

行政院所屬各機關出國報告
(出國類別：洽公)

民國一百年澳洲地區煤礦實地查證報告

服務機關：	台灣電力公司	
出國人職稱：	燃料處	發電處
	物料管理監	機械工程監
姓 名：	俞梅貞	林銘政
出國地區：	澳洲	
出國期間：	100.7.5 - 100.7.14	
報告日期：	100.9.6	

民國100年澳洲地區煤礦實地查證報告

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民國100年澳洲地區煤礦實地查證報告

壹、出國任務

赴澳洲地區查證Moolarben Coal Sales Pty. Ltd.公司之Moolarben礦、Clermont Coal Mines Limited之Clermont礦及Centennial Mandalong Pty Ltd.公司之Mandalong礦，共計3礦之生產作業、產銷實績、採礦權與蘊藏量及申請廠商是否有權出售該煤礦所生產之煤炭等資料，以供本公司定期契約購煤邀請對象之依據。

貳、查礦對象

依「2011候選查礦名單」，本次澳洲地區查礦對象為Moolarben、Clermont與Mandalong三礦。

參、目前本公司進口煤定期契約合格礦評選條件

1. 以生產中之煤礦為限。
2. 可符合台電公司燃煤採購品質規範之煤炭出口實績應符合下列情形之一：
 - (1) 前5年內，累計出口實績至少達台電公司定期契約招標標的契約量。
 - (2) 前5年內，單次契約已完成交貨之出口實績至少達台電公司定期契約招標標的契約量之五分之二。
 - (3) 前5年內，任1年之出口實績達60萬公噸。
3. 具煤礦所在國政府核發之採礦權文件。
4. 以前一日曆年度煤產量為基礎，煤礦剩餘可採煤量可供開採之年限至少達台電公司定期契約年限。
5. 裝貨港可安全靠泊巴拿馬極限型以上煤輪。
6. 無其他經台電公司或查礦人員認定不適合成為定期契約合格礦之原因。

肆、出國行程及工作內容

此次出國查礦日程自民國100年7月5日至7月14日止，包括往返行程共計10天，茲簡要說明主要工作內容如下：

日期	停留地	工作內容
7月5-6日	雪梨	往程（台北—雪梨）
7月7日	雪梨	赴Moolarben礦區查證
7月8-9日	雪梨	赴Mandalong礦區查證及假日整理資料
7月10日	布里斯本	飛程（雪梨—布里斯本）
7月11日	Mackay	飛程（布里斯本—Emerald） 赴Clermont礦區查證
7月12日	雪梨	赴Clermont裝貨港Dalrymple Bay Coal Terminal查證，夜宿雪梨 飛程（Mackay --雪梨）
7月13-14日		返程（雪梨—台北）

伍、各煤礦資料

一、 Moolarben煤礦

1. 申請公司基本資料：

公司名稱	Moolarben Coal Sales Pty. Ltd.
地址	Level 6, 316 Adelaide St, Brisbane, Queensland 4000, Australia
聯絡人	Mr. Goran Stamenkovic/General Manager Marketing
電話	61-2-9964-4447
電傳	61-407-284-443
E-Mail	gstamenkovic@yancoal.com.au

2. 煤礦名稱及煤炭種類：

煤礦名稱：Moolarben煤礦

煤炭種類：屬本公司煤質之Quality A、B1、B2之一般煙煤。

3. 煤礦位置及交通：

Moolarben礦區屬於新南威爾斯州之Western煤田，Mudgee東北方約1小時車程，位於Ulan礦與Wilpinjong礦之間，面積12,145公頃（請參照圖1-1）。

4. 煤礦所有人：

本礦區係Moolarben Coal Mines Pty. Ltd.所擁有，該公司之主要股東及股權比例如下：

<u>主 要 股 東 名 稱</u>	<u>股權比例(%)</u>
Yancoal Australia	80%
Sojitz Moolarben Resources Pty. Ltd.	10%
Korean Consortium	10%

Moolarben煤礦原由White Mining Ltd (WML)所擁有，於2004年8月獲得5年期探勘執照(Exploration License, EL6288)，由WML百分之百子公司Moolarben Coal Mines Pty Ltd(MCM)持有。WML於2005年4月併入Felix Resources Ltd(FRL)，Yancoal Australia在購買FRL後與Sojitz、Korean Consortium（包括Korea Resource Corporation (KORES), Korea Electric Power Company (KEPCO) and其四個子電力公司, Kosep、Komipo、Kowepo 及 Kospo，加上 Hanwha Corporation Limited）以非法人方式合資共同開發Moolarben煤礦。

申請公司Moolarben Coal Sales Pty. Ltd.係合資事業 Ltd.之全屬銷售公司。

5. 煤礦之採礦權租約(Mining Lease)由新南威爾斯州政府核發，內容如下：

<u>租約字號</u>	<u>效期</u>
ML1605	2028/12/20
ML1606	2028/12/20

附件 1－Moolarben 礦之礦權文件

6. 商業生產年月：

係自2010年5月開始商業生產。

7. 地質條件：

該礦煤炭屬二疊紀中至晚期形成Illawarra煤系(Coal Measures)之一部分。該煤系具有多層煤層，但其中以Ulan Coal之煤層具經濟開發價值，柱狀圖如圖1-2。依Moolarben之探勘顯示，該礦區可露天與地下開採。礦區北部地區覆土較厚，該地區之Ulan Coal煤層已列為地下開採區。礦區南部與中西部地區之覆土較薄蝕，故這地區之Ulan Coal煤層已較薄，而列為地上開採區，預定於2012年底開始生產。

礦區主要煤層為 Ulan 煤層，其餘不具經濟性，厚度 12.0 - 13.5 公尺，傾斜度為東北走向 2°，2010 年剝土比為 3:1。

8. 剩餘蘊藏量：

礦區剩餘煤炭蘊藏量，係由該公司資格、資歷與經驗皆符合 JORC 準則所認定合格人員(Competent Person)之標準之開礦工程師(Mining Engineer)依澳洲 2004 年頒布之 JORC 準則所編撰與簽署之。

依上述報告，至 2010 年 12 月 31 日止之礦區煤炭蘊藏量(原煤)之確定蘊藏量(Proved Coal Reserves)為 79.4 百萬公噸，可能蘊藏量(Probable Coal Reserves)為 272.3 百萬公噸，合計 351.7 百萬公噸，以該礦 recovery factory 78.5%計，可取得之蘊藏量為 276.1 百萬公噸。

該礦 2010 年 5 月才開始生產，依該公司之估計，現有採礦區可採礦量約可採 27 年。

9. 煤礦類型與開採方式

屬露天煤礦，以Truck & Shovel方式開採。Moolarben礦採礦區與基礎設施分布圖如圖1-3。採礦區煤系具有多層煤層，Moolarben煤礦之Ulan Coal之煤層柱狀圖如圖1-4，Moolarben煤礦之Ulan Coal之該煤層未來計畫之以下開採區柱狀圖如圖1-5，其中以Ulan Coal之煤層具經濟

表 1-1 Moolarben 礦區煤層原煤典型品質

Coal Seam and Parting	Thickness			Coal Quality						
	Mean	Max.	Min.	C.V.	T.M.	ASH	V.M.	T.S.	F.C.	AFT
	(m)	(m)	(m)	kc/kg A.R.	% A.R.	% A.D.	% A.D.	% A.D.	% A.D.	℃ (H=W)
Ulan	10.0	11.0	9.0	6,100	9.0	16.0	30.0	0.60	50.0	+1,560

覆土經爆破後，以挖土機與卡車運移至已開採礦區回填，煤炭則以挖土機與卡車運至原煤儲煤場。Moolarben 煤礦之 Ulan Coal 煤層如圖 1-6，Moolarben 煤礦生產過程如圖 1-7。主要其主要的開採設備如表 1-2。

表 1-2 Moolarben 礦區主要開採設備

Equipment	No.	Type
Liebherr 996	2	Excavator
Liebherr 9350	1	Excavator
Komatsu WA1200	1	FEL
Komatsu 830E	12	Dump Truck
Sandvik	2	Blast Drill Rig
Komatsu 475	5	Track Dozer
Komatsu 375	3	Track Dozer
Komatsu WD900	1	Wheel Dozer
Komatsu 785	2	Watertruck
Komatsu GD825	2	Graders

10. 煤處理與內陸運輸：

露天開採之煤炭，以卡車運至容量每小時 2,500 公噸之碎煤機進行第一級碎煤機壓碎至 125mm 大小後，再經第二級碎煤機壓碎至 50mm 粒度後以皮帶機送至原煤堆煤場，不洗煤(By-pass Coal)數量約占原煤產量 22%，直接送至容量產品煤儲煤場，若須洗煤，以皮帶機送至容量每小時 1,800 公噸之二階段洗煤廠洗選後，再依不同灰份分堆儲存於產品煤儲煤場，皮帶機上裝置自動取樣器，取樣後送化驗。Moolarben 煤礦煤炭處理流程圖如圖 1-8。

成品煤皮帶機運至火車裝煤站(如圖 1-9)裝上火車，送至國內電廠燃用或運至 275 公里遠之 Newcastle 港出口。

11. 煤質管控制度：

原煤(ROM (run of mine) coal)飼入第1段及第2段碎煤機，之後用輸送帶送入「煤處理和準備場」(CHPP，Coal Handling and Preparation Plant)。線上取樣及實驗室分析等，監測灰含量及總水份，CHPP的密度篩選可以調整得到產品煤所要求的灰含量。淨煤依據不同灰含量分堆堆放，經由地下輸送系統取煤飼入火車加料斗，煤炭以7200噸容量的火車運送至港口，每列到達港口的煤火車都經分析及24小時內產生資料。由港口煤堆裝載至煤輪時，都經過自動取樣站以確保品質。

12. 過去三年符合台電採購品質規範之出口量

日曆年	總出口量(百萬公噸)
2008	---
2009	---
2010	0.7

13. 過去三年之煤炭生產實績及未來五年之計畫生產量：

日曆年	原煤年生產量 (百萬公噸)	可售煤年生產量(百 萬公噸)
2008	---	---
2009		
2010	4.9	3.35
2011	7	4.6
2012	8	5.6
2013	8	6.7
2014	13	10
2015	13	10

14. 現有定期契約客戶與契約資訊：

Customer's Name	Country	Quantity (million metric tons/year)	Contract Duration (starting / expiration year)
KOSEP	KOREA	0.625	01/07/09 – Life of Mine
KOWEPO	KOREA	0.625	01/07/09 – Life of Mine
KOMIPO	KOREA	0.625	01/07/09 – Life of Mine
EWP	KOREA	0.625	01/07/09 – 31/03/2015
KOSPO	KOREA	0.625	01/07/09 – Life of Mine
HANWHA	KOREA	0.300	01/07/09 – Life of Mine

15. 裝貨港設施：

出口煤炭經火車裝貨站再以鐵路運輸運至Newcastle，大部分由 Newcastle Coal Infrastructure Group (NCIG) 出口，小部分由 PWCS出

口。目前NCIG年出口能力為3千萬公噸，PWCS之Kooragang為7千7百萬公噸，Carginton為2千5百萬公噸。

NCIG於2010年5月啟用，初期受限於航到吃水深，僅能容納85,000dwt船隻靠泊，經濬深後，預計在今年第四季可以完成濬深，允許capesize靠泊。Kooragan碼頭之第四個席位預計在2012年初完工，PWCS之出口能力可望再增加2千萬公噸。

16. 獨立之公証公司：

有3家，即SGS Australia，Bureau Veritas Australia，ACRIL。

17. 從業人員與勞資關係：

公司員工總數為181人，包括Management為27人，Clerk為27人，礦工為127人。目前有一個工會組織，去年未有因勞工糾紛而停工，目前勞資關係良好。

18. 煤質資料分析：

本礦煤質如表1-3所示，煤灰灰質如表1-4所示。經由如表1-5研判可歸納如下：

- (1)、煤質符合本公司現行外購煤規範A、B1及B2。
- (2)、燃料比1.71，符合一般鍋爐設計基準2.0以下，煤粒易於點火燃燒，對抑低氮氧化物及未燃碳有助益。
- (3)、C/H比16.6，燃燒性佳。
- (4)、就煤灰積垢特性分析， Na_2O 含量為0.07%，很低，其積垢傾向“低”（煤灰屬煙煤式灰）。
- (5)、就煤灰結渣特性分析，灰中酸鹼比B/A為 1.8×10^{-2} ，其結渣傾向“低”； $\text{SiO}_2/\text{Al}_2\text{O}_3$ 比值5.96，煤灰流化溫度遽減而初變形溫度不影響。
- (6)、磨蝕指數16.2較高，由於灰份16%，較高，須注意爐管磨蝕的問題。
- (7)、研磨指數50，符合規範要求。
- (8)、氮含量1.9%，以經驗公式預估其排放濃度為346ppm，因目前各火力電廠皆已加裝低氮氧化物燃燒器、選擇性觸媒還原(SCR)等設備，氮氧化物排放量可符合各地方政府排放標準。

