is 872 ML per year; and
- on average the Mine Water Dam releases during two months of the year. These are commonly during the wet season.

The revised water management system is shown as a schematic in **Figure 2-10**.

The water balance model was run with the revised reconfiguration of the site water management system. The entire recorded climatic history of the site was tested through the model to optimise the size of storages and test the security of supply for mine operations.



QE06243/Supplementary Report/Graphics/Figure 2-8_road intersection-preferred arrangement.pdf

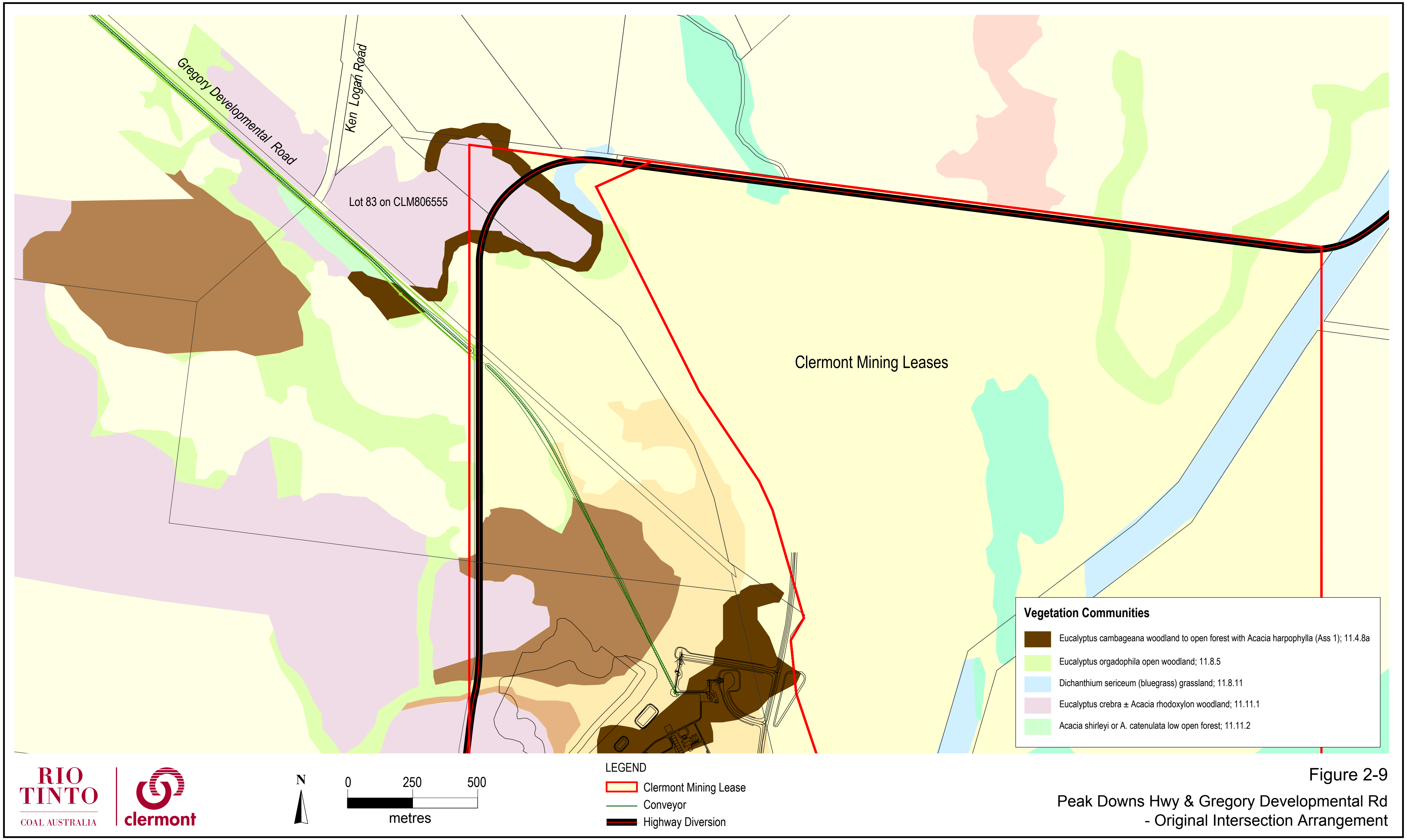


Figure 2-9

Peak Downs Hwy & Gregory Developmental Rd - Original Intersection Arrangement

QE06243/Supplementary Report/Graphics/Figure 2-9_road intersection-original arrangement.pdf

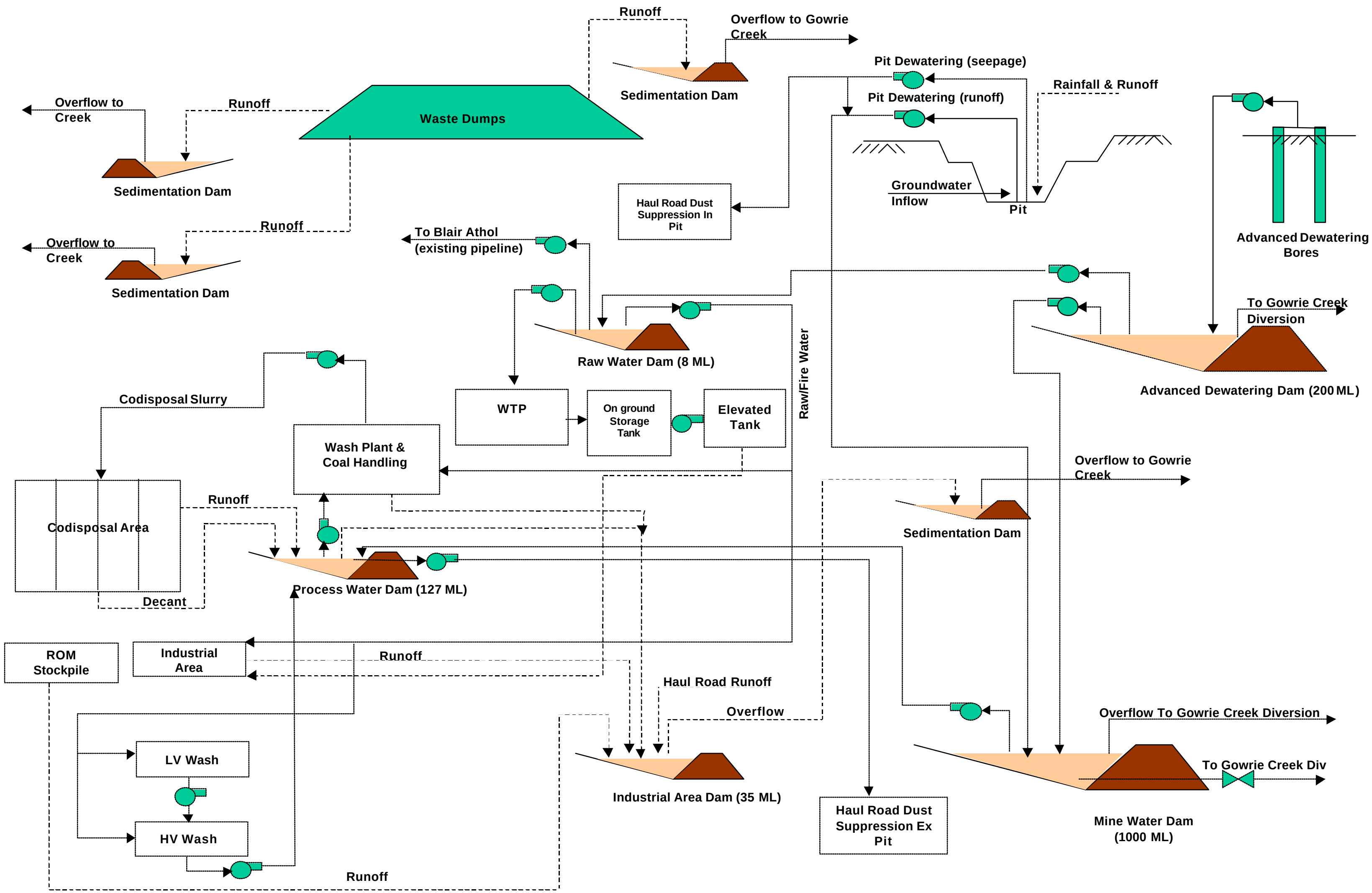


Figure 2-10 Revised Water Management System

Table 2-3 shows the summary of water balance modelling results for three stages of mine development - during box cut development, during Production Year 1 and during Production Year 3. The figures reflect the increased demand for road watering and the increased use of advanced dewatering water and site runoff to meet the increased demands.

Table 2-3 Water Balance Model Result Summary

Heading	Box Cut Development	Production Year 1	Production Year 3
Losses			
Storage evaporation and seepage	784	784	784
Mine Demands			
Construction	800	0	0
Coal processing plant	0	408	408
Haul Roads and Dust Suppression	2 150	2 400	2 400
ROM Stockpile	0	28	28
Clean Water Demands			
Potable Water	84	84	84
Blair Athol Mine	473	473	0
Total Demands (ML)	**4 291**	**4 177**	**3 704**
Supply from runoff	1 379	1 788	1 930
Supply from Advanced Dewatering to operations	2 355	1 832	1 690
Supply from Advanced Dewatering to clean water demands	557	557	84
TOTAL SUPPLY (ML)	**4 291**	**4 177**	**3 704**

The water balance model was used to test mine operation during periods of prolonged wet weather and prolonged dry weather. It was found that a Mine Water Dam with a volume of 1000 ML could maintain operations with a suitable level of water supply security.

2.4.2 Surplus Groundwater Release

Revision of the water balance resulted in a reduction in the requirement to release surplus groundwater from the Advanced Dewatering Dam. The aggregate volume that would need to be released has reduced by approximately half compared to the original water balanced model. The EIS reported that during median climatic conditions, there would be no release of surplus groundwater for an average of 1.2 months per year after Production Year 2. In contrast, the reduction in groundwater surplus under the revised water management scheme means that there would be no release of surplus groundwater under median climatic conditions for an average of 5.7 months per year after Production Year 2.

Figure 2-11 shows a comparison between annualised groundwater surplus and demands on groundwater.

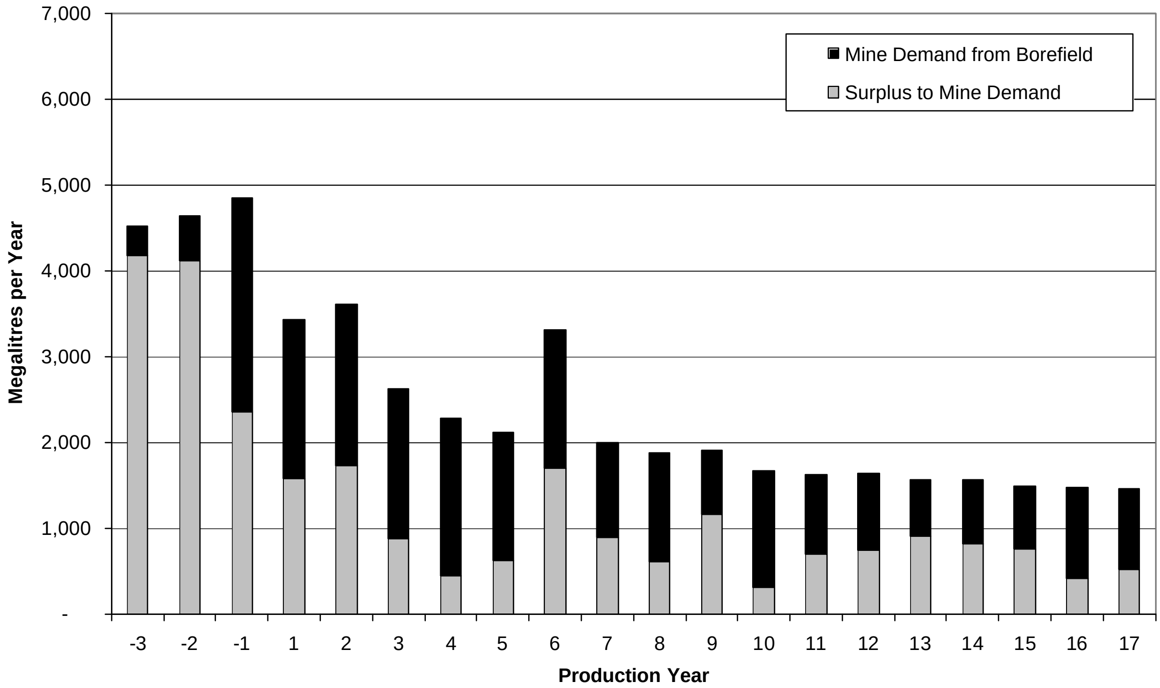


Figure 2-11 Annualised Chart of Dewatering Volume and Demands

2.4.3 Gowrie Creek Diversion

The northern section of the Gowrie Creek diversion channel was moved eastward by approximately 150 m in certain places to increase the distance to the mine pit in order to increase pit stability and to provide some additional waste rock dump space. The proposed eastern levee has been removed after additional modelling showed it had a marginal impact of flood levels.

The revised diversion channel alignment was assessed in detail for the 1 in 100 year Average Recurrence Interval (ARI) flood without the presence of the eastern levee. The area of inundation is shown in **Figure 4-8** in **Appendix D** and the area where there is an increase in flood depth due to the diversion channel system is shown in **Figure 4-9** in **Appendix D**. The removal of the eastern levee would cause minor increases of up to a maximum of 100 mm in flood levels on land immediately to the east of the eastern boundary of ML 1884. This land is owned by the Proponent and already experiences flooding across the Wolfang Creek floodplain during the 1 in 100 ARI flood. The model results also show a minor increase in flood levels up to 100 mm in the Wolfang Creek floodplain south-east of ML 1884. The land east of the Wolfang Creek channel in this vicinity is owned by a neighbouring farmer. The increase in flood level is minor (up to 100 mm) compared to the depth of flooding that would occur normally (>1.0 m). The 1 in 100 year ARI flood line moved marginally (approximately 30 m) at the area of greatest impact. The changes to the diversion channel system would not adversely impact on the suitability of the land for cultivation.

The revised diversion channel alignment was assessed for floods less than 1 in 10 year ARI flood without the presence of the eastern levee. It was found that flow from such events had the potential to flow over the low ridge separating the diversion from Wolfang Creek floodplain. In these more minor events there was no increase to the extent of inundation in the Wolfang Creek floodplain. The land affected is owned by the Proponent.

The modelling results for a 1 in 100 ARI event also showed that there would be a minor increase in flood levels (up to 100 mm) in the Gowrie and Tea Tree Creek floodplains north of the northern boundary of ML 1884. This is primarily due to the presence of the realigned Peak Downs Highway. The culverts under the highway have been designed to minimise this increased flood risk. The terrain in the area is steeper than the downstream floodplain this will result in limiting the spread of the flooding impacts upstream. In an extreme event (1 in 100 years), an additional area of land of up to 5 ha could be temporarily inundated. This land is not cropped.

The height of the western Gowrie Creek levee that protects the pit has been increased to provide protection during a 1 in 500 year flood event, compared to the 1 in 100 year criterion used in the EIS. This increase in height reduces the Annual Exceedance Probability of the pit being flooded during operations and after mine closure, from 1% to 0.2%. The increase in the height of the levee does not change the assessment of flood impacts made in Section 4.2.4.2 of the EIS.

2.5 Coal Conveyor

Since the EIS was prepared, Project optimisation has led to two changes in the overland conveyor that will transport coal from the Clermont Mining Leases (MLs) to the coal handling facilities on the BAM. These changes are:

- alteration to the conveyor's vertical alignment, so that it now goes under the Gregory Highway and stock route, under the Blair Athol-Clermont railway line and under the BAM haul road; and
- an alteration of the shielding over the overland conveyor.

2.5.1 Conveyor Alignment

The original alignment of the coal conveyor between the Clermont MLs and BAM was above ground for the full length of the conveyor. With further design work completed during the Project feasibility study, parts of the coal conveyor will now be constructed underneath roads and railway lines. The horizontal alignment of the conveyor has not been changed.

The decision to locate the conveyor under the Gregory Highway, stock route and railway line has been made to improve access for conveyor maintenance. It will also enable the construction of the maintenance road next to the conveyor for a longer continuous length than when the conveyor was constructed over the highway, stock route and railway line, improving access to the conveyor.

The corridor for the overland coal conveyor is 30 m wide. The conveyor corridor will be fenced and will contain the conveyor, a gravel road to allow access for maintenance and all associated infrastructure. All impacts will be limited to the conveyor corridor.

The length of the conveyor that passes beneath the Gregory Highway, stock route and railway line is approximately 150 m, with the length of the conveyor being 13 kilometres. Impacts arising from the placement of the conveyor beneath the Highway, stock route and railway line are very localised and contained within the conveyor corridor. Erosion controls and drainage controls will be implemented as part of the construction of the conveyors and associated infrastructure.

2.5.2 Conveyor Shielding

Engineering studies undertaken as part of the Project feasibility study identified a requirement for maintenance access from the conveyor service road on the northern side of the conveyor. The shielding that was formerly proposed for the whole length of the northern side of the conveyor has therefore been reduced to cover only those parts of the conveyor that are required to be shielded for noise control. A total of one kilometre of shielding, centred on New Blair Athol homestead, will be provided on the northern side of the conveyor to provide noise protection for the homestead. Similarly, 3 km of shielding will be provided on the southern side of the conveyor, centred on Old Blair Athol homestead to provide noise protection for that location.

The results of noise modelling for the revised conveyor configuration are presented in **Section.4.2**.

2.6 Explosives Facilities

It is now proposed that bulk explosives would be stored at a location on the Clermont MLs, rather than at the off-site location described in the EIS (Section 2.3.6). Two separate facilities will be required. These are:

- an explosives magazine - used to store explosion-enabling materials (primers, detonators, etc.) (refer to Section 2.3.6); and
- a bulk explosives storage and preparation facility.

2.6.1 Explosives Magazine

The explosives magazine is a secure bunded area for the storage of primers, cartridged emulsion explosives, detonating cord (up to 10 tonnes) and detonators (30,000 detonators).

Because of the type and amount of materials to be stored, the facility will consist of three separate magazines with appropriate internal separation and bunding. The size of the magazines has been based on storage of two months supply.

The facility will be fenced and locked, will incorporate area lighting and closed circuit television for security, and will have an overall footprint of approximately 57 m x 50 m. **Figure 2-12** shows the general layout of the explosives magazine.

It is proposed that the facility is located on the mining lease to the north east of the coal handling area along the overland conveyor alignment. The location of the facility is based on a separation distance of 480 m (Australian Standard AS 2187) from offices, accommodation and public roads.

2.6.2 Bulk Explosives Facility

The bulk explosives facility is a secure area for the storage of emulsion (up to 320 tonnes) and ammonium nitrate (200 tonnes). The tonnages shown above will provide approximately six days storage on site. It is expected that there will be three B-double trucks making daily deliveries to site, most likely from Moura. The bulk ammonium nitrate undergoes some preparation at this location prior to later use. Materials will be transported to the advancing mine face by dedicated explosives trucks.

The facility will be fenced and locked, and will incorporate area lighting and closed circuit television for security. The area will also contain offices for the operation of the facility, and will have an overall footprint of approximately 100 m x 45 m.

Figure 2-13 shows the general layout of the bulk explosives store.

It is proposed that the facility is located on the mining lease near the intersection of the existing Peak Downs Highway and Gregory Developmental Road (becoming operational once both roads have been diverted). The location of the facility is based on a separation distance of 1.6 kilometres from offices and accommodation, as required by the relevant standard (COAG, 2004).

2.7 Miscellaneous Changes to Project Layout

Fuel Storage and Refuelling Station

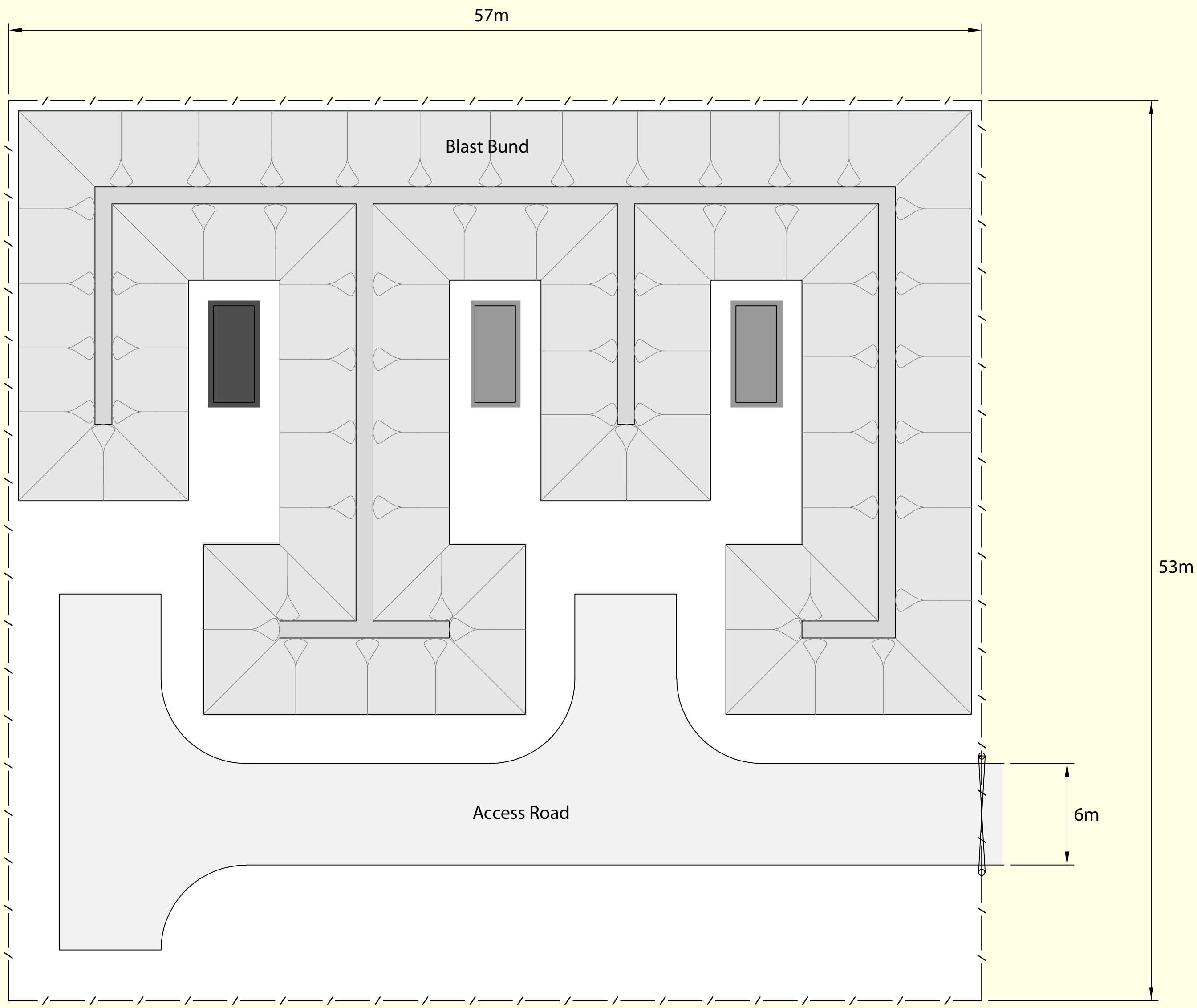
The relocatable fuel storage and refuelling station referred to in Section 2.3.8 of the EIS will be located to the north-east of the box-cut in the initial years of mine life (refer to revised **Figure 2-5** and **Figure 2-6** (**Appendix D**). Relocatable crib facilities will be located nearby.

Quarry

The EIS (Section 2.12.2) noted that raw materials for road base would be sourced on site. A basalt quarry will be established in the ridge in the north-east corner of the ML 1884 (refer revised **Figure 2-5**, **Appendix D**). Material has to be removed from this location to form the cut for the realignment of the Peak Downs Highway. The quarry will extend the dimensions of this cut in this location. The material will be used for road base and other construction purposes during the construction phase of the Project.

Site Construction Village

In order to mitigate the impact of increased demand on accommodation in the Clermont area, it is proposed that the Site Construction Village be kept operational after the end of the construction phase. This will provide additional accommodation capacity during the overlap period when the Clermont Coal Mine and Blair Athol Mine are both in production. The Site Construction Village would be closed and decommissioned once the Blair Athol Mine ceases production.



LEGEND

Explosive magazine

Detonator magazine

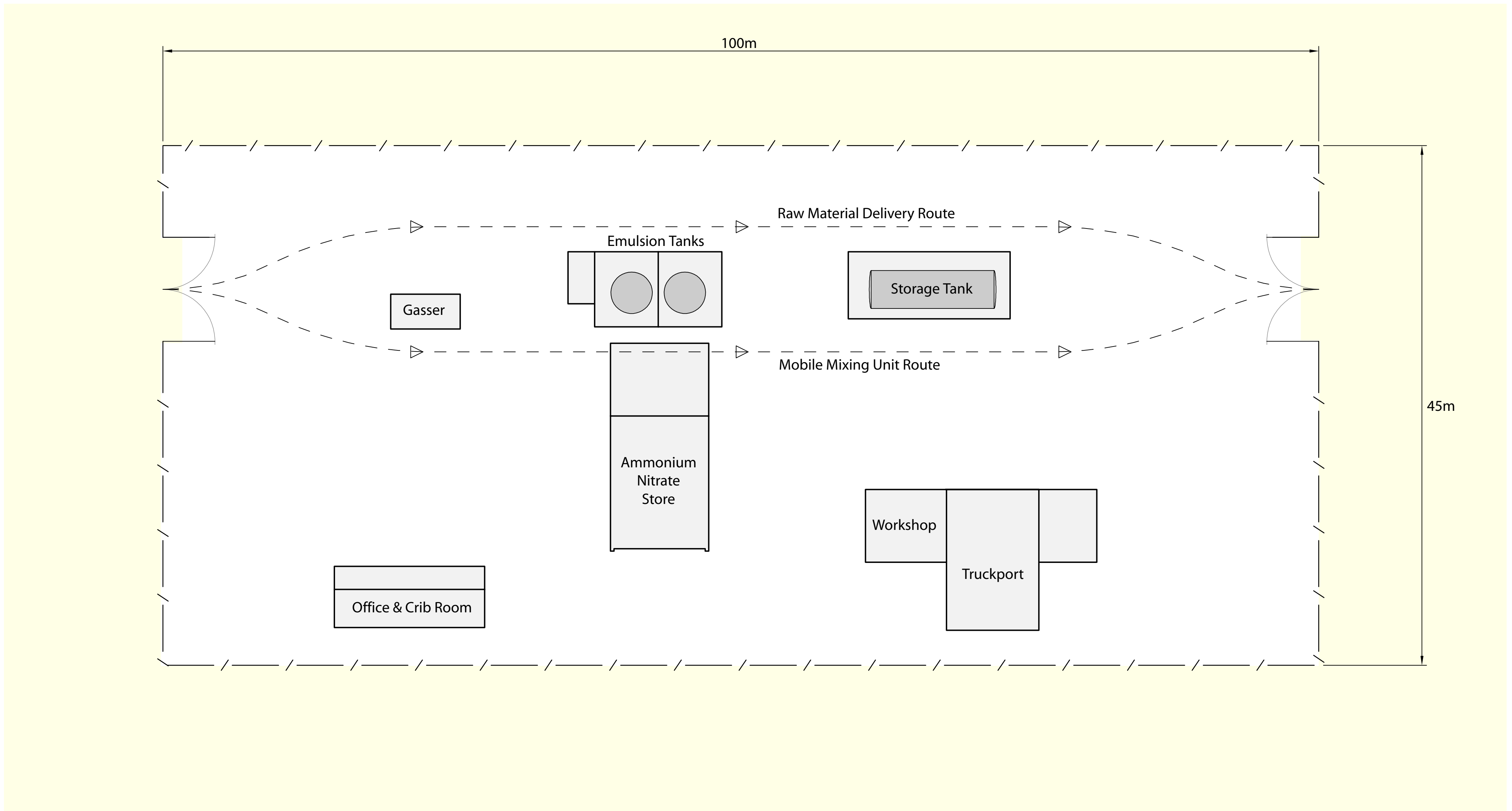
Security Fence

Scale 1:20

Figure 2-12

Magazine Layout

QE06243/Supplementary Report/Graphics/Figure 2-12_magazine layout.pdf



RIO TINTO COAL AUSTRALIA | clermont

Scale 1:200

LEGEND
Security fence

Figure 2-13
Bulk Explosive Facility Layout

3. Air Quality

3.1 Clermont Coal Mine Project – Revised Dust Modelling Results

In the process of assessing the potential impacts associated with the introduction of the IPCC system for the Project, it was noticed that some of the emission rates used in the air quality modelling conducted for the EIS were incorrect. This was caused by a transcription error converting the emission estimation results into a suitable format for dispersion modelling. As the Industrial Source Complex version 3 (ISC3) model utilises flux rates for area sources (i.e. $g/m^2/s$), the erroneous numbers were not immediately apparent as would have been the case had total emission rates been used.

Modelling has now been revised, incorporating the corrected emission rates.

The cumulative predicted levels at the nearest sensitive locations to the Project are outlined in **Table 3-1** and **Table 3-2** for the Production Years 1 and 8 respectively. Note that these predicted levels include the assumed background levels.

Table 3-1 Revised Predicted Dust Concentrations and Deposition Rates at Nearby Sensitive Locations (including background levels) – Production Year 1

Residence	Max. 24-hr PM_{10} ($\mu g/m^3$) [days > 50 $\mu g/m^3$]	Annual PM_{10} ($\mu g/m^3$)	Annual TSP ($\mu g/m^3$)	Annual Dust Deposition ($mg/m^2/day$)
EPP(Air) goal	***150***	***50***	***90***	***120***
Araluen Residence	129.2 [9]	17.7	25.1	35.4
Homelea Downs Residence [1, 2]	47.9	15.8	40.9	30.4
Fleurs Residence [1, 2]	54.5 [1]	15.8	40.9	32.0
Crillee Residence [1]	45.3	16.9	42.2	37.1
Airport Residence	61.5 [2]	17.5	21.8	33.6
Old Blair Athol Homestead [1, 2]	43.1	17.7	42.9	38.5
New Blair Athol Homestead [1, 2]	47.5	17.0	42.2	34.5
Glenmore Residence	83.5 [9]	19.9	51.3	47.7

Notes:
1 Sites with no baseline TSP data. Baseline TSP data for these sites were estimated as the mean of TSP concentrations at sites Airport, Glenmore and Araluen
2 Sites with no baseline deposited dust data. Baseline dust for these sites was estimated as the mean of deposited dust concentrations at sites Airport, Crillee, Glenmore and Fleurs.

Table 3-2 Revised Predicted Total Dust Concentrations and Deposition Rates at Nearby Sensitive Locations (including background levels) – Production Year 8

Residence	Max. 24-hr PM_{10} (µg/m³) [days > 50 µg/m³]	Annual PM_{10} (µg/m³)	Annual TSP (µg/m³)	Annual Dust Deposition (mg/m²/day)
EPP(Air) goal	***150***	***50***	***90***	***120***
Araluen Residence	65.5 [1]	16.4	23.4	30.5
Homelea Downs Residence [1, 2]	41.0	15.7	40.7	31.2
Fleurs Residence [1, 2]	50.2 [1]	15.7	40.7	31.0
Crillee Residence [1]	53.5 [2]	17.3	42.9	48.4
Airport Residence	48.6	18.0	22.8	48.1
Old Blair Athol Homestead [1, 2]	42.7	17.0	42.2	38.0
New Blair Athol Homestead [1, 2]	38.4	16.3	41.4	34.5
Glenmore Residence	62.1 [5]	17.4	48.6	40.7

Notes:
1 Sites with no baseline TSP data. Baseline TSP data for these sites was estimated as the mean of TSP concentrations at sites Airport, Glenmore and Araluen
2 Sites with no baseline deposited dust data. Baseline dust for these sites was estimated as the mean of deposited dust concentrations at sites Airport, Crillee, Glenmore and Fleurs.

Graphical comparisons of the original EIS results and the revised results are presented in **Appendix A**, **Figure A-1** to **Figure A-8**. The annual average results show very little variation, while the short-term 24-hr average PM_{10} levels show some degree of variation, the most notable experienced at the Araluen residence in Production Year 1 (increasing from 80.7 µg/m³ to 129.2 µg/m³ as a 24-hr maximum PM_{10}). A 24-hour PM_{10} level of 50 µg/m³ would be exceeded 9 times during Production Year 1 at Araluen and Glenmore. The maximum PM_{10} levels at Araluen and Glenmore would decline after Production Year 1 as the mining activity moved to the south. All results remain below the relevant goal from the Queensland Environmental Protection Agency (EPA) *Environmental Protection (Air) Policy 1997a* (EPP (Air)) (shown as a solid line).

The 24-hour PM_{10} level of 50 µg/m³ is equivalent to the National Environmental Protection Measure (NEPM) goal. The NEPM goals are not designed to be used as 'beyond-the-boundary' compliance criteria for specific developments, unlike the EPP (Air). The NEPM goal includes five exceedances per annum of the 50 µg/m³ criterion.

The 50 µg/m³ criterion used in the NEPM is based on an assessment of health risks identified from epidemiological studies of PM_{10} exposure in large US cities. Urban atmospheres are dominated by particles emitted from combustion sources (e.g. motor vehicles, heating, industrial processes). These particles are predominantly in the lower part of the PM_{10} size range, less than 1-2 µm. They also tend to be carbonaceous and contain a variety of products of incomplete combustion such as PAHs, and other toxic compounds. The size and chemical characteristics of these urban particles are important with respect to health effects.

On the other hand, particles emitted from activities such as mining, construction and agriculture are predominantly generated from soil and rock and because they are mechanically generated they tend to be coarser. Mine dusts have relatively small fractions below 2 µm and are heavily weighted towards the higher end of the PM10 size range (and above). There is far less potential for these types of dust to penetrate deep into the respiratory system and cause adverse health effects.

The exceedances of the 24-hour PM_{10} level of 50 µg/m³ at Araluen and Glenmore in Production Year 1 do not constitute a health risk.

3.2 Air Quality – In-Pit Crushing and Conveying

Variation from EIS

In the EIS, the air quality assessment for the project was based on all waste rock being removed from the pit via haul trucks. As part of the feasibility study for the Project, the option of installing a mobile in-pit crusher and conveyor (IPCC) system for overburden removal is being investigated. The IPCC system would require nine fewer operational trucks, one less grader and less machine time for dozers and haul road watering. The number of trucks required to move coal would be the same, and the footprint and final configuration of the dumps and pit would be basically the same.

The IPCC system is designed to operate at a maximum of 12 000 tonnes of waste rock per hour (average of 10 000 tonnes per hour). For the purposes of this assessment, the conveying system was assumed to continuously operate at its maximum rate of 12 000 tonnes per hour.

Initially the waste rock spreader will be operating on the North West dump (Production Year 1 to 4). During Production Year 4 the overburden spreader will begin returning the waste rock to the pit for in-pit dumping and will move south at approximately 250 m per year following the mining path. The South West waste dump will be constructed with dump trucks, as reported in the EIS.

Methodology

The prediction and assessment of dust impacts utilises the same methodology as that in the EIS, relying on:

- generation of required input meteorology for the ISC3 model using the TAPM model and CALMET models, as well as observational data;
- estimation of emission rates based on accepted methods such as those developed by Environment Australia now the Department of the Environment and Heritage and the USEPA. Estimated emission rates are a required input for the ISC3 model;
- use of the ISC3 dispersion model to predict pollutant ground level concentrations; and
- comparison of predicted levels against the criteria presented in the EIS.

3.2.1 Emissions Estimation

As in the EIS, estimation of particulate emissions from activities at the project involved the following general steps:

- identification of key activities likely to generate airborne particulates;
- obtaining for each operation the best available emission estimation techniques - from various sources, including the National Pollutant Inventory (NPI) Emission Estimation Technique Manual for Mining (Environment Australia, 2003) and the USEPA's AP-42 Compilation of Air Pollutant Emission Factors (USEPA, 1998); and
- calculation of airborne particulate emissions from the operations data for each activity and the emission factors. Where necessary, additional approximations were made based on best available information. The emissions used in modelling are given below in **Section 3.2.3**.

3.2.2 Dust Emission Sources and Controls

The main dust generating activities at the project were characterised to allow the estimation of dust emissions. A summary of particulate emissions from the main dust generating activities used as input into the ISC3 dispersion model for the IPCC option is presented in **Appendix A.1 Table A-1**. A conservative assumption that dust emissions from the IPCC were uncontrolled was made.

The dust emission estimates include assumptions that dust emission controls are utilised on many of the dust emitting processes. The specific controls assumed to be utilised to reduce dust emissions are presented in **Appendix A.1 Table A-2**.

3.2.3 Dispersion Modelling Inputs

The identified dust emission sources were allocated to specific emission areas for input to the ISC3 dispersion model. A description of how dust emission sources were allocated to modelling areas is presented in **Appendix A.1 Table A-3**. The allocation of sources was made to decrease the amount of time required for the dispersion model to process the inputs. Each modelling area was defined into an appropriate source type as outlined in **Appendix A.1 Table A-4** and an average particle size distribution defined to allow the model to calculate dry depletion of the particulate plume.

3.3 Air – Potential Impacts

As in the EIS, modelling of dust impacts was based on Production Years 1 and 8, which were considered to represent the stages of the mine life with the greatest potential for air quality impacts. Production Year 1 is characterised by a high rate of overburden removal near the surface in the north of the mine, and Production Year 8 has a high rate of overall activity and with the South-West out-of-pit dump active.

3.3.1 Sensitive Locations

The predicted dust concentrations resulting from the inclusion of the IPCC system at the nearest sensitive locations to the Project are outlined in **Table 3-3** for the Production Year 1 modelling scenario and **Table 3-4** for Production Year 8. These predicted levels include the assumed background levels identified in the EIS. The number of days per annum that 24-hr PM_{10} is predicted to exceed 50 µg/m³ is also shown.

Table 3-3 Predicted Dust Concentrations and Deposition Rates at Nearby Sensitive Locations (including background levels) – Production Year 1

Residence	Max. 24-hr PM_{10} (µg/m³) [days > 50 µg/m³]	Annual PM_{10} (µg/m³)	Annual TSP (µg/m³)	Annual Dust Deposition (mg/m²/day)
EPP(Air) Goal	***150***	***50***	***90***	***120***
Araluen Residence	109.7 [5]	17.0	24.1	33.3
Homelea Downs Residence [1, 2]	39.3	15.7	40.7	30.0
Fleurs Residence [1, 2]	68.2 [1]	15.6	40.7	31.8
Crillee Residence [1]	53.9 [1]	16.7	41.8	37.3
Airport Residence	57.1 [2]	17.2	21.3	33.6
Old Blair Athol Homestead [1, 2]	44.7	17.7	42.5	38.8
New Blair Athol Homestead [1, 2]	53.6 [1]	17.0	41.9	34.6
Glenmore Residence	125.2 [12]	20.5	50.8	48.8

Notes:

1 Sites with no baseline TSP data. Baseline TSP data for these sites were estimated as the mean of TSP concentrations at sites Airport, Glenmore and Araluen

2 Sites with no baseline deposited dust data. Baseline dust for these sites was estimated as the mean of deposited dust concentrations at sites Airport, Crillee, Glenmore and Fleurs.

Table 3-4 Predicted Total Dust Concentrations and Deposition Rates at Nearby Sensitive Locations (including background levels) – Production Year 8

Residence	Max. 24-hr PM_{10} (µg/m³) [days > 50 µg/m³]	Annual PM_{10} (µg/m³)	Annual TSP (µg/m³)	Annual Dust Deposition (mg/m²/day)
EPP(Air) Goal	***150***	***50***	***90***	***120***
Araluen Residence	81.5 [3]	16.6	23.6	31.2
Homelea Downs Residence [1, 2]	49.2	15.8	40.9	31.8
Fleurs Residence [1, 2]	58.2 [1]	15.8	40.8	31.5
Crillee Residence [1]	61.8 [6]	17.8	43.3	52.3
Airport Residence	59.6 [1]	18.6	23.3	52.2
Old Blair Athol Homestead [1, 2]	45.7	17.3	42.3	39.6
New Blair Athol Homestead [1, 2]	40.8	16.5	41.5	35.4
Glenmore Residence	73.2 [6]	17.8	48.8	42.3

Notes:
1 Sites with no baseline TSP data. Baseline TSP data for these sites were estimated as the mean of TSP concentrations at sites Airport, Glenmore and Araluen
2 Sites with no baseline deposited dust data. Baseline dust for these sites was estimated as the mean of deposited dust concentrations at sites Airport, Crillee, Glenmore and Fleurs.

Predicted impacts under the IPCC system are compared to the truck and shovel base case results in **Appendix A.2 Figures A-9 to A-16**.

3.3.2 PM_{10}

Annual average levels of PM_{10} at the nearest sensitive location (Araluen) during Production Year 1 with the IPCC system (refer to **Table 3-3**) are predicted to be only 17 µg/m³ including the assumed background concentration of about 15 µg/m³. While Araluen is the closest residence to the Project, meteorological conditions in the area result in slightly higher concentrations being predicted at Glenmore (20 µg/m³). These levels are well below the relevant EPP(Air) annual average goal for PM_{10} of 50 µg/m³.

Annual average levels of PM_{10} for the Project during Production Year 8 with the IPCC system (**Table 3-4**) also remain low with Araluen predicted to be 16.6 µg/m³ and the highest level predicted at the Airport (18.6 µg/m³ with background). These levels are also well below the relevant EPP (Air) goal for PM_{10} of 50 µg/m³.

Predicted 24-hour concentrations of PM_{10} are also within the relevant EPP (Air) goal of 150 µg/m³. The highest predicted 24-hour levels in Production Year 1 are at Glenmore with 125.2 µg/m³ and Araluen with 109.7 µg/m³. It is predicted that a 24-hour level of 50 µg/m³ will be exceeded 12 times at Glenmore and 5 times at Araluen during Production Year 1. The highest predicted 24-hour levels in Production Year 8 are at Glenmore with 73.2 µg/m³ and Araluen with 81.5 µg/m³. It is predicted that a 24-hour level of 50 µg/m³ will be exceeded six times at Glenmore and 3 times at Araluen in Production Year 8.

The 24-hour PM_{10} level of 50 µg/m³ is equivalent to the National Environmental Protection Measure (NEPM) goal. The NEPM goals are not designed to be used as ‘beyond-the-boundary’ compliance criteria for specific developments, unlike the EPP (Air). The NEPM goal includes five exceedances per annum of the 50 µg/m³ criterion. The irrelevance of the NEPM goal for the Clermont situation is discussed in Section 3.1 above. The exceedances of the 24-hour PM_{10} level of 50 µg/m³ at Araluen and Glenmore do not constitute a health risk.

3.3.3 TSP

The maximum predicted annual average concentrations of TSP are at Glenmore in Production Years 1 and 8 (50.8 µg/m³ and 48.8 µg/m³ respectively). These concentrations are well below the relevant EPP (Air) goal of 90 µg/m³.

3.3.4 Dust Deposition

As with the predicted concentrations of suspended particles, the predicted levels of deposited dust are also well below the relevant EPP(Air) goal of 120 mg/m²/day as an annual average. The highest predicted levels due to the Project are 48.8 mg/m²/day (Glenmore) in Production Year 1 and 52.3 mg/m²/day (Crillee) in Production Year 8.

3.3.5 Discussion of IPCC Results

A comparison of the model results at Production Years 1 and 8 with and without an IPCC system are presented graphically in **Appendix A.2 Figures A-9** to **A-16**.

The predicted dust levels associated with the IPCC system show that, relative to the base case (without the IPCC system), the annual PM_{10}, TSP and deposited dust levels show little change in Production Year 1 and 8. The maximum 24-hour PM_{10} level in Production Year 1 increases from 83.5 to 125.2 µg/m³ at Glenmore and decreases from 129.2 to 109.7 µg/m³ at Araluen. In Production Year 8 there are slight increases in the maximum 24-hour PM_{10} level at all sensitive receptors. Model results indicate that with or without an IPCC system, predicted particulate levels will be below the relevant EPP (Air) goals.

The emissions modelled for the IPCC system were conservatively high, as it was assumed that there were no dust controls in place. The IPCC system in an uncontrolled state represents the second highest dust emission source, after 'wheel generated dust' (refer **Appendix A.1 Table A-1**).

4. Noise and Vibration

4.1 Noise and Vibration Assessment - In Pit Crushing and Conveying

The noise and vibration assessment for the Project in the EIS was based on all waste rock being removed from the pit via haul trucks. As part of the feasibility study for the Project, the option of installing a mobile in-pit crusher and conveyor (IPCC) system for overburden removal is being investigated. The IPCC system would require nine fewer operational trucks, one less grader and less machine time for dozers and haul road watering. The number of trucks required to move coal would be the same, and the footprint and final configuration of the dumps and pit would be basically the same.

The IPCC system is designed to operate at a maximum of 12 000 tonnes of waste rock per hour (average of 10 000 tonnes per hour). For the purposes of this assessment, the IPCC conveying system is assumed to continuously operate at its maximum rate of 12 000 tonnes per hour.

Initially the waste rock spreader will be operating on the North West dump (Production Years 1 to 4). During Production Year 4 the overburden spreader will begin returning the waste rock to the pit for in-pit dumping and will move forward at approximately 250 m per year following the mining path. The South West waste dump will be constructed with dump trucks, not the spreader, as in the EIS.

4.1.1 Noise Modelling

In order to determine the extent of noise emission from the site, a 3D computer noise model has been developed. This model was developed using SoundPLAN 6.1 in conjunction with topographic information from the EIS provided by the Proponent (refer EIS Section 7.3.1). SoundPLAN is a modelling package that is accepted and endorsed by numerous agencies Australia-wide, including the EPA. The model is also widely accepted worldwide. The CONCAWE prediction method was used. The accuracy of this method is discussed in Appendix M4 of the EIS.

The number of units of mobile equipment working at any particular time with the IPCC option in place was provided by the Proponent and is presented in **Table 4-1**. The sound power levels of equipment and location of the equipment in the noise model are shown in **Appendix B.1** and **Appendix B.2**.

As in the EIS, the modelling of noise impacts was based on Production Years 1 and 8, which were considered to represent the stages of the mine life with the greatest potential for noise impacts. Production Year 1 is characterised by a high rate of overburden removal near the surface in the north of the mine, and Production Year 8 has a high rate of overall activity and with the South-West out-of-pit dump active.

Table 4-1 Equipment List for Noise Model – IPCC Option

Item	Units in Noise Model (12Mtpa)	
	Production Year 1	Production Year 8
Waste Removal		
Rope Shovel (43 m^3)	1	1
Hydraulic Excavator (34 m^3)	3	2
Rear Dump Truck (236 t)	15	10
Overburden Drill	3	3
Tracked Dozer –Dump	1	1
Rubber Tyred Dozer	1	1
Coal Removal		
Hydraulic Excavator (25 m^3)	1	1
Front End Loader	1	1
Rear Dump Truck (196t)	5	5
Coal Drill	1	1
Tracked Dozer – Pit	3	3
Tracked Dozer – ROM Coal Stockpile	1	1
Rubber Tyred Dozer	2	2
Grader	2	2
Water Cart	1	2

4.1.2 Noise Predictions

The predicted noise levels at each residence during conventional base case operation (truck and shovel) as described in the EIS are summarised in **Table 4-2**. The predicted noise levels at Glenmore, Old Blair Athol and New Blair Athol have not been included as they are controlled by noise emission from the overland conveyor as described in **Section 4.2**.

Table 4-2 Noise Levels at Nearby Residences during Mine Operation – Base Case

Receiver	Sound Pressure Levels due to Mine Operation (dB(A)) (L_{eq})					
	Production Year 1			Production Year 8		
	Class D No Wind	Class F 3m/s SE Wind	Class F 3m/s NE Wind	Class D No Wind	Class F 3m/s SE Wind	Class F 3m/s NE Wind
Araluen	34	37	30	22	28	18
Fleurs	<15	<15	<15	<15	<15	<15
Crillee	<15	<15	<15	25	19	31
Airport	<15	<15	<15	27	24	32
Homelea Downs	<15	<15	<15	<15	<15	<15
Fairfield	<15	<15	<15	<15	<15	<15

The predicted noise levels at each residence during mine operation with IPCC are summarised in **Table 4-3** below. Instances where the background level has increased are shown in **bold**. Instances where the noise level has decreased are shown marked with (-).

Table 4-3 Noise Levels at Nearby Residences during Mine Operation – IPCC Option

Receiver	Sound Pressure Levels due to Mine Operation (dB(A)) (L_{eq})					
	Production Year 1			Production Year 8		
	Class D No Wind	Class F 3m/s SE Wind	Class F 3m/s NE Wind	Class D No Wind	Class F 3m/s SE Wind	Class F 3m/s NE Wind
Araluen	33 (-)	37	29 (-)	**23**	**29**	**19**
Fleurs	<15	<15	<15	<15	<15	<15
Crillee	<15	<15	<15	24 (-)	19	31
Airport	<15	<15	<15	27	24	32
Homelea Downs	<15	<15	<15	<15	<15	<15
Fairfield	<15	<15	<15	<15	<15	<15

To illustrate the type of noise that will occur due to the IPCC option, the predicted noise spectra for Araluen under Production Year 1, Class F and 3m/s wind from the South-East conditions are presented **Table 4-4**. Overall sound pressure levels are also given in both A-weighted (dB(A)) and linear (dB (lin)) format.

Table 4-4 Sound Pressure Level Spectrum at Most Affected Receivers (Araluen)

Receiver	Sound Pressure Levels at Receivers due to IPCC Operation (L_{eq})								
	Sound Pressure Level Spectrum (dB(A))							Overall Level	
	63	125	250	500	1000	2000	4000	dB(A)	dB (lin)
Araluen	12	28	27	35	30	10	0	37	47

4.1.3 Noise Impacts

The operation of the mine during Production Year 1, with the IPCC option in place, is expected to produce noise levels of up to 37 dB(A) at the Araluen homestead under typical worst case conditions. This is no worse than the noise levels predicted for the base case mine operation. In general, the noise level at most residences has remained the same, or decreased by less than 1 dB(A), during Production Year 1.

By Production Year 8, the noise level at Araluen is forecast to reduce to 29 dB(A). This is 1 dB(A) higher than the noise level expected from the base case mine operation. However the level is still within the relevant criterion, and the typical worst-case noise level at Araluen has not changed. The noise levels at all other residences due to the operations will reduce or remain the same if the IPCC option is implemented.

The noise levels at Old Blair Athol, New Blair Athol and Glenmore are controlled primarily by the overland conveyor operation and are not affected by the IPCC system.

Noise levels of up to 37 dB(A) may be audible, especially when ambient background noise levels fall below 30 dB(A) at the receivers. These mine noise emission levels are nevertheless considered acceptable as they fall within the 30 – 40 dB(A) acceptable range (refer Section 7.1.5 of the EIS). The residences will not be exposed to higher maximum noise levels with the IPCC option compared to the base case truck and shovel operation.

The sound pressure level spectrum received at Araluen under typical worst-case conditions is shown in **Table 4-4**. Low frequency noise can be assessed by comparing the overall A-weighted (dB(A)) level to the overall linear (dB(Lin)) level. Where the overall dB(Lin) minus the dB(A) level is greater then 15 dB, low frequency noise may be considered part of the noise environment. Note also that where the noise level within dwellings is more than 50 dB(Lin), the low frequency noise character of the intruding noise needs to be considered.

The overall A-weighted noise levels at Araluen of 37 dB(A) is 10 dB below the overall linear noise levels of 47 dB. The overall linear noise level is less than 50 dB outside the dwelling and the resultant level within the dwelling is forecast to be less than 40 - 45 dB lin.

The predicted noise levels satisfy both tests for low frequency noise as described above and as such, it is concluded that the predicted noise emission from the IPCC option would not be characterised by significant low frequency noise components.

4.2 Noise Assessment – Overland Conveyor

Noise emission from the conveyor belt was originally modelled based on the layout and cross section described in Section 2.7 of the EIS with the mitigation measures described in Section 7.4.2.3 of the EIS in place. The model assumed that shielding was provided on the northern side of the conveyor over its entire length. Engineering studies undertaken as part of the Project feasibility study identified a requirement for maintenance access from the conveyor service road on the northern side of the conveyor. The shielding has therefore been reduced to cover those parts of the conveyor that are required for noise control. The proposed revised conveyor treatment is as follows:

- the shielding will be weather resistant (e.g. corrugated 0.42 mm steel or similar);
- covering over belt along the entire length, forming a gap free joint with the side barriers where applicable. Covering is curved with lower edge approximately level with belt;
- northern side: side shielding required for a total distance of 1 km, centred on the New Blair Athol homestead. Maximum 250 mm gap between the conveyor and the ground;
- southern side: side shielding required for a total distance of 3 km, centred on the Old Blair Athol homestead. Maximum 250 mm gap between conveyor and ground;
- where the conveyor is at a raised elevation, i.e. over roads and creek beds, additional cladding is proposed underneath the conveyor to limit noise transmission; and
- vibration transfer and re-radiated noise from the shielding to be minimised through appropriate design of supports for the shielding.

4.2.1 Noise Modelling

Noise in the area surrounding the overland conveyor was modelled using SoundPLAN 6.1 (refer Section 7.3.1 of the EIS).

The noise level experienced at various residences varies according to the terrain between the conveyor belt and the receiver, the distance from the belt to the receiver and the meteorological conditions modelled. Noise emission from the overland conveyor is not expected to change significantly from year to year.

Noise emission from the conveyor belt rather than the mine is the dominant source of Project noise at the Old Blair Athol, New Blair Athol and Glenmore residences. The predicted noise levels for these locations are shown in **Table 4-5**.

Table 4-5 Noise Levels at Nearby Residences during Project Operation

Receiver	Sound Pressure Levels (dB(A)) (L_{eq})					
	EIS (August 2003)			Revised Conveyor Shielding		
	Class D No Wind	Class F 3m/s SE Wind	Class F 3m/s NE Wind	Class D No Wind	Class F 3m/s SE Wind	Class F 3m/s NE Wind
Glenmore*	28	33	29	32	37	33
Old Blair Athol	34	37	37	33	34	37
New Blair Athol	24	31	23	30	37	32

* Production Year 1

The predicted noise levels at Old Blair Athol, New Blair Athol and Glenmore residences are each 37 dB(A) during typical worst case weather conditions. The predicted typical worst case noise level at Old Blair Athol has not changed with the revised conveyor shielding. The predicted typical worst case noise levels at New Blair Athol and Glenmore have increased from 31 to 37 dB(A) and 33 to 37 dB(A) respectively. These mine noise emission levels are nevertheless considered suitable as they fall within the 30 - 40 dB(A) acceptable range (refer Section 7.1.5 of the EIS).

There is some reduction in noise levels at Old Blair Athol. Shielding on the northern side of the conveyor, which was included in the conveyor design used for EIS modelling, but will not be present under the new conveyor design, would have acted to reflect additional noise back towards the homestead; the reduction in shielding on this side reduces noise reflection.

Overall, it is considered that none of the residences will be unduly affected by noise emission from the proposed overland conveyor.

4.2.2 Low Frequency Analysis

The predicted noise spectrum for the Old Blair Athol homestead under Production Year 1, Class F and 3 m/s wind from the North -East conditions is presented in **Table 4-6**. Overall sound pressure levels are also given in both dB(A) and linear dB (lin) format.

Table 4-6 Sound Pressure Level Spectrum at Most Affected Receivers (Old Blair Athol)

Receiver	Sound Pressure Levels due to Project Operation (L_{eq})								
	Sound Pressure Level Spectrum (dB(A))							Overall Level	
	63	125	250	500	1000	2000	4000	dB(A)	dB (lin)
Old Blair Athol	14	22	27	35	30	18	0	37	47

Low frequency noise can be assessed by comparing the overall dB(A) level to the overall dB(Lin) level. Where the overall dB(Lin) minus dB(A) level is greater than 15 dB, low frequency noise may be considered part of the noise environment. Note also that where the noise level within dwellings is more than 50 dB(Lin), the low frequency noise character of the intruding noise needs to be considered.

The overall A-weighted noise level at Old Blair Athol of 37 dB(A) is 10 dB below the overall linear noise levels of 47 dB(Lin). The overall linear noise level is less than 50 dB(A) outside the dwelling and the resultant level within the dwelling is forecast to be less than 40 - 45 dB (Lin).

The predicted noise levels satisfy both tests for low frequency noise as described above and as such, it is concluded that the predicted noise emission from the re-configured overland conveyor would not be characterised by significant low frequency noise components.

5. Cultural Heritage Management Plan

The EIS discussed the status of the development of a Cultural Heritage Management Plan as the situation stood in August 2004 (Sections 8.2 and 8.3 of the EIS). RTCA has continued working with the Wangan and Jagalingou Peoples native title claimants, the endorsed Aboriginal Parties, to develop an approved Cultural Heritage Management Plan (CHMP) for the Project. In addition to both RTCA's and the Aboriginal Parties' desire to have an agreed cultural heritage management process for the Project, an approved CHMP is required under Section 3.12 of the EIS Terms of Reference and s.87 of the *Aboriginal Cultural Heritage Act 2003* (ACHA).

Notification letters were sent out in accordance with Part 7, Division 3, s.91 of the ACHA to identify and subsequently endorse Aboriginal Parties for the purpose of developing the CHMP. The endorsed Aboriginal Parties are the Wangan and Jagalingou Peoples Native Title Claimants (National Native Title Tribunal file number QC04/06) and their authorised nominees (as defined in s102 (2) of the ACHA).

RTCA and the endorsed Aboriginal Parties held meetings specifically for the purpose of developing the CHMP. A draft CHMP was then provided to the Cultural Heritage Coordination Unit (CHCU) of the DNRM, under cover letters from both parties to the agreement, seeking comment and confirmation that it met requirements of both the CHCU and the ACHA. RTCA and the Aboriginal Parties subsequently received written advice from the CHCU that the draft CHMP met the requirements of the ACHA.

RTCA and the endorsed Aboriginal Parties finalised and signed the CHMP developed specifically for the Project in October 2004 and received formal DNRM approval on 2nd December 2004.

6. Supplementary Report Response Table

7. Draft EMOS

8. References

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Appendix A Air Quality Appendices