- (9)、硫份為0.6%，其SO_x排放濃度預估會大於200ppm，無法符合環保排放要求，故須依靠FGD設備之正常運轉或混拌低硫煤以改善SO_x排放濃度。
- (10)、就粉塵特性而言，K₂O為0.34%<1%、Na₂O為0.07%<2.0%，兩者皆有助於EP性能之提升；硫份為0.6%，符合一般EP硫份設計規範；SiO₂+Al₂O₃之和96.1%>90%，將影響EP部份性能；CaO+MgO之和0.44%<20%，不影響EP性能；而Fe₂O₃為0.95%<7%無助於提升EP性能。

表1-3 Moolarben 礦之燃煤煤質

礦商名稱 Moolarben Coal Sales Pty. Ltd.	產地國名：澳洲-NSW 省	
	查礦日期:100.7.7	
Item	Typical	Value
1.Gross Calorific Value (Kcal/Kg) A.R.		6100
2.Total Moisture (%) A.R.		9.0
3.Ash Content (%) A.D.		16.0
4.Sulphur Content (%) A.D.		0.6
5.Volatile Matter (%) A.D.		30.0
6.Fixed Carbon (%) A.D.		51.5
7.Grindability(H.G.I)		50
8.Ash Fusion Temperature	1560	
(°C Under reducing condition,H=W)		
9.Size(%)		5
>50mm		30
<2mm		
10.Na ₂ O in Ash (%)		0.07
備註：1.本煤質資料由礦商提供。		
2.煤質符合目前本公司煤質規範 A B1 B2。		

表1-4 Moolarben煤礦之煤灰灰質

礦商名稱 Moolarben Coal Sales Pty. Ltd.	產地國名：澳洲-NSW 省
	查礦日期:100.7.7
Item	Typical Value (%)
SiO ₂	82.3
Al ₂ O ₃	13.8
TiO ₂	0.66
Fe ₂ O ₃	0.95
CaO	0.14
MgO	0.30
Na ₂ O	0.07
K ₂ O	0.34
P ₂ O ₅	0.03
SO ₃	0.15
Mn ₃ O ₄	0.01
Other (BaO)	0.02
備註:1.此煤灰灰質係由礦商提供。	
2.此煤灰屬煙煤式灰(Bituminous type ash,CaO + MgO < Fe ₂ O ₃)。	

表1-5 Moolarben 煤礦特性表

礦 商 名 稱 : Moolarben Coal Sales Pty. Ltd.			
	評 估 項 目	參 考 值	研 判 結 果
燃 燒 特 性	1. H.H.V. (Kcal/Kg, A.R.)	6,100	合格
	2.Fixed Carbon , % , A.D.	51.5	合格
	3.Volatile Matter , % , A.D.	30	合格
	4.Fuel Ratio	1.71	中等
	5.C / H (13-18 佳)	16.6	佳
	6.U.B.C, % (預測值)	1.82	低. 佳
積 垢 特 性	1.Na ₂ O , %	0.07	積垢傾向"低"
	2.Cl in Coal , %	—	礦商未提供
	3.Fouling Factor	1.3×10^{-3}	積垢傾向"低"
	4.CaO , %	0.14	適用於煙煤式灰
結 渣 特 性	1.B / A	1.8×10^{-2}	適用於煙煤式灰
	2.Fe ₂ O ₃ / CaO	6.8	適用於煙煤式灰
	3.Slagging Factor	0.01	結渣傾向"低"
	4.Rs (°C)	1512	適用於煙煤式灰
	5.SiO ₂ / Al ₂ O ₃	5.96	>2.8 灰之流化溫度驟減
磨 蝕 性	1.磨蝕指數	16.2	>10. 磨蝕傾向高
	2.Ash , %	16	灰份較高
研 磨 性	H.G.I.	50	合格
Nox 排 放 特 性	1.Nitrogen , %	1.9	—
	2.Fuel Ratio	1.71	中等
	3.NOx Emission Level(預測值, ppm)	346	備註 1
SOx 排 放 特 性	1.Sulphur , %	0.6	低. 佳
	2.SOx Emission Level(預測值, ppm)	>200	備註 2
粉 塵 排 放 特 性	1.K ₂ O , %	0.34	<1. 有助於提升 EP 性能
	2.Sulphur , %	0.6	低. 佳
	3.Na ₂ O , %	0.07	符合 EP 設計值
	4.SiO ₂ +Al ₂ O ₃ , %	96.1	>90. 會影響 EP 性能
	5.CaO+MgO , %	0.44	<20. 不影響 EP 效率
	6.Fe ₂ O ₃ , %	0.95	<7. 無助於提升 EP 性能
備 註	1.NOx 排放濃度各電廠均可符合環保排放要求。 2.SOx 排放濃度超過環保排放要求，需利用裝置排煙脫硫設備(FGD)或 混拌低硫煤以滿足環保排放標準。		

二、Mandalong煤礦：

1. 申請公司基本資料：

公司名稱	Centennial Mandalong Pty Ltd.
地址	12 Kerry Anderson Drive, Mandalong NSW 2264, Australia
聯絡人	Brendon Wilson/Deputy General Manager Marketing
電話	61-2-9266-2700
電傳	61-2-9261-5533
E-Mail	brendon.wilson@centennialcoal.com.au

2. 煤礦名稱及煤炭種類：

煤礦名稱：Mandalong煤礦

煤炭種類：屬本公司煤質之Quality A、B1、B2之一般煙煤。

3. 煤礦位置及交通：

煤礦位於澳洲NSW省，在雪梨北西北方約100公里，Macquarie湖之西側。由雪梨至礦區車程約1.5小時，礦區面積約1014公頃，東臨雪梨至Newcastle之F3高速公路，東北方靠近Morisset城，煤礦地理位置圖如圖2-1。Mandalong煤礦係在Sydney Basin 裡東北方的Newcastle Coalfield 內，Sydney Basin則是全長1500公里，由昆士蘭中部沿海一直延伸至NSW省的Sydney-Bowen Basin 內最南端的亞盆地。

4. 煤礦所有人：

本礦區係申請公司Centennial Mandalong Pty Ltd.所擁有。該公司之主要股東及股權比例如下：

主 要 股 東 名 稱	股權比例(%)
Centennial Coal Company Ltd.	100

Mandalong煤礦原名Cooranbong 礦，自 1982起開始生產，由Centennial 於2002年取得，並由continuous miner 採礦方式改爲以longwall方式開採。

5. 採礦權：

煤礦之採礦權租約(Mining Lease)由新南威爾斯州政府核發，內容如下：

租約字號	效期
ML1443	2020/3/1
ML1543	2024/11/25
EL6317	2014/8/8

附件2－Mandalong礦之礦權文件

6. 商業生產年月：

自2005年1月開始商業生產。

7. 地質條件：

礦區位於雪梨盆地 Newcastle Coal Measures 之一部分，屬 Newcastle 煤田，礦區內 Wallarah Coal Seam 及 Great Northern Coal Seam 煤層較厚且具經濟開採價值，目前開採區，位於上方之 Wallarah 煤層與位於下方之 Great Northern 煤層結合，稱之為 West Wallarah Seam，West Wallarah 煤層位於地下 240-250 公尺間，目前開採區之厚度為 3-6.5 公尺。West Wallarah 煤層內有有兩個大的岩床及西北走向之火成岩侵入。礦區傾斜度為西南方向 1 度。

Mandalong 礦區地理位置圖如圖 2-1，Mandalong 礦區 Concession 示意圖如圖 2-2，Mandalong 採礦區煤層柱狀圖如圖 2-3。

8. 剩餘蘊藏量：

礦區剩餘煤炭蘊藏量之查證，係以 Centennial 公司內，其資格、資歷與經驗皆符合 JORC 準則所認定合格人員(Competent Person)，Mr. Malcolm Lves, Mr. Andrew Myers 及 Mr. Neil Alston 依澳洲 2004 年頒布之 JORC 準則(Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves) 為依據進行編撰與簽署，所簽署之煤蘊藏量文件具公信力。

依上述報告，至 2010 年 12 月 31 日止之礦區煤炭蘊藏量(原煤)之確定

蘊藏量(Proved Coal Reserves)為 31.5 百萬公噸，可能蘊藏量(Probable Coal Reserves)為 56.5 百萬公噸，合計 88 百萬公噸。

以該礦 2010 年可銷售量 5.3 百萬公噸，現有採礦區可採礦量約可採 16.6 年。

9. 煤礦類型與開採方式

屬地下煤礦，以 longwall 方式開採。Mandalong 礦區鑽探圖如圖 2-4，長達 3 公里之 LW10 開採區於 2010 年 9 月開採，經過 7 個月總計開採 300 萬公噸煤炭，目前正開採中之 LW11 係於 2011 年 4 月開採。Mandalong 礦開採計畫圖如圖 2-5。煤質範圍參見表 2-1：

表 2-1 Mandalong 煤礦原煤品質範圍

Coal Seam and Parting	Thickness			Coal Quality						
	Mean	Max.	Min.	C.V.	T.M.	ASH	V.M.	T.S.	F.C.	AFT
	(m)	(m)	(m)	ke/kg A.R.	% A.R.	% A.D.	% A.D.	% A.D.	% A.D.	°C (H=W)
Great Northern	5m	7m	4m	6322	9	16	28	0.45	53.5	1500

Coal Quality

The following table summarises the quality of coal by seam at Mandalong Mine.

Seam	Ash (% d)	Volatile Matter (% ad)	Total Sulphur (% ad)	Specific Energy (MJ/kg daf)	HGI	Ash Fusion Temp. (Deg C Hemi)	Chlorine (% ad)
Walarah	15.0	28.2	0.34	33.65	47	>1570	0.02
Great Northern	19.5	28.7	0.40	33.74	47	>1560	0.03
West Walarah	18.0	26.7	0.30	33.66	47	>1560	0.02
Fassifern	27.5	23.7	0.50	31.48	51	> 1550	-

表 2-2 Mandalong 煤礦主要開採設備

Mining Equipment

Development Equipment

Description	Type	Qty
Continuous Miners	ABM25 remote control	4
Road Headers	Voest Alpine AM75	1
Shuttle Cars	Joy 10SC32	4
Shuttle Cars	Joy 15SC	3
Breaker Feeders	Stamler	5

Longwall Equipment

Description	Type
Shearer	Joy 7LS6
Roof Supports	Joy 1053 tonne 2 leg
AFC (MG)	Joy 1000mm wide 1000kW TTT drive Ex Newstan 855kW
AFC (TG)	Joy 1000mm wide 1000kW TTT drive Ex Newstan 855kW
BSL	Joy 375 kW drive + 375kW crusher
Transformer	Amp control 5.2 MVA on cat tracks
Pump Station (**)	RMI on cat tracks
Monorail	Macquarie Manufacturing
Shearer Water Pump	RMI

Mine Visit



10. 原煤處理與內陸運輸

該礦所產 100%煤炭須經洗選。原煤以地下皮帶機運至約 9 公里外容量 60 萬公噸之原煤儲煤場進行碎煤，售與附近之電力公司部分，售 Vales Point power station 部份，係未經水洗之煤以地下皮帶機加上 5.7 公里長之地上皮帶機送至電廠，每年合約量約 90 萬公噸；售 Eraring power station 部分，經洗煤後以地下皮帶機加上 1.8 公里長之地上皮帶機送至電廠，在 2013 年前每年合約量約 250 萬公噸，再 2014 年減至 140 萬公噸，2015 年僅餘 7000 公噸；供出口之部份係以卡車運送至車程約 20 分鐘之 Newstan 洗煤場，再依不同之灰份分堆於容量 30 萬公噸之產品煤儲煤場。產品煤運至 27 公里外 Newcastle 港出口。Mandalong 礦地面設施 Concession 圖如圖 2-6。Mandalong 煤礦洗煤過程圖如圖 2-7。

11. 煤質管控制度：

- (1) 除了由洗煤場至煤堆以線上監測外，地下皮帶機並設有金屬偵測機及排水設施以確保煤質，另在港口儲煤場也取樣試驗。而裝船前經獨立公證公司取樣化驗，作為決定交貨品質之用。
- (2) Mandalong煤礦煤炭開採、儲運過程與品質控制示意圖如圖2-8。

12. 過去三年符合台電採購品質規範之出口量

日曆年	總出口量(百萬公噸)
2008	0.5
2009	0.65
2010	1.03

13. 過去三年之煤炭生產實績及未來五年之計畫生產量：

日曆年	可售煤年生產量(百萬公噸)
2008	4.7
2009	5.1
2010	5.3
2011	5
2012	5.5
2013	5.1
2014	5.1
2015	5.4

受火成岩侵入之影響，2013/2014年計畫生產量略微降低。

14. 現有定期契約客戶與契約資訊：

Customer's Name	Country	Quantity (million metric tons/year)	Contract Duration (starting / expiration year)
J Power	Japan	600,000 tonnes	Annual renewal
Spot		+500,000 tonnes	