Appendix A Air Quality Appendices

A.1 Revised Dust Levels

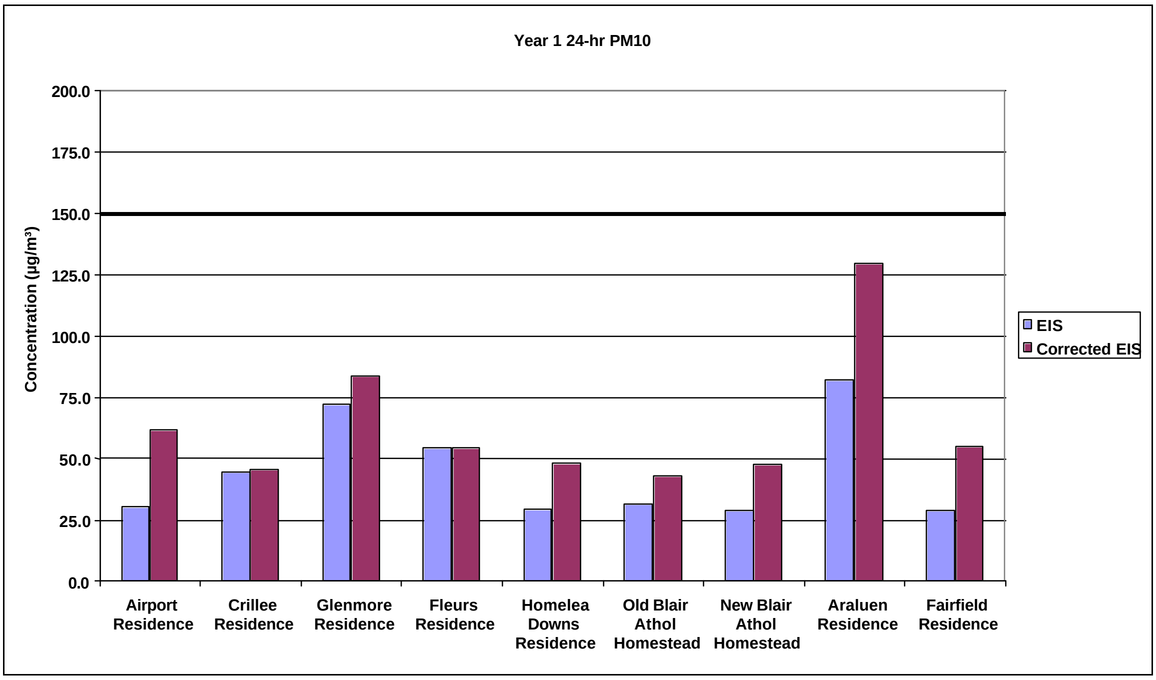

Figure A-1 Production Year 1 24-hr PM_{10}

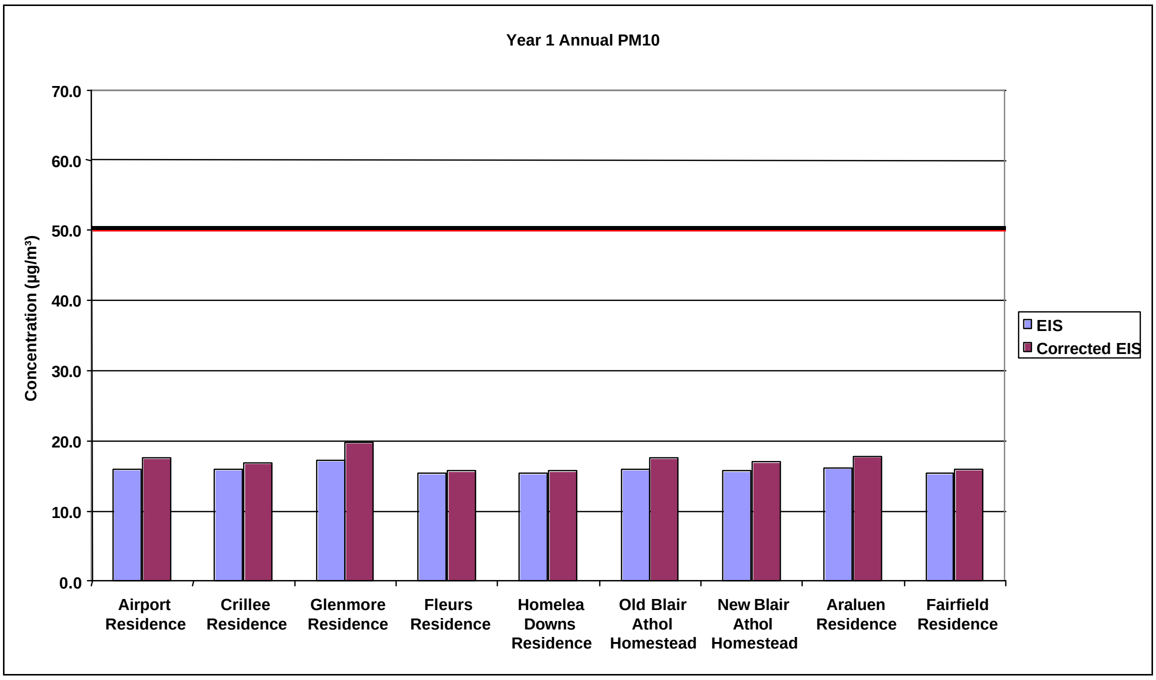

Figure A-2 Production Year 1 Annual PM_{10}

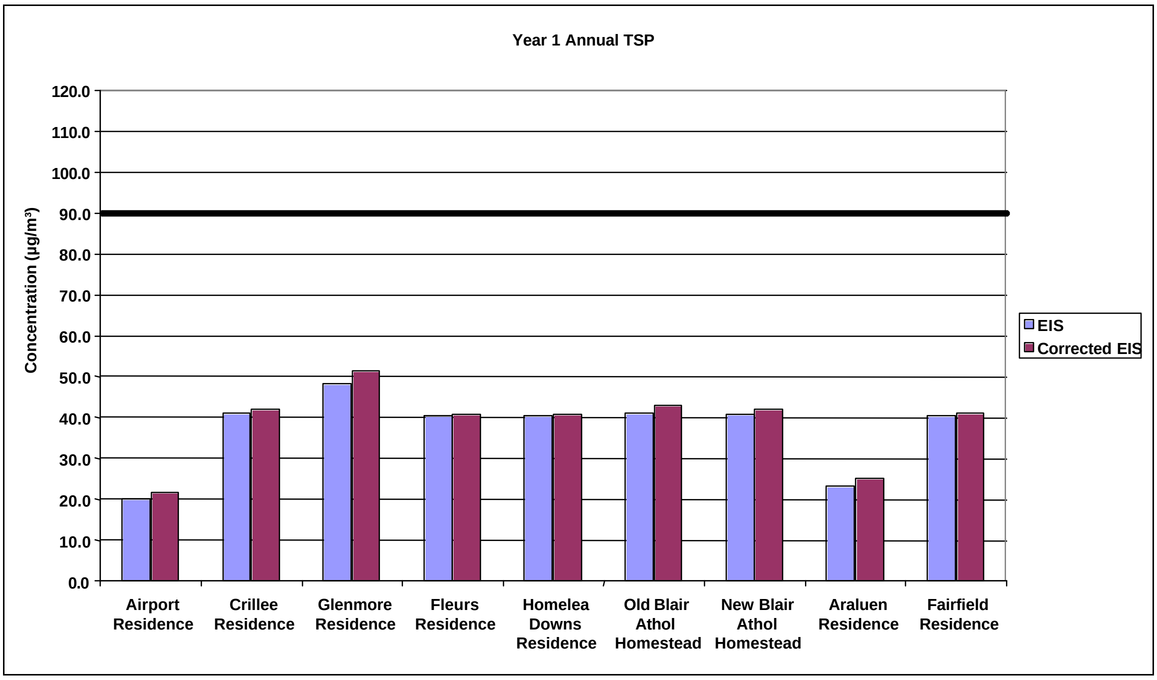

Figure A-3 Production Year 1 Annual TSP

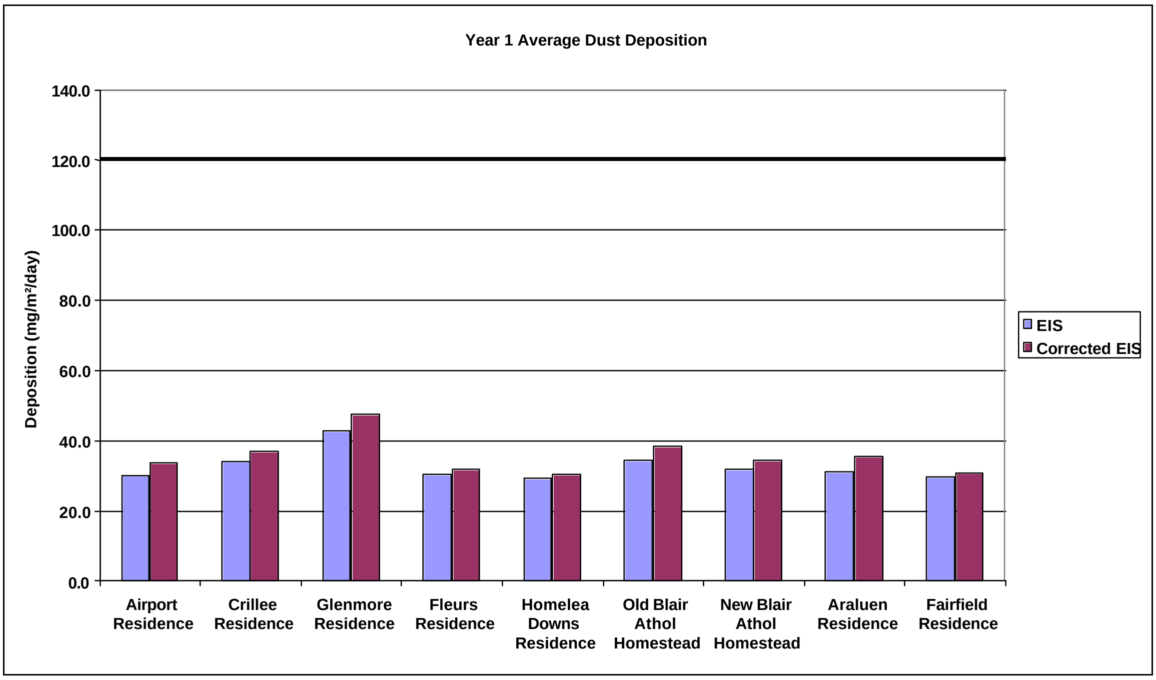

Figure A-4 Production Year 1 Annual Average Dust Deposition

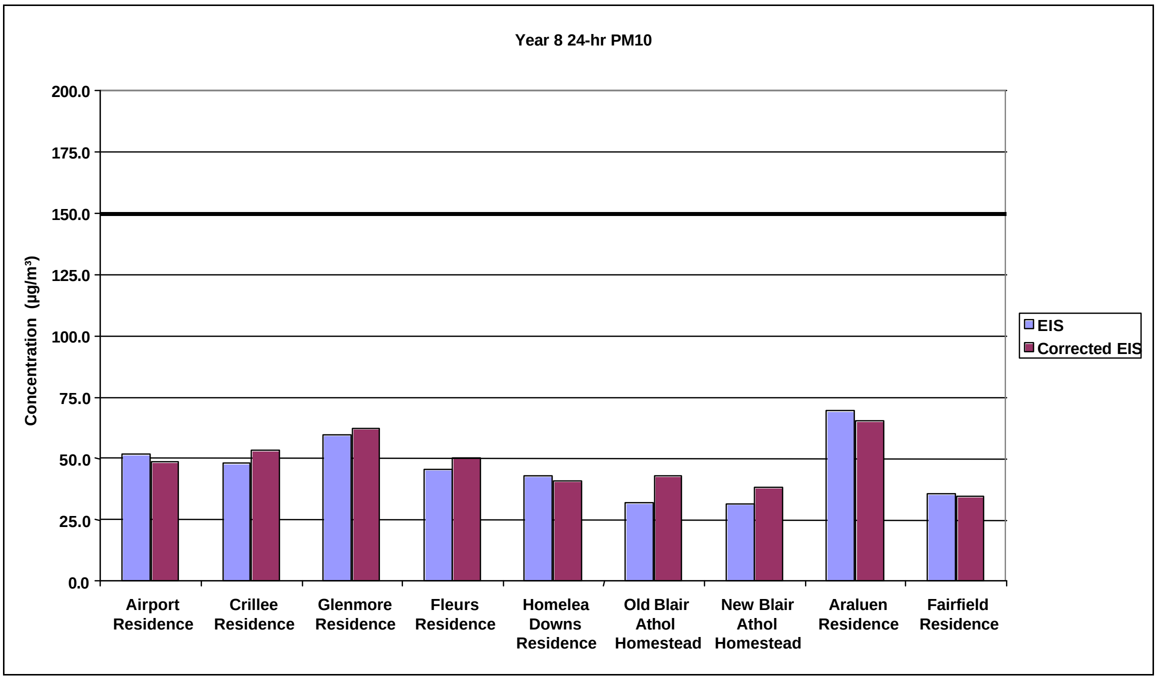

Figure A-5 Production Year 8 24-hr PM_{10}

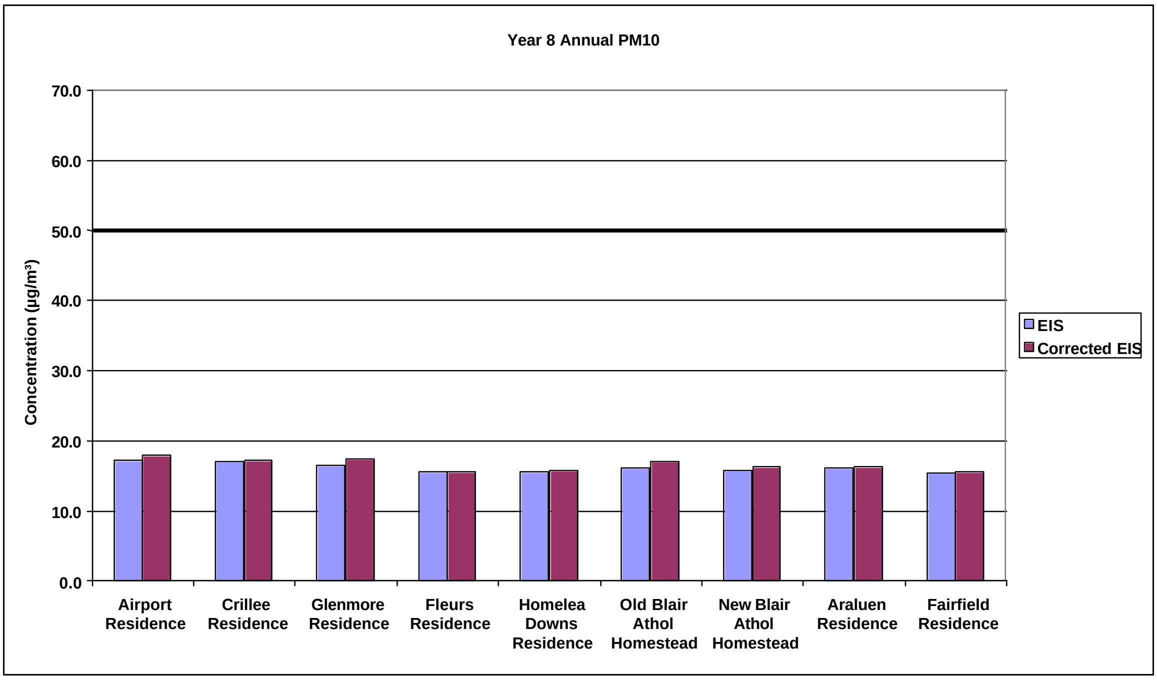

Figure A-6 Production Year 8 Annual PM_{10}

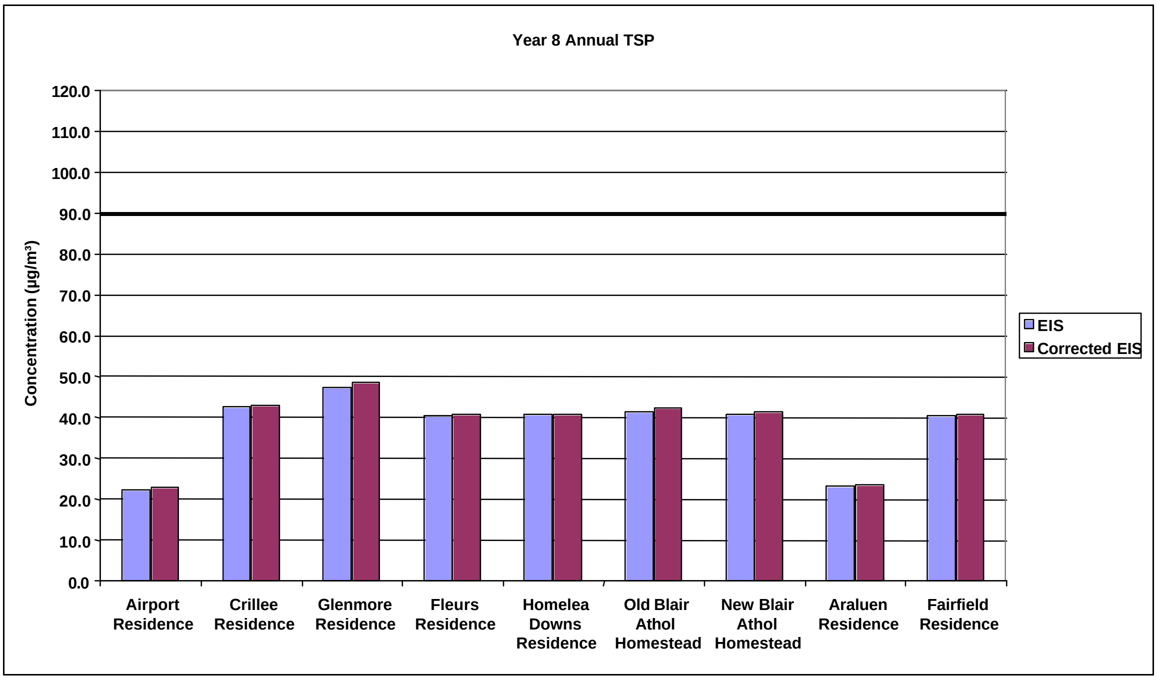

Figure A-7 Production Year 8 Annual TSP

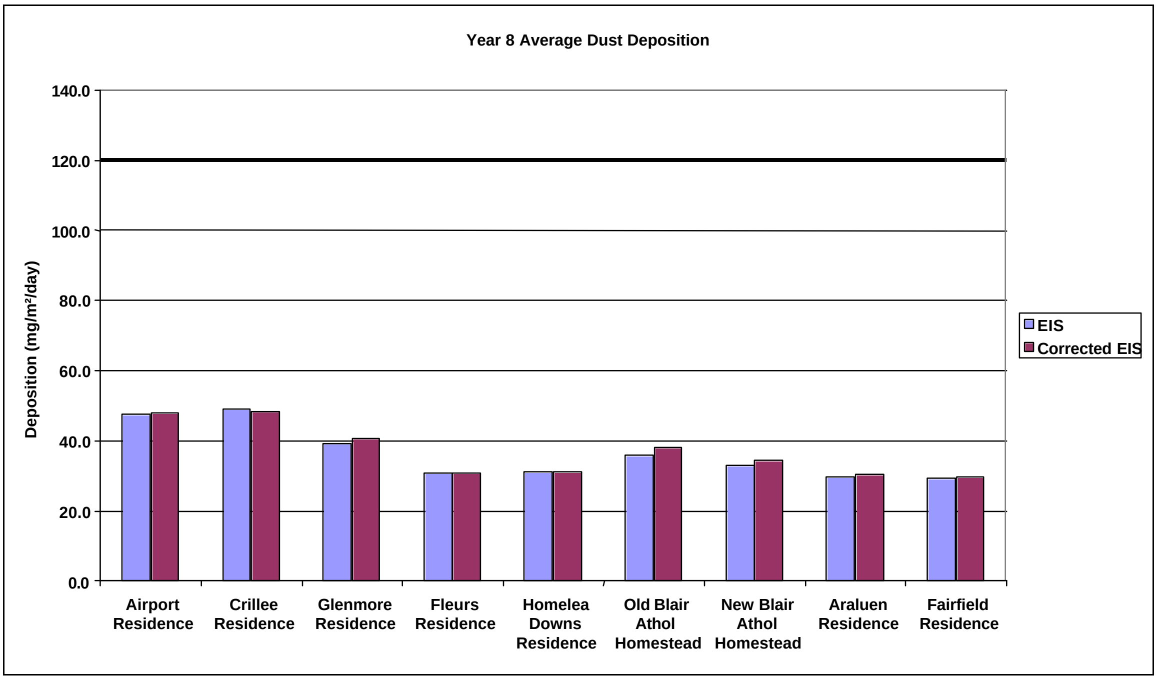

Figure A-8 Production Year 8 Annual Average Dust Deposition

Table A-1 Dust Emissions (with IPCC)

Operation	Units	Production Year 1		Production Year 8	
		TSP	PM_{10}	TSP	PM_{10}
IPCC Activities	kg/yr	3,574,080	1,440,144	3,574,080	1,440,144
Excavators/Shovels/Front-end loaders	kg/yr	2,958,194	1,419,948	2,456,871	1,179,381
Bulldozing	kg/yr	332,918	98,098	332,918	98,098
Trucks dumping	kg/yr	997,130	329,694	745,764	241,564
Drilling	kg/yr	2,930	1,539	3,909	2,054
Blasting	kg/yr	10,406	5,411	12,219	6,354
Wheel Generated Dust from Unpaved Roads - Haul Roads	kg/yr	4,268,685	1,103,476	3,201,514	827,605
Scrapers	kg/yr	23,834	6,007	82,280	21,013
Graders	kg/yr	15,740	11,594	15,740	11,594
Loading Stockpiles	kg/yr	4,549	1,933	25,560	10,863
Unloading from Stockpiles	kg/yr	34,120	14,785	191,702	83,071
Loading to Trains	kg/yr	910	387	5,112	2,173
Miscellaneous Transfer Points and Conveying	kg/yr	3,066	1,450	17,229	8,149
Wind Erosion – Active Stockpiles	kg/yr	1,424,798	712,399	3,736,126	1,868,063
Coal Crushing	kg/yr	125,106	104,941	702,908	589,610
Vehicle Exhausts	kg/yr	76,969	76,969	58,324	58,324
TOTAL	Tonnes/yr	13,853,435	5,328,775	15,162,256	6,448,060

Table A-2 Dust Emission Controls

Emission Source	Control(s) Utilised	Control Efficiency Applied [a]
IPCC System	No controls utilised	0%
Excavators/Shovels/Front-end loaders Loading trucks	No control available for truck loading	0%
Bulldozing	No control available for dozers	0%
Trucks dumping	No control utilised for unloading overburden,	0%
	Water Sprays utilised for unloading coal	70%
Drilling	Rubber curtain	70%
Blasting	No control available for blasting	0%
Wheel Generated Dust from Haul Roads	Watering roads at >2L/m^2/hour	75%
Scrapers	Average road wetting along scraper route of 2L/m^2/hour	50%
Graders	No control utilised for graders	0%
Loading Stockpiles	Water sprays utilised for loading stockpiles	50%
Unloading Stockpiles	Water sprays utilised for unloading stockpiles	50%
Loading Trains	No control utilised	0%
Wind Erosion – Active Stockpiles	No control utilised for active dumps	0%
Miscellaneous Transfer Points and Conveying:		
From stockpile to dump hopper	Water Sprays	50%
Bypass coal crushing station	Dust Seals	50%
Transfer of crushed coal onto conveyor	No control utilised	0%
Overland conveying of crushed coal	Partial enclosure of conveyor	80%
Coal from conveyor to surge bin	Enclosed bin	80%
Coal from surge bin to yard conveyors	No control utilised	0%
Yard conveying of coal	No control utilised	0%
Coal Crushing	Cyclone utilised, control efficiency incorporated in the emission factor for coal crushing	
Vehicle Exhausts	Current level of control utilised for vehicle types and fuel used	

a – NPI EET Manual for Mining Version 2.3 (Environment Australia 2001)

Table A-3 ISC3 Source Allocation

As in the EIS, the dust emission sources were allocated to specific emission areas for input to the ISC3 dispersion model.

Source	Modelling Area(s)
Excavators/Shovels/Front-end loaders – loading trucks	Pit
IPCC	Pit, NW Waste Dump, Conveyor Transfer
Bulldozing	Pit, Coal Handling Plant, SW Waste Dump, NW Waste Dump
Trucks dumping	Pit, Coal Handling Plant, NE Topsoil Stockpile, SW Topsoil Stockpile, SW Waste Dump, NW Waste Dump
Drilling	Pit
Blasting	Pit
Wheel Generated Dust from Unpaved Roads - Haul Roads	Pit, Haul Roads
Scrapers	NE Topsoil Stockpile, SW Topsoil Stockpile
Graders	Haul Roads
Loading Stockpiles	Coal Handling Plant, Blair Athol
Unloading from Stockpiles	Coal Handling Plant, Blair Athol
Loading to Trains	Coal Handling Plant, Blair Athol
Miscellaneous Transfer Points and Conveying	Coal Handling Plant, Blair Athol
Wind Erosion – Active Stockpiles	Coal Handling Plant, NE Topsoil Stockpile, SW Topsoil Stockpile, SW Waste Dump, NW Waste Dump
Coal Crushing	Coal Handling Plant
Vehicle Exhausts	Haul Roads

Each modelling area was defined into an appropriate source type as outlined in **Table A-4** and an average particle size distribution defined to allow the model to calculate dry depletion of the particulate plume.

Table A-4 ISC3 Source Types

Modelling Area	ISC3 Source Type
Pit [a]	Open Pit
Conveyor Transfer	Area
Coal Handling Plant	Volume
Haul Roads	Area
NE Topsoil Stockpile	Area
SW Topsoil Stockpile	Area
SW Waste Dump	Area
NW Waste Dump	Area
Blair Athol	Volume

a: the Pit was divided into mid-pit sources (e.g. blasting) and bottom sources (e.g. bulldozing)

A.2 Comparison Between Truck and Shovel and IPCC

A.2.1 Production Year 1

A comparison of the above results with those from the Project excluding an IPCC system for Production Year 1 are presented below in **Figure A-9** to **Figure A-12**. The relevant EPP(Air) goal is shown as a solid black line.

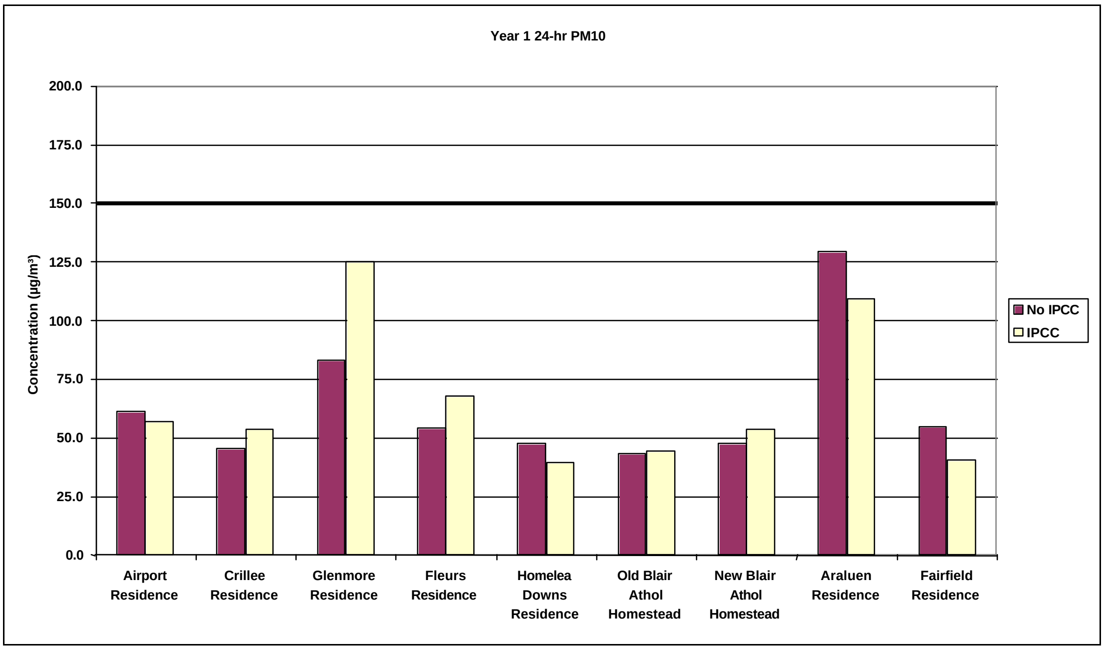

Figure A-9 Comparison of Dust Levels with and without an IPCC System – Year 1 Maximum 24-hour Average PM_{10}

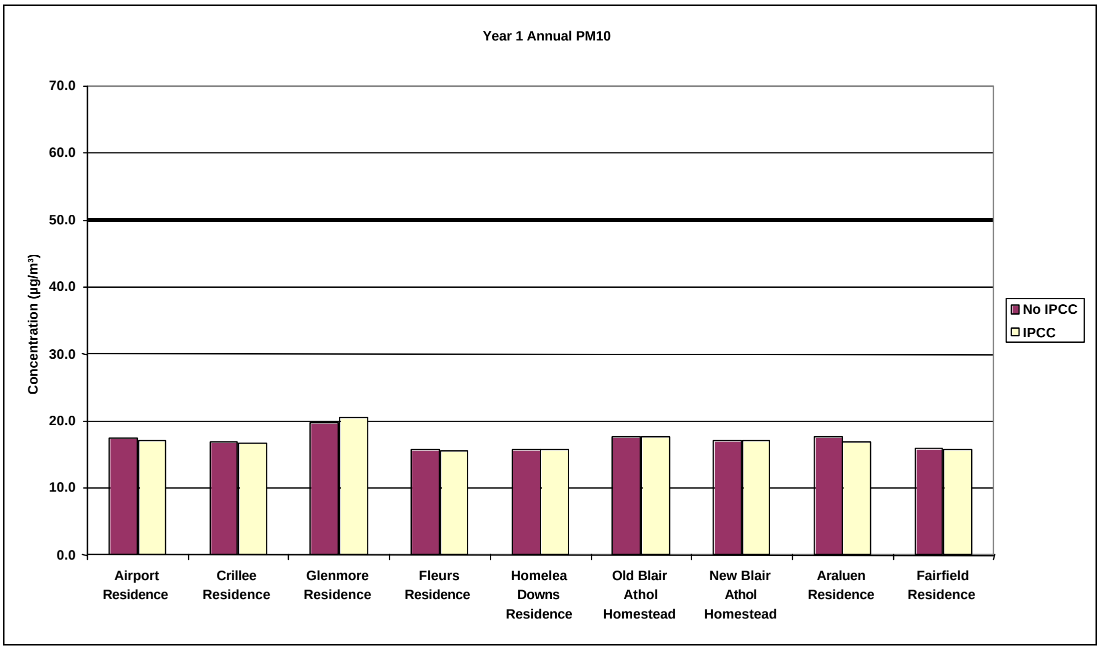

Figure A-10 Comparison of Dust Levels with and without an IPCC System – Year 1 Annual Average PM_{10}

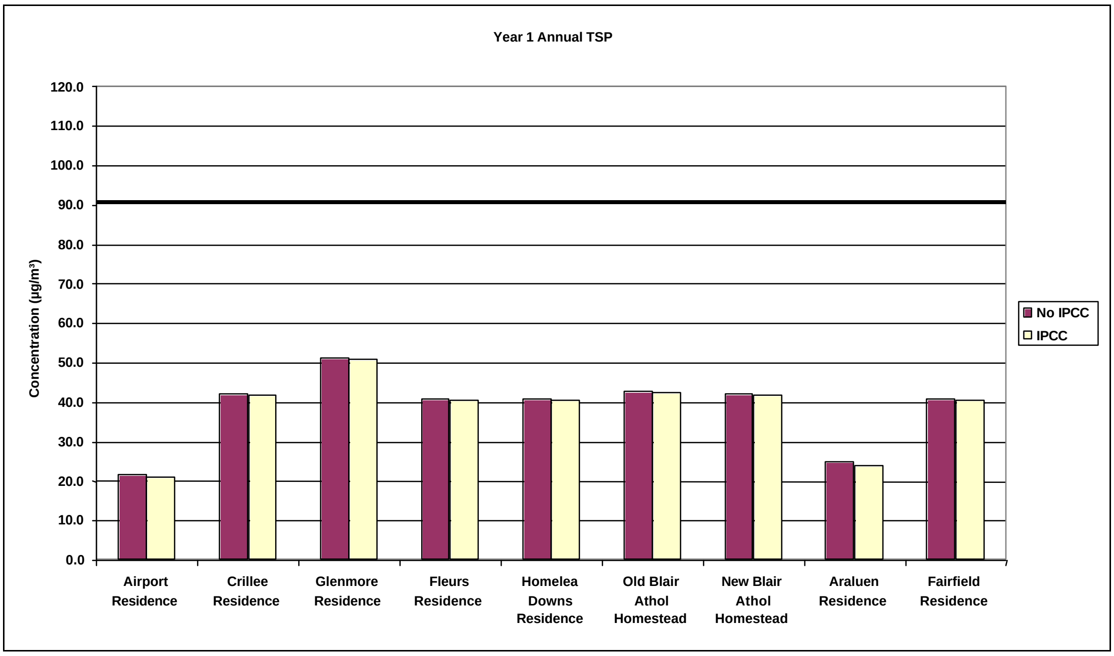

Figure A-11 Comparison of Dust Levels with and without an IPCC System – Year 1 Annual Average TSP

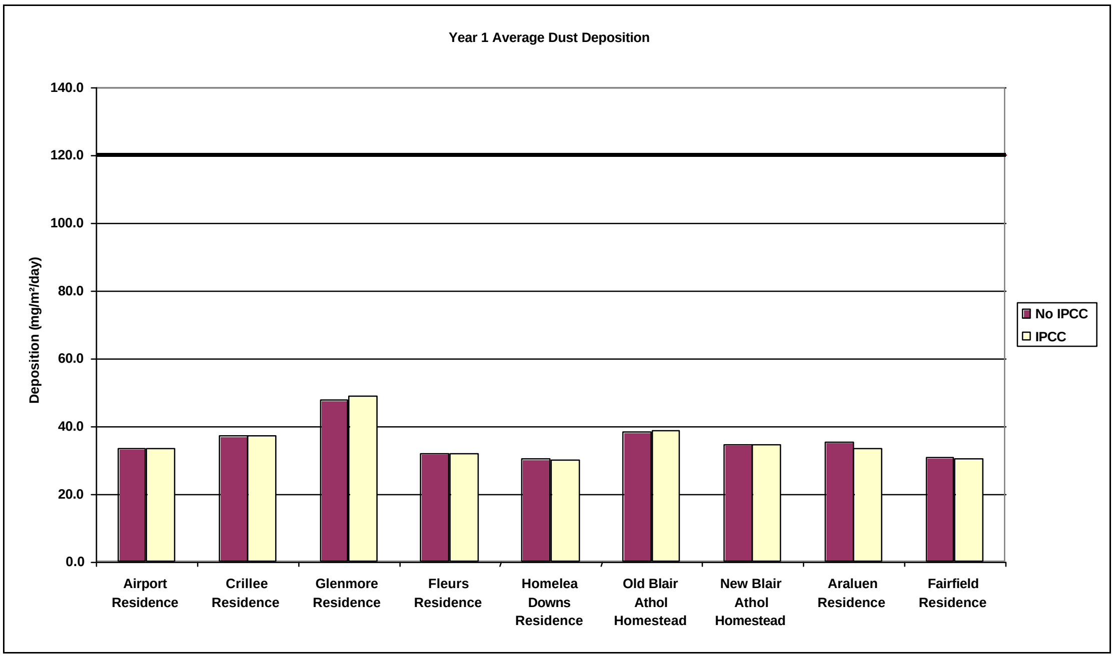

Figure A-12 Comparison of Dust Levels with and without an IPCC System – Year 1 Annual Average Dust Deposition

A.2.2 Production Year 8

A comparison of the above results with those from the Project excluding an IPCC system for Production Year 8 is presented below in **Figure A-13** to **Figure A-16**. The relevant EPP(Air) goal is shown as a solid black line.

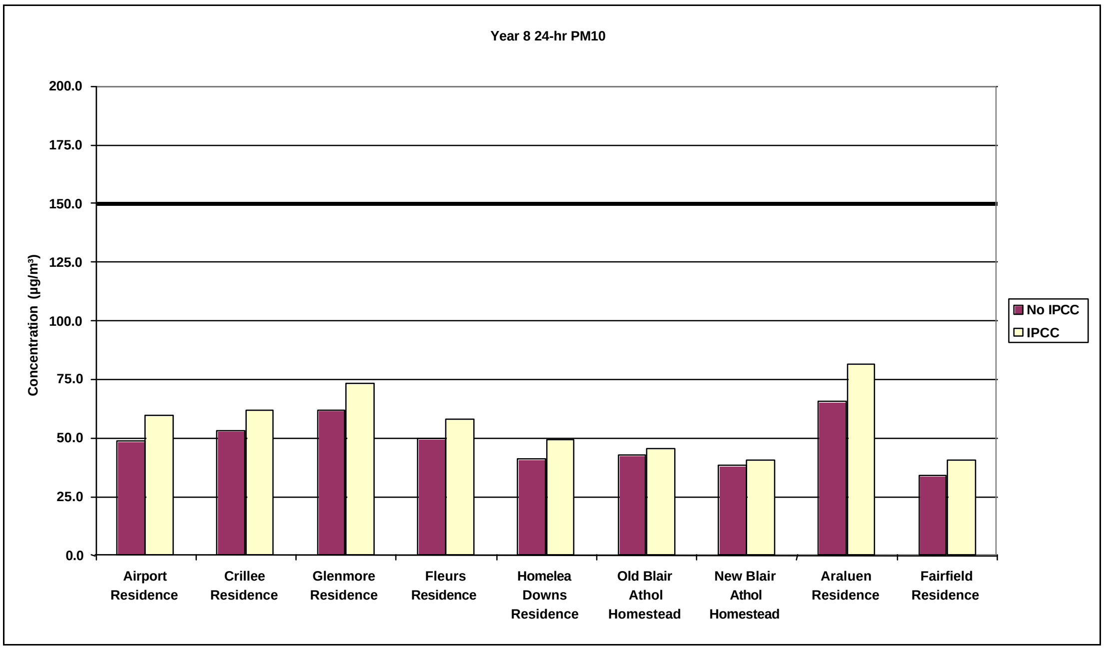

Figure A-13 Comparison of Dust Levels with and without an IPCC System – Year 8 Maximum 24-hour Average PM_{10}

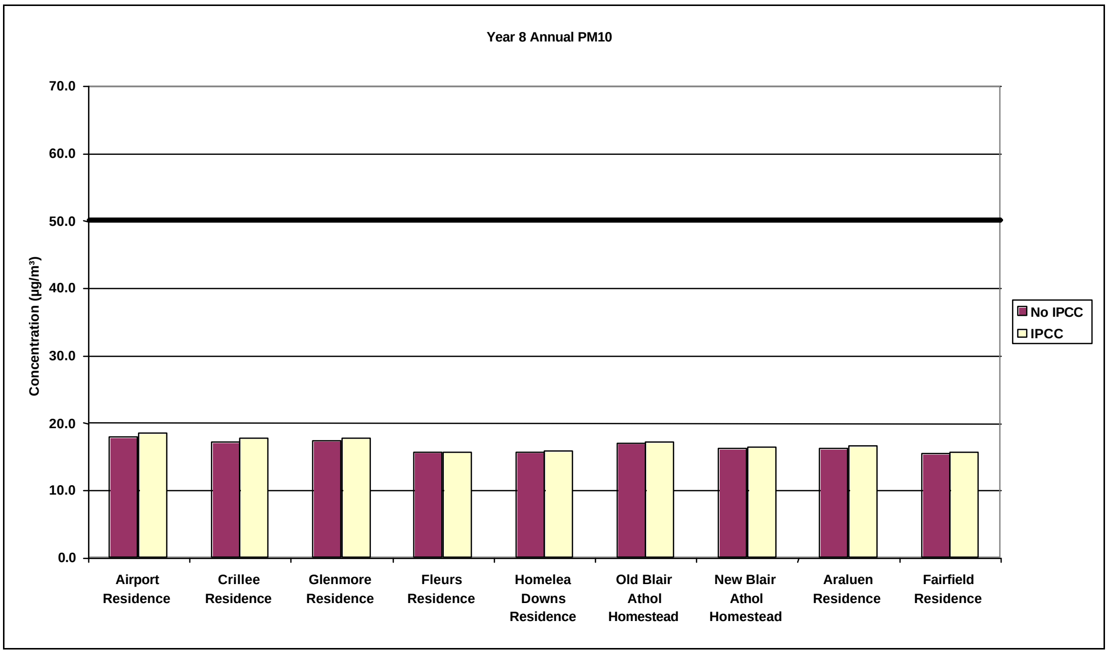

Figure A-14 Comparison of Dust Levels with and without an IPCC System – Year 8 Annual Average PM_{10}

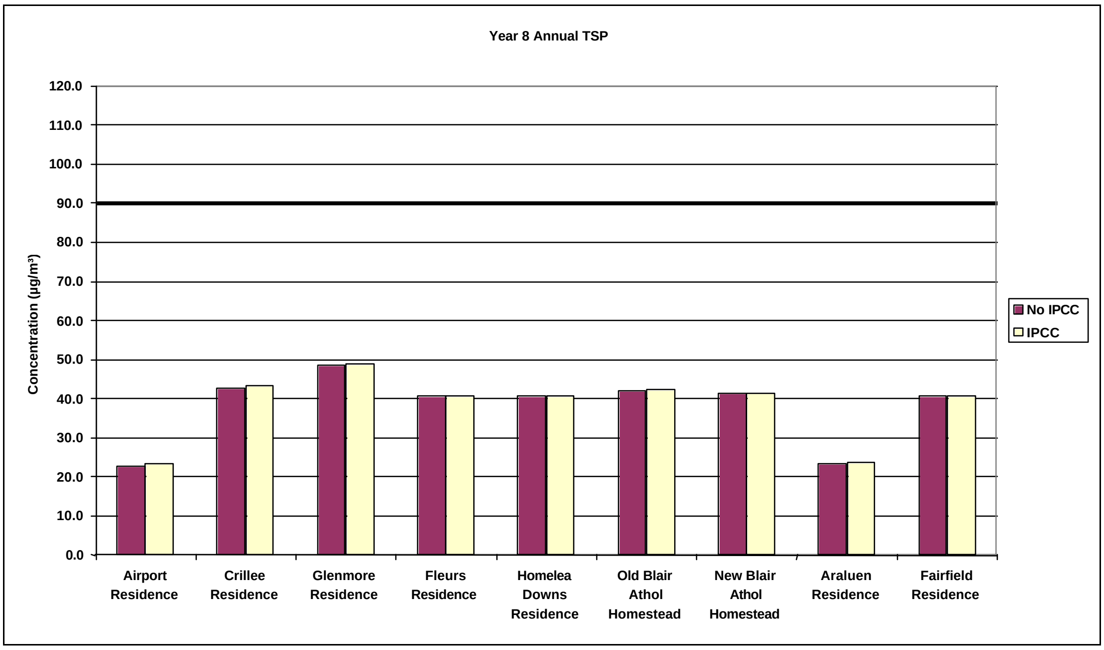

Figure A-15 Comparison of Dust Levels with and without an IPCC System – Year 8 Annual Average TSP

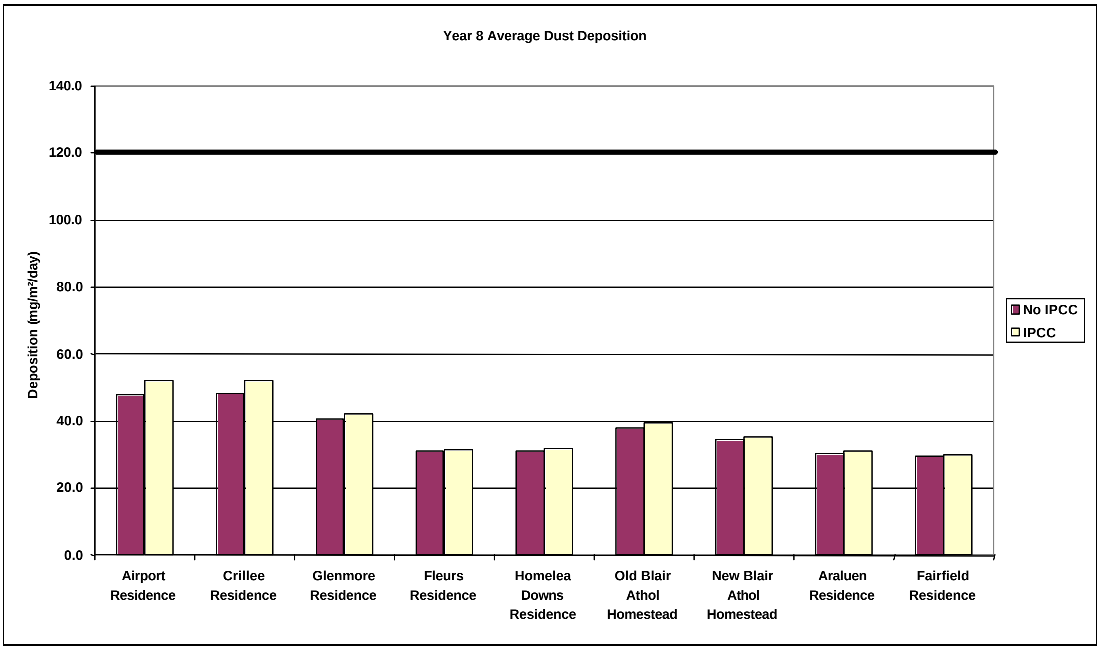

Figure A-16 Comparison of Dust Levels with and without an IPCC System – Year 8 Annual Average Dust Deposition