15. 裝貨港設施：

NCIG，使用K8，K9碼頭。

16. 獨立之公証公司：

有3家，即ACTest，SGS，BVI。

17. 從業人員與勞資關係：

公司員工總數為84人，包括Management為57人，Clerk為2人，礦工為282人，外包人數平均為50人。目前有工會組織，2010年未有因勞工糾紛而停工，目前勞資關係良好。

18. 煤質資料分析：

本礦煤質如表2-3所示，煤灰灰質如表2-4所示。經由如表2-5研判可歸納如下：

- (1)、煤質符合本公司現行外購煤規範A、B1及B2。
- (2)、燃料比1.91，符合一般鍋爐設計基準2.0以下，煤粒易於點火燃燒，對抑低氮氧化物及未燃碳有助益。
- (3)、C/H比16.6，燃燒性佳。
- (4)、就煤灰積垢特性分析， Na_2O 含量為0.5%，很低，其積垢傾向”低”（煤灰屬煙煤式灰）。
- (5)、就煤灰結渣特性分析，灰中酸鹼比B/A為 8.6×10^{-2} ，結渣因子為 6.3×10^{-2} 其結渣傾向”低”； $\text{SiO}_2/\text{Al}_2\text{O}_3$ 比值1.8，對灰熔點幾乎沒影響。
- (6)、磨蝕指數15.8較高，由於灰份16%，較高，須注意爐管磨蝕的問題。
- (7)、研磨指數50，符合規範要求。
- (8)、氮含量1.6%，以經驗公式預估其排放濃度為325ppm，因目前各火力電廠皆已加裝低氮氧化物燃燒器、選擇性觸媒還原(SCR)等設備，氮氧化物排放量可符合各地方政府排放標準。
- (9)、硫份為0.73%，其 SO_x 排放濃度預估會大於200ppm，無法符合環保排放要求，故須依靠FGD設備之正常運轉或混拌低硫煤以改善 SO_x 排放濃度。
- (10)、就粉塵特性而言， K_2O 為 $0.5\% < 1\%$ 、 Na_2O 為 $0.5\% < 2.0\%$ ，兩者皆有助於EP性能之提升；硫份為0.73%，符合一般EP硫份設計規範； $\text{SiO}_2 + \text{Al}_2\text{O}_3$ 之和 $87\% < 90\%$ ，不影響EP部份性能； $\text{CaO} + \text{MgO}$ 之和 $2.6\% < 20\%$ ，不影響EP性能；而 Fe_2O_3 為 $4\% < 7\%$ 無助於提升EP性能。

表2-3 Mandalong礦之燃煤煤質

礦商名稱 Centennial Mandalong Pty Ltd.	產地國名：澳洲-NSW 省 Mandalong
	查礦日期:100.7.8
Item	Typical Value
1.Gross Calorific Value (Kcal/Kg) A.R.	6260
2.Total Moisture (%) A.R.	
3.Ash Content (%) A.D.	9.0
4.Sulphur Content (%) A.D.	16.0
5.Volatile Matter (%) A.D.	0.73
6.Fixed Carbon (%) A.D.	28.0
7.Grindability(H.G.I)	53.5
8.Ash Fusion Temperature (°C Under reducing condition,H=W)	50
9.Size(%) >50mm	1450
<2mm	
10.Na ₂ O in Ash (%)	0
	25
	0.5
備註：1.本煤質資料由礦商提供。	
2.煤質符合目前本公司煤質規範 A B1 B2。	

表2-4 Mandalong 煤礦之煤灰灰質

礦商名稱 Centennial Mandalong Pty Ltd.	產地國名：澳洲-NSW 省 Mandalong
	查礦日期:100.7.8
Item	Typical Value (%)
SiO ₂	56.0
Al ₂ O ₃	31.0
TiO ₂	1.1
Fe ₂ O ₃	4.0
CaO	2.2
MgO	0.4
Na ₂ O	0.5
K ₂ O	0.5
P ₂ O ₅	0.6
SO ₃	0.8
Mn ₃ O ₄	0.1
Other (BaO)	0.2
備註: 1.此煤灰灰質係由礦商提供。 2.此煤灰屬煙煤式灰(Bituminous type ash,CaO + MgO < Fe ₂ O ₃)。	

表2-5 Mandalong 煤礦特性表

礦商名稱：Centennial Mandalong Pty Ltd.			
	評估項目	參考值	研判結果
燃燒特性	1. H.H.V. (Kcal/Kg, A.R.)	6,260	合格
	2.Fixed Carbon , %, A.D.	53.5	合格
	3.Volatile Matter , %, A.D.	28	合格
	4.Fuel Ratio	1.91	中等
	5.C / H (13-18 佳)	17	佳
	6.U.B.C, % (預測值)	2.28	低. 佳
積垢特性	1.Na ₂ O , %	0.5	積垢傾向"低"
	2.Cl in Coal , %	—	礦商未提供
	3.Fouling Factor	4.3×10^{-2}	積垢傾向"低"
	4.CaO , %	2.2	適用於煙煤式灰
結渣特性	1.B / A	8.6×10^{-2}	適用於煙煤式灰
	2.Fe ₂ O ₃ / CaO	1.82	適用於煙煤式灰
	3.Slagging Factor	6.29×10^{-2}	結渣傾向"低"
	4.Rs (°C)	1420	適用於煙煤式灰
	5.SiO ₂ / Al ₂ O ₃	1.8	1.7-2.8 對灰熔點幾乎沒影響
磨蝕性	1.磨蝕指數	15.8	>10. 磨蝕傾向高
	2.Ash , %	16	灰份較高
研磨性	H.G.I.	50	合格
Nox 排放特性	1.Nitrogen , %	1.6	--
	2.Fuel Ratio	1.91	中等
	3.NOx Emission Level(預測值, ppm)	325	備註 1
SOx 排放特性	1.Sulphur , %	0.73	低. 佳
	2.SOx Emission Level(預測值, ppm)	>200	備註 2
粉塵排放特性	1.K ₂ O , %	0.5	<1. 有助於提升 EP 性能
	2.Sulphur , %	0.73	有助於 EP 性能提升
	3.Na ₂ O , %	0.5	符合 EP 設計值
	4.SiO ₂ +Al ₂ O ₃ , %	87	<90. 不會影響 EP 性能
	5.CaO+MgO , %	2.6	<20. 不影響 EP 效率
	6.Fe ₂ O ₃ , %	4	<7. 無助於提升 EP 性能
備註	1. NOx 排放濃度各電廠均可符合環保排放要求。 2. SOx 排放濃度超過環保排放要求，需利用裝置排煙脫硫設備(FGD)或 混拌低硫煤以滿足環保排放標準。		

三、 Clermont煤礦

1. 申請公司基本資料：

公司名稱	Clermont Coal Mines Limited
地址	Level3, West Tower, 410 Ann Street, Brisbane QLD 4000, Australia
聯絡人	Mr. Kinji Mizuno/Manager Marketing (Thermal Coal)
電話	61-7-3361-4206
電傳	61-7-3361-4366
E-Mail	kinji.mizuno@riotinto.com

2. 煤礦名稱及煤炭種類：

煤礦名稱：Clermont Mine

煤炭種類：屬本公司煤質之Quality A、B1、B2之一般煙煤。

3. 煤礦位置及交通：

煤礦位於澳洲昆士蘭省Emerald西北方，由Emerald至礦區車程約1.5個小時，西臨Blair Athol礦，在Blair Athol礦已接近結束之際，本礦之開發為接替使用Blair Athol煤礦之設施。Clermont礦地理位置圖如圖3-1。

4. 煤礦所有人：

本礦區由下列合資人以非法人方式合資共同擁有礦權，並未如一般之合資企業另成立一公司以擁有礦權並負責開採。該礦由Rio Tinto Coal Australia (RTCA)負責營運，Australian Coal Holdings Pty. Ltd (ACH) 100%擁有RTCA及QCPL，Rio Tinto Limited則100%擁有ACH。該煤礦之主要合資人及股權比例如下：

主 要 合 資 人 名 稱	股權比例(%)
Queensland Coal Pty. Ltd. (QCPL)	50.1
JCD Australia Pty. Ltd.	3.5
J-Power Australia Pty. Ltd.	15.0
Mitsubishi Development Pty. Ltd.	31.4

5. 採礦權：

煤礦之採礦權租約(Mining Lease)由 Qld Department of Natural Resources and Mines 核發，，礦區總面積約 3,026 公頃，礦區礦權分布圖請參照圖 3-2，該礦包含採礦租約如下：。

Mining Lease	效期
ML 70343	2027/11/30
ML1884	2025/4/1
ML1904	2025/4/4

附件 3—Clermont 礦採礦租約文件

6. 商業生產年月：自2010年5月開始生產。

7. 地質條件：

該礦煤炭屬二疊紀之一部分。Clermont coalfield 基本上視為單一煤層，最大煤層 Wolfgang 厚達 45 公尺，佔總儲量 90%，上有兩個小煤層，Gowrie 及 Prospect，該礦以露天方式開採，深度最大達 295 公尺，柱狀圖如圖 3-3，煤層之傾角 13~ 17 度。平均剝土比為 3.7:1。

Clermont 礦區空照圖如圖 3-3，礦區煤層柱狀圖如圖 3-4，煤層 Cross Section 如圖 3-5。

8. 剩餘蘊藏量：

礦區剩餘煤炭蘊藏量之查證，係以 Minarco-Mineconsult Pty Ltd 公司工程師 Mr. William Park 依澳洲 2004 年頒布之 JORC 準則(Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves)為依據進行編撰與簽署。Mr. William Park 為 Australian Institute of Geoscientist 之會員，其資格、資歷與經驗皆符合 JORC 準則所認定合格人員(Competent Person)之標準，所簽署之煤蘊藏量文件具公信力。

Clermont 礦區煤炭露天蘊藏量(原煤)之確定蘊藏量(Proved Coal Reserves)為 185.5 百萬公噸，可能蘊藏量(Probable Coal Reserves)為 4.6 百萬公噸，以該礦 recovery factor 95.8%計，可取得之蘊藏量為 182.1 百萬公噸，該礦 2010 年 5 月才開始生產，依該公司之估計，現有採礦區可採礦量約可採 17 年

9. 煤礦類型與開採方式：

該煤礦以露天礦方式開採，並以 Truck & Shovel 方式開採。各煤層平均厚度與典型煤質參見表 3-1：

表 3-1 Clermont 煤礦各煤層原煤典型品質

Coal Seam and Parting	Thickness			Coal Quality						
	Mean	Max.	Min.	C.V.	T.M.	ASH	V.M.	T.S.	F.C.	AFT
	(m)	(m)	(m)	kc/kg	%	%	%	%	%	°C
				A.R.	A.R.	A.D.	A.D.	A.D.	A.D.	(H=W)
Wolfgang	45	60	15	6020	14.5	10	27.4	0.4	36.4	1560

表 3-2 Clermont 煤礦主要開採設備

Type	Model	Capacity	No. Units
Hard Truck	830E	220 tonnes	7
Hard Truck	930SE	242 tonnes	13
Hard Truck	789	180 tonnes	7
Excavator	EX3600		1
Excavator	EX3500		1
Excavator	P&H 4100 XPC		1
Front End Loader	Le Tourneau L1850		1
Drzers	D10 & D11		
Graders	160 & 24M		
Drills	Terex Blasthole		3
Drill	Atlas Copco L8		1

10. 原煤處理與內陸運輸

露天開採之煤炭，分別以 Inpit Crushing and Conveying System (IPCC) 輸送帶及以以卡車運至之碎煤機進行第一級碎煤機壓碎後，再送至第

二級碎煤機壓碎，碎煤機容量每小時 2,050 公噸，壓碎後以皮帶機送至原煤堆煤場，由於本礦屬低灰低硫煤，不洗煤(By-pass Coal)數量約占原煤產量 90%，直接送至容量產品煤儲煤場，僅有煤層之最頂端及最底部所採之煤須洗煤，以皮帶機送至容量每小時 300 公噸之洗煤廠洗選後，再依不同灰份分堆儲存於產品煤儲煤場，皮帶機上裝置自動取樣器，取樣後送化驗。Clermont 礦區原煤第一次碎煤如圖 3-6，Clermont 礦區原煤第二次碎煤如圖 3-7，Clermont 礦區生產現況圖如圖 3-8。

成品煤以 13.3 公里長皮帶機運至 Blair Athol 煤礦之產品煤儲煤場，及在 Blair Athol 火車裝煤站裝上火車，運至 285 公里遠之 Dalrymple 港出口。

11. 煤質管控制度：

原煤粉碎後被送至3個產品煤堆之前須接受煤掃瞄器分析。煤掃瞄器分析煤中灰含量及硫含量。煤堆被定型化作為混煤準備以符合顧客要求。裝載火車時，也用煤掃瞄器分析煤中灰含量及硫含量。由 DBCT(Dalrymple Bay Coal Terminal)火車卸貨時，以人工取樣，分析水份、灰份、揮發物、硫份及熱值，在DBCT之煤由儲煤場以皮帶機運送至煤輪前均經自動取樣站，由獨立公證公司取樣化驗，作為決定交貨品質之用。Clermont礦區煤質管控圖如圖3-9。