A.3 Example Modelling Files

```
**Input file for ISC3 model

**Job 1763 Clermont Mine SCENARIO 2008 PM10 Dep

**TSP Model including Deposition and Depletion


CO STARTING
CO TITLEONE Clermont Mine PM10 SCENARIO 2008
CO MODELOPT CONC DRYDPLT RURAL GRDRIS HE>ZI
CO AVERTIME 24 PERIOD
CO POLLUTID TSP10
CO ERRORFIL ERROR1.TXT
CO TERRHGTS ELEV
CO ELEVUNIT METERS
CO RUNORNOT RUN
**CO SAVEFILE RESTART1.DAT 7 RESTART2.DAT
CO FINISHED

SO STARTING

**PIT EMISSIONS
SO LOCATION PIT OPENPIT 564580 7487768 270
SO SRCPARAM PIT 4.04e-5 1.0 1269 918 1E+8 0
SO PARTDIAM PIT 2.5 10
SO MASSFRAX PIT 0.05 0.95
SO PARTDENS PIT 2.5 2.5

**IN PIT HAULAGE, BLASTING AND DRILLING EMISSIONS
SO LOCATION BLAST OPENPIT 564580 7487768 270
SO SRCPARAM BLAST 8.9e-6 50 1269 918 1E+8 0
SO PARTDIAM BLAST 2.5 10
SO MASSFRAX BLAST 0.12 0.88
SO PARTDENS BLAST 2.5 2.5

** WIND EROSION EMISSIONS
** WIND1 = NTOP
** WIND2 = NWD
** WIND3 = STOP AND SWD
** wind4 - CHP STOCKPILES
SO LOCATION WIND1 AREA 566600 7487938 270
SO LOCATION WIND2 AREA 563500 7488500 300
SO LOCATION WIND3 AREA 563785 7484477 290
SO LOCATION WIND4 AREA 564125 7486750 290
SO HOUREMIS PM101.txt WIND1
SO HOUREMIS PM101.txt WIND2
SO HOUREMIS PM101.txt WIND3
SO HOUREMIS PM101.txt WIND4
SO SRCPARAM WIND1 1.0 0.0 294 1417 -20
SO SRCPARAM WIND2 1.0 0.0 1456 1456 -25
SO SRCPARAM WIND3 0.0 0.0 1173 1208 -20
SO SRCPARAM WIND4 1.0 5.0 125 125 0
SO PARTDIAM WIND1-WIND4 2.5 10
SO MASSFRAX WIND1-WIND4 0.4 0.6
SO PARTDENS WIND1-WIND4 2.5 2.5

** NE TOPSOIL STOCKPILE EMISSIONS
SO LOCATION NTOP AREA 566600 7487938 270
SO SRCPARAM NTOP 9.99e-5 0.5 294 1417 -20
SO PARTDIAM NTOP 2.5 10
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SO MASSFRAX NTOP 0.07 0.93
SO PARTDENS NTOP 2.5 2.5

** SW TOPSOIL STOCKPILE EMISSIONS
** SO LOCATION STOP AREA 563219 7486000 290
** SO SRCPARAM STOP 0.0 0.5 165 1208 70
** SO PARTDIAM STOP 2.5 10
** SO MASSFRAX STOP 0.07 0.93
** SO PARTDENS STOP 2.5 2.5

** NWD EMISSIONS
SO LOCATION NWD AREA 563500 7488500 300
SO SRCPARAM NWD 7.68E-6 0.5 1456 1456 -25
SO PARTDIAM NWD 2.5 10
SO MASSFRAX NWD 0.06 0.94
SO PARTDENS NWD 2.5 2.5

** SWD EMISSIONS
** SO LOCATION SWD AREA 563785 7484477 290
** SO SRCPARAM SWD 0.0 0.5 1208 1208 -20
** SO PARTDIAM SWD 2.5 10
** SO MASSFRAX SWD 0.06 0.94
** SO PARTDENS SWD 2.5 2.5

** CHP EMISSIONS
SO LOCATION CHP VOLUME 563947 7486690 290
SO SRCPARAM CHP 3.58 15 46.5 7
SO PARTDIAM CHP 2.5 10
SO MASSFRAX CHP 0.05 0.95
SO PARTDENS CHP 2.5 2.5

** CONVEYOR EMISSIONS
** ASSUMED TO BE NEGLIGABLE

** HAUL ROAD EMISSIONS
SO LOCATION HAUL1 AREA 564382 7486864 290
SO SRCPARAM HAUL1 8.61e-4 0.5 30 558 -80
SO PARTDIAM HAUL1 2.5 10
SO MASSFRAX HAUL1 0.2 0.8
SO PARTDENS HAUL1 2.5 2.5
SO LOCATION HAUL2 AREA 564276 7486354 290
SO SRCPARAM HAUL2 8.61e-4 0.5 30 1226 10
SO PARTDIAM HAUL2 2.5 10
SO MASSFRAX HAUL2 0.2 0.8
SO PARTDENS HAUL2 2.5 2.5


** BLAIR ATHOL EMISSIONS
SO LOCATION BA VOLUME 553800 7491000 290
SO SRCPARAM BA 0.55 15 46.5 7
SO PARTDIAM BA 2.5 10
SO MASSFRAX BA 0.04 0.96
SO PARTDENS BA 2.5 2.5

SO SRCGROUP ALL

SO FINISHED

RE STARTING
**RE INCLUDED clermnew.ter
RE DISCCART 563910 7480968 270
RE DISCCART 567386 7481612 265
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RE DISCCART 561657 7492759 310
RE DISCCART 570080 7483299 280
RE DISCCART 570370 7489713 275
RE DISCCART 557610 7491419 325
RE DISCCART 557345 7494386 335
RE DISCCART 568315 7490457 284
RE DISCCART 569899 7492868 275
RE FINISHED

ME STARTING
ME ANEMHGHT 10
ME WDROTATE 180
ME SURFDATA 99999 2003
ME UAIRDATA 99999 2003
ME INPUTFIL CLERMONT.ISC
ME FINISHED

OU STARTING
OU RECTABLE ALLAVE FIRST
** OU MAXTABLE ALLAVE 10
OU PLOTFILE PERIOD ALL 1-PM10ANN.dat
OU PLOTFILE 24 ALL FIRST 1-PM1024.dat
OU FINISHED
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Hourly Varying Wind Erosion Sample.

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SO HOUREMIS 03 01 24 10 WIND4 0
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SO HOUREMIS 03 01 24 11 WIND2 7.59041E-05
SO HOUREMIS 03 01 24 11 WIND3 0
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SO HOUREMIS 03 01 24 12 WIND2 7.59041E-05
SO HOUREMIS 03 01 24 12 WIND3 0
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SO HOUREMIS 03 01 24 13 WIND2 7.59041E-05
SO HOUREMIS 03 01 24 13 WIND3 0
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SO HOUREMIS 03 01 24 14 WIND3 0
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SO HOUREMIS 03 01 24 15 WIND1 1.71263E-05
SO HOUREMIS 03 01 24 15 WIND2 7.59041E-05
SO HOUREMIS 03 01 24 15 WIND3 0
SO HOUREMIS 03 01 24 15 WIND4 3.11859E-05
SO HOUREMIS 03 01 24 16 WIND1 1.71263E-05
SO HOUREMIS 03 01 24 16 WIND2 7.59041E-05
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SO HOUREMIS 03 01 24 19 WIND2 0
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SO HOUREMIS 03 01 24 23 WIND2 0
SO HOUREMIS 03 01 24 23 WIND3 0
SO HOUREMIS 03 01 24 23 WIND4 0
SO HOUREMIS 03 01 24 24 WIND1 0
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SO HOUREMIS 03 01 24 24 WIND3 0
SO HOUREMIS 03 01 24 24 WIND4 0

A.4 Meteorological Comparison

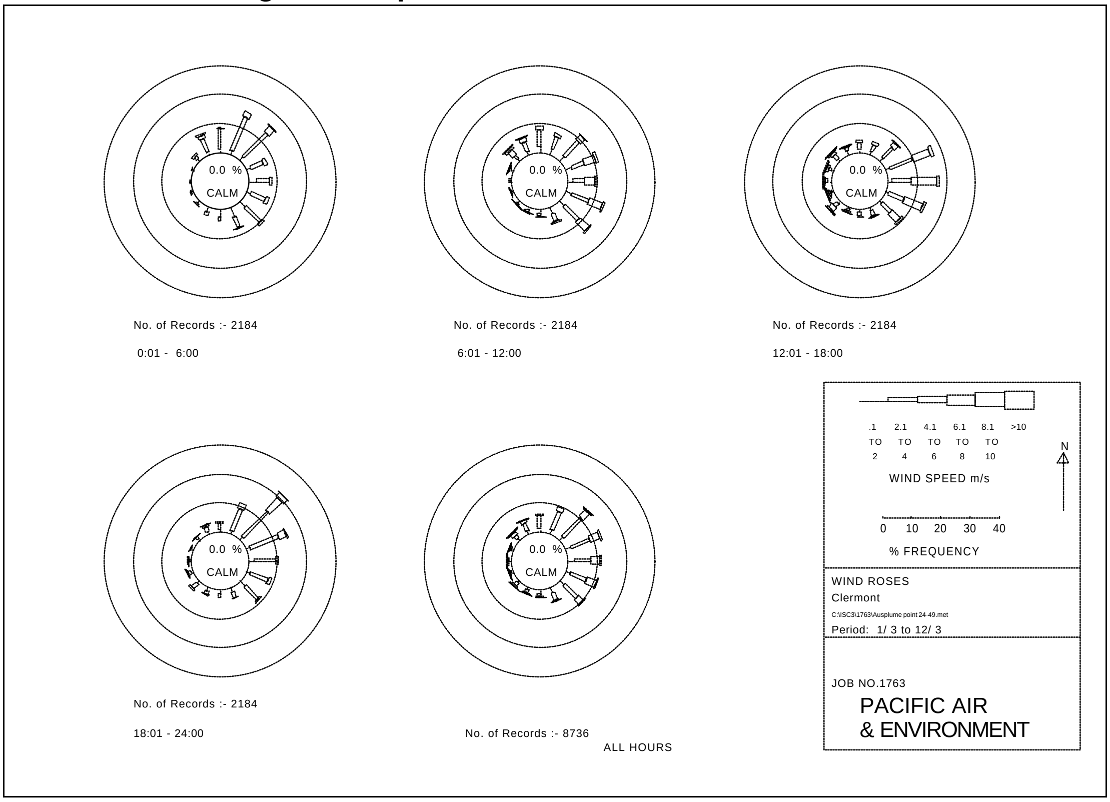


Figure A-17 Wind Roses from CALMET Data Set

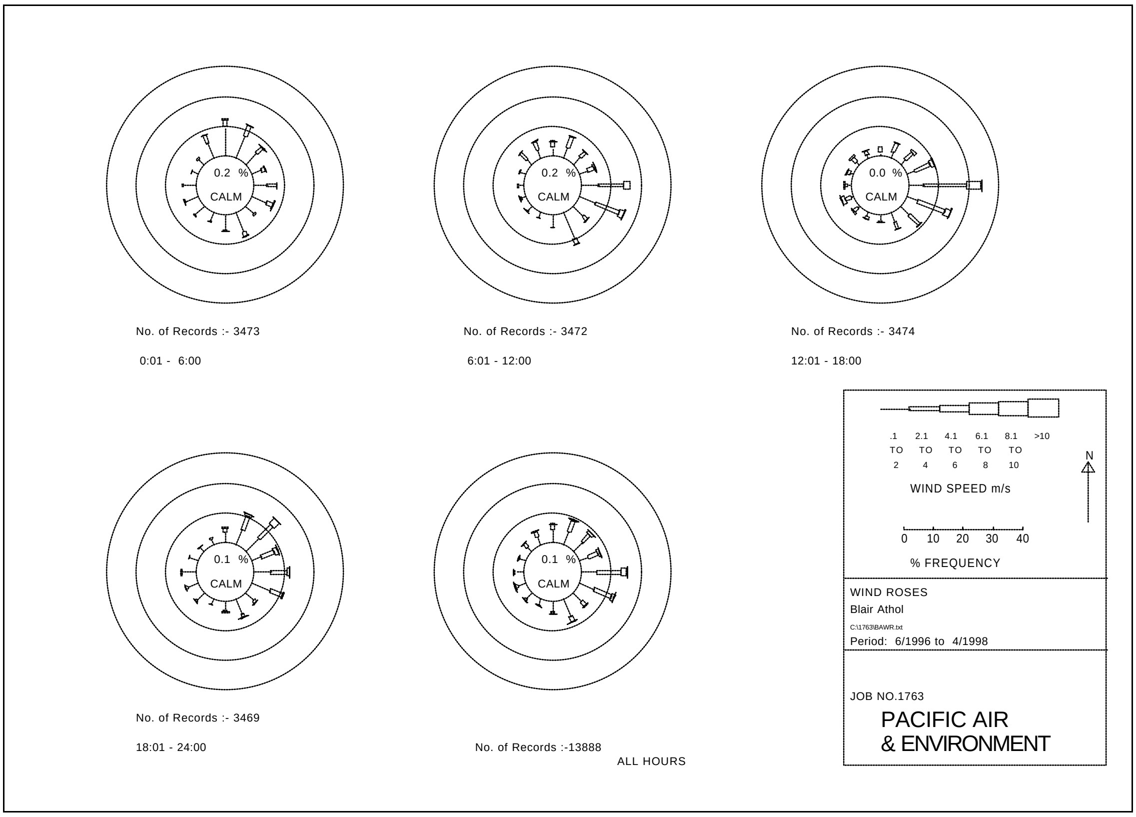


Figure A-18 Average annual wind rose: Blair Athol June 1996 – March 1998

Appendix B Noise and Vibration Appendices

Appendix B Noise and Vibration Appendices

B.1 Sound Power Levels

Table B-1 Maximum Sound Power Level of Mine Equipment for Clermont Coal Mine Project

Source	Overall (dB(A))	Sound Power Level (dB) Octave Band Centre Frequency (Hz) 63	125	250	500	1000	2000	4000	8000
Excavator (34 m^3)	123	115	126	122	121	119	114	108	103
Front End Loader	117	112	111	112	114	112	112	106	101
Dump Truck	121	95	100	109	114	117	116	111	100
Dozer (tracked)	109	118	118	104	100	104	102	97	92
Dozer (rubber tyred)	115	117	123	119	111	107	101	91	83
Open Conveyor (per metre)	82	80	81	81	83	77	72	63	55
Enclosed Conveyor (per metre)	71	72	72	70	71	64	59	51	43
Grader	109	111	117	113	105	101	95	85	77
Water Truck	116	107	110	116	114	109	107	101	102
Excavator (25 m^3)	119	111	122	118	117	115	110	104	99
Rope Shovel	118	111	112	114	118	112	108	103	96
Overburden Drill	119	110	123	114	119	111	109	103	98
Coal Drill	119	110	123	114	119	111	109	103	98
Primary Crusher	121	141	129	120	111	103	100	96	89
Secondary Crusher	129	147	130	123	118	111	106	99	94
Tertiary Crusher	127	146	129	116	112	108	102	95	89
Coal Wash Plant	113	115	110	110	109	109	106	101	94
Reclaimer	115	135	121	115	111	105	104	102	99
Train Load-out Facilities	118	129	122	114	113	112	111	109	104
IPCC Conveyor (per metre)	84	85	84	80	80	79	78	73	66
IPCC Conveyor Drive	105	115	111	105	103	99	93	86	79
In-Pit Crusher	121	141	129	120	111	103	100	96	89

B.2 IPCC Equipment Locations

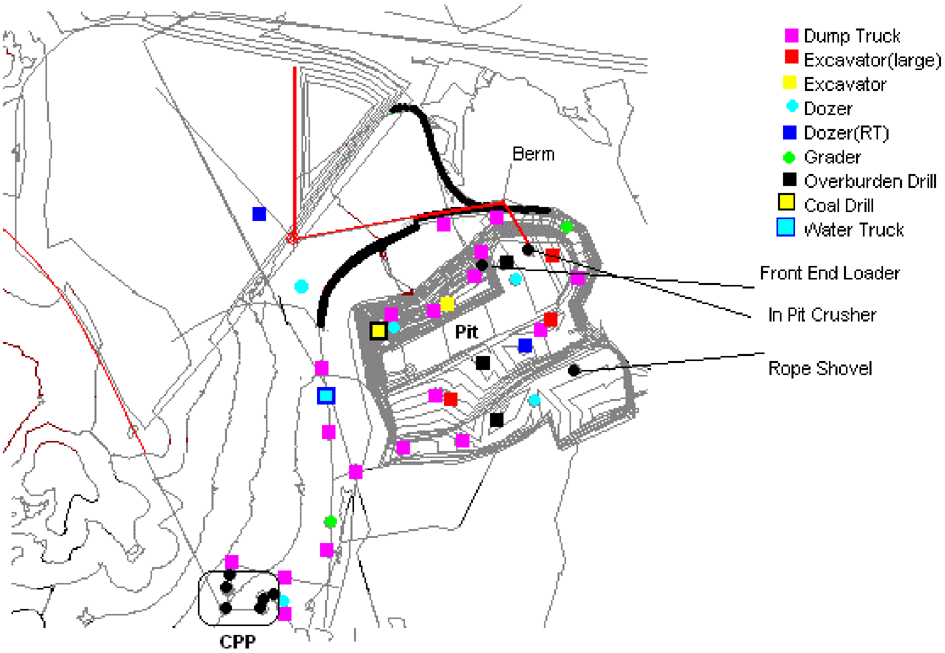


Figure B-1 Equipment Locations Production Year 1

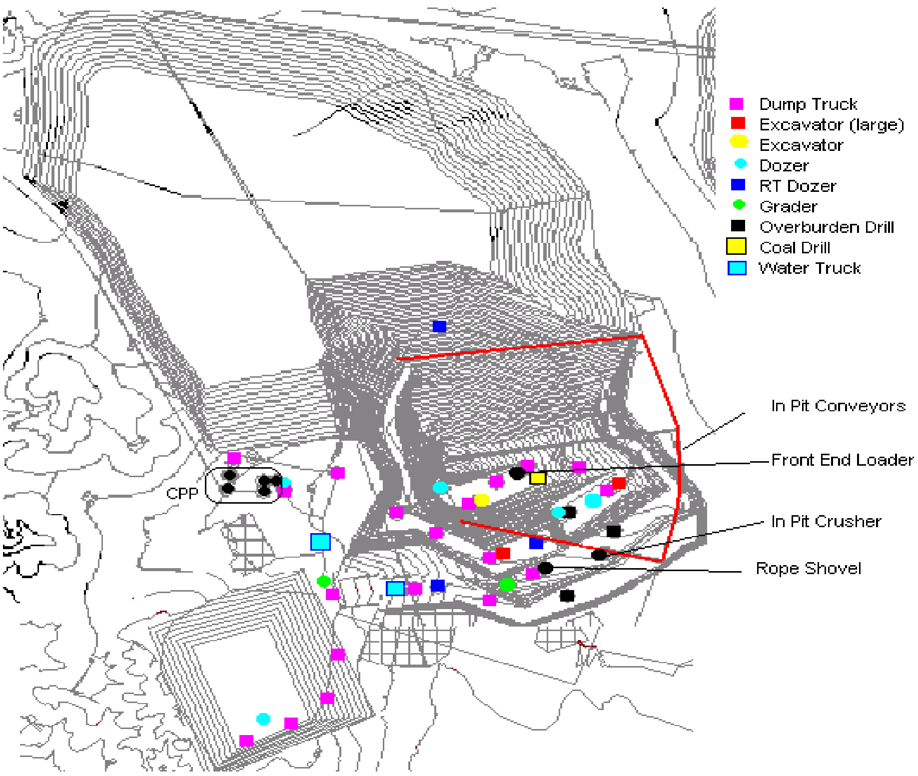


Figure B-2 Equipment Locations Production Year 8

Appendix C Additional Geochemistry Results

Appendix C Additional Geochemistry Results

Table C-1 Sample Results for Sodicity

Exchangeable Sodium Percentage	2004 Samples (EGI)		1997 Samples (Rio Tinto)		Total	
	No.	**%**	**No.**	**%**	**No.**	**%**
< 6% (Non-sodic)	59	88	104	86	163	87
6- 10% (Low)	7	10.5	14	11	21	11
10-15% (Medium)	1	1.5	2	2	3	1.5
> 15% (Strong)	0	0	1	1	1	0.5

Table C-2 Distribution of Geochemical Types for Major Lithological Units

Lithological Unit	% Distribution Of Geochemical Types			Volume of Each Lithological Unit Mbcm (% volume)	Volume of Geochemical Types (Mbcm)		
	NAF	**PAF-LC**	**PAF**		**NAF**	**PAF-LC**	**PAF**
Quaternary Clay/Weathered Basalt	100	0	0	123 (17%)	123	0	0
Tertiary Basalt (Fresh)	100	0	0	189 (27%)	189	0	0
Tertiary Sediments	85	12	3	62 (9%)	53	7	2
Permian Sediments	77	17	6	334 (47%)	258	55	21
	Life of mine overall % weighted distribution of ARD types for all waste rock (EGI samples 2004)				**88%**	**9%**	**3%**
	Life of mine overall % weighted distribution of ARD types for all waste rock (Rio Tinto samples 1997)				96%	3%	1%
	% weighted distribution of ARD types for all waste rock up to commencement of in-pit dumping (EGI samples 2004)				92%	6%	2%

Table C-3 Waste Rock Analysis

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC (kgH_2SO_4/t)	MPA (kgH_2SO_4/t)	NAPP (kgH_2SO_4/t)	ESP%	Ex Ca (meq/100g)	Ex K (meq/100g)	Ex Mg (meq/100g)	Ex Na (meq/100g)	Ca/Mg Ratio
WF2034	6	10	4	Basalt	Tertiary	Top of Tertiary basalt at 5 m	Light yellow-brown	Weathered			32278	8.5	223	<0.01	78	<0.3	-77	0.6	151	<1	30	1	5.0
WF2034	11	26	15	Basalt	Tertiary	Base of Tertiary weathering at 17 m	Light yellow-brown to Dark grey	Weathered up to 17m, then fresh below 17m			32279	8.3	312	0.03	60	0.9	-59	2.0	87	<1	13	2	6.7
WF2034	27	35	8	Basalt	Tertiary		Dark grey				32280	8.1	596	0.17	80	5.1	-74	2.6	135	<1	15	4	9.0
WF2034	36	58	22	Basalt	Tertiary		Dark grey				32281	7.9	481	0.14	48	4.2	-43	3.2	81	<1	11	3	7.4
WF2034	59	100	41	Tertiary Clay with Gravel and Basalt (top 7m)	Tertiary	Base of Tertiary basalt & top of Tertiary unconsolidated sediments at 66m. Base Tertiary Sediments at 105.5m	Light creamy grey				32282	8.1	247	0.07	17	2.1	-14	1.9	29	<1	5	<1	5.8
WF2028	0	32	32	Basalt	Quaternary/ Tertiary	Base of Soil 1m, Clay 1-3m, Top of Tertiary basalt at 3m, Base of Tertiary weathering 18m, Top of water table 25m,	Brown	Weathered up to 18 m, then fresh			32266	8.5	272	<0.01	77	<0.3	-77	1.3	126	<1	27	2	4.7
WF2028	33	52	19	Basalt	Tertiary		Dark grey				32267	8.5	308	0.05	56	1.5	-55	3.7	65	<1	14	3	4.6

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg Ratio
															kgH_2SO_4/t				(meq/100g)				
WF2028	53	81	28	Basalt/ Clay with minor Tertiary sand and gravel	Tertiary	Base of Tertiary basalt & top of Tertiary unconsolidated sediments at 65m	Dark grey/ Light grey		Carbonaceous fragments between 65-67m		32268	8.3	344	0.14	43	4.2	-39	1.3	70	<1	9	1	7.8
WF2028	82	93	11	Siderite and Gravel	Permian	Base of Tertiary unconsolidated sediments & base of Permian oxidation at 99.7m	white				32269	7.6	199	0.03	16	0.9	-15	4.6	7	1	3	<1	2.3
WF2028	110	125	15	Coal with minor shale and siltstone	Quaternary / Tertiary		Black/Dark grey			WF2	32270	7.7	423	0.49	24	15	-9	3.2	15	2	5	<1	3.0
WF2027	0	5	5	Basalt	Tertiary	Base of soil and top of Tertiary basalt at 1 m	Light yellow-brown	Weathered			32271	8.3	247	0.01	58	0.3	-58	0.7	129	<1	21	1	6.1
WF2027	6	19	13	Basalt with Clay	Tertiary	Base of Tertiary weathering at 19 m	Light yellow-brown	Weathered			32272	8.5	249	<0.01	100	<0.3	-99	0.6	153	<1	27	1	5.7
WF2027	20	34	14	Basalt	Tertiary		Dark grey	Fresh			32273	8.9	228	<0.01	88	<0.3	-88	2.5	54	<1	24	2	2.3
WF2027	35	43	8	Basalt with Clay	Permian	Top of water table at 43 m	Dark green-grey				32274	8.0	487	0.09	43	2.7	-40	4.7	69	<1	13	4	5.3
WF2027	44	67	23	Basalt	Quaternary /Tertiary		Dark green-grey				32275	8.2	361	0.08	50	2.4	-48	2.4	67	<1	13	2	5.2
WF2027	68	105	37	Gravel with Clay and Basalt	Tertiary	Base of Tertiary basalt at 70m. Base of Tertiary unconsolidated sediments at 108.8m		Both Fresh and weathered Clay			32276	8.1	225	0.08	9	2.4	-7	3.3	24	<1	5	1	4.8

Hole	From	To	Int	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample	$pH_{1:5}$	$EC_{1:5}$	Total S	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg
	(m)	(m)	(m)								No.		(uS/cm)	%	kgH_2SO_4/t				(meq/100g)				Ratio
WF2027	128	158	30	Coal with sandstone and shale	Tertiary	Top of Conglomerate at 157 m			Carbonaceous shale, carb. siltstone, pyritic siltstone	WF2, WL	32277	5.8	258	0.37	2	11.4	**10**	10.7	2	<1	1	<1	2.0
WF2011	0	7	7	Basalt	Tertiary	Base of soil and top of Tertiary basalt at 1 m	Brown	Moderately weathered	Calcite veins		32256	8.8	305	<0.01	124	<0.3	-124	1.6	160	<1	30	3	5.3
WF2011	8	12	4	Basalt	Tertiary	altered partly to clay	Reddish-brown	Weathered			32257	7.8	242	0.01	38	0.3	-37	1.9	66	<1	37	2	**1.8**
WF2011	13	17	4	Basalt	Tertiary	Base of Tertiary weathering at 18 m,	Light grey	Moderately to highly weathered			32258	7.7	418	<0.01	27	<0.3	-26	2.4	53	<1	30	2	**1.8**
WF2011	18	32	14	Basalt	Tertiary	Top of water table at 25 m	Dark bluish-grey	Fresh	Calcite veins		32259	9.5	239	0.01	83	0.3	-82	2.1	71	<1	22	2	3.2
WF2011	33	36	3	Basalt	Tertiary		Brownish-red	Weathered	Limonite staining		32260	7.7	1140	0.82	71	25.2	-45	2.9	111	1	24	4	4.6
WF2011	37	43	6	Basalt	Tertiary		Dark reddish-grey	Fresh to slightly weathered	Occasional calcite veins		32261	8.5	363	0.01	44	0.3	-43	3.8	60	<1	17	3	3.5
WF2011	44	57	13	Basalt	Tertiary		Dark bluish-grey	Fresh	Occasional calcite veins		32262	8.8	289	0.04	43	1.2	-41	3.0	44	<1	20	2	2.2
WF2011	58	67	9	Basalt	Tertiary		Dark bluish-grey	Fresh	Calcite veins, rare chlorite on fractures		32263	7.9	345	0.08	18	2.4	-15	6.1	23	1	7	2	3.3
WF2011	68	75	7	Clay with basalt	Tertiary	Base of Tertiary basalt at 69m	Light grey	Clay weathered, basalt fresh	Minor calcite veins in basalt		32264	8.2	247	0.02	15	0.6	-14	4.9	11	1	4	<1	2.8
WF2011	76	84	8	Sand with Clay	Tertiary	Base of Tertiary sediments at 115.34m	White	Weathered	Kaolinitic clay		32265	8.3	343	0.04	22	1.2	-20	5.9	33	<1	15	3	2.2

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg Ratio
															kgH_2SO_4/t				(meq/100g)				
WF2037	0	4	4	Clay and soil	Tertiary	Base of soil at 2 m, top of Tertiary basalt at 4 m	Brown				32251	8.4	667	0.02	150	0.6	-149	2.0	151	3	40	4	3.8
WF2037	5	20	15	Basalt	Quaternary /Tertiary	Base of Tertiary weathering at 20 m	Light yellow-brown	Weathered			32252	8.6	272	0.01	88	0.3	-87	1.6	151	<1	30	3	5.0
WF2037	21	69	48	Basalt with Clay	Tertiary	Top of water table at 22 m, Base of Tertiary basalt & top of unconsolidated sediments at 69m	Dark grey	Fresh?			32253	9.7	233	0.04	83	1.2	-82	1.5	87	<1	47	2	**1.9**
WF2037	70	102	32	Tertiary Clay and Gravel with Permian Siltstone and Sandstone	Tertiary/ Permian	Base of Tertiary unconsolidated sediments & base of Permian oxidation at 96 m	Grey		Carbonaceous clay at 70-74 m		32254	8.0	296	0.05	68	1.5	-66	4.1	14	1	4	<1	3.5
WF2037	103	138	35	Coal with Shale	Tertiary					WF2, WL	32255	8.6	267	0.14	28	4.2	-24	4.8	7	2	3	<1	2.3
WF2003	0	12	12	Basalt	Quaternary/ Tertiary	Base of soil and top of Tertiary basalt at 0.7 m	Green-brown-grey	Slightly to highly weathered			32306	8.1	253	<0.01	79	<0.3	-78	0.3	136	<1	13	<1	10.5
WF2003	13	30	17	Basalt with Claystone	Tertiary	Base of Tertiary weathering at 28 m	Green-brown-grey	Moderately weathered	Chloritic and haematitic		32307	7.9	405	0.01	19	0.3	-18	1.2	61	<1	24	1	2.5
WF2003	31	60	29	Basalt and Claystone	Tertiary	Top of water table at 32 m	Green-grey	Fresh	Haematitic, chloritic, sparse calcite veins		32308	7.7	811	0.17	46	5.1	-41	2.7	93	<1	17	3	5.5

Hole	From	To	Int	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample	$pH_{1:5}$	$EC_{1:5}$	Total S	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg
	(m)	(m)	(m)								No.		(uS/cm)	%	kgH_2SO_4/t				(meq/100g)				Ratio
WF2003	61	74	13	Basalt with Claystone	Tertiary	Base of Tertiary basalt and top of Tertiary unconsolidated sediments at 74 m	Dark green	Fresh	Chloritic		32309	8.2	362	0.03	21	0.9	-20	3.2	43	<1	18	2	2.4
WF2003	75	90	15	Claystone	Tertiary	Base of Tertiary unconsolidated sediments & base of Permian oxidation at 122 m	Whitish-grey	Fresh			32310	8.0	345	0.05	18	1.5	-16	3.3	48	<1	11	2	4.4
WF2003	122	140	18	Coal with Sandstone	Permian		Brown-black-grey	Fresh		WF2	32311	6.7	234	0.20	5	6	2	2.9	5	<1	1	<1	5.0
WF2002	0	11	11	Basalt	Quaternary/ Tertiary	Base of soil and top of Tertiary basalt at 0.5 m	Reddish-brown	Moderately weathered to weathered			32299	8.5	340	<0.01	61	<0.3	-61	0.5	116	<1	18	<1	6.4
WF2002	12	14	2	Basalt	Tertiary		Dark grey	Moderately weathered	Minor calcite veins		32300	8.0	420	0.02	46	0.6	-45	0.7	76	<1	29	<1	2.6
WF2002	15	16	1	Basalt	Tertiary		Red	Moderately weathered			32301	8.2	454	0.01	17	0.3	-16	1.2	50	<1	36	1	**1.4**
WF2002	17	30	13	Basalt	Tertiary	Top of water table 30.5 m	Green-brown-red	Slightly to moderately weathered	Calcite veins, chloritic, haematitic, epidote		32302	8.4	251	<0.01	42	<0.3	-41	3.6	91	<1	16	4	5.7
WF2002	31	60	29	Basalt with Clay	Tertiary	Base of Tertiary weathering at 33 m	Green & red	Mostly fresh	Minor calcite veins, haematitic, disseminated epidote		32303	8.0	580	0.06	94	1.8	-92	3.2	105	<1	17	4	6.2

Hole	From	To	Int	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample	$pH_{1:5}$	$EC_{1:5}$	Total S	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg
	(m)	(m)	(m)								No.		(uS/cm)	%	kgH_2SO_4/t				(meq/100g)				Ratio
WF2002	61	90	29	Claystone with Basalt	Tertiary?	Base of Tertiary basalt at 68 m	Green, brownish-red	Fresh	Minor calcite veins		32304	8.2	490	0.03	59	0.9	-58	3.4	83	<1	30	4	2.8
WF2002	91	120	29	Claystone and Siltstone	Tertiary?/ Permian		Brown-red, Green-grey	Fresh?	Haematitic, Chloritic		32305	8.3	470	0.03	67	0.9	-66	3.3	88	<1	31	4	2.8
WF2035	0	12	12	Basalt	Tertiary	Top of Tertiary basalt 0 m, Top of water table 11 m	Light yellow-brown	Weathered			32292	8.5	215	0.02	61	0.6	-60	0.8	117	<1	13	1	9.0
WF2035	13	34	21	Basalt	Tertiary	Base of Tertiary weathering at 12 m	Dark grey	Fresh?			32293	8.3	315	0.01	45	0.3	-44	1.7	97	<1	17	2	5.7
WF2035	35	74	39	Basalt with Clay	Tertiary		Dark grey	Fresh?			32294	8.8	263	0.05	30	1.5	-28	15.8	6	<1	10	3	**0.6**
WF2035	75	82	7	Clay	Tertiary	Base of Tertiary basalt and top of Tertiary unconsolidated sediments at 76 m Base of Tertiary unconsolidated sediments at 80m	Grey	Fresh?	Arenaceous bands?		32295	8.2	254	0.08	7	2.4	-5	6.3	11	<1	4	1	2.8
WF2035	83	104	21	Clay and Sandstone	Tertiary		Yellowish-brown	Weathered	Mottled arenaceous bands		32296	8.0	99	0.01	4	0.3	-4	8.6	6	<1	2	<1	3.0
WF2035	105	124	19	Coal with Siltstone	Permian	Base of Permian oxidation at 109.3 m	Brown-grey	Siltstone weathered	Carbonaceous micaceous	WU, WF1	32297	7.2	106	0.11	4	3.3	0	7.2	5	<1	2	<1	2.5

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg Ratio
															kgH_2SO_4/t				(meq/100g)				
WF2035	165	182	17	Coal with siltstone and sandstone	Permian		White/ Brown-grey			WL	32298	6.4	205	0.28	5	8.7	**4**	4.6	8	<1	4	<1	2.0
WF2020	0	17	17	Basalt with Clay	Quaternary/ Tertiary	Base of soil and top of Tertiary basalt at 1 m Base of Tertiary weathering at 17 m	Brownish-grey	Weathered			32287	8.3	261	<0.01	90	<0.3	-89	0.6	155	<1	22	1	7.0
WF2020	18	44	26	Basalt and Clay	Tertiary		Greyish-green	Fresh			32288	8.4	255	0.02	69	0.6	-68	1.0	91	<1	13	1	7.0
WF2020	45	55	10	Basalt and Clay	Tertiary		Green-grey, red-grey	Fresh			32289	8.1	417	0.02	22	0.6	-21	5.7	51	<1	15	4	3.4
WF2020	56	70	14	Basalt	Tertiary	Base of Tertiary basalt and top of Tertiary unconsolidated sediments at 75 m.	Red-grey, dark-grey	Fresh			32290	8.4	310	0.08	46	2.4	-43	2.4	72	<1	11	2	6.5
WF2020	71	108	37	Tertiary Clay with Permian Sandstone	Tertiary/ Permian	Base of Tertiary basalt at 75 m. Base of Tertiary unconsolidated sediments at 104 m.	Cream-grey-brown	Fresh and weathered			32291	8.0	284	0.05	10	1.5	-9	2.7	29	<1	7	1	4.1
WF2021	0	14	14	Basalt with Clay	Quaternary/ Tertiary	Base of soil and top of Tertiary basalt at 1 m	Yellow-grey-brown	Weathered			32283	8.2	257	<0.01	76	<0.3	-76	0.6	133	<1	24	1	5.5
WF2021	15	40	25	Basalt	Tertiary	Base of Tertiary weathering at 16 m	Greyish-green	Weathered to 16 m then Fresh			32284	8.2	275	0.02	65	0.6	-64	0.8	106	<1	19	1	5.6
WF2021	41	68	27	Basalt with Clay	Tertiary		Greyish-green	Fresh			32285	8.0	411	0.17	52	5.1	-47	1.8	101	<1	11	2	9.2

Hole	From	To	Int	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample	$pH_{1:5}$	$EC_{1:5}$	Total S	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg
	(m)	(m)	(m)								No.		(uS/cm)	%	kgH_2SO_4/t				(meq/100g)				Ratio
WF2021	69	100	31	Tertiary Clay	Tertiary	Base of Tertiary basalt at 73 m Base of Tertiary sediments at 113.7	Greyish-green	Weathered and Fresh			32286	8.2	185	0.02	8	0.6	-7	7.1	11	<1	2	1	5.5
WF2007	0	10	10	Basalt and Clay	Quaternary/ Tertiary	Base of soil and top of Tertiary basalt at 1 m	Yellow-red-brown	Weathered			32318	8.2	226	<0.01	73	<0.3	-72	0.4	130	<1	21	<1	6.2
WF2007	11	18	7	Basalt	Tertiary	Base of Tertiary weathering at 19 m.	Green-brown-red	Moderately weathered	Occasional calcite veins		32319	8.3	218	<0.01	85	<0.3	-85	0.4	115	<1	22	<1	5.2
WF2007	19	51	32	Basalt	Tertiary	Base of Tertiary basalt at 51 m	Green-grey	Fresh and weathered	Calcite veins, Chloritic,		32320	7.8	427	0.09	57	2.7	-54	0.7	78	<1	18	<1	4.3
WF2007	52	96	44	Tertiary Clay with Permian Sandstone and minor shale	Tertiary/ Permian	Base of Tertiary unconsolidated sediments at 68m. Base of Permian oxidation and base of Permian Upper at 97 m	White-grey-red-brown	Weathered			32321	7.5	307	0.33	6	10.2	**4**	0.8	12	<1	6	<1	2.0
WF2007	97	99	2	Mudstone	Permian		Dark grey	Fresh	Occasional carbonaceous lamellae		32322	7.8	139	0.02	5	0.6	-4	1.7	8	<1	4	<1	2.0
WF2007	100	116	16	Sandstone with minor mudstone/ siltstone	Permian		Brown-grey	Fresh	Occasional carbonaceous lamellae		32323	7.9	74	0.02	2	0.6	-1	5.1	5	<1	2	<1	2.5
WF2007	117	126	9	Sandstone	Permian		Grey	Fresh	Common carbonaceous lamellae, coaly fragments		32324	7.6	88	0.02	6	0.6	-5	6.4	7	<1	3	<1	2.3

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg Ratio
															kgH_2SO_4/t				(meq/100g)				
WF2023	0	18	18	Basalt	Quaternary/ Tertiary	Base of soil and top of Tertiary basalt at 1 m	Light greyish-brown	Weathered			32312	8.3	253	0.02	66	0.6	-65	0.5	118	<1	28	<1	4.2
WF2023	19	42	23	Basalt with Clay	Tertiary	Base of Tertiary basalt at 41 m	Grey	Mostly fresh	Common calcite fragments		32313	8.0	325	0.01	69	0.3	-69	0.7	91	<1	17	<1	5.4
WF2023	43	86	43	Tertiary Clay with Permian siltstone	Tertiary/ Permian	Base of Tertiary unconsolidated sediments at 82 m. Base of Permian oxidation and base of Permian Upper at 86 m	Cream-brown-grey	Both Fresh and weathered.	Kaolinitic, fragments of coal,		32314	7.8	135	0.06	5	1.8	-3	2.2	13	<1	5	<1	2.6
WF2023	87	114	27	Sandstone and Siltstone	Permian		Brown-grey, Cream-white	Fresh?	Carbonaceous partings		32315	7.8	150	0.11	5	3.3	-1	1.7	7	<1	3	<1	2.3
WF2023	115	168	53	Shale, siltstone and coal with sandstone	Permian				Carbonaceous partings	WU	32316	7.5	123	0.03	3	0.9	-2	3.3	5	<1	3	<1	**1.7**
WF2023	220	232	12	??	Permian	Interval greater than total depth	??	??	??	??	32317	7.3	141	0.06	2	1.8	0	4.9	4	<1	2	<1	2.0
WF2006	0	13	13	Basalt	Quaternary / Tertiary	Base of soil and top of Tertiary basalt at 0.5 m	Greenish-brown-grey	Slightly to highly weathered			32325	8.4	210	0.01	57	0.3	-57	0.6	114	<1	19	<1	6.0
WF2006	14	28	14	Basalt/ Clay	Tertiary	Base of Tertiary weathering at 24 m	Green-grey	Fresh?	Argillaceous		32326	7.7	448	0.33	97	10.2	-87	0.7	85	<1	20	<1	4.3
WF2006	29	48	19	Basalt with Clay	Tertiary	Top of water table at 31 m	Green-grey	Fresh	Chloritic and haematitic		32327	8.2	297	0.04	38	1.2	-36	1.7	37	<1	21	1	**1.8**
WF2006	49	72	23	Clay/ Basalt	Tertiary	Base of Tertiary basalt at 69 m	Brown-green-red	Fresh	Chloritic		32328	8.1	243	0.34	24	10.5	-14	1.3	28	<1	14	<1	2.0

Hole	From	To	Int	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample	$pH_{1:5}$	$EC_{1:5}$	Total S	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg
	(m)	(m)	(m)								No.		(uS/cm)	%	kgH_2SO_4/t				(meq/100g)				Ratio
WF2006	73	90	17	Sandstone	Tertiary?/ Permian	Base of Permian oxidation and base of Permian Upper at 87 m	Red-brown-grey	Fresh	Carbonaceous		32329	7.9	223	0.38	11	11.7	**1**	1.5	17	<1	9	<1	**1.9**
WF2006	91	126	35	Sandstone/ Coal/Siltstone	Permian			Fresh	Minor disseminated pyrite, carbonaceous, calcite cleats, pyritic, limonitic	G, P	32330	6.5	249	0.24	1	7.2	**6**	7.7	3	<1	2	<1	**1.5**
WF2006	127	139	12	Coal/ Sandstone/ Siltstone	Permian			Fresh	Carbonaceous mudstone	P	32331	7.8	126	0.05	3	1.5	-1	6.5	5	<1	4	<1	**1.3**
WF2006	140	145	5	Sandstone minor Siltstone	Permian		Dark to whitish grey	Fresh			32332	7.9	66	0.01	1	0.3	-1	9.7	2	<1	2	<1	**1.0**
WF2013	0	12	12	Basalt	Quaternary /Tertiary	Base of soil and top of Tertiary basalt at 2 m	Yellowish-brown	Weathered			32333	8.3	432	<0.01	86	<0.3	-86	1.9	126	<1	33	3	3.8
WF2013	13	22	9	Basalt	Tertiary	Base of Tertiary weathering at 22 m	Brown	Moderately weathered	Minor calcite veins		32334	8.5	239	0.01	87	0.3	-86	0.7	112	<1	26	1	4.3
WF2013	23	30	7	Basalt	Tertiary	Top of water table at 25 m	Bluish-grey	Fresh	Occasional calcite veins		32335	8.5	205	0.03	59	0.9	-58	0.9	88	<1	16	<1	5.5
WF2013	31	48	17	Basalt	Tertiary		Greenish-grey	Mostly weathered	Minor and occasional calcite veins, Chloritic		32336	8.3	336	0.04	39	1.2	-37	1.0	72	<1	26	1	2.8

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg Ratio
															kgH_2SO_4/t				(meq/100g)				
WF2013	49	60	11	Basalt	Tertiary/ Permian	Base of Tertiary basalt & top of Tertiary unconsolidated sediments at 60 m	Dark grey	Mostly fresh	Minor and occasional calcite veins		32337	7.9	557	0.29	38	9	-29	2.4	65	<1	18	2	3.6
WF2013	61	90	29	Tertiary Sand and Permian Sandstone	Permian	Base of Tertiary unconsolidated sediments at 66 m					32338	8.4	311	0.08	46	2.4	-44	0.9	95	<1	18	1	5.3
WF2013	91	97	6	Sandstone	Permian	Base of Permian oxidation and base of Permian Upper at 92 m	Light grey	Above 92 m weathered, below fresh			32339	8.2	259	0.02	24	0.6	-23	1.2	68	<1	12	1	5.7
WF2013	98	137	39	Sandstone/ Siltstone	Permian		Brown-grey	Fresh	Carbonaceous remains on bedding, rare coaly lenses		32340	8.7	150	0.03	9	0.9	-8	2.4	17	<1	4	<1	4.3
WF2013	138	157	19	Sandstone/ Siltstone	Permian		Grey	Fresh	Rare pyrite and carbonaceous remains on bedding surfaces		32341	8.4	153	0.03	6	0.9	-5	5.1	11	<1	4	<1	2.8
WF2013	202	210	8	Sandstone/ Siltstone	Permian		Brown-grey	Fresh	Minor carbonaceous lamellae		32342	8.6	121	0.04	3	1.2	-1	8.7	6	<1	2	<1	3.0
WF2043	0	2	2	Soil	Quaternary	Base of soil at 2 m					32349	8.6	431	0.01	52	0.3	-51	2.1	101	2	36	3	2.8
WF2043	3	10	7	Clay	Tertiary	Top of Tertiary basalt at 9 m	Yellowish-brown	Weathered			32350	8.8	541	0.01	118	0.3	-118	5.1	121	1	44	9	2.8

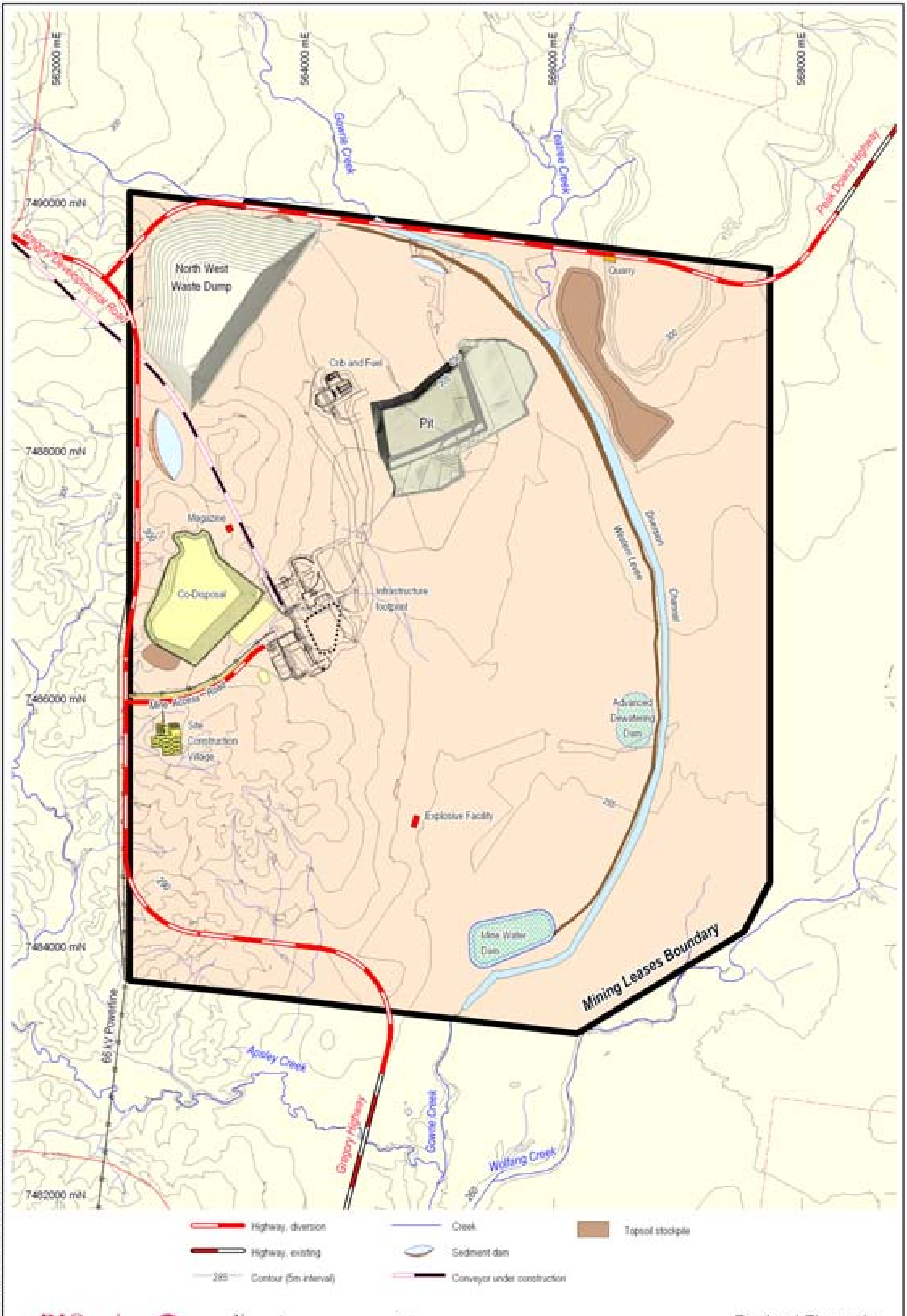
Hole	From	To	Int	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample	$pH_{1:5}$	$EC_{1:5}$	Total S	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg
	(m)	(m)	(m)								No.		(uS/cm)	%	kgH_2SO_4/t				(meq/100g)				Ratio
WF2043	11	50	39	Basalt	Tertiary	Base of Tertiary weathering at 21 m	Dark grey	Mostly fresh	Vesicular common calcite fragments		32501	8.3	334	0.07	56	2.1	-54	2.2	70	<1	19	2	3.7
WF2043	51	96	45	Basalt, Clay, Gravel and Silcrete	Tertiary	Base of Tertiary basalt & top of Tertiary unconsolidated sediments at 60 m	Grey		Vesicular common calcite fragments above 60 m		32502	8.5	475	0.06	79	1.8	-77	2.0	113	<1	35	3	3.2
WF2043	97	136	39	Tertiary Gravel and Permian Coal and Shale/Siltstone	Tertiary/ Permian	Base of Tertiary unconsolidated sediments & base of Permian oxidation at 103.23 m				W, WL	32503	8.5	131	0.27	4	8.4	**4**	5.4	6	<1	3	<1	2.0
WF2043	137	142	5	Siltstone	Permian		Dark grey	Fresh			32504	8.3	223	0.18	15	5.4	-9	1.2	29	<1	8	<1	3.6
WF2017	0	1	1	Soil	Tertiary	Base of soil at 1.5 m					32505	7.9	409	<0.01	48	<0.3	-48	0.5	104	1	27	<1	3.9
WF2017	2	4	2	Clay	Tertiary		Yellowish-brown	Highly weathered			32506	8.2	348	0.02	94	0.6	-93	0.6	138	<1	29	1	4.8
WF2017	5	13	8	Basalt	Tertiary	Top of Tertiary basalt at 6 m	Orangey-brown	Moderately weathered	Calcite veins		32507	8.3	262	0.01	70	0.3	-70	1.3	118	<1	34	2	3.5
WF2017	14	18	4	Basalt	Tertiary	Top of water table at 18 m	Brownish-orange	Slightly weathered	Occasional calcite veins		32508	8.5	478	0.03	50	0.9	-49	2.0	61	<1	38	2	**1.6**
WF2017	19	47	28	Basalt	Tertiary	Base of Tertiary weathering at 24 m	Blue-green-brown-grey	Slightly weathered above 24m, fresh below	Minor and occasional calcite veins, Chloritic		32509	8.3	295	0.06	46	1.8	-44	2.4	66	<1	17	2	3.9

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC (kgH_2SO_4/t)	MPA (kgH_2SO_4/t)	NAPP (kgH_2SO_4/t)	ESP%	Ex Ca (meq/100g)	Ex K (meq/100g)	Ex Mg (meq/100g)	Ex Na (meq/100g)	Ca/Mg Ratio
WF2017	48	71	23	Basalt/ Clay/ Gravel	Tertiary	Base of Tertiary basalt at 53 m	Grey/ White	Basalt fresh, gravels & clays slightly weathered	Minor and occasional calcite veins in basalt		32510	8.4	346	0.21	23	6.3	-16	3.3	33	<1	26	2	**1.3**
WF2017	72	97	25	Tertiary Clay/Gravel and Permian Sandstone/ Conglomerate/ shale	Tertiary/ Permian	Base of Tertiary unconsolidated sediments at 77 m. Base of Permian oxidation and base of Permian Upper at 86 m	Brownish-grey	Slightly weathered	Carbonaceous remains on bedding surfaces, minor disseminated pyrite		32511	8.5	311	0.25	18	7.8	-10	3.5	29	<1	27	2	**1.1**
WF2017	127	135	8	Coal/ Sandstone	Permian				Slightly carbonaceous	W	32512	8.2	190	0.11	9	3.3	-5	2.7	13	<1	3	<1	4.3
WF2016	0	2	2	Soil	Quaternary	Base of soil and top of Tertiary basalt at 2 m	Black				32343	8.1	298	0.01	52	0.3	-51	0.5	118	<1	34	<1	3.5
WF2016	3	19	16	Basalt	Tertiary	Base of Tertiary weathering at 19 m	Light brown	Weathered	Minor calcite veins between 18 & 19 m		32344	8.5	229	<0.01	111	<0.3	-111	1.1	143	<1	31	2	4.6
WF2016	20	52	32	Basalt	Tertiary	Top of water table at 24 m. Base of Tertiary basalt at 52 m	Greyish-green	Fresh and weathered	Occasional calcite veins, Chloritic		32345	8.4	319	0.06	44	1.8	-42	2.2	64	<1	24	2	2.7
WF2016	53	73	20	Clay	Tertiary	Base of Tertiary unconsolidated sediments at 73 m	White/ Brown	Weathered	Minor limonite staining		32346	8.2	394	0.62	43	18.9	-24	0.9	80	<1	14	<1	5.7

Hole	From	To	Int	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample	$pH_{1:5}$	$EC_{1:5}$	Total S	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg
	(m)	(m)	(m)								No.		(uS/cm)	%	kgH_2SO_4/t				(meq/100g)				Ratio
WF2016	74	85	11	Conglomerate/ Sandstone	Permian	Base of Permian oxidation and base of Permian Upper at 85 m	White/ Brown-grey	Weathered			32347	8.6	157	0.04	6	1.2	-5	3.7	10	<1	3	<1	3.3
WF2016	86	131	45	Sandstone with coal	Permian	Coal band between 130 and 130.15 m	Grey	Fresh	Carbonaceous remains on bedding surfaces	WU	32348	8.4	601	5.13	3	157	**154**	2.2	7	<1	3	<1	2.3
WF2018	0	2	2	Soil	Quaternary	Base of soil at 2 m	Black				32513	8.6	481	0.02	42	0.6	-41	4.7	84	<1	37	6	2.3
WF2018	3	5	2	Clay	Tertiary	Top of Tertiary basalt at 5 m	Brown	Weathered			32514	8.9	468	0.01	80	0.3	-79	3.2	121	<1	30	5	4.0
WF2018	6	17	11	Basalt	Tertiary	Base of Tertiary basalt at 16.5 m	Yellow-red-brown	Slightly to moderately weathered	Minor calcite veins		32515	8.7	233	0.01	80	0.3	-79	1.6	95	<1	32	2	3.0
WF2018	18	41	23	Claystone/ Sandstone	Tertiary	Top of water table at 39 m. Base of Tertiary unconsolidated sediments at 41 m	White, Brown-grey	Moderately weathered	Limestone between 16.5 and 18 m (weathered)		32516	8.7	109	0.77	15	23.7	**9**	7.1	4	<1	1	<1	4.0
WF2018	42	50	8	Claystone/ Sandstone	Permian		Grey/ Brownish-grey	Slightly weathered			32517	8.4	111	0.11	8	3.3	-4	7.2	4	<1	3	<1	**1.3**
WF2018	51	52	1	Conglomerate	Permian		Light reddish-brown, white	Slightly weathered			32518	8.4	88	0.06	3	1.8	-1	13.9	2	<1	1	<1	**2.0**
WF2018	53	62	9	Siltstone/ Shale	Permian		Medium to dark grey	Slightly weathered	Carbonaceous		32519	8.5	231	0.13	3	3.9	**1**	8.1	4	<1	4	<1	**1.0**

Hole	From (m)	To (m)	Int (m)	Lithology	Age	Comments (Horizon/seam)	Colour	Weathering	Fossil or Mineral Type	Coal Seam	Sample No.	$pH_{1:5}$	$EC_{1:5}$ (uS/cm)	Total S %	ANC	MPA	NAPP	ESP%	Ex Ca	Ex K	Ex Mg	Ex Na	Ca/Mg Ratio
															kgH_2SO_4/t				(meq/100g)				
WF2018	63	69	6	Sandstone	Permian	Base of Permian oxidation and base of Permian Upper at 69 m	Brownish-grey	Slightly weathered			32520	8.2	109	0.05	3	1.5	-1	8.9	4	<1	3	<1	**1.3**
WF2018	70	78	8	Sandstone	Permian		Light brownish grey	Fresh			32521	8.1	89	0.04	3	1.2	-2	7.8	3	<1	2	<1	**1.5**

Appendix D Revised Figures



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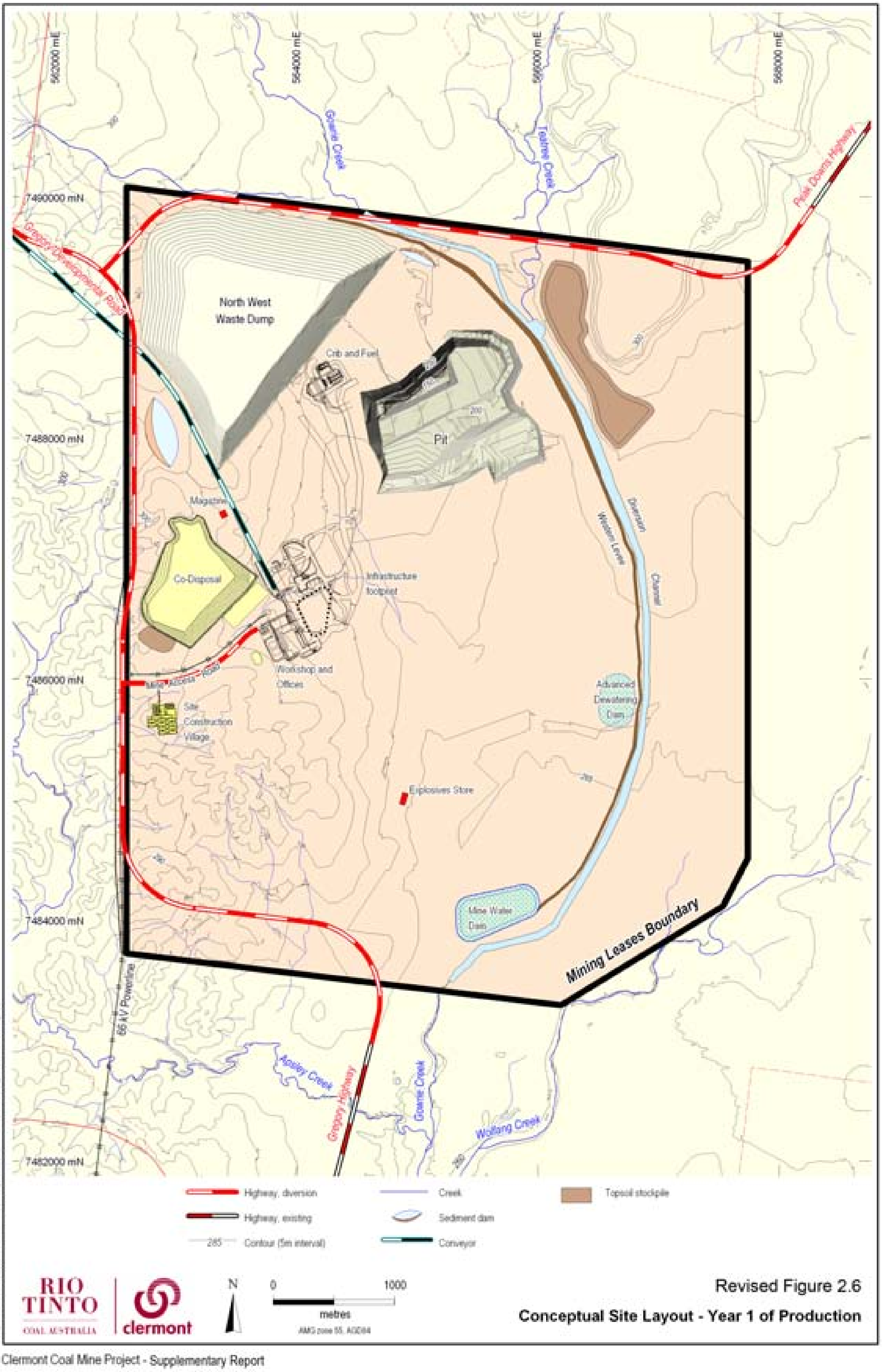
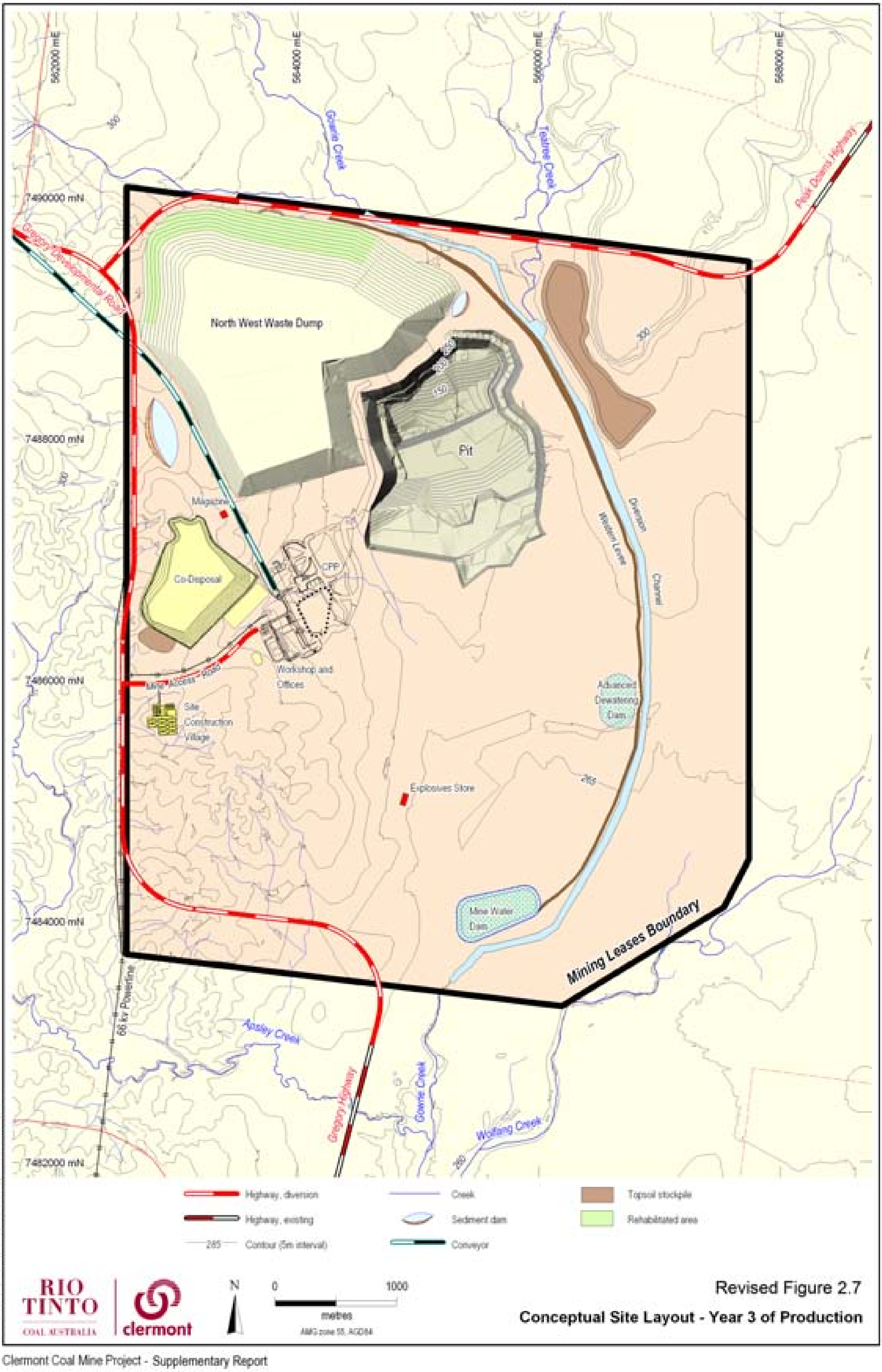
Revised Figure 2.5

Conceptual Site Layout - Construction



Revised Figure 2.6

Conceptual Site Layout - Year 1 of Production


562000 mE
564000 mE
566000 mE
568000 mE
7490000 mN
7488000 mN
7486000 mN
7484000 mN
7482000 mN
Grosvenor Creek
Teatree Creek
Peak Downs Highway
Gregory Developmental Road
North West Waste Dump
Pit
Magazine
Co-Disposal
CPP
Workshop and Offices
Mine Access Road
Site Construction Village
Explosives Store
Western Levee
Diversion Channel
Advanced Dewatering Dam
Mine Water Dam
Mining Leases Boundary
66 kv Powerline
Apsley Creek
Gregory Highway
Gowrie Creek
Wolfang Creek
Highway, diversion
Highway, existing
Contour (5m interval)
Creek
Sediment dam
Conveyor
Topsoil stockpile
Rehabilitated area
RIO TINTO
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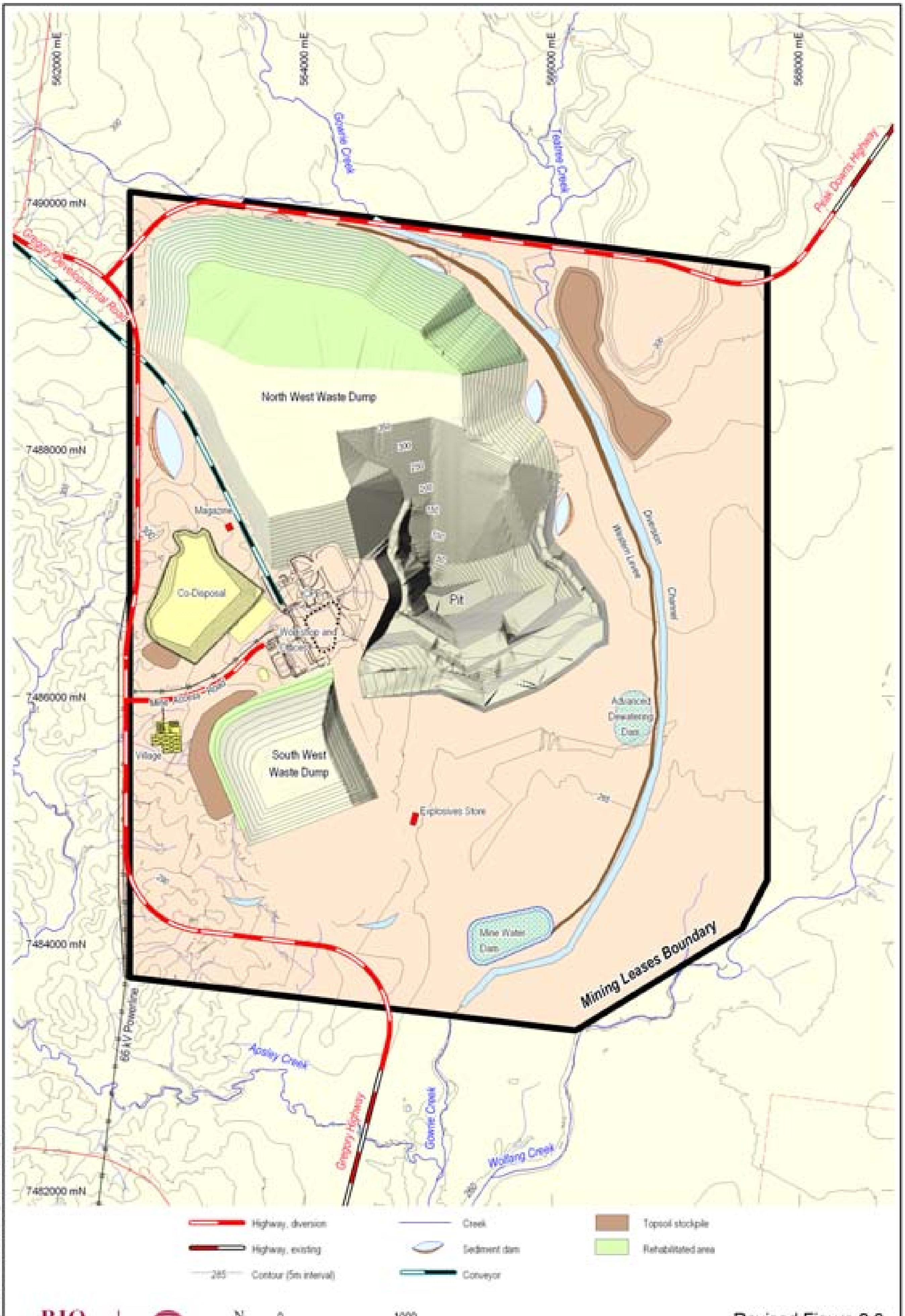
N
0
1000
metres
AMG zone 55, AGD84
Revised Figure 2.7
Conceptual Site Layout - Year 3 of Production



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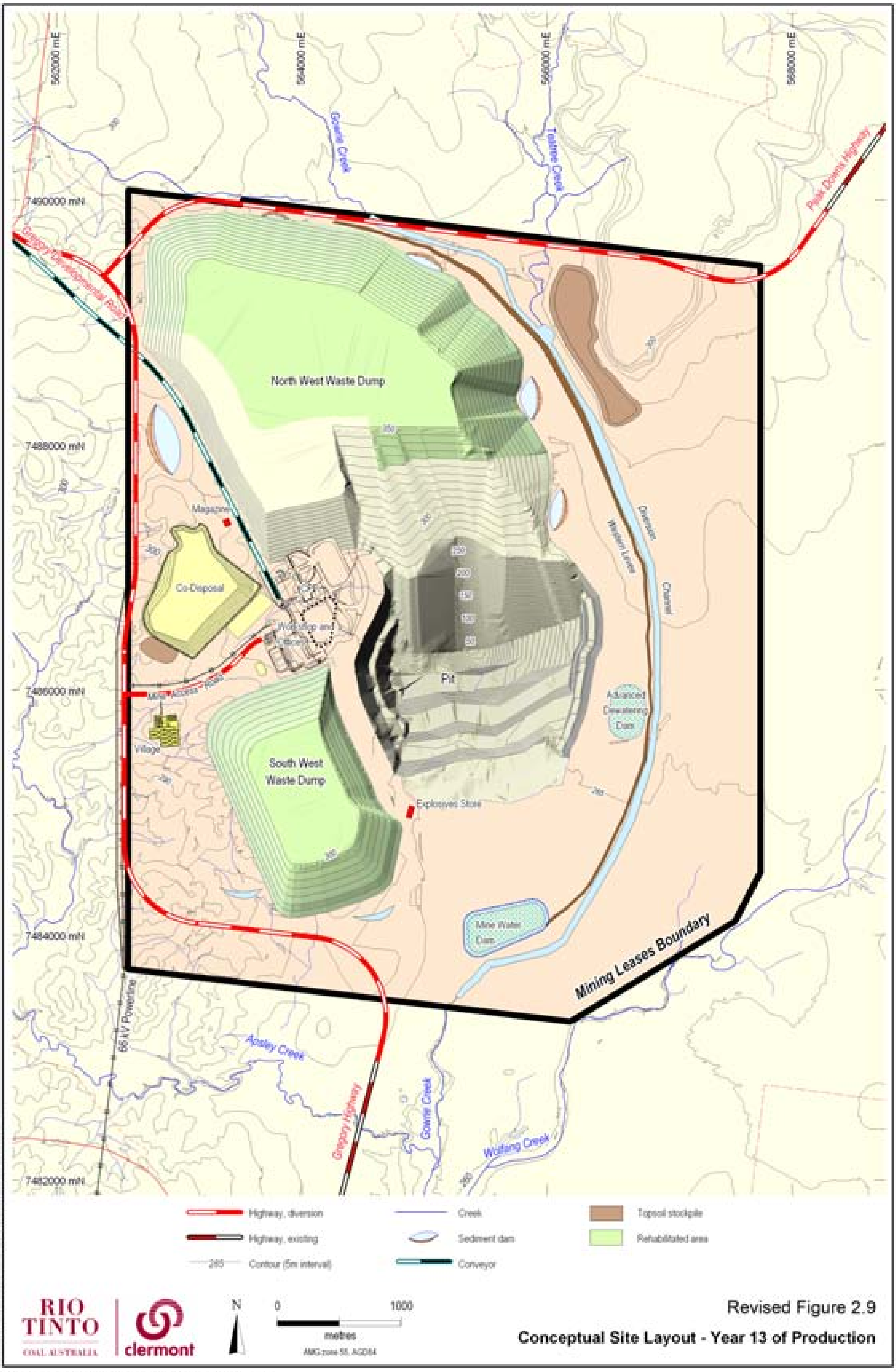
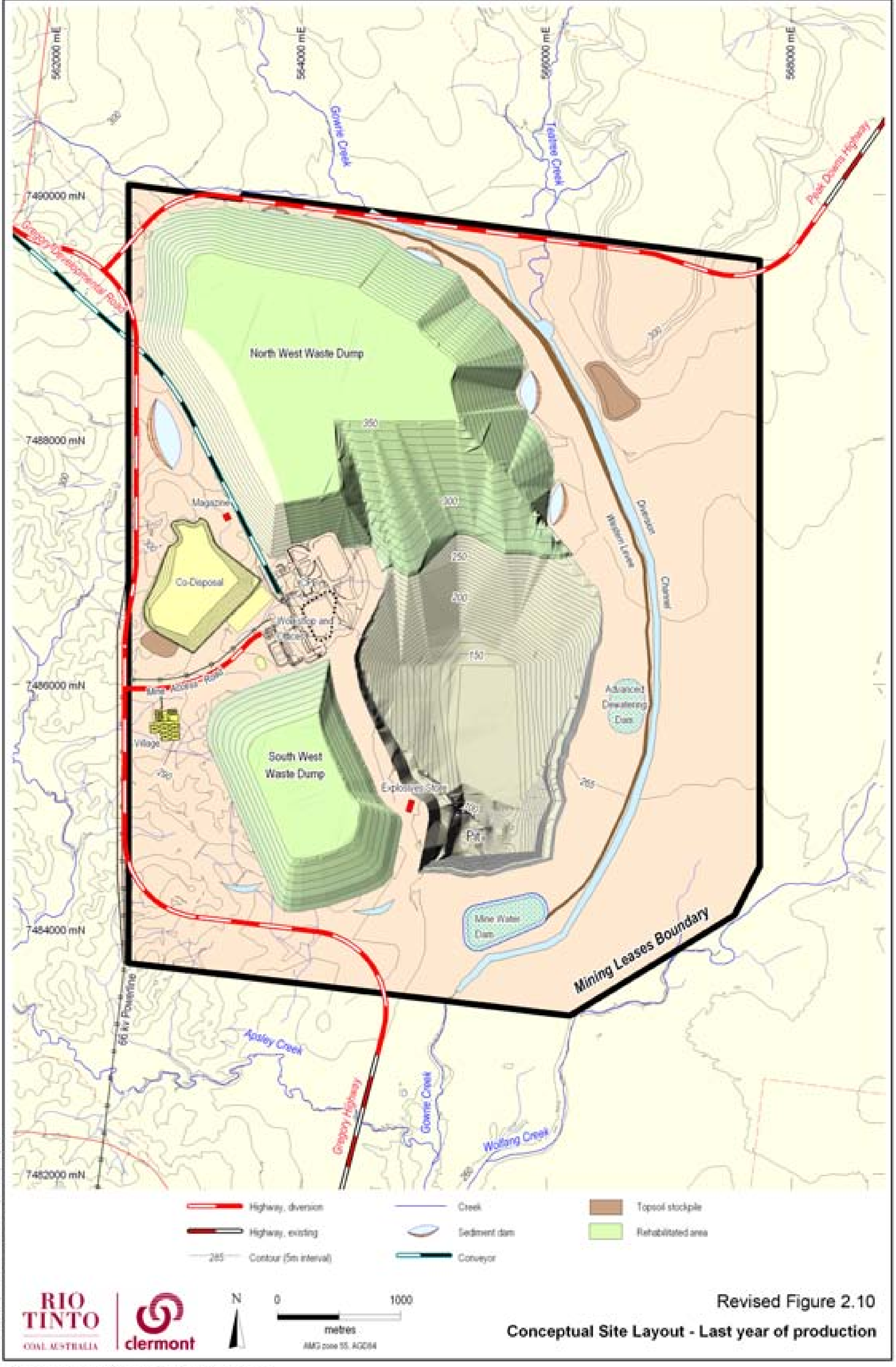
Revised Figure 2.8

Conceptual Site Layout - Year 8 of Production



Revised Figure 2.9

Conceptual Site Layout - Year 13 of Production



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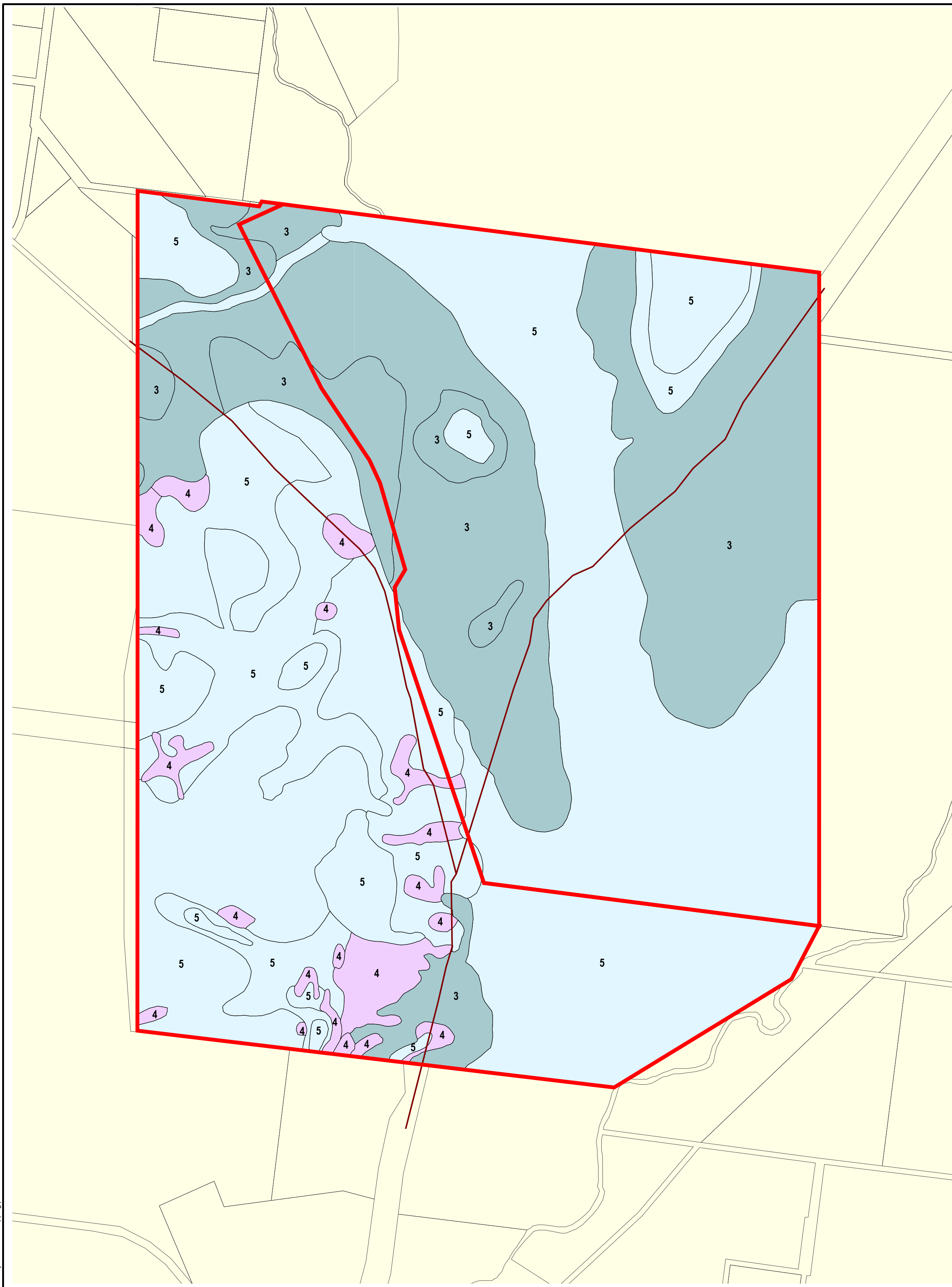
Revised Figure 2.10

Conceptual Site Layout - Last year of production



LEGEND

- Class 3 - Suitable land with moderate limitations
- Class 4 - Marginal land - presently unsuitable
- Class 5 - Unsuitable land
- Roads
- Lease Boundary

N

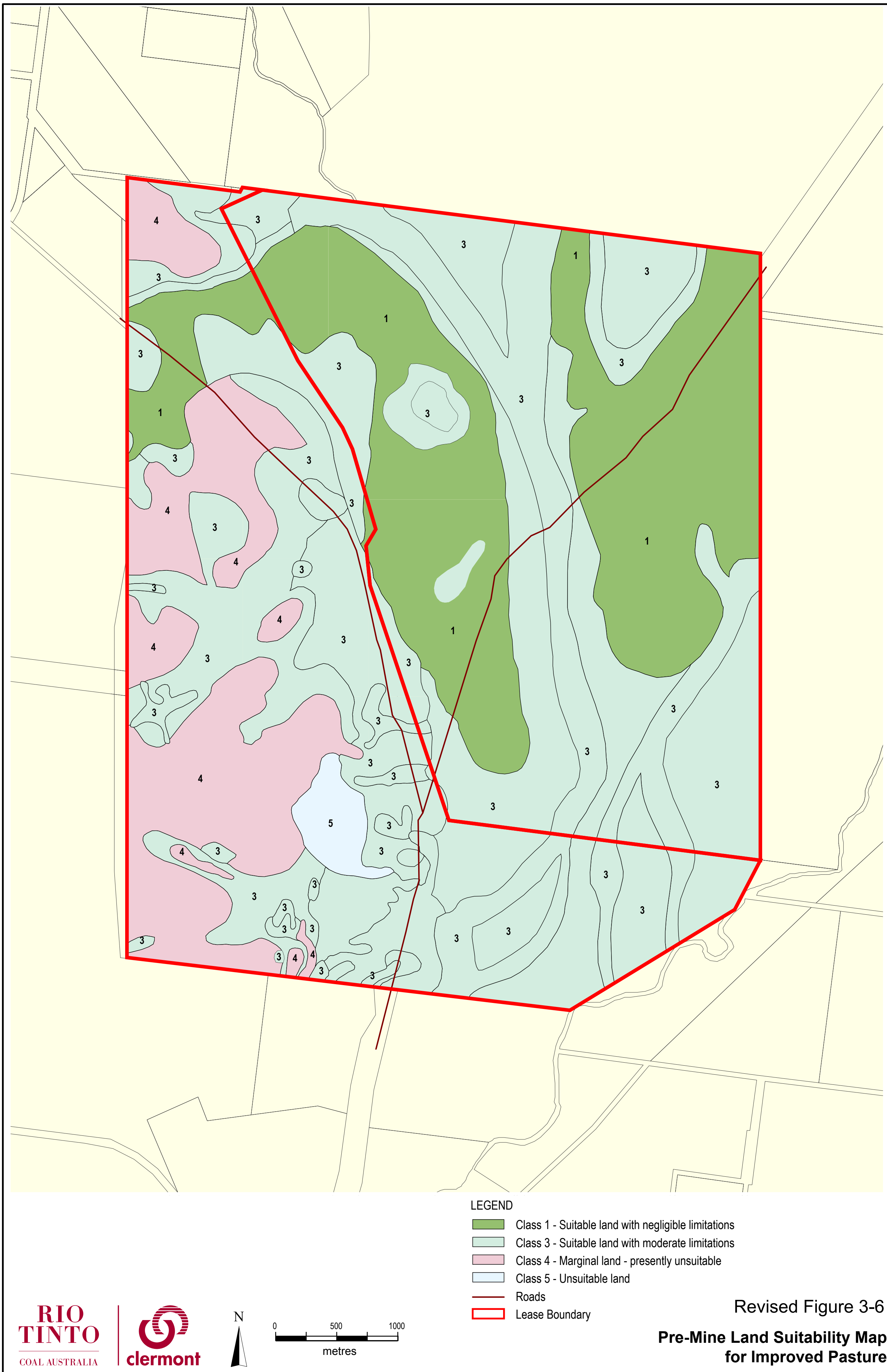
0 500 1000

metres

Revised Figure 3-5

Pre-Mine Land Suitability Map for Rainfed Cropping

QE006243/supplementary/graphics/Figure 3-05_rev_Mine land suitability for rainfed cropping.pdf



QE006243/supplementary/graphics/Figure 3-06_rev_Pre Mine land suitability for improved pature.pdf

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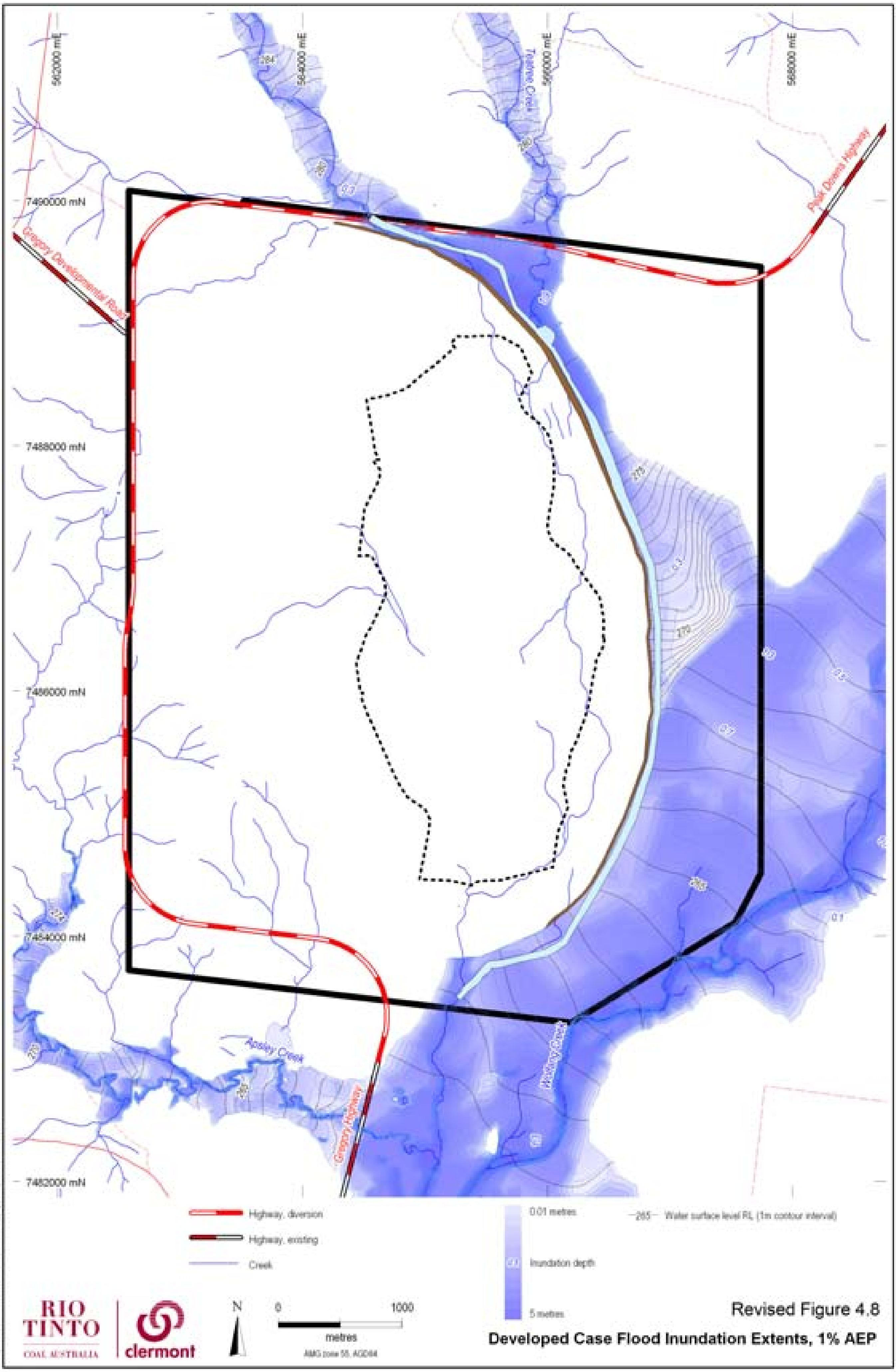
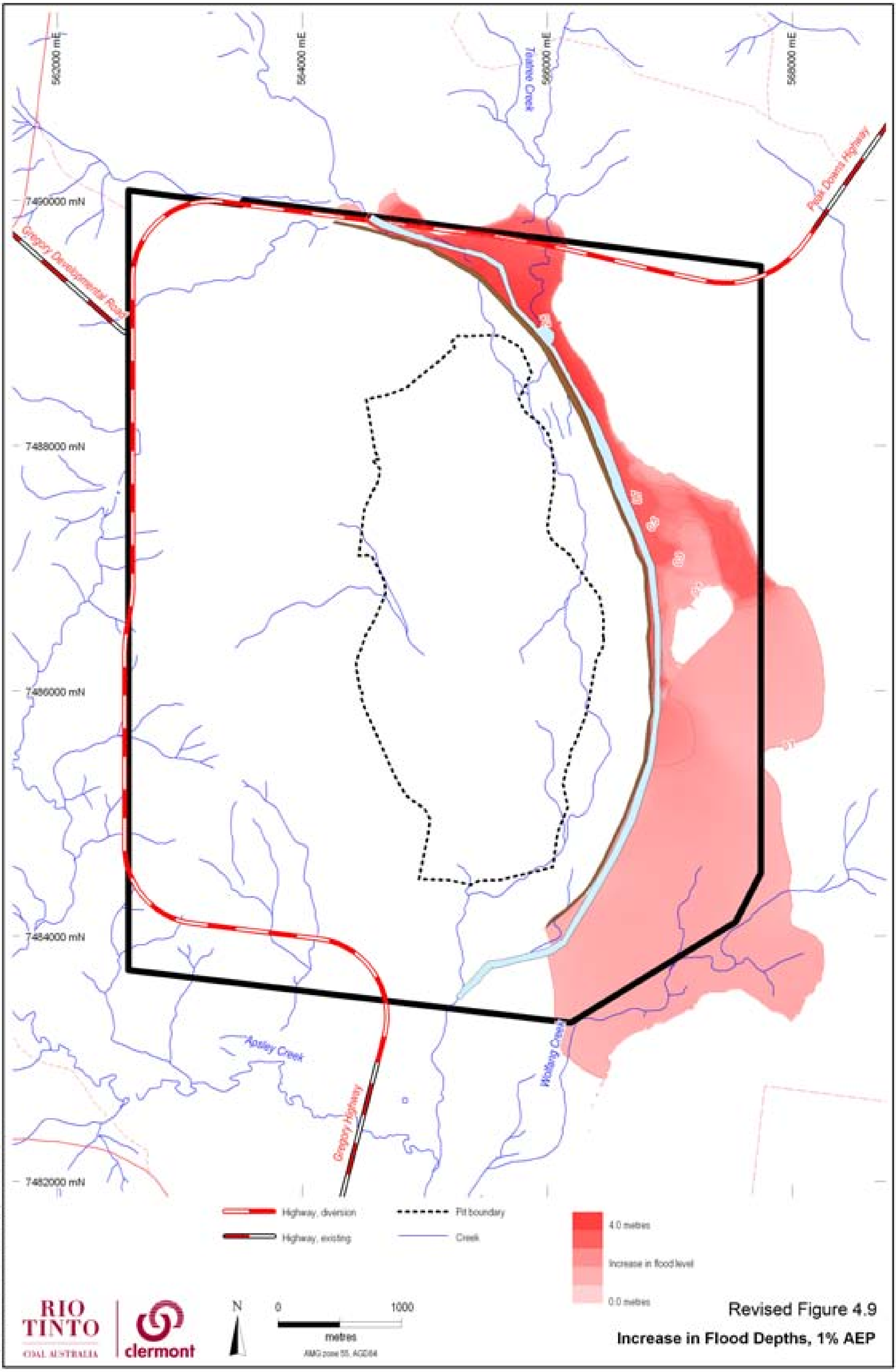
Revised Figure 3-6

Pre-Mine Land Suitability Map for Improved Pasture



Revised Figure 4.8

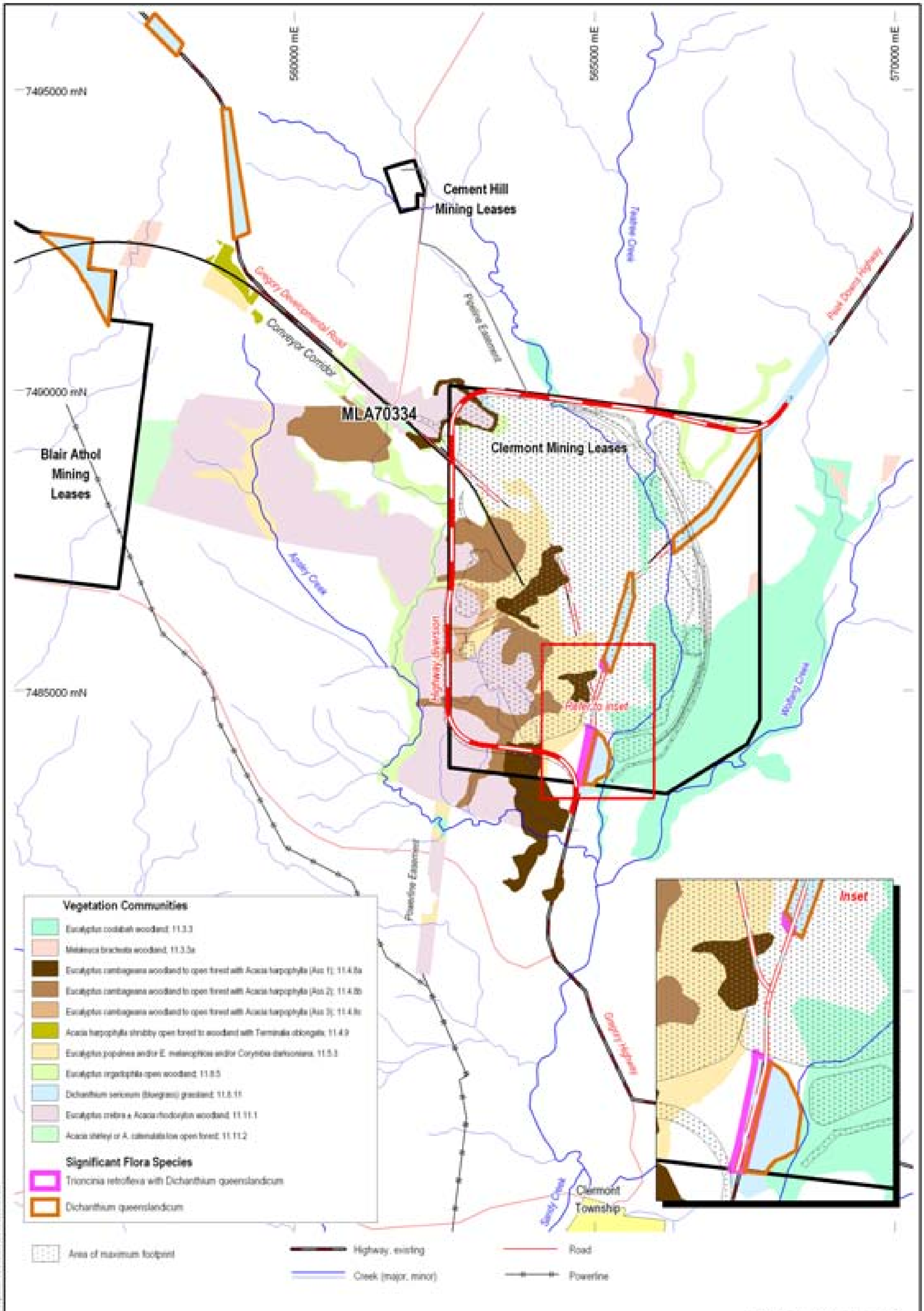
Developed Case Flood Inundation Extents, 1% AEP



Revised Figure 4.9

Increase in Flood Depths, 1% AEP

AFFLUX-dev9-existing.tab



Revised Figure 5.4

Remnant Vegetation Communities, Significant Flora Species and Infrastructure

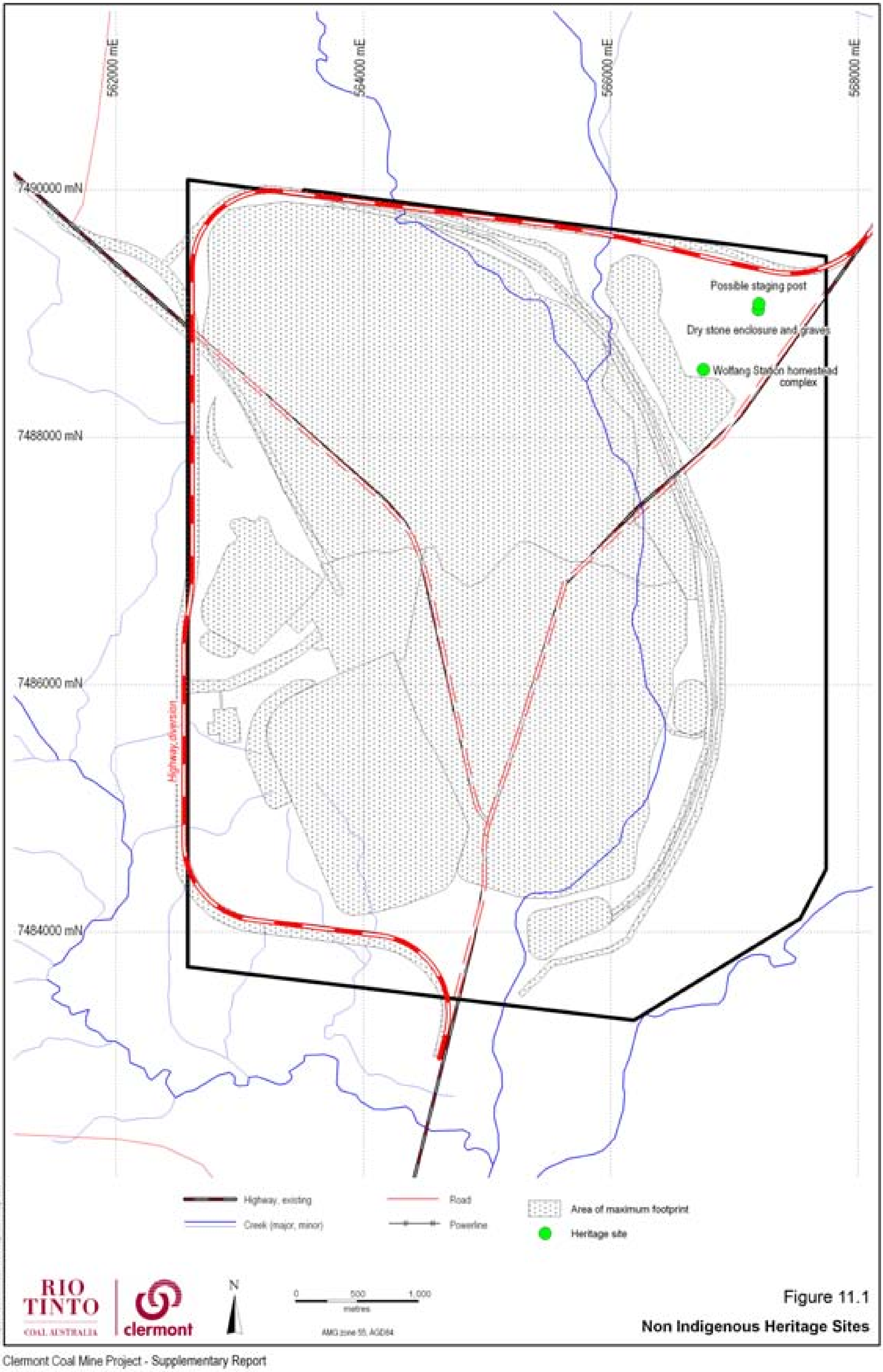


Figure 11.1

Non Indigenous Heritage Sites

Appendix E Final Dump Landform

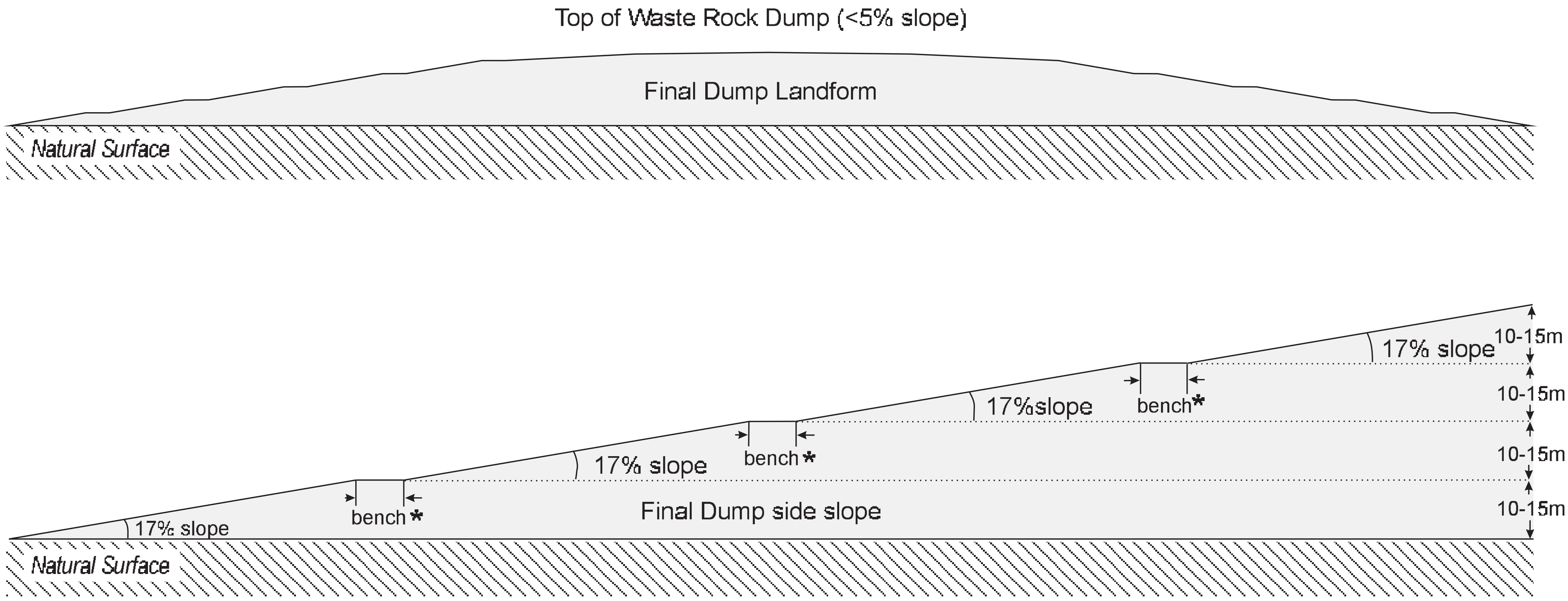


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Diagram not to scale

* *Bench width depends on catchment area*

Appendix E

Final Dump Landform - Schematic Cross Section

QE06243/Supplementary Report/Graphics/Figure 0-0_final dump landform EMOS.pdf

Appendix F Final Void

Appendix F Final Void

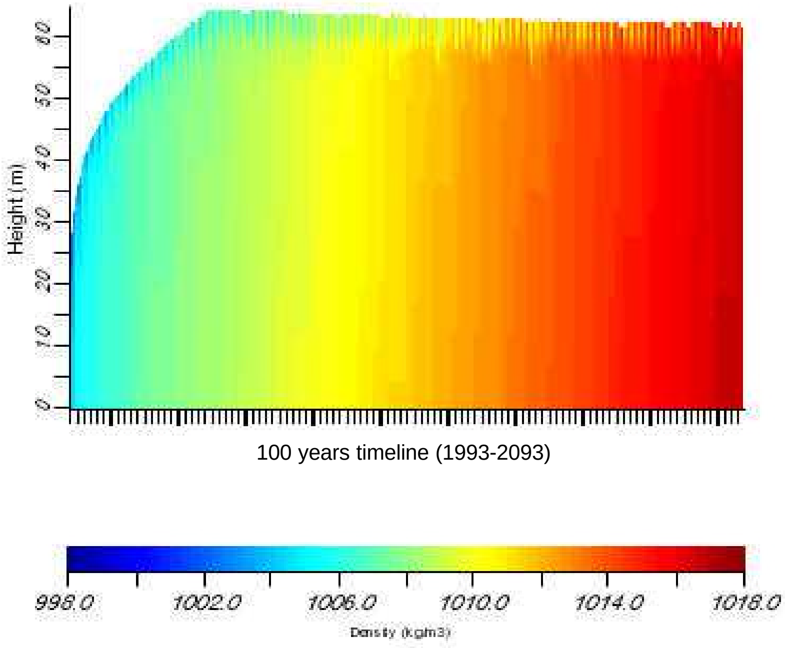

Figure F-1 Water Density Profile in a Final Void with Minimal Catchment

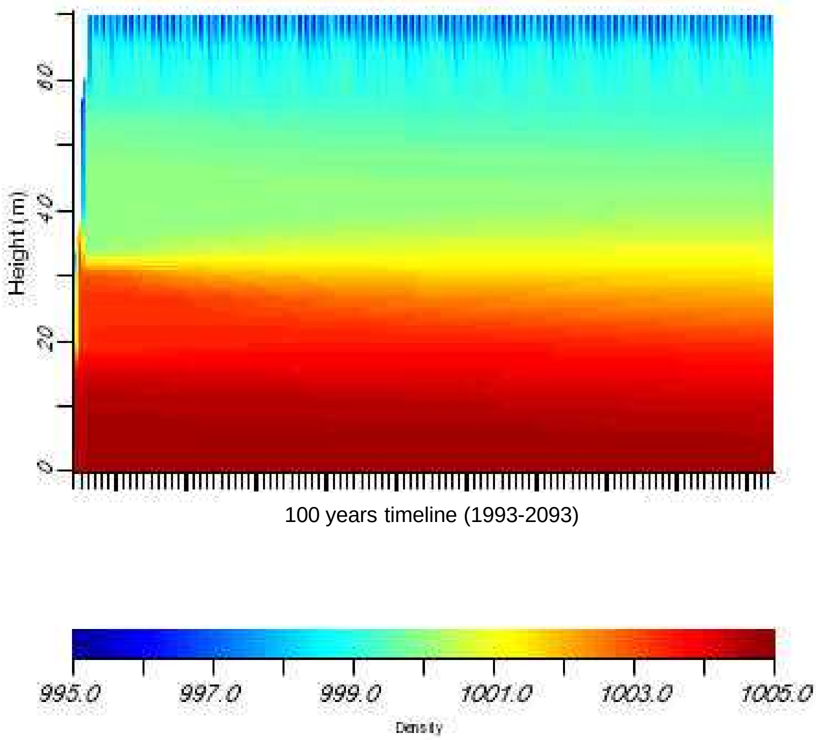

Figure F-2 Water Density Profile in a Final Void with Creek Inflows

Appendix G Revised Traffic Volumes

Appendix G Revised Traffic Volumes

Table G-1 Actual (2002) Traffic Volumes

Road	Average Annual Daily Traffic Volume (AADT) [vpd]	% Commercial (Heavy) Vehicles (CV%)
Gregory Highway (27C) between Clermont Connection Road and Blair Athol Connection Road	1,048	18.5 %
Gregory Highway (27C) between Blair Athol Connection Road and Gregory Developmental Road	831	21.7 %
Gregory Highway (27B) between Clermont Connection Road and Retro Turnout	731	22.0 %
Peak Downs Highway (33A) at Araluen	389	17.6 %
Gregory Developmental Road (98A) near Lodestar Mine	301	27.5 %
Clermont Connection Road (551) near Sandy Creek	1,596	13.0 %
Blair Athol Connection Road west of Gregory Highway	253	19.9 %
Kenlogan Road south of Mt McLaren Road	35	29.8 %

Table G-2 Construction Phase Traffic Volumes

Road	Background Only (Without Project)			With Proposed Construction		
	AADT	CV%	LOS[1]	AADT	CV%	LOS[1]
Gregory Highway (27C) between Clermont Connection Road and Blair Athol Connection Road	1,145	18.5 % (212)	A	1,272	18.8 % (239)	A
Gregory Highway (27C) between Blair Athol Connection Road and Gregory Developmental Road	908	21.7 % (197)	A	1,035	21.6 % (224)	A
Gregory Highway (27B) between Clermont Connection Road and Retro Turnout	799	22.0 % (176)	A	806	22.7 % (183)	A
Peak Downs Highway (33A) at Araluen	425	17.6 % (75)	A	438	20.0 % (88)	A
Clermont Connection Road (551) near Sandy Creek	1,744	13.0 % (227)	B	1,864	13.2 % (247)	B

Note (1) Level of Service: A – Excellent; B - Good; C -Satisfactory; D -Tolerable; E – Congested; F – Very Congested

Table G-3 Construction Phase Pavement Impacts (Equivalent Standard Axles)

Road	Background Only (Without Project)		Total Construction Phase Traffic			
	Existing Traffic (ESA/day)	Nominal 20 year design life (ESA)[1]	Peak Project Traffic (ESA/day)	Peak Increase in Daily ESA	Total Project Traffic (ESA)	Proportion of Nominal Design Life
Gregory Highway (27C) between Clermont Connection Road and Blair Athol Connection Road	621	3.81×10^6	76	12.2 %	29.3×10^3	0.8 %
Gregory Highway (27C) between Blair Athol Connection Road and Gregory Developmental Road	577	3.54×10^6	76	13.2 %	29.3×10^3	0.8 %
Gregory Highway (27B) between Clermont Connection Road and Retro Turnout	515	3.16×10^6	20	3.9 %	7.7×10^3	0.2 %
Peak Downs Highway (33A) at Araluen	219	1.34×10^6	38	17.3 %	14.7×10^3	1.1 %
Clermont Connection Road (551) near Sandy Creek	663	4.07×10^6	56	8.4 %	21.6×10^3	0.5 %

Note (1) Nominal 20 year design life, provided for comparison purposes, calculated from base year of latest traffic data (2002).

Table G-4 Operational Stage Traffic Volumes – BAM and project Operating

Road	Estimated Background Traffic (2008, Without Project, with BAM)			Estimated Traffic (With Project Operation)		
	AADT	CV%	LOS[1]	AADT	CV%	LOS[1]
Gregory Highway (27C) between Clermont Connection Road and Blair Athol Connection Road	1,251	18.5 % (231)	A	1,697	14.2 % (241)	B
Gregory Highway (27C) between Blair Athol Connection Road and Gregory Developmental Road	992	21.7 % (215)	A	1,438	15.7 % (225)	B
Gregory Highway (27B) between Clermont Connection Road and Retro Turnout	873	22.0 % (192)	A	902	21.7 % (196)	A
Peak Downs Highway (33A) at Araluen	464	17.6 % (82)	A	490	17.1 % (84)	A
Clermont Connection Road (551) near Sandy Creek	1,906	13.0 % (248)	B	2,323	10.9 % (254)	B

Note (1) Level of Service: A – Excellent; B - Good; C -Satisfactory; D -Tolerable; E – Congested; F – Very Congested

The traffic increases expected during full operation of the Project are minimal and will not affect the LOS experienced by drivers on most of these roads. On section 27C of the Gregory Highway, the small traffic increase contributed by the Project takes total daily traffic just below the LOS A threshold. The resultant LOS B is still a "good" driving experience. Drivers will spend slightly longer travelling in platooned groups of vehicles than in LOS A (for which most vehicles travel singly and are able to overtake freely if desired when another vehicle travelling in the same direction is encountered). The LOS B is still well within the desirable maximum identified by DMR for rural state controlled roads.

Table G-5 Operational Stage Traffic Volumes – Ten Year Horizon (2018)

Road	Projected Traffic Volumes (Without the BAM or Project)			Projected Traffic Volumes (With Project)		
	AADT	CV%	LOS[1]	AADT	CV%	LOS[1]
Gregory Highway (27C) between Clermont Connection Road and Blair Athol Connection Road	1,365	20.5 % (280)	A	1,811	16.0 % (290)	B
Gregory Highway (27C) between Blair Athol Connection Road and Gregory Developmental Road	1,323	20.4 % (269)	A	1,769	15.8 % (279)	B
Gregory Highway (27B) between Clermont Connection Road and Retro Turnout	1,131	22.4 % (253)	A	1,160	22.2 % (257)	A
Peak Downs Highway (33A) at Araluen	609	16.3 % (99)	A	635	15.9 % (101)	A
Clermont Connection Road (551) near Sandy Creek	2,255	13.3 % (300)	B	2,672	11.5 % (306)	B

Note (1) Level of Service: A – Excellent; B - Good; C -Satisfactory; D -Tolerable; E – Congested; F – Very Congested

Table G-6 Operational Stage Pavement Impacts (Equivalent Standard Axles)

Road	Background Only (Without Project)		Operational Stage Daily Traffic			
	Existing Traffic [2002] (ESA/day)	Nominal 20 year design life (ESA)[1]	Project Traffic (ESA/day)	Increase in Daily ESA	Design Life Project Traffic (ESA)	Proportion of Nominal Design Life
Gregory Highway (27C) between Clermont Connection Road and Blair Athol Connection Road	621	3.81×10^6	29	4.6 %	14.7×10^4	3.9 %
Gregory Highway (27C) between Blair Athol Connection Road and Gregory Developmental Road	577	3.54×10^6	29	5.0 %	14.7×10^4	4.2 %
Gregory Highway (27B) between Clermont Connection Road and Retro Turnout	515	3.16×10^6	4	2.3 %	6.1×10^4	1.9 %
Peak Downs Highway (33A) at Araluen	219	1.34×10^6	6	2.7 %	3.1×10^4	2.3 %
Clermont Connection Road (551) near Sandy Creek	663	4.07×10^6	17	2.5 %	8.6×10^4	2.1 %

Note (1) Nominal 20 year design life, provided for comparison purposes, calculated from base year of latest traffic data (2002)

Appendix H Project Commitments

Appendix H Project Commitments

General

1. 1 The Project will operate in accordance with an Environmental Management System.

1. 2 An Environmental Monitoring Manual (EMM) will be developed as part of the Project Environmental Management System. The EMM will outline the Project's environmental monitoring program (including monitoring sites, parameters and their frequency of measurement and make reference to monitoring procedures and records).

1. 3 Annual Returns will be prepared as required under the *Environmental Protection Act 1994*.

1. 4 A Register of Environmental Incidents will be maintained. Incidents that may potentially compromise compliance with the conditions of the Environmental Authority will be reported immediately to operations management.

1. 5 Environmental monitoring will be implemented, including rehabilitation success, surface water quality, groundwater quality and level, the stability of the Gowrie Creek diversion, aquatic ecology, dust deposition and noise.