12. 過去三年符合台電採購品質規範之出口量：

日曆年	總出口量(百萬公噸)
2008	
2009	
2010	3.38

13. 過去三年之煤炭生產實績及未來五年之計畫生產量：

日曆年	原煤年生產量 (百萬公噸)	可售煤年生產量(百 萬公噸)
2011	6	6
2012	8.5	8.5
2013	11	11
2014	12.2	12.2
2015	12.2	12.2

由於僅10%原煤經過水洗，yield rate又高達95%，故原煤年生產量與可售煤年生產量相當接近。Clermont礦區開採計畫圖-2012如圖3-10，Clermont礦區開採計畫圖-2022如圖3-11。

14. 現有定期契約客戶與契約資訊：

客戶名稱	國別	供應量 (百萬公噸)	契約期間 (起訖年)
日本之電力公司	日本	6.5	長約
IPP	---	0.5	一年

15. 裝貨港設施：

Dalrymple 裝煤港 (DBCT) 係由昆士蘭州政府於 1983 年所建，主要是出口 coking coal (燃煤僅有 Blair Athol 及 Clermont 煤)，對象為 Bowen 煤田之煤商。DBCT 計有 3 個煤炭輸送棧橋，4 個裝煤碼頭，3 個裝煤機，年出口能力達 8 千 5 百萬公噸。該港口已不敷使用，塞港非常嚴重，惟因腹地有限，幾已無再擴建之空間。Dalrymple 港口空照圖如圖 3-12。

16. 獨立之公証公司：

有3家，即SGS Australia，Bureau Veritas Australia，ACRIL。

17. 從業人員與勞資關係：

員工總數為2,489人，包括Management為4人，Clerk為3人，礦工為68人，外包人數為1870人。目前該公司無工會組織，2009年無停工事件。

18. 煤質資料：

本礦煤質如表3-3所示，煤灰灰質如表3-4所示。經由如表3-5研判可歸納如下：

- (1)、煤質符合本公司現行外購煤規範A、B1及B2。
- (2)、燃料比2.0，達一般鍋爐設計基準上限，煤粒適合點火燃燒，對抑制氮氧化物及未燃碳有助益。
- (3)、C/H比16.2，燃燒性佳。
- (4)、就煤灰積垢特性分析， Na_2O 含量為0.15%，結垢因子為 7.7×10^{-3} 很低，其積垢傾向”低”（煤灰屬煙煤式灰）。
- (5)、就煤灰結渣特性分析，灰中酸鹼比B/A為 5.17×10^{-2} ，結渣因子為 2.48×10^{-2} 其結渣傾向”低”； $\text{SiO}_2/\text{Al}_2\text{O}_3$ 比值2.17，對灰熔點幾乎沒影響。
- (6)、磨蝕指數10.3，佳，灰份10%，灰份適當，對爐管磨蝕中等。
- (7)、研磨指數56，符合規範要求。
- (8)、氮含量1.8%，以經驗公式預估其排放濃度為340ppm，因目前各火力電廠皆已加裝低氮氧化物燃燒器、選擇性觸媒還原(SCR)等設備，氮氧化物排放量可符合各地方政府排放標準。
- (9)、硫份為0.48%，其 SO_x 排放濃度預估會大於200ppm，無法符合環保排放要求，故須依靠FGD設備之正常運轉或混拌低硫煤以改善 SO_x 排放濃度。
- (10)、就粉塵特性而言， K_2O 為0.7%<1%、 Na_2O 為0.15%<2.0%，兩者皆有助於EP性能之提升；硫份為0.48%，符合一般EP硫份設計規範； $\text{SiO}_2+\text{Al}_2\text{O}_3$ 之和92%>90%，將影響EP部份性能； $\text{CaO}+\text{MgO}$ 之和1.1%<20%，不影響EP性能；而 Fe_2O_3 為2.9%<7%無助於提升EP性能。

表3-3 Clermont 礦之燃煤煤質

礦商名稱 Clermont Coal Mines Limited	產地國名：澳洲-Queensland 省 Clermont
	查礦日期:100.7.11
Item	Typical Value
1. Gross Calorific Value (Kcal/Kg) A. R.	6020
2. Total Moisture (%) A. R.	
3. Ash Content (%) A. D.	14.5
4. Sulphur Content (%) A. D.	10.0
5. Volatile Matter (%) A. D.	0.4
6. Fixed Carbon (%) A. D.	27.6
7. Grindability(H. G. I)	56.4
8. Ash Fusion Temperature (°C Under reducing condition, H=W)	56
9. Size(%) >50mm	1560
<2mm	
10. Na2O in Ash (%)	0
	30
	0.15
備註：1. 本煤質資料由礦商提供。	
2. 煤質符合目前本公司煤質規範 A B1 B2。	

表3-4 Clermont 煤礦之煤灰灰質

礦商名稱 Clermont Coal Mines Limited	產地國名：澳洲-Queensland 省 Clermont
	查礦日期:100.7.11
Item	Typical Value (%)
SiO ₂	63.0
Al ₂ O ₃	29.0
TiO ₂	1.80
Fe ₂ O ₃	2.90
CaO	0.60
MgO	0.50
Na ₂ O	0.15
K ₂ O	0.70
P ₂ O ₅	0.50
SO ₃	0.10
Mn ₂ O ₄	0.01
Other (BaO)	礦商未提供
備註:1. 此煤灰灰質係由礦商提供。	
2. 此煤灰屬煙煤式灰(Bituminous type ash, CaO+MgO<Fe ₂ O ₃)。	

表3-5 Clermont 煤礦特性表

礦 商 名 稱 : Clermont Coal Mines Limited			
	評 估 項 目	參 考 值	研 判 結 果
燃 燒 特 性	1. H. H. V. (Kcal/Kg. A.R.)	6,020	合格
	2. Fixed Carbon , % , A.D.	56.4	合格
	3. Volatile Matter , % , A.D.	27.6	合格
	4. Fuel Ratio	2.0	中等
	5. C / H (13-18 佳)	16.2	佳
	6. U. B. C, % (預測值)	4.0	中等
積 垢 特 性	1. Na ₂ O , %	0.15	積垢傾向"低"
	2. Cl in Coal , %	—	礦商未提供
	3. Fouling Factor	7.7×10^{-3}	積垢傾向"低"
	4. CaO , %	0.6	適用於煙煤式灰
結 渣 特 性	1. B / A	5.17×10^{-2}	適用於煙煤式灰
	2. Fe ₂ O ₃ / CaO	4.8	適用於煙煤式灰
	3. Slagging Factor	2.48×10^{-2}	結渣傾向"低"
	4. Rs (°C)	1548	適用於煙煤式灰
	5. SiO ₂ / Al ₂ O ₃	2.17	1.7-2.8 對灰熔點幾乎沒影響
磨 蝕 性	1. 磨蝕指數	10.3	>10. 磨蝕傾向中等
	2. Ash , %	10	灰份適當
研 磨 性	H. G. I.	56	合格
Nox 排 放 特 性	1. Nitrogen , %	1.8	—
	2. Fuel Ratio	2.0	中等
	3. NOx Emission Level(預測值, ppm)	340	備註 1
SOx 排 放 特 性	1. Sulphur , %	0.48	低. 佳
	2. SOx Emission Level(預測值, ppm)	>200	備註 2
粉 塵 排 放 特 性	1. K ₂ O , %	0.7	<1. 有助於提升 EP 性能
	2. Sulphur , %	0.48	低. 佳
	3. Na ₂ O , %	0.15	符合 EP 設計值
	4. SiO ₂ +Al ₂ O ₃ , %	92	>90. 會影響 EP 部份性能
	5. CaO+MgO , %	1.1	<20. 不影響 EP 效率
	6. Fe ₂ O ₃ , %	2.9	<7. 無助於提升 EP 性能
備 註	1. NOx 排放濃度各電廠均可符合環保排放要求。 2. SOx 排放濃度超過環保排放要求，需利用裝置排煙脫硫設備(FGD)或 混拌低硫煤以滿足環保排放標準。		

陸、查礦結果及綜合結論與建議：

一、各礦查證結果：

1. Moolarben礦

- (1) 公司名稱：Moolarben Coal Sales Pty. Ltd. (全屬銷售公司)
- (2) 煤礦位置：Mudgee東北方約1小時車程，位於Ulan礦與Wilpinjong礦之間
- (3) 礦權：ML1605，ML1606(面積約12,145公頃)
- (4) 商業生產日期：2010年5月
- (5) 剩餘蘊藏量：以recovery factor 78.5%計，蘊藏量為276.1百萬公噸
- (6) 開採方式：O/C，Truck & Shovel，目前剝土比3：1
- (7) 碎煤能力：2500 MTH
- (8) 洗煤：1800 MTH (Dense Medium/Spirals)
- (9) 儲煤場：200Kt(原煤) + 400 Kt(可售煤)
- (10) 原煤年產量：2010/4.9mt
- (11) 年出口量：2010/3.35mt
- (12) 內陸運輸：conveyer 0.5公里，鐵路275公里
- (13) 出口港：NCIG/Newcastle
- (14) 符合煤質：本公司燃煤採購A、B1、B2類煤質規範

2. Mandalong礦

- (1) 公司名稱：Centennial Mandalong Pty Ltd. (礦主)
- (2) 煤礦位置：煤礦位於澳洲NSW省，在雪梨北西北方約100公里，

Macquarie湖之西側。由雪梨至礦區車程約1.5小時，

- (3) 礦權：ML 1443/ML1543 (面積約1014公頃公頃)
- (4) 商轉日期：2005年1月
- (5) 剩餘蘊藏量：88百萬公噸
- (6) 開採方式：Underground，longwall
- (7) 碎煤能力：600MTH
- (8) 洗煤：700 MTH (Dense Medium cyclone)
- (9) 儲煤場：600K原煤, 300K產品煤
- (10) 原煤年產量：2010/5.2mt
- (11) 年出口量：2010/ 1.9mt
- (12) 內陸運輸：underground conveyer 9公里, train 27公里
- (13) 出口港：NCIG/Newcastle
- (14) 符合煤質：本公司燃煤採購A、B1、B2類煤質規範

3. Clermont礦

- (1) 公司名稱：Clermont Coal Mines Limited (全屬銷售公司)
- (2) 煤礦位置：煤礦位於澳洲昆士蘭省Emerald西北方，由Emerald至礦區車程約1.5個小時，西臨Blair Athol礦
- (3) 礦權：ML70343/ML1884/ML1904(面積約3026公頃)
- (4) 商業生產日期：2010年5月
- (5) 剩餘蘊藏量：以recovery factory 95.8%計，可取得之蘊藏量為182.1百萬公噸

- (6)開採方式：O/C，Truck & Shovel，剝土比3.7:1 (2010年)
- (7)洗煤：300 MTH (Dense Medium/Spirals)
- (8)碎煤能力：2,050 MTH
- (9)儲煤場：650K (產品煤)
- (10)原煤年產量：2010/3.5mt
- (11)年出口量：2010/3.5mt
- (12)內陸運輸：13.3公里conveyor to Blair Athol, 285公里 train至出口港
- (13)出口港：Haypoint/DBCT
- (14)符合煤質：本公司燃煤採購A、B1、B2類煤質規範。

二、各礦綜合結論：

此次所查各礦標準煤質與本公司進口煤採購規範比較一覽表如表4，各礦之綜合結論與建議如表5。

表4 2011年澳洲各煤礦標準煤質與本公司進口煤採購規範比較一覽表

煤 礦 名 稱	TPC QUALITY A	TPC QUALITY B1	TPC QUALITY B2	澳洲 Moolarben	澳洲 Mandalong	澳洲 Clermont
熱 值 (Kcal/Kg, A.R.)	5900Min.	5,500 Min.	5,500 Min.	6,100	6,260	6,020
總水份(% ,A.R.)	15 Max.(註 3)	15 Max.(註 2)	15 Max.(註 2)	9.0	9.0	14.5
固定碳(% ,A.D.)	60 Max.	60 Max.	60 Max.	51.5	53.5	56.4
揮發物(% ,A.D.)	26 Min.	26 Min.	26 Min.	30	28	27.6
灰份(% ,A.D.)	16 Max.	16 Max.	16 Max.	16	16	10
硫份(% ,A.D.)	1.1 Max.	1.1 Max.	1.1 Max.	0.6	0.73	0.48
灰軟化點°C (H=W)	1150 Min.	1150 Min.	1150 Min.	1560	1,450	1,560
研 磨 率(HGI)	45 Min.	45 Min.	42 Min.	50	50	56
粒 度(mm)	5% Max.	5% Max.	5% Max.	5%	0%	0%
>50mm						
<2mm	35% Max.	35% Max.	35% Max.	30%	25%	30%
Na ₂ O(% ,註 1)	2.0 Max.	2.0 Max.	2.0 Max.	0.07	0.5	0.15
否符合公司規範				符合規範--A、B1、B2	符合規範--A、B1、B2	符合規範--A、B1、B2