1. 6 The Proponent will obtain the necessary landholder consent for approvals associated with the Project.

1. 7 The Proponent will obtain all necessary approvals required for the diversion of Gowrie Creek.

1. 8 The Proponent will obtain all necessary approvals required for the construction and operation of the overland coal conveyor.

1. 9 The Proponent will ensure all relevant registrations and licences under the *Food Act 1981* are obtained by the provider of food services within the construction village.

Section 2 – Project Description

2. 1 In relation to the overland coal conveyor, The Proponent will make necessary arrangements with Queensland Rail for the staging and timing of construction, interruptions to other rail infrastructure and any other matters that are relevant to the Proponent and QR.

Section 3 – Land Resources

3. 1 The Proponent commits to developing processes whereby matters surrounding the question of Native Title can be effectively negotiated. It is accepted that some resources will need to be provided by the Proponent to enable the relevant group to negotiate with the Proponent in an equitable fashion, and the proponent commits to providing such resources within reasonable limits.

3. 2 Stable landforms will be established following mining, using soils capable of supporting vegetation communities adapted to the local environment. The disturbed land will be rehabilitated to a condition that is self-sustaining, or to a condition where the maintenance requirements are consistent with the post-mining land use.

3. 3 Progressive rehabilitation will occur, and the post-mine land use for areas disturbed by mining at the Project will be a self sustaining vegetation community using appropriate native tree, shrub and grass species based on site-specific trials.

3. 4 On-site field trials will be conducted with a range of native tree and shrub species and grasses to optimise regeneration on major soil types.

3. 5 On-site trials will be conducted to establish native bluegrass on former grazing and cropping land.

3. 6 Vegetation clearing will be restricted to that necessary for the works and vegetation will not be burnt without a permit.

3. 7 Topsoil will be salvaged from all disturbed areas, unless they are unsuitable for use in the rehabilitation program.

3. 8 Topsoil stockpiles will be located away from drainage lines and the final surface will be ripped to promote natural vegetation.

3\. 9 Soil types with significantly different properties will be stockpiled separately.

3\. 10 Erosion and sediment control measures will be employed, consistent with the practices described in the 'Technical Guidelines for Environmental Management for Exploration and Mining in Queensland'.

3\. 11 In the management of topsoil, the Engineering Guidelines for Queensland for Soil Erosion and Sediment Control (IEAust 1996) will be followed, where appropriate.

3\. 12 Rehabilitated areas will be monitored to identify any areas in need of maintenance at an early stage. Rehabilitated areas that have not reached a sufficient density of vegetation will be reseeded. Supplementary plantings or seeding may be used to increase species diversity. Maintenance work will be performed to repair any areas exhibiting excessive soil erosion.

3\. 13 Rehabilitated areas will be monitored using the selected parameters and trends tracked to demonstrate progress towards achievement of a self-sustaining vegetation community.

3\. 14 Trials will be conducted to vary the slope angle used on final landforms. The use of competent waste rock and soil will be trailed on slopes steeper than 17%.

3\. 15 Additional sampling and analyses will be carried out before mining commences to allow development of an ARD block model of geochemical rock types. The outcomes from this model will inform the detailed waste placement strategies in the Plan of Operations.

3\. 16 A Waste Rock Management Plan will be developed which aims to minimise ARD processes. This plan will provide for the on-going analysis and identification of waste to ensure their appropriate placement.

3\. 17 The management of any potentially acid forming (PAF) materials will be achieved by the selective placement and burial of PAF waste rock and the construction of an earth material cover over the final Coal Washery Waste Disposal Area.

3\. 18 Once run-of-mine waste materials are available, investigations of appropriate waste rock dump design and optimal depth of burial of PAF waste rock will be undertaken.

3\. 19 Once run-of-mine waste materials and coal washery waste are available, investigations of cover strategies to minimise the release of oxidation products in leachate, and salt rise into the growth horizon, will be undertaken.

3\. 20 While the design of final covers is being finalised, the Proponent will operate under the following interim controls:

- no placement of PAF materials within 10m vertically and horizontally of final waste rock dump surfaces;
- no placement of PAF-LC materials within 10m vertically or horizontally of final waste rock dump surfaces unless blended with NAF material containing excess ANC (neutralising capacity > 10 kg H_2SO_4/t);
- treatment of PAF and PAF-LC materials on dump surfaces with limestone to inhibit oxidisation where necessary; and
- selective placement of PAF material such that any runoff reports to the pit or to a containment dam (separated from the sediment dam control system).

3\. 21 On the completion of mining, infrastructure will be treated as follows:

- mine roads will be left behind for use as farm roads (or rehabilitated);
- water dams and levee banks will remain if required by the subsequent landowner and approved by regulators; otherwise, they will be breached;
- buildings, plant and equipment will be removed and the surface rehabilitated. This will include the CPP, workshop, offices, storage tanks and coal handling facilities; and
- concrete pads will be covered with benign waste rock, topsoiled and revegetated.

3. 22 A contaminated site assessment will be carried out prior to surrender of the mining lease, and reported as part of the Final Rehabilitation Report.

3. 23 A bund and fence will be constructed around the crest of the pit to prevent access to the final void remaining at the end of the mine life.

Section 4 – Water Resources

4. 1 The Project will have a site water management system comprised of a series of storages and sediment dams. Stored water will be preferentially reused in the CPP or for dust suppression. Design of all storages and dams will be in accordance to the design criteria specified for this project to mitigate the potentially adverse environmental impacts identified in the EIS.

4. 2 Routine monitoring of key water storages within the Project site will be undertaken to provide information on the operation of the mine water management system. Locations and parameters to be monitored regularly are described in **Table 4-21** of the EIS.

4. 3 The impacts of the mining operation on downstream water quality will be minimised by:

- releasing from the Mine Water Dam only during times of flow in Wolfang or Gowrie Creeks;
- releasing from the Mine Water Dam only if the resultant EC in Wolfang Creek does not exceed 1 800 µS/cm, and the resultant pH in Wolfang Creek is maintained in the range 6.0 – 8.5; and
- ensuring all runoff from disturbed areas passes through sediment dams before entering local creeks.

4. 4 During a release event from the Mine Water Dam, the quality of the release water and the quality of the receiving waters (Wolfang creek) will be monitored. The range of parameters shall be reviewed after four years.

4. 5 All water quality sampling will be undertaken in accordance with the *Water Quality Sampling Manual, Third edition* (EPA, 1999). The frequency of monitoring and range of parameters analysed during flow and routine monitoring as described in the EIS will be reviewed after the first two years of mine operation.

4. 6 Upon completion of the construction phase of the proposed diversion a quantitative monitoring and evaluation program will be put in place to ensure that the diversion is working as intended. The program will follow the principals and procedures outlined in the Australian Coal Association Research Program (ACARP) Project “Monitoring and Evaluation Program for Bowen Basin River Diversions” (Project Number C9068). Specifically, a combination of pre-determined frequency and event based monitoring would be implemented.

4. 7 A program of adaptive waterway management (i.e. intervention management) within the Gowrie Creek diversion would be undertaken. Adaptive waterway management will be undertaken as a result of a diversion monitoring program which will be part of the environmental monitoring program for the site.

4. 8 The Proponent will develop a program of monitoring of the diversion levees associated with Gowrie Creek, to ensure their integrity and their ongoing operation as designed.

4. 9 The Proponent will model the final void water quality once kinetic testwork is complete and water quality data are available from the mine pit.

4. 10 The Proponent will undertake further hydrogeological evaluations to assess the potential availability of alternative groundwater supplies that would be unaffected by the mine dewatering program. Based on the results of these assessments and discussions with relevant landholders, options to ensure access to adequate alternative water supplies will be developed and discussed with the affected parties.

4. 11 The Proponent will continue discussions with landholders affected by groundwater draw-down, with a view to reaching mutually agreeable arrangements for the provision of alternative supplies throughout the mine life, and after mine closure.

4. 12 The Proponent will cover costs associated with changes to landholder extraction of groundwater from bores on affected land. This will include (where necessary) the deepening and/or replacement of existing bores; and/or replacement of pumps; and/or other alternatives if the dewatering process renders existing bores inefficient. Proposed changes will be agreed with individual landholders.

4. 13 A groundwater monitoring program will be undertaken during the operation of the dewatering borefield and during the operational phase of the Project. Groundwater level fluctuation and water chemistry monitoring will be undertaken of groundwater bores within major aquifers surrounding the Mining Leases. Monitoring results (water level and chemistry) will be entered into the existing RTCA groundwater database which will be regularly updated.

4. 14 The Proponent will conduct a stygofauna survey to establish if stygofauna are present within the Project area and if so, the range of taxa present. This survey is planned to occur once the regional monitoring bore network is installed. Selected bores both within and outside the anticipated zone of groundwater drawdown will be sampled.

4. 15 Prior to relinquishment of the mining leases, the Proponent will undertake predictive groundwater modelling to accurately predict the long term behaviour of the aquifer.

Section 5 – Nature Conservation

5. 1 The Proponent will implement off-set strategies for the unavoidable loss of 44 ha of the bluegrass community by compensatory establishment of 44 ha of bluegrass on in-situ black soil in the north-east of ML 1884.

5. 2 Areas to be cleared will have boundaries clearly marked by tape, pegs or other means, means and will conform to the limits of design drawings. Particular attention will be paid to defining the boundaries of clearing where endangered and of concern regional ecosystems are present.

5. 3 Key dominant and understorey species from RE 11.3.3, RE 11.4.8, RE 11.5.3 and RE 11.11.1 will be included in the rehabilitation seed mix for areas where suitable soil types have been replaced. The revegetation success of these species will be monitored and the seed mix modified if required to remove unsuitable species.

5. 4 All vegetation clearance will be restricted to that necessary for the works.

5. 5 Small areas of Belyando cobblers pegs will be disturbed by the Project, however, the Proponent is committed to managing the remaining community for long-term survival. The Proponent will fence off remaining communities of Belyando cobblers pegs to exclude stock, machinery and people.

5. 6 The Proponent will obtain all necessary approvals for the disturbance to Belyando cobblers pegs.

5. 7 Rehabilitation strategies for the flood plain of the Gowrie Creek diversion will include the establishment of Coolibah open woodland with a grassy understorey.

5. 8 The Proponent will consider strategies such as a nature conservation agreement or land covenant for the long-term protection and management of the proposed bluegrass off-set planted areas before the remnant community is disturbed.

5. 9 A Weed Management Plan will be prepared for the Project. It will be consistent with the Belyando Shire Weed Management Strategy. The Weed Management Plan will include provision for the installation of wash down points for vehicles and plant used on the Project during the construction phase of the mine.

5. 10 Once development of the Project commences, a routine ecological monitoring program would be undertaken. To ensure consistency with baseline data collected for the EIS, monitoring would be scheduled to follow significant regional rainfall (ideally in the early part of the 'wet season'). Monitoring would comprise habitat assessment, water quality monitoring, and the components of biological monitoring used to establish the baseline data set for the EIS. Annual monitoring during the operational life of the mine, and for a period of three years post cessation of groundwater discharge is considered appropriate. Frequency of monitoring may be reduced if there is little change between years.

5. 11 Monitoring of the four plots established for the riparian vegetation assessment for the EIS will be undertaken. Monitoring will include assessment against baseline floristics and structural information to determine whether the abundance of weeds are increasing downstream of the Project or whether there is a major change to riparian communities downstream of the Project.

5. 12 Monitoring for weed species at random locations above and below the Project will be undertaken to ascertain whether new weed species are spreading downstream of the proposed low-flow discharge point.

5. 13 If monitoring of aquatic biota identifies significant changes downstream of the Project, the Proponent is committed to investigating appropriate mitigation measures.

Section 6 – Air Quality

6. 1 Dust control measures will be implemented through best management practice and as far as it is practicable to reduce dust impact and nuisance in the engineering design and during the construction and operation of the mine

6. 2 Dust deposition monitoring will be carried out at Araluen, Crillee, the Airport and Glenmore residences for five years, following the commencement of construction, to confirm the modelling prediction that operations shall not result in a significant increase in dust levels.

6. 3 Any dust complaint will be investigated expeditiously and the complainant will be responded to.

6. 4 The Proponent will maintain an inventory of greenhouse gas emissions for the Project once construction starts; publicly report greenhouse emissions and progress on greenhouse mitigation measures; and maintain membership of the Commonwealth Government Greenhouse Challenge Program.

Section 7 – Noise and Vibration

7. 1 Noise at the nearest residences shall not exceed 37 dB(A) under typical adverse night time weather conditions.

7. 2 The following measures will be adopted where required to meet the noise criteria described in the Environmental Authority, at the nearest sensitive receptors:

- installation of 5m noise control berms adjacent to major haul roads;
- adoption of proper maintenance and operation procedures to minimise nuisance noise emissions from equipment;
- provision of a cover over the conveyor and side barriers where necessary. The conveyor is required to have weather resistant corrugated steel shielding for a distance of 1km on the northern side and 3 km on the southern side centring on the Old Blair Athol homestead; and
- best management practices where reasonable and feasible to limit the amount of noise emission and annoyance during the construction and operation of the mine.

7. 3 Noise monitoring will be conducted at least annually at Araluen, Homelea Downs, Glenmore, New Blair Athol and Old Blair Athol for the first five years of mining and thereafter if requested by the residents. For Crillee, Fleurs and Clermont Airport, noise monitoring will be conducted in Year 7-11. Occupants will be informed of mine progress and any changes to mine operations that have the potential to cause a significant change to noise emissions.

7. 4 Noise monitoring is required to assess noise generated by new equipment, or equipment, which has undergone major maintenance procedures.

7. 5 A site contact number will be provided to neighbours to allow a timely response to any complaint about nuisance noise. Complaints will be investigated to determine the source of the nuisance noise and, where appropriate, noise monitoring will be conducted at the affected residence. Should monitoring indicate that the noise level is persistently over 35 dB(A) and is causing a continuing nuisance, Clermont Coal Mine shall seek to reach an agreement with the occupier of the residence to provide noise reduction treatment of the dwelling to minimise the nuisance. Measurement and reporting of noise levels will be in accordance with the EPA's Noise Measurement Manual.

7. 6 Airblast will be managed by environmental blast design and accurate implementation to achieve the 115 dBL limit at the nearby residences.

7. 7 A predictive airblast model will be calibrated based on field observation and used to determine blast specifications (such a stemming, hole spacing and charge factor) such that blasts are managed within *Environmental Protection Regulation 1998* limits.

7. 8 Ground vibration due to blasting shall not exceed 10 mm/s at the nearest residences.

7. 9 Blasting will be restricted to daylight hours and measurement and reporting of blast noise and vibration at the mine will comply with the EPA Guideline 'Noise and Vibration from Blasting'.

Section 8 – Cultural Heritage

8. 1 The Proponent will implement the Cultural Heritage Management Plan (CHMP) and meet duty of care standards set by the *Aboriginal Cultural Heritage Act 2003*.

8. 2 The Proponent will engage with the endorsed Aboriginal parties to compile a comprehensive schedule of the cultural heritage places and values of the study area, and then to negotiating a strategy to manage those places and values in a culturally appropriate fashion in the context of the proposed development.

8. 3 In order to minimise the risk of accidental damage to cultural heritage features, the Proponent will incorporate cultural heritage awareness into worker induction sessions and training; and implement a procedure requiring a permit to be obtained from the relevant site person(s) prior to undertaking any clearing or excavations.

Section 9 – Scenic Values

9. 1 Vegetation will be retained and progressive rehabilitation will occur to reduce visual impacts.

9. 2 The Proponent will retain/establish a buffer of vegetation between the North West Waste Dump and the realigned section of the Peak Downs Highway and Gregory Highway.

9. 3 The Proponent will vegetate the Gowrie Creek diversion progressively to replace woodland presently acting as a mid-field screen for views from the east.

9. 4 The Proponent will consult with the occupiers of the Homelea Downs residence in order to determine if the impact requires mitigation, and if so, discuss what form of mitigation is acceptable.

9. 5 The Proponent will locate night lights as required for safety and security, but ensure lights are focussed on the areas required, with shields around the globes to limit extraneous light where necessary.

Section 10 – Waste Management

10. 1 The Proponent will estimate and report Project emissions to the NPI annually once mining commences.

10. 2 The Project will comply with the state waste management policies, the EP Act and associated regulatory requirements as a minimum.

10. 3 The Project will manage wastes in accordance with the Waste Management Hierarchy listed in the EPP (Waste Management).