註： 1.若 $\text{CaO}+\text{MgO}>\text{Fe}_2\text{O}_3$ 且 $\text{CaO}+\text{MgO}+\text{Fe}_2\text{O}_3>20\%$ ，則 Na_2O 為 5% Max。

2.灰份<10%，則 總水份為 20% Max。

3.灰份<10%，則 總水份為 18% Max。

表5 2011年澳洲地區查礦結果與建議

地區		澳洲地區					
申請公司		Moolarben Coal Sales Pty. Ltd.		Centennial Mandalong Pty Ltd.		Clermont Coal Mines Limited	
礦名		Moolarben 礦		Mandalong 礦		Clermont 礦	
符合之煤質規範		A、B1、B2		A、B1、B2		A、B1、B2	
供應煤礦評選條件		查證結果	符合	查證結果	符合	查證結果	符合
1.具煤礦所在國政府核發之採礦權文件		有	✓	有	✓	有	✓
2.生產中煤礦		生產中，原煤年產量4.9百萬公噸	✓	生產中，原煤年產量5.3百萬公噸	✓	生產中，原煤年產量3.38百萬公噸	✓
3.符合本公司採購煤質規範之出貨量，前5年內，任1年達60萬公噸以上		2010年符合規範之出口量超過60萬公噸	✓	2010年符合規範之出口量超過60萬公噸	✓	2010年符合規範之出口量超過60萬公噸	✓
4.以查礦前一年之年產量為基楚，已確定之剩餘可採煤量可供開採之年限		82年(已探蘊藏量352百萬公噸)	✓	16年(已探蘊藏量88百萬公噸)	✓	53年(已探蘊藏量190百萬公噸)	✓
5.裝貨港可安全靠泊巴拿馬極限型以上煤輪		NCIG/Newcastle港	✓	NCIG/Newcastle港	✓	Haypoint/DBCT	✓
6.其他經本公司或查礦人員認定不適合成為定期契約合格礦之原因		無	✓	無	✓	無	✓
查礦小組其他查證意見		無		無		無	
查礦小組建議		合格		合格		合格	

圖1-1 Moolarben礦區地理位置圖

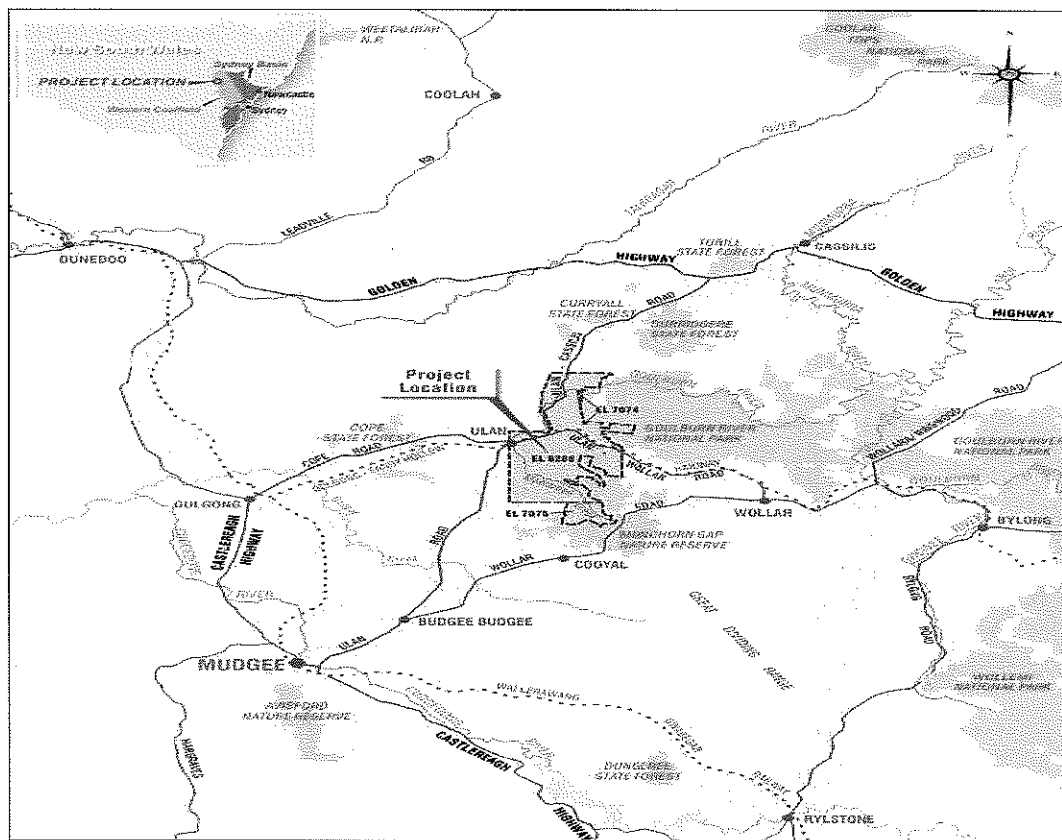


圖1-2 Moolarben煤層及開採示意圖



圖1-3 Moolarben礦探礦區與基礎設施分布圖

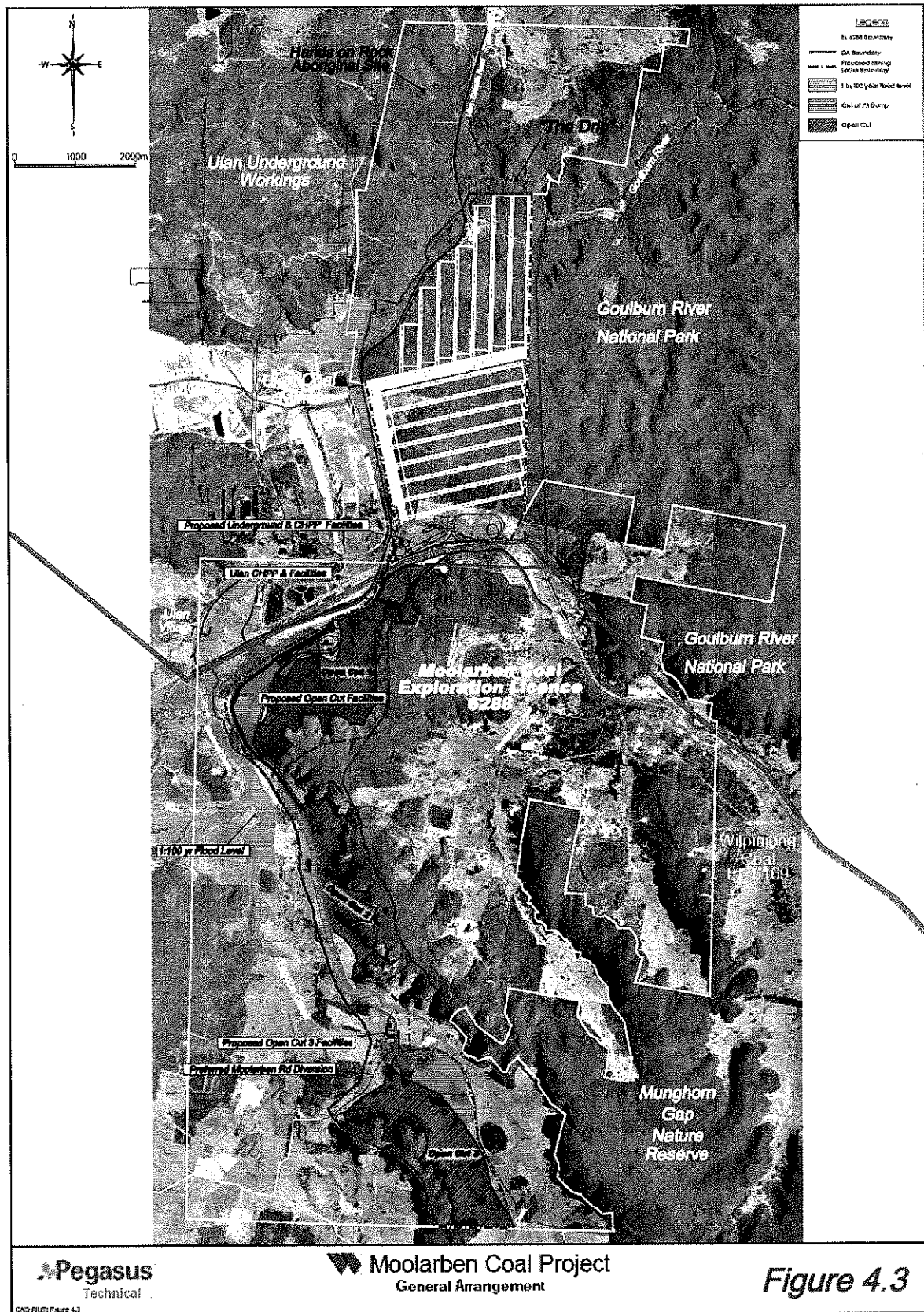


圖1-4 Moolarben煤礦之Ulan Coal之煤層柱狀圖

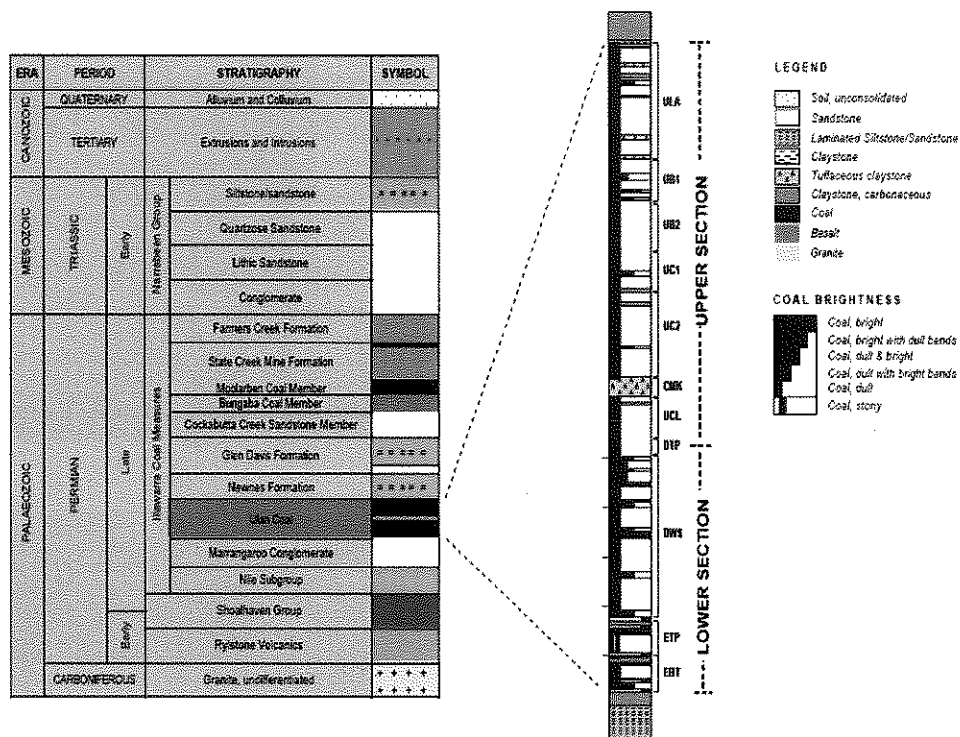


Figure 4.1: Generalised stratigraphic section of Ulan Coal.

圖1-5 Moolarben煤礦之Ulan Coal之地下開採區柱狀圖

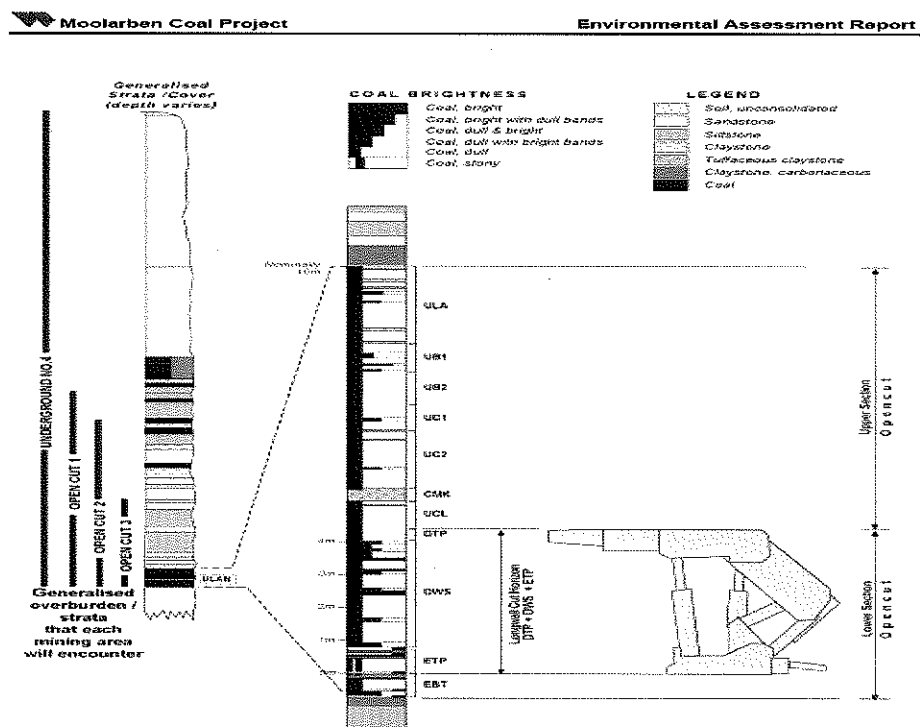


Figure 4.2: Proposed working sections of Ulan Coal for Underground and Open Cut operations.

圖1-6 Moolarben煤礦之Ulan Coal煤層

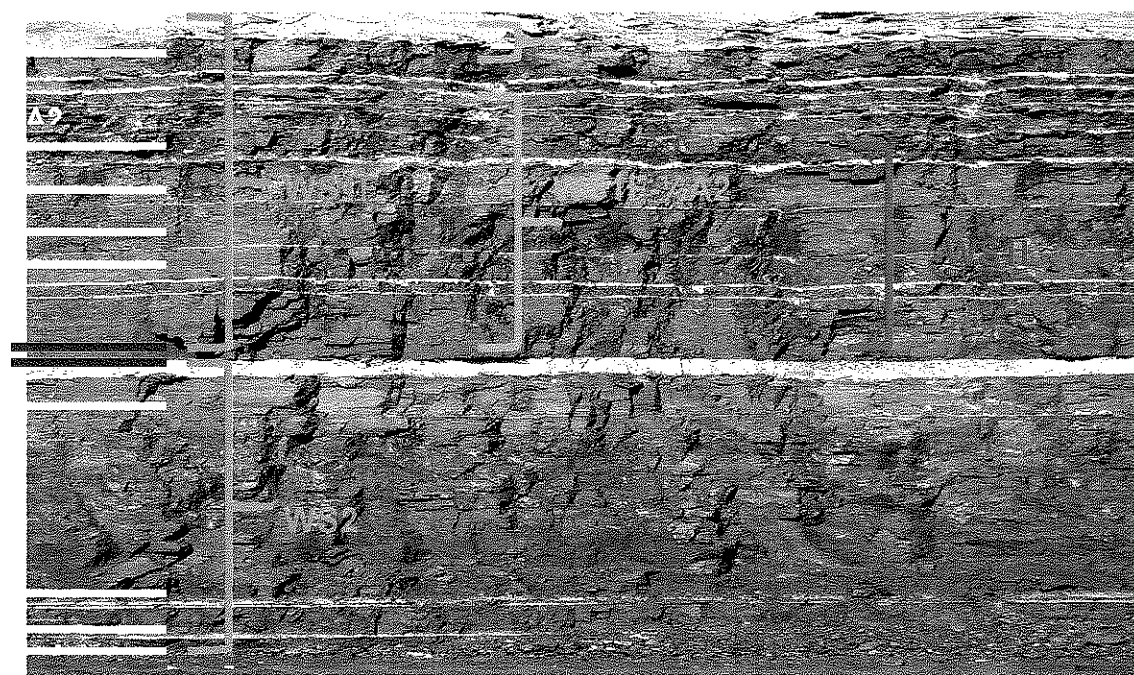


圖1-7 Moolarben煤礦生產過程圖

Mining Process



1. Overburden Blasted, minimal free-dig. (15 to 40m thick)
2. Overburden Removed by 996 excavators
3. Ulan Seam will be blasted
4. Ulan Seam mined in 2 working sections – WS1 & WS2

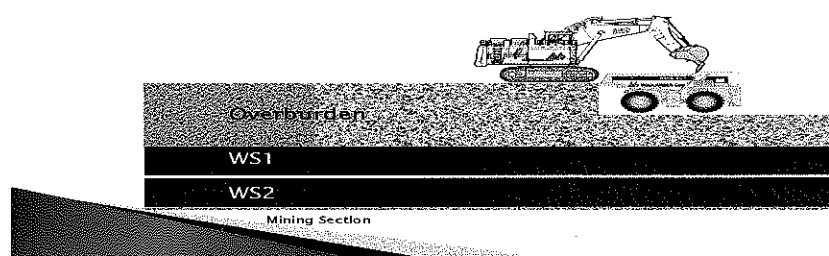


圖1-8 Moolarben煤礦煤炭處理流程圖

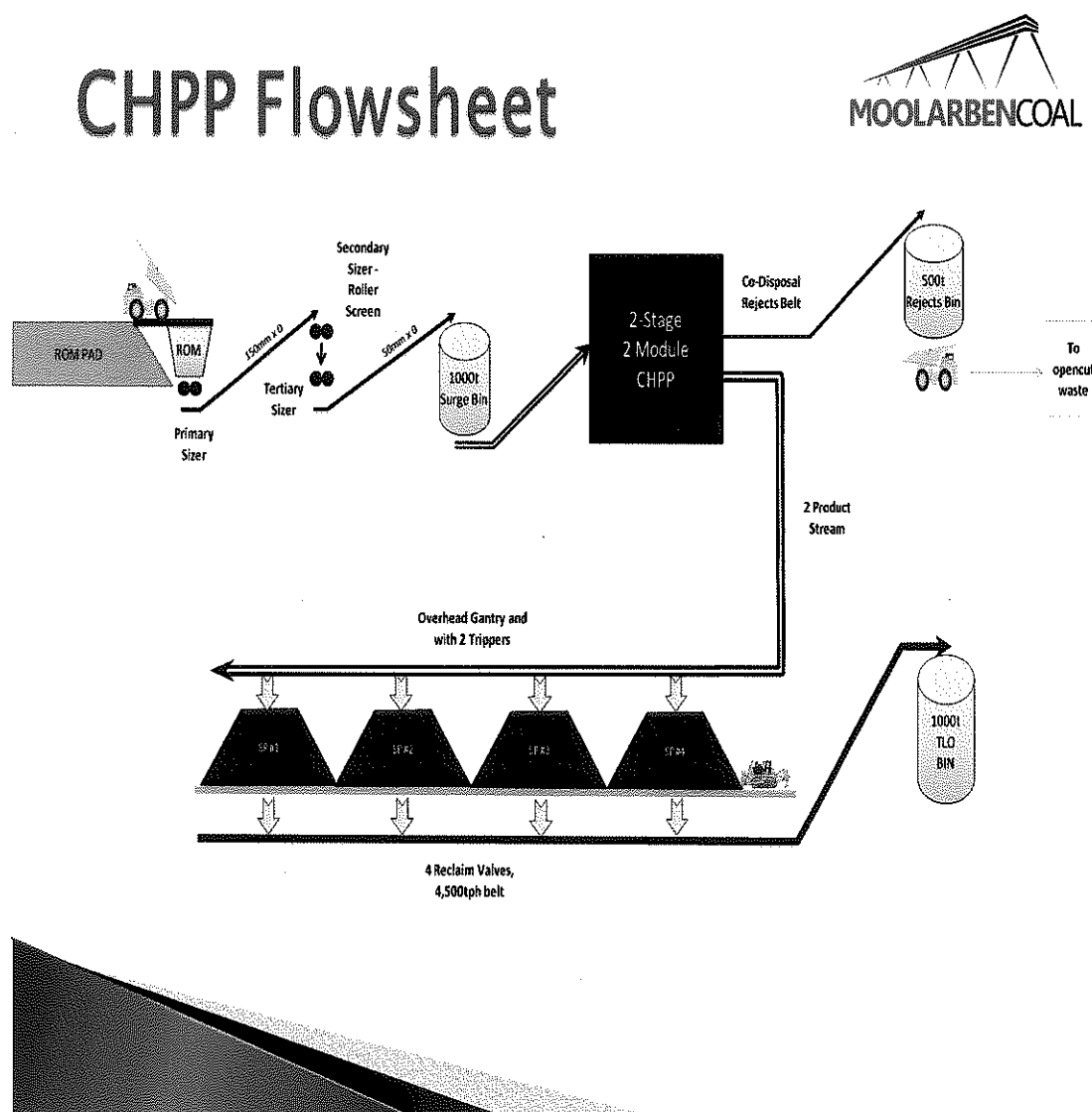


圖1-9 Moolarben產品煤火車裝煤站

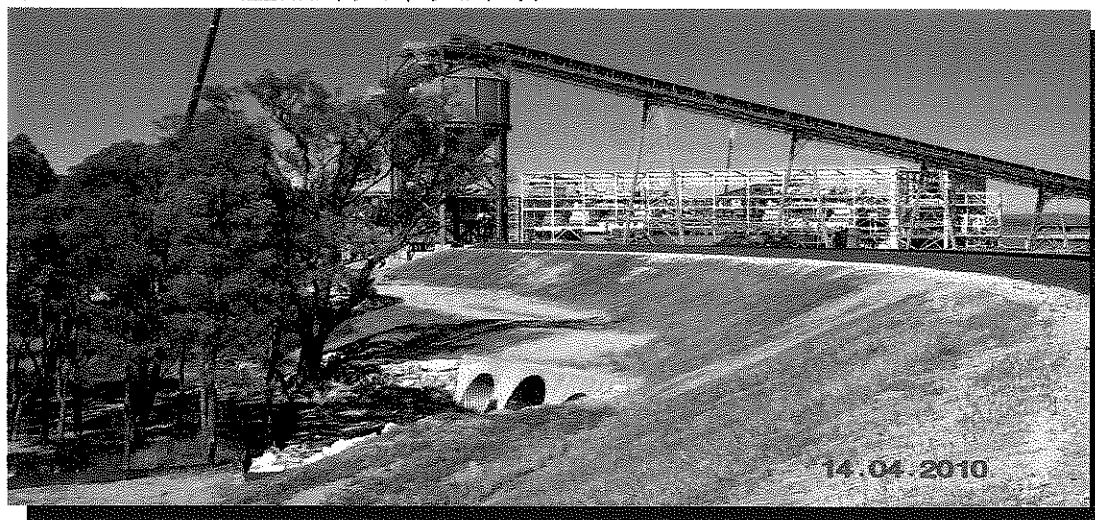


圖2-1 Mandalong礦區地理位置圖

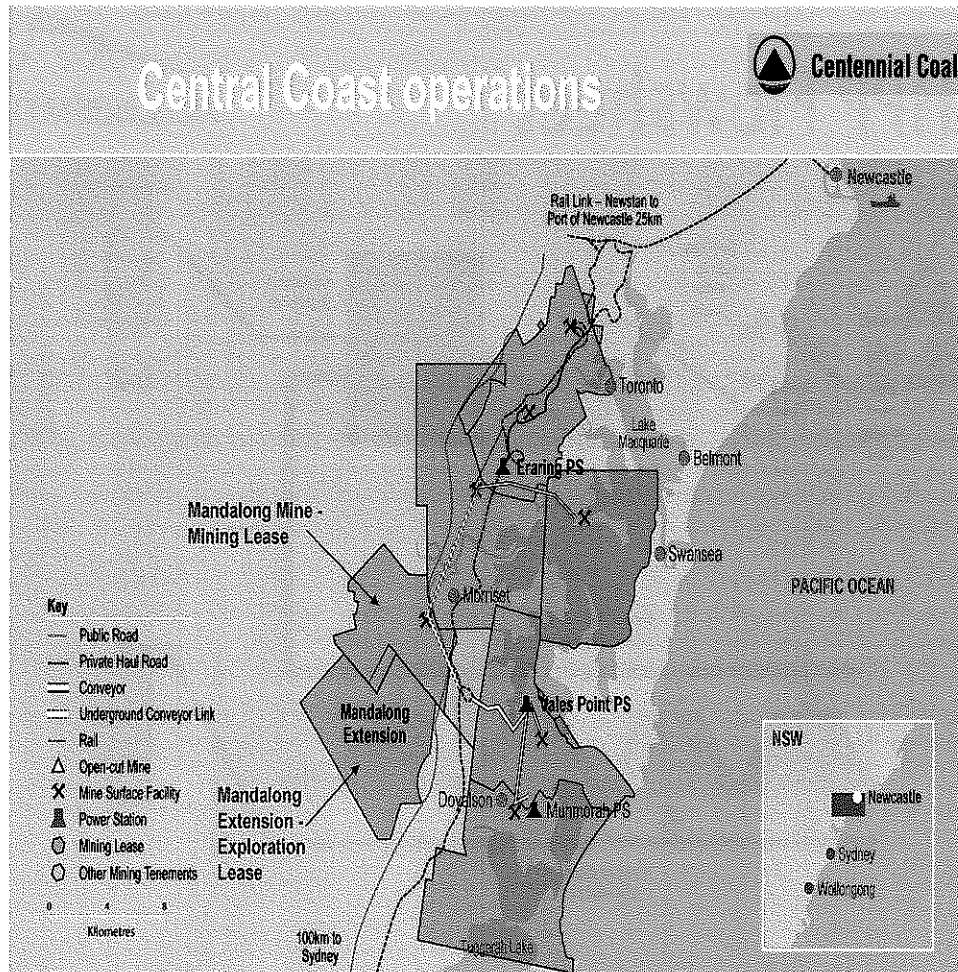
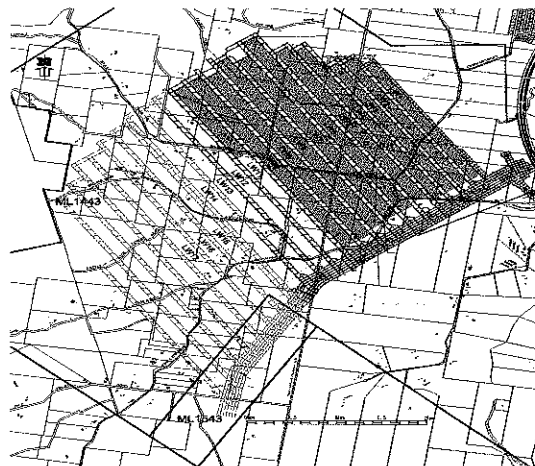


圖2-2 Mandalong礦區Concession示意圖

Mining Lease Area - Workings

ML 1443
ML 1543



Mine Visit

Centennial Mandalong

圖2-3 Mandalong採礦區煤層柱狀圖

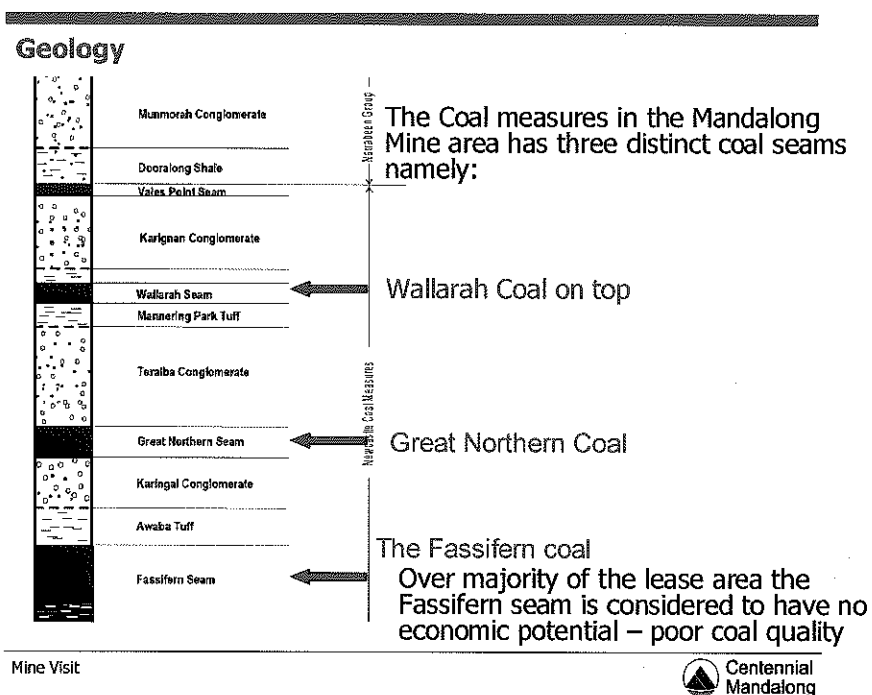


圖2-4 Mandalong礦區鑽探圖



圖2-5 Mandalong礦開採計畫圖

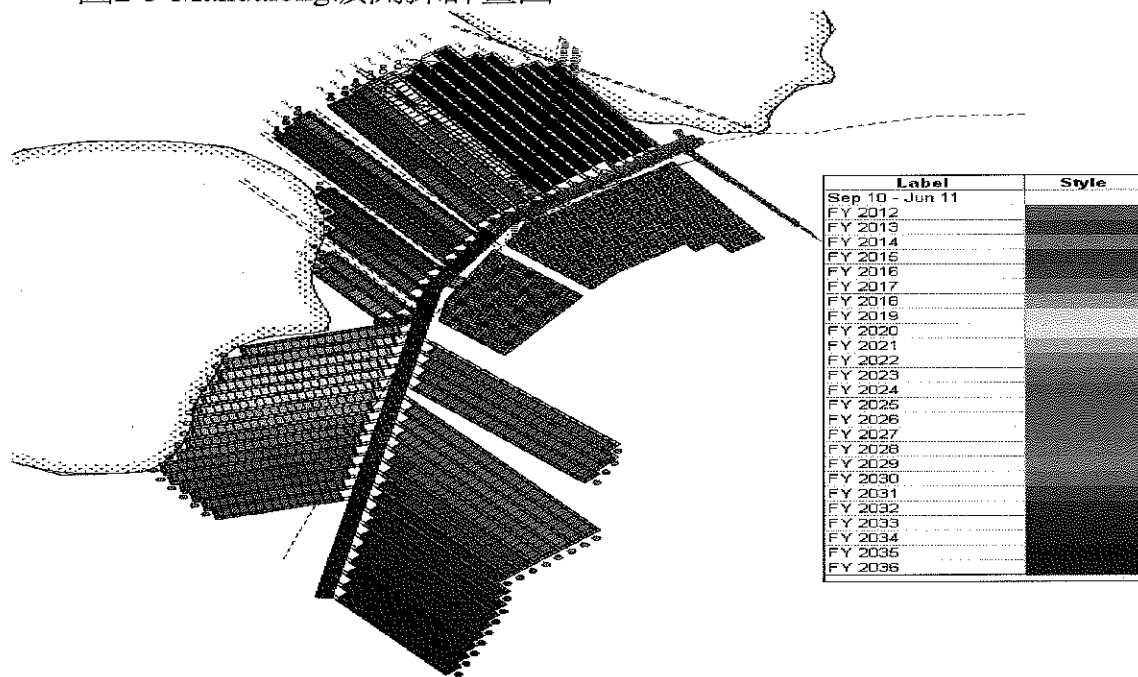
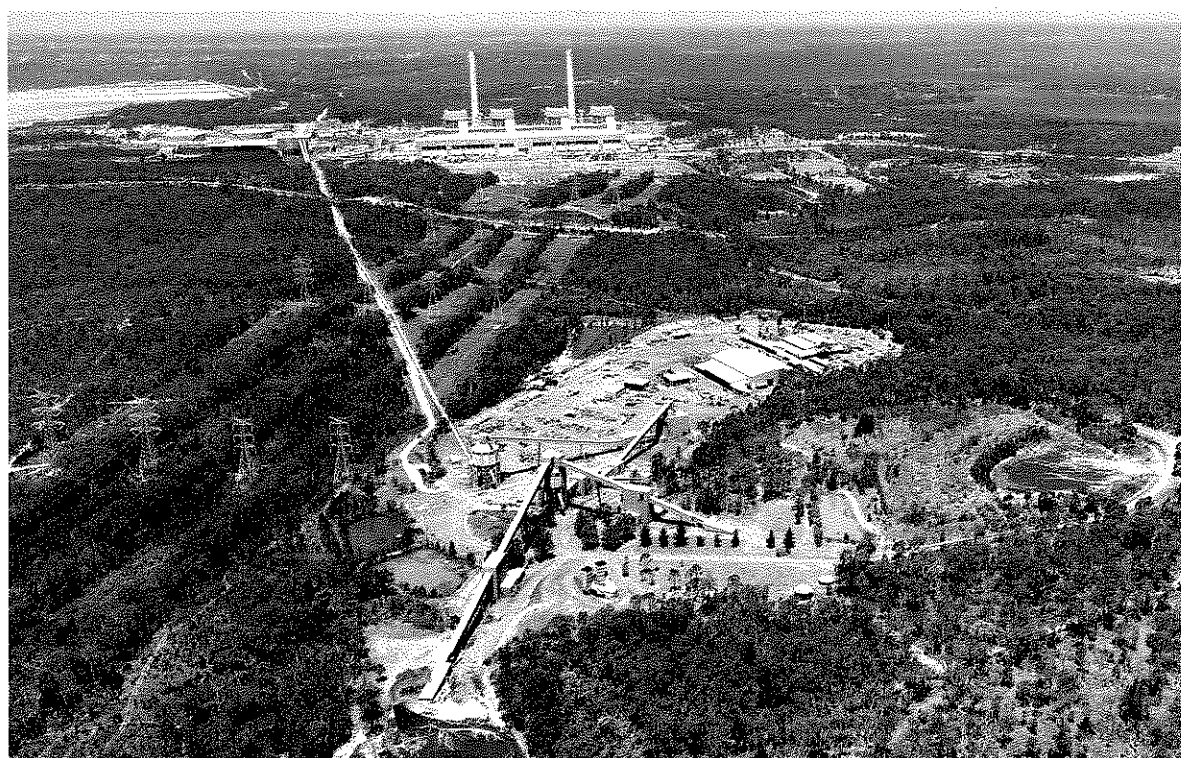


圖2-6Mandalong礦地面設施Concession圖



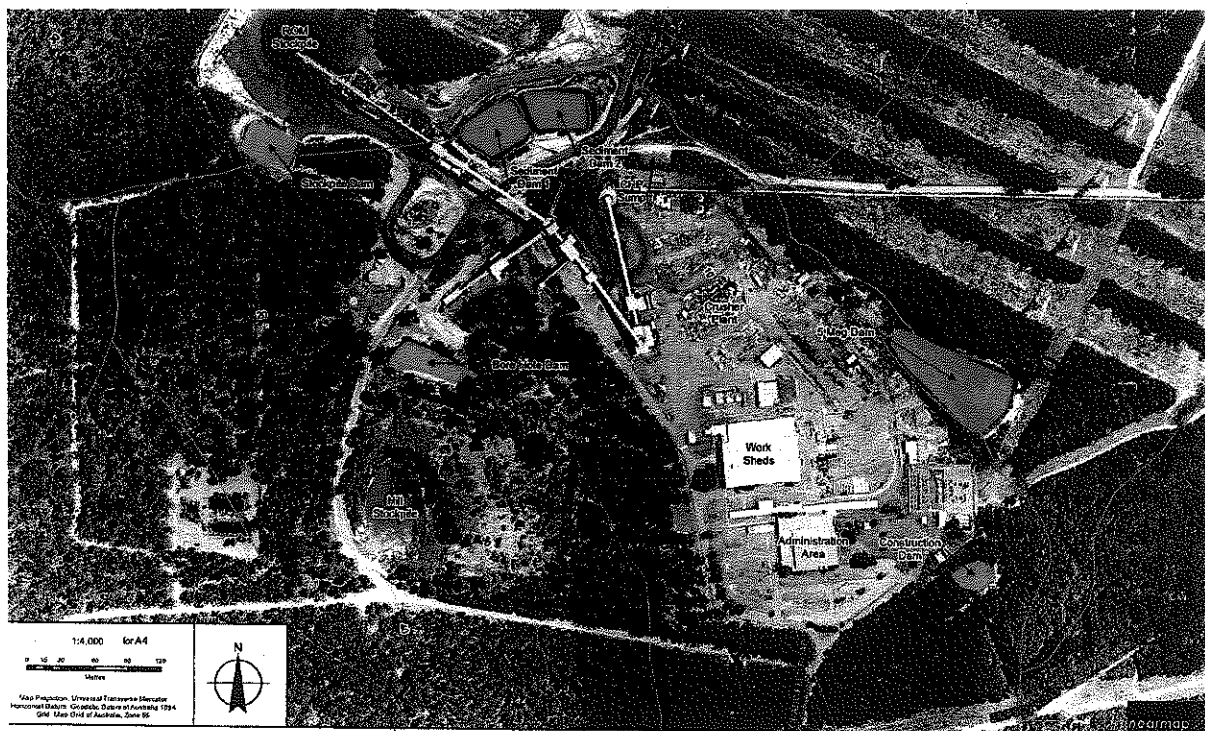


圖2-7 Mandalong煤礦洗煤過程圖

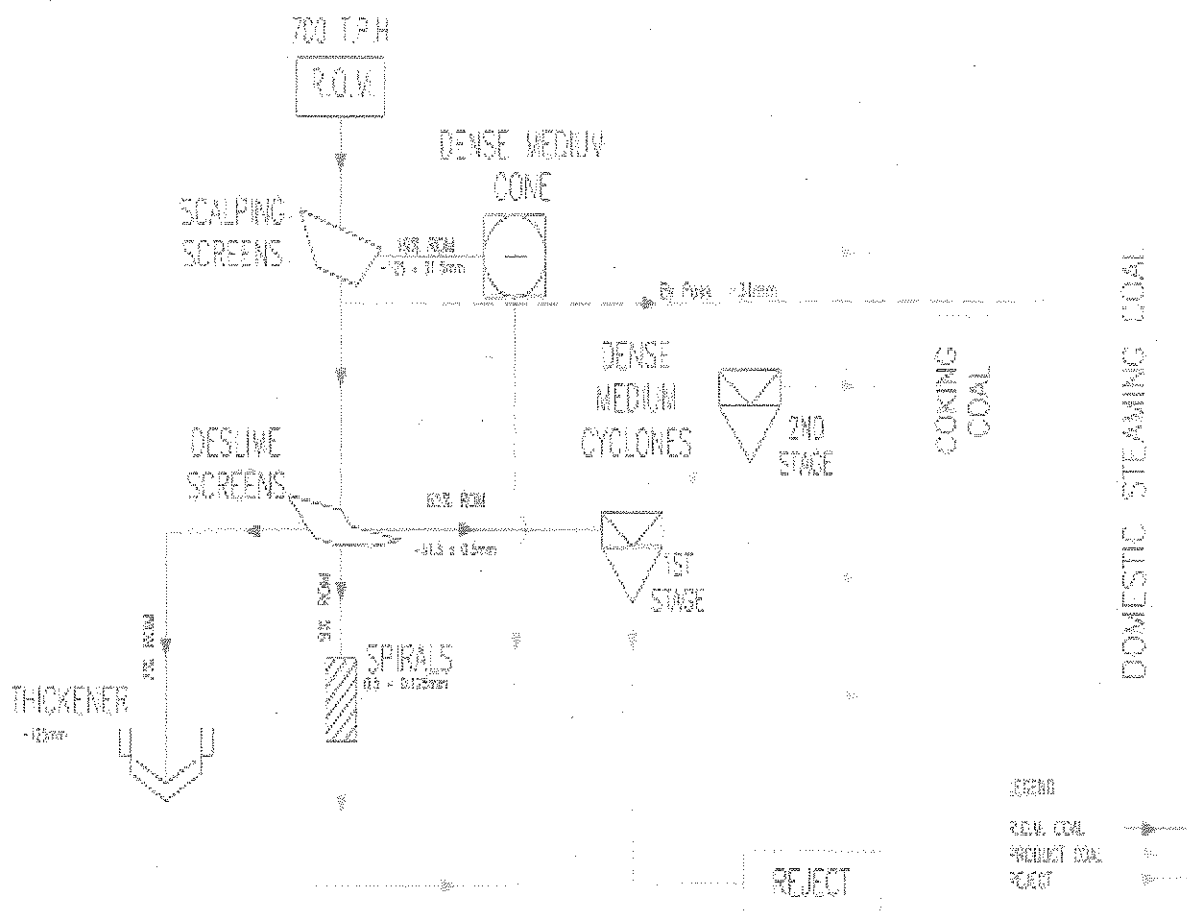


圖2-8 Mandalong煤礦煤炭開採、儲運過程與品質控制示意圖

CENTENNIAL MANDALONG COAL FLOW

1. LONGWALL: JOY 7LSB Shearer. Max. cutting height 4.8m x 150m wide feeding onto 1400mm trunk belt at max. 2,700TPH.
2. & 3. : GATE-ROADS: ABM25 Continuous Miners with 2 x JOY 15SC Shuttle cars feeding coal onto 1400mm trunk belt at max. 2,700 TPH.
4. MAINS Development: ABM25 Continuous Miner with 2 x JOY 15SC Shuttle cars feeding coal onto 1800mm belt at max. 3,800 TPH.
5. Main belt 1800mm @ 3,800 TPH conveyor
6. 1,500t In-seam bin
7. Delta Headings incorporating 1:3 Drift: 1200mm @ 1,600TPH.
8. 79t FINISHED PRODUCT BIN
9. Overland conveyor (5.7km) to DELTA ELECTRICITY
10. 1200mm @ 2,000TPH Underground conveyor for 9km.
11. 2,000t surface ROM BIN.
12. Overland conveyor to 1,200t TRUCK-LOADING BIN
13. 100,000t Stack-out
14. Newton Coal Handling Plant
15. Rail (51km) to Port of Newcastle
16. EXPORT
17. Coal-handling-Plant 750 TPH
18. 2,000t FINISHED PRODUCT BIN
19. Overland conveyor (1.9km) to ERARING ENERGY - Eraring Power Station

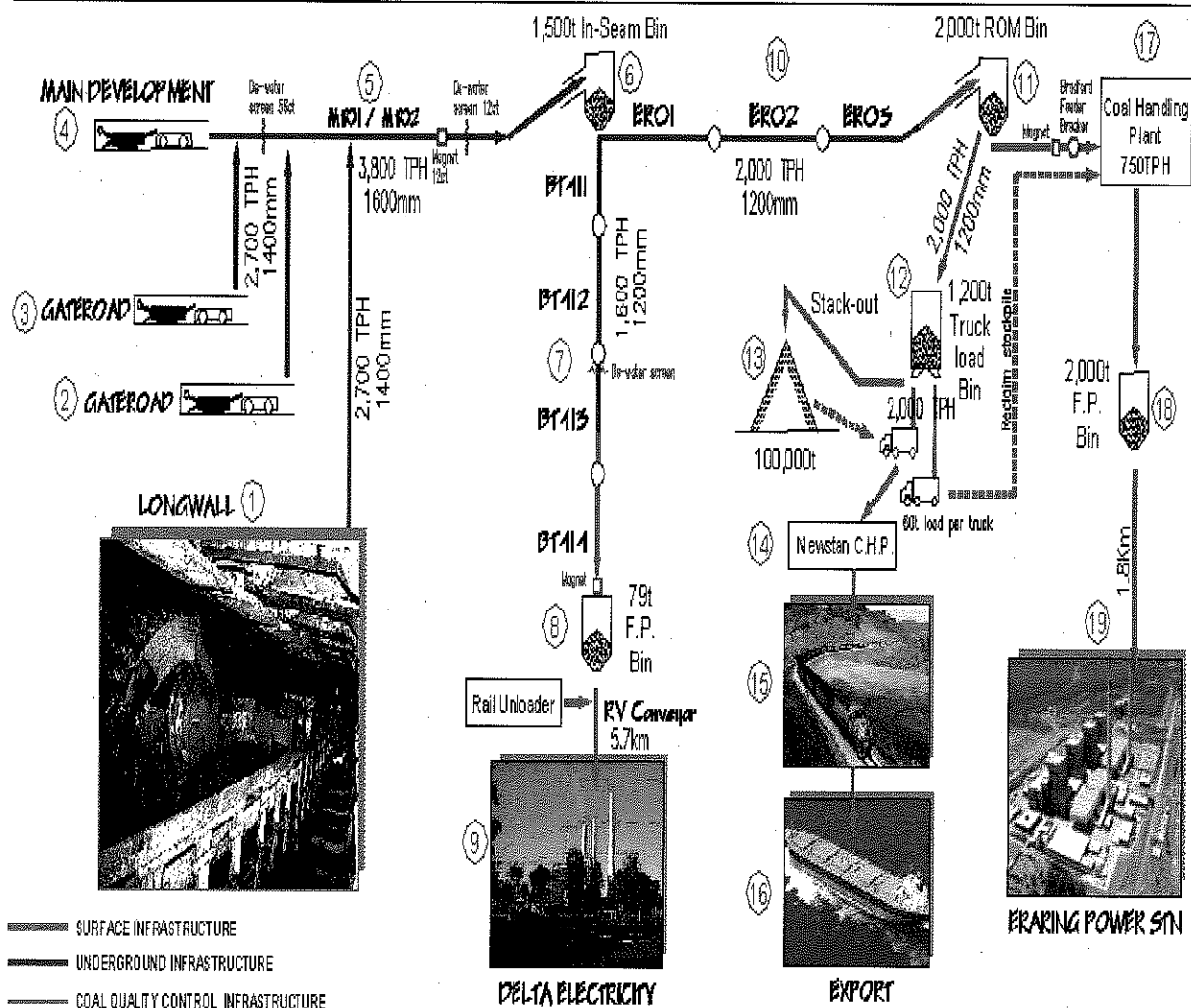
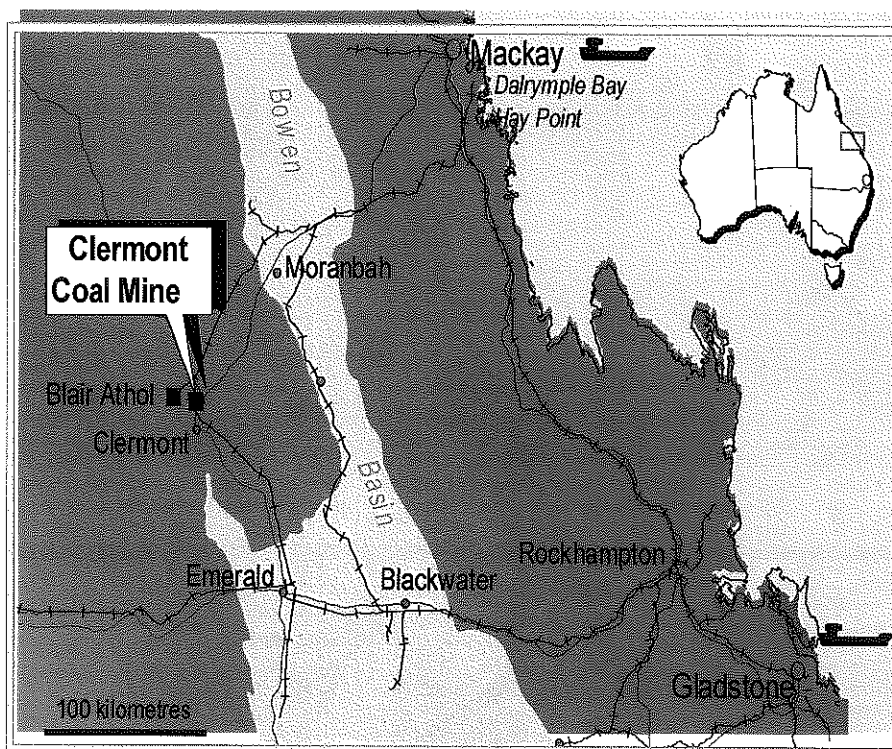


圖3-1 Clermont礦區地理位置圖

RioTinto



- Located in the Bowen Basin Region of Queensland, Australia
- Adjacent to Blair Athol Mine (Rio Tinto mine) which started winding down in 2010.
- Railed 278km to Dalrymple Bay Coal Terminal for export.

2

圖3-2 Clermont礦區礦權分布圖

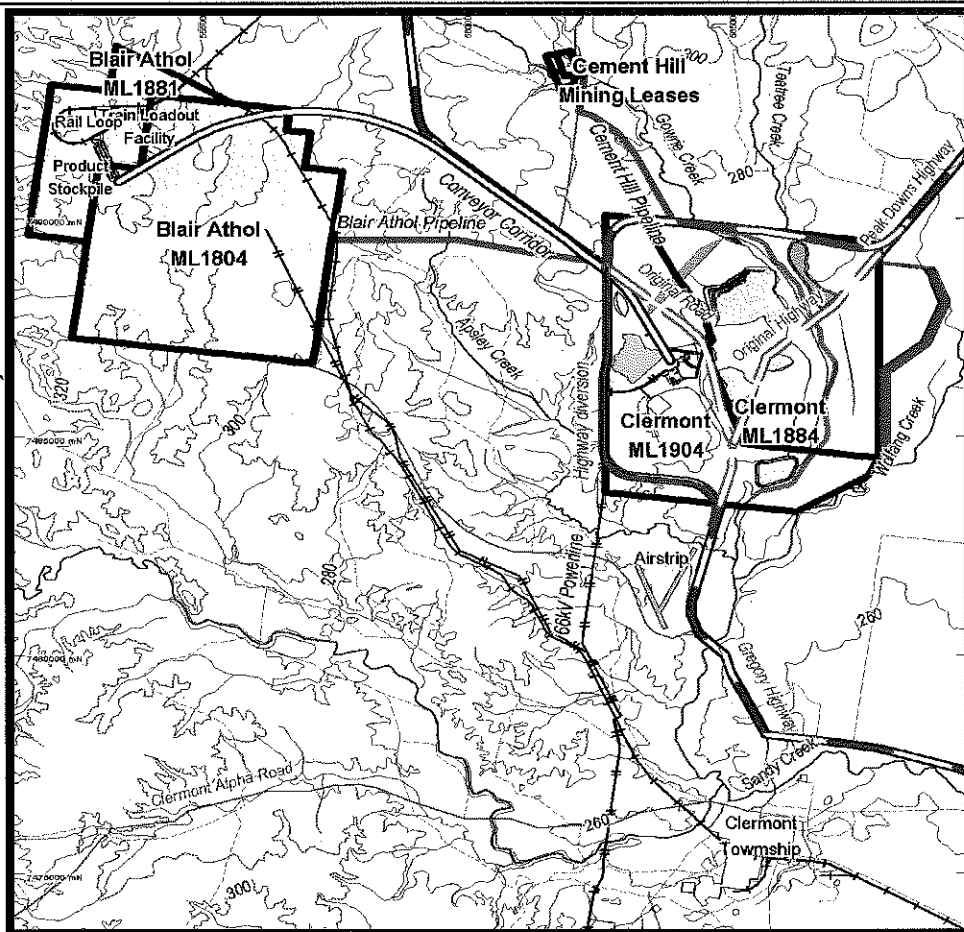