10. 4 Separate skips will be provided to maintain waste segregation and maximise economic reuse and recycling, in preference to disposal to landfill.

10. 5 Transportation of wastes off-site will be by a licensed waste contractor.

10. 6 Any hazardous materials used on site will be recorded in a Hazardous Materials Register.

10. 7 A Waste Management Procedure will be developed and will include an approved waste tracking system for those wastes that require tracking.

10. 8 Spill response procedures will be developed for potentially hazardous waste materials.

10. 9 The project will require contractors to adopt best practise waste minimisation procedures.

10. 10 Sites that become contaminated will be investigated, managed and remediated in accordance with the requirements of the contaminated land provisions of the *Environmental Protection Act 1994*.

10. 11 Waste monitoring and auditing will be undertaken at the Project.

Section 11 – Traffic and Infrastructure

11. 1 The new road sections and intersections will all be designed in accordance with the appropriate safety and geometric standards to the satisfaction of Department of Main Roads.

11. 2 As required by Department of Main Roads, the effect of heavy vehicle traffic generated by the development on pavement life and maintenance needs will be assessed in detail in accordance with the DMR (2000) Guidelines, and the Proponent will consult with DMR about mitigation of any effects identified.

11. 3 The single landholder affected by the conveyor has been fully consulted and suitable access over the conveyor will be provided in two locations.

11. 4 RTCA has agreed with a DNRM request that:

- the road reserve be widened from minimum 60m to minimum 90m width along western boundary south from intersection with Peak Downs Highway;
- the stock route be selectively cleared and stick-raked along the western boundary where the timber is quite thick and there is a lot of fallen timber;
- additional fencing be provided so that stock move in a laneway separated from road traffic by a fence, and a post and rail fence (or stock yard fencing) be provided to separate stock from road traffic where the stock will cross under the conveyor (the need and scope of these fences will be confirmed with the stock inspector once road construction and conveyor overpass are complete); and
- additional stock watering be provided (tank and trough or small dam in one of the gullies) at a point midway down western side.

11. 5 RTCA will continue to consult with DMR and DNRME and negotiate the approvals for the realignment of the Peak Downs Highway and the Gregory Highway and associated stock routes. RTCA also proposes to work closely with the Belyando Shire Council throughout the Project to ensure that benefits to the Shire are maximised and potentially adverse impacts are minimised.

11. 6 A new school bus stop will be provided on the Peak Downs Highway near the Gregory Developmental Road intersection to replace the existing stop. The location and design of the bus stop will conform with the relevant geometric and safety standards.

11. 7 Coal will be transported to product stockpiles at the BAM by conveyor. The Proponent does not propose to tranport coal to the BAM via road when the conveyor is shut down (e.g. for maintenance).

11. 8 The part closure and realignment of affected state-controlled roads will be dealt with in a Compensation Agreement and Infrastructure Agreement that will be signed between the Proponent and Main Roads.

11. 9 The Proponent has commenced negotiations with DMR on issues associated with the Project and will continue to work with DMR on mine access matters.

Section 13 – Social Impact

13. 1 During the approval phase of the Project, the Proponent will continue ongoing communication with the Clermont community and existing BAM employees about the Project approval process and timeline, and key Project milestones.

13. 2 The Site Construction Village is temporary and will be decommissioned and removed at the end of the construction phase.

13. 3 The Proponent would cater for the employees who choose to maintain their home base outside of Clermont during the operational phase by providing accommodation in the Township Village. The proponent would restrict the distance employees travel on a daily basis to and from the mine to minimise the exposure to fatigue.

13. 4 The Project will provide employees with financial assistance towards the cost of purchase or rental of a principal place of residence.

13. 5 RTCA will continue to inform the existing BAM workforce, accommodation services providers, and other relevant stakeholders on the progress of the Project, including proposed plans for accommodating the workforce.

13. 6 The Proponent would monitor the demand for accommodation and consider options to ensure that demand for workforce accommodation is met and impacts on the Clermont housing market are minimised.

13. 7 After Project approval, the Proponent will provide to Belyando Shire Council a layout for a 100 lot housing subdivision in Clermont as a contingency in case of excessive demand for new housing.

13. 8 The Proponent would provide training to all employees. The Proponent would also work closely with the BACJV to ensure that all BAM employees are:

- aware of the employment opportunities available at the Project;
- understand the recruitment and selection process and criteria that will be used to assess their applications; and
- aware of the timeframe for decisions relating to employment at the Project.

13. 9 RTCA will provide opportunities for people to be trained under traineeships and apprenticeships. Initiatives in this area will include:

- encouraging contractors working on construction, developing the box-cut or providing services to site to provide traineeships for young people;
- seeking to work with engineering companies in the region to support additional apprenticeships, including opportunities for females and indigenous applicants through the provision of financial support and site placements to gain experience. An example of this type of initiative is the partnership between RTCA's Hail Creek Mine and the Mackay Area Industry Network (MAIN); and
- providing opportunities, either directly or through external providers for traineeships and apprenticeships. Initiatives similar to those developed through the Blair Athol Mine Community Development Fund, would be continued during the Project.

13. 10 A relationship with Central Queensland TAFE and other training organisations would be developed to ensure that these agencies are aware of Project requirements and build them into long-term training and upskilling plans. Partnerships with the community and agencies, that help to develop skills within the community, would also be considered by the Proponent.

13. 11 The Proponent will continue to support certain local community enterprises through programs similar to the Blair Athol Mine Community Development Fund. An objective of such support is that the enterprises must be self-sustaining.

13. 12 Counselling services would be provided for employees during the construction and operational phases of the Project by phone and regular Project site or town visits by a counsellor. During the operational phase counselling services would also be extended to families of all employees, including those who do not reside in Clermont.

13. 13 The construction and operational phase workforce would be governed by the policies and codes of conduct devised and implemented by RTCA and its contractors. RTCA's policies from "The Way We Work" and the "RTCA Code of Good Conduct" would be implemented.

Section 15 – Health and Safety

15. 1 The Proponent will implement the RTCA Safety Standards and Occupational Health Standards that are currently in use at all RTCA operations and provide the basis for effective management of employee and public health and safety.

15. 2 The Rio Tinto Occupational Health Standard for Hearing Conservation will apply to all phases of the Project. The Project will implement hearing conservation standards and procedures during construction and operation to ensure that employees and contractors will not suffer adverse health effects from noise generated in the workplace.

15. 3 The Proponent would provide first aid and emergency rescue facilities and equipment during all phases of the Project. The Proponent would ensure that appropriately trained personnel would be on site throughout the life of the Project to provide first aid and respond to on-site emergencies as required.

15. 4 MSDS information will be obtained and communicated to all site personnel involved in the storage, handling use and disposal of hazardous substances and materials.

15. 5 Designated first aid and emergency rescue facilities and equipment will be available during the construction and operation phases.

15. 6 The site will have a fire brigade approved fire response/fighting system.

15. 7 The Proponent will liase with local State Emergency Services and local ambulance and hospital services with respect to planning for Emergency Response.

15. 8 An Emergency Response Plan will be prepared and implemented.

Section 16 EMOS

16. 1 RTCA will ensure that employees, contractors and visitors receive appropriate environmental awareness training. Environmental awareness training will occur at induction, and will be a regular feature of site-wide training. Records of training content and attendance will also be maintained.

16. 2 Employees and contractors required to undertake work at the site must undergo an environment, health and safety induction.

16. 3 The Proponent will develop and implement a complaints procedure. Any complaints will be recorded on a register. Complaints will be investigated and where appropriate, corrective action will be implemented.

Appendix I Surplus Groundwater and Sandy Creek Alluvial Aquifer Water Quality

Appendix I Surplus Groundwater and Sandy Creek Alluvial Aquifer Water Quality

Parameter	Total/ Filtered	Unit	Released Groundwater				Sandy Creek Alluvium			
			Count	20th %ile	Median	80th %ile	Count	20th %ile	Median	80th %ile
Electrical Conductivity		µS/cm	98	718	908	1176	21	715	1150	1480
pH			119	7.5	7.7	8	20	7.08	7.25	7.72
Suspended Solids		mg/L	16	<1	2	5	-	-	-	-
TDS		mg/L	88	422	542	678	21	400	685	855
Turbidity		NTU	18	3.3	15.5	244	-	-	-	-
Dissolved Oxygen		mg/L	6	5.1	7	8.2	-	-	-	-
Nitrate as N		mg/L	6	<0.01	<0.01	0.02	8	0.5	1.8	20.1
Nitrite as N		mg/L	6	<0.01	<0.01	<0.01	-	-	-	-
Total Nitrogen as N		mg/L	6	0.1	0.2	0.3	-	-	-	-
Organic Nitrogen as N		mg/L	5	0.1	0.8	2.6	-	-	-	-
Total Kjeldahl Nitrogen as N		mg/L	11	0.2	0.2	1	-	-	-	-
Ammonia as N		mg/L	11	0.05	0.2	0.26	-	-	-	-
Total Phosphorus as P		mg/L	6	0.04	0.09	0.31	-	-	-	-
Reactive Phosphorus as P		mg/L	6	0.02	0.02	0.03	-	-	-	-
Sodium Adsorption Ratio			57	-	2.1	-	20	1.5	2.9	3.5
Alkalinity as CaCO3		mg/L	70	-	320	-	21	200	273	345
Chloride		mg/L	98	-	88	-	21	95	195	267
Calcium		mg/L	87	-	40	-	21	44	55	66
Fluoride		mg/L	16	-	0.3	-	20	0.18	0.3	0.4
Magnesium		mg/L	85	-	38	-	21	5	47	66
Potassium		mg/L	73	-	3	-	16	2	3	44
Sodium		mg/L	82	-	102	-	21	56	129	152
Sulphate		mg/L	80	-	15	-	21	12	39	92
Silica		mg/L	-	-	-	-	6	29	33	35
Alkalinity (bicarbonate) as CaCO3		mg/L	-	-	-	-	21	244	325	421
Carbonate		mg/L	-	-	-	-	7	0.34	2.6	3.8
Aluminium	Total	mg/L	15	-	0.003	-	3	<0.01	<0.01	<0.01
Antimony	Total	mg/L	7	-	<0.001	-	-	-	-	-
Arsenic	Total	mg/L	15	-	0.002	-	-	-	-	-
Barium	Total	mg/L	7	-	0.048	-	-	-	-	-
Beryllium	Total	mg/L	9	-	<0.001	-	-	-	-	-
Boron	Total	mg/L	9	-	<0.1	-	3	0.1	0.1	0.14
Cadmium	Total	mg/L	15	-	<0.0001	-	-	-	-	-
Chromium	Total	mg/L	9	-	<0.01	-	-	-	-	-
Cobalt	Total	mg/L	9	-	<0.001	-	-	-	-	-
Copper	Total	mg/L	15	-	0.003	-	3	0.004	0.01	0.02
Iron	Total	mg/L	10	-	0.06	-	14	<0.01	0.2	18.6
Lead	Total	mg/L	15	-	<0.001	-	-	-	-	-
Manganese	Total	mg/L	15	-	0.015	-	6	<0.001	0.005	0.01

Parameter	Total/ Filtered	Unit	Released Groundwater				Sandy Creek Alluvium			
			Count	20th %ile	Median	80th %ile	Count	20th %ile	Median	80th %ile
Mercury	Total	mg/L	15	-	<0.000 1	-	-	-	-	-
Molybdenum	Total	mg/L	14	-	0.001	-	-	-	-	-
Nickel	Total	mg/L	15	-	0.003	-	-	-	-	-
Selenium	Total	mg/L	14	-	<0.01	-	-	-	-	-
Silver	Total	mg/L	7	-	<0.001	-	-	-	-	-
Zinc	Total	mg/L	15	-	0.009	-	3	0.008	0.02	0.05

Note: Discharged groundwater chemical analysis data sourced from Clermont Coal Mine Project, EIS, August 2004

Note: Sandy Creek groundwater chemical analysis data sourced from the State of Queensland Department of Natural Resources and Mines 2004

Note: Bold values indicate highest median values

Appendix J Summary of Surface Water Quality

Appendix J Summary of Surface Water Quality

Parameter	Total / Filtered	Unit	ANZECC Aquatic Ecosystems	Gowrie Creek GCK10				Gowrie Creek GCK20			
				Count	20th %ile	Median	80th %ile	Count	20th %ile	Median	80th %ile
Electrical Conductivity		µS/cm	250	22	209	249	318	45	100	176	242
pH			**6.0-7.5**	23	7.7	**7.9**	8.4	45	7.8	**8.1**	9.7
Suspended Solids		mg/L	-	22	15	1545	13920	45	1036	4790	11280
TDS		mg/L	-	23	121	160	267	44	100	142	268
Turbidity		NTU	15	1	70	70	70	0			
Total Kjeldahl Nitrogen as N		mg/L	-	3	0.80	1.1	1.16	9	1.28	4.7	6.7
Ammonia		mg/L	**0.006**	8	0.018	**0.085**	0.158	15	0.02	**0.03**	0.07
Nitrate as N		mg/L	**0.030**	4	<0.01	**0.2**	0.71	9	0.318	**0.63**	1.158
Nitrite as N		mg/L	0.030	4	<0.01	0.02	0.038	9	0.01	0.01	0.03
Total Nitrogen as N		mg/L	**0.150**	3	0.96	**1.5**	2.04	9	1.8	**5.8**	7.22
Total Phosphorus as P		mg/L	**0.010**	3	0.108	**0.24**	0.312	9	0.874	**2.34**	3.606
Reactive Phosphorus as P	Filtered	mg/L	**0.005**	3	0.014	**0.02**	0.312	9	0.022	**0.03**	0.044
Calcium	Filtered	mg/L	-	9	18.6	23	26.4	15	12.16	16	20.8
Chloride		mg/L	-	24	6.2	14.5	39.6	44	5.6	9.5	18.4
Hardness as Ca CO_3		mg/L	-	0				0			
Magnesium	Filtered	mg/L	-	8	6.4	8.5	11.4	15	5	7	8
Potassium		mg/L	-	15	1.8	3	5	29	1	2	3.4
Sodium		mg/L	-	18	17.8	24.5	30	32	14	18.5	26.6
Sulphate		mg/L	-	18	2	2	3	32	2	2	3
Total Alkalinity		mg/l	-	7	93.6	117	136	15	91	97	126.4

Note: Bold indicates median values in exceedance of the guideline value

Parameter	Total / Filtered	Unit	ANZECC Aquatic Ecosystems	Gowrie Creek GCK10				Gowrie Creek GCK20			
				Count	20th %ile	Median	80th %ile	Count	20th %ile	Median	80th %ile
Toxicant 90% protection guideline value											
Aluminium	Filtered	mg/L	0.08	8	<0.01	0.015	0.047	15	<0.01	<0.01	0.0264
Antimony	Filtered	mg/L	-	8	<0.001	<0.001	0.0064	15	<0.001	<0.001	<0.001
Arsenic	Filtered	mg/L	0.042	8	<0.001	<0.001	<0.001	15	<0.001	<0.001	<0.001
Barium	Filtered	mg/L	-	8	<0.01	0.135	0.02	15	0.005	0.007	0.0102
Beryllium	Filtered	mg/L	-	7	<0.001	<0.001	<0.001	15	<0.001	<0.001	<0.001
Boron	Filtered	mg/L	0.68	8	<0.1	<0.1	<0.1	15	<0.1	<0.1	<0.1
Cadmium	Filtered	mg/L	0.0004	8	<0.0001	<0.0001	<0.0001	15	<0.0001	<0.0001	<0.0001
Chromium	Filtered	mg/L	0.006	8	<0.01	<0.01	<0.01	15	<0.01	<0.01	<0.01
Cobalt	Filtered	mg/L	-	7	<0.001	<0.001	<0.001	15	<0.001	<0.001	<0.001
Copper	Filtered	mg/L	**0.0018**	8	0.002	**0.003**	0.008	15	0.0028	**0.003**	0.0052
Iron	Filtered	mg/L	-	8	<0.01	0.055	0.37	15	<0.01	0.06	0.118
Lead	Filtered	mg/L	0.0056	8	<0.001	<0.001	<0.001	15	<0.001	<0.001	<0.001
Manganese	Filtered	mg/L	2.5	8	<0.001	<0.001	<0.001	15	<0.001	<0.001	<0.001
Mercury	Filtered	mg/L	0.0019	8	<0.0001	<0.0001	<0.0001	15	<0.0001	<0.0001	<0.0001
Molybdenum	Filtered	mg/L	-	8	<0.001	<0.001	<0.001	15	<0.001	<0.001	<0.001
Nickel	Filtered	mg/L	0.013	8	0.0024	0.004	0.0056	15	0.002	0.003	0.003
Selenium	Filtered	mg/L	0.018	8	<0.01	<0.01	<0.01	15	<0.01	<0.01	<0.01
Silver	Filtered	mg/L	0.0001	8	<0.001	<0.001	<0.001	15	<0.001	<0.001	<0.001
Zinc	Filtered	mg/L	0.015	8	<0.001	<0.001	0.0036	15	<0.001	<0.001	<0.001

Note: Bold indicates median values in exceedance of the guideline value

Parameter	Total / Filtered	Unit	ANZECC Aquatic Ecosystems	Tea Tree Creek TTCK10				Wolfang Creek DNRM 130211 (A,B)			
				Count	20th %ile	Median	80th %ile	Count	20th %ile	Median	80th %ile
Electrical Conductivity		µS/cm	**250**	34	173	**288**	357	19	321	**1600**	2052
pH			**6.0-7.5**	34	7.8	**7.88**	8.2	19	7.8	**8.1**	8.4
Suspended Solids		mg/L	-	34	4516	15250	32540	15	20	145	296
TDS		mg/L	-	33	113	240	377	19	190	856	1068
Turbidity		NTU	15	0				1	100	100	100
Total Kjeldahl Nitrogen as N		mg/L	-	2	1.36	1.6	1.84	0			
Ammonia		mg/L	**0.006**	13	0.034	**0.11**	0.42	0			
Nitrate as N		mg/L	**0.030**	1	0.41	**0.41**	0.41	11	0.16	**1**	2.5
Nitrite as N		mg/L	0.030	3	<0.01	0.01	0.028	0			
Total Nitrogen as N		mg/L	**0.150**	3	0.842	**1.4**	2.12	0			
Total Phosphorus as P		mg/L	**0.010**	2	0.436	**0.55**	0.664	0			
Reactive Phosphorus as P	Filtered	mg/L	**0.005**	2	0.032	**0.065**	0.098	0			
Calcium	Filtered	mg/L	-	12	19.8	24	33	19	16.4	23	45.6
Chloride		mg/L	-	34	3	7.5	23.2	19	29.6	286	433.6
Hardness as Ca CO_3		mg/L	-	1	72	72	72	19	80.6	306	456.2
Magnesium	Filtered	mg/L	-	12	8	9	13.8	19	8.66	57	87
Potassium		mg/L	-	21	1	2	4	18	1.88	2.5	4.62
Sodium		mg/L	-	25	14.8	24	26.8	19	38.8	182	252.8
Sulphate		mg/L	-	25	1	2	3.2	14	7.66	28	41.2
Total Alkalinity		mg/l	-	13	127.4	143	195.6	19	117.2	239	362.6

Note: Bold indicates median values in exceedance of the guideline value

Parameter	Total / Filtered	Unit	ANZECC Aquatic Ecosystems	Tea Tree Creek TTCK10				Wolfang Creek DNRM 130211 (A,B)			
				Count	20th %ile	Median	80th %ile	Count	20th %ile	Median	80th %ile
Toxicant 90% protection guideline value											
Aluminium	Filtered	mg/L	0.08	13	<0.01	<0.01	0.052	0			
Antimony	Filtered	mg/L	-	12	<0.001	<0.001	<0.001	0			
Arsenic	Filtered	mg/L	0.042	12	<0.001	<0.001	<0.001	0			
Barium	Filtered	mg/L	-	12	0.0092	0.0115	0.018	0			
Beryllium	Filtered	mg/L	-	12	<0.001	<0.001	<0.001	0			
Boron	Filtered	mg/L	0.68	12	<0.1	<0.1	<0.1	2	0.132	0.18	0.228
Cadmium	Filtered	mg/L	0.0004	12	<0.0001	<0.0001	<0.0001	0			
Chromium	Filtered	mg/L	0.006	12	<0.01	<0.01	<0.01	0			
Cobalt	Filtered	mg/L	-	12	<0.001	<0.001	<0.001	0			
Copper	Filtered	mg/L	**0.0018**	12	0.0022	**0.003**	0.0038	0			
Iron	Filtered	mg/L	-	12	<0.01	<0.01	0.018	1	0.13	0.13	0.13
Lead	Filtered	mg/L	0.0056	12	<0.001	0.001	0.001	0			
Manganese	Filtered	mg/L	2.5	12	<0.001	<0.001	<0.001	1	<0.01	<0.01	<0.01
Mercury	Filtered	mg/L	0.0019	12	<0.0001	<0.0001	<0.0001	0			
Molybdenum	Filtered	mg/L	-	12	<0.001	<0.001	<0.001	0			
Nickel	Filtered	mg/L	0.013	12	0.0022	0.004	0.0048	0			
Selenium	Filtered	mg/L	0.018	12	<0.01	<0.01	<0.001	0			
Silver	Filtered	mg/L	0.0001	12	<0.001	<0.001	<0.001	0			
Zinc	Filtered	mg/L	0.015	12	<0.001	<0.001	<0.001	0			

Note: Bold indicates median values in exceedance of the guideline value

Appendix K Summary of Accommodation Providers

Appendix K Summary of Accommodation Providers

(Peak and off peak based on 2002 occupancy rates)

Provider	**Rooms Available**	**Peak Times** **90 – 100% occupancy**	**Average trading** **60 – 70% occupancy**	**Off Peak** **Less than 40%**	**Rates**	**Type of guests**
Grand Hotel	13	Mine shuts down for repair 2002 June/July/August	Feb – May Sept – Christmas	Christmas – Feb	Single $50 Double $61 Every extra $6	Commercial Tourists
Peppercorn Motel	16	June/July/August November	Feb – May Sept - Oct	Christmas – Feb	Single $81 Double twin $96	Commercial Local graziers staying overnight for special events Tourists
Clermont Motor Inn	25	May - Show June/July/ August	Feb – April Sept - Oct	Christmas – Feb	Single $68 Double $75 Twin room $78	
Clermont Hotel/Motel	Total: 21 12 rooms in hotel and 9 in separate building across road. The rooms are suitable for shift workers Seeking to supply catering to mine site	June/July/ August	Feb – May Sept – Oct	Christmas – Feb	Single $39.50 Twin room $55	Commercial 45% associated with mine 45% Main Roads, Railway Telstra 5% - tourists
Leo Hotel	13 motel rooms and five have potential to be refurbished in the Hotel	June/July/August	Sept – Nov	Dec/Jan	Single $38 Double $45	Mainly commercial trade

Provider	Rooms Available	Peak Times 90 – 100% occupancy	Average trading 60 – 70% occupancy	Off Peak Less than 40%	Rates	Type of guests
Commercial Hotel	18 rooms + 2 bedroom residence Land next to hotel available for modular accommodation – has approached Council for approval to develop Can accommodate 16 – 20 rooms	May – Show June/July/August	Feb – April Sept – Nov	Christmas – Feb	Single $25 Double $30	Farmers, farm workers, railway workers
Clermont Caravan Park	Total of 95 caravan sites available. Park owns 14 vans on site and 4 cabins. (Park owned accommodation takes up to 50 people on a shared basis if required). Space is available for about 20 more cabin-style buildings. A shower block is also available but may have to be supplemented.	April – August is peak time for tourists	No average trading time	Oct, Nov, Dec Jan and Feb	$25 - $40 a night for caravans $45 - $55 a night for cabins (all airconditioned).	Tourists mainly

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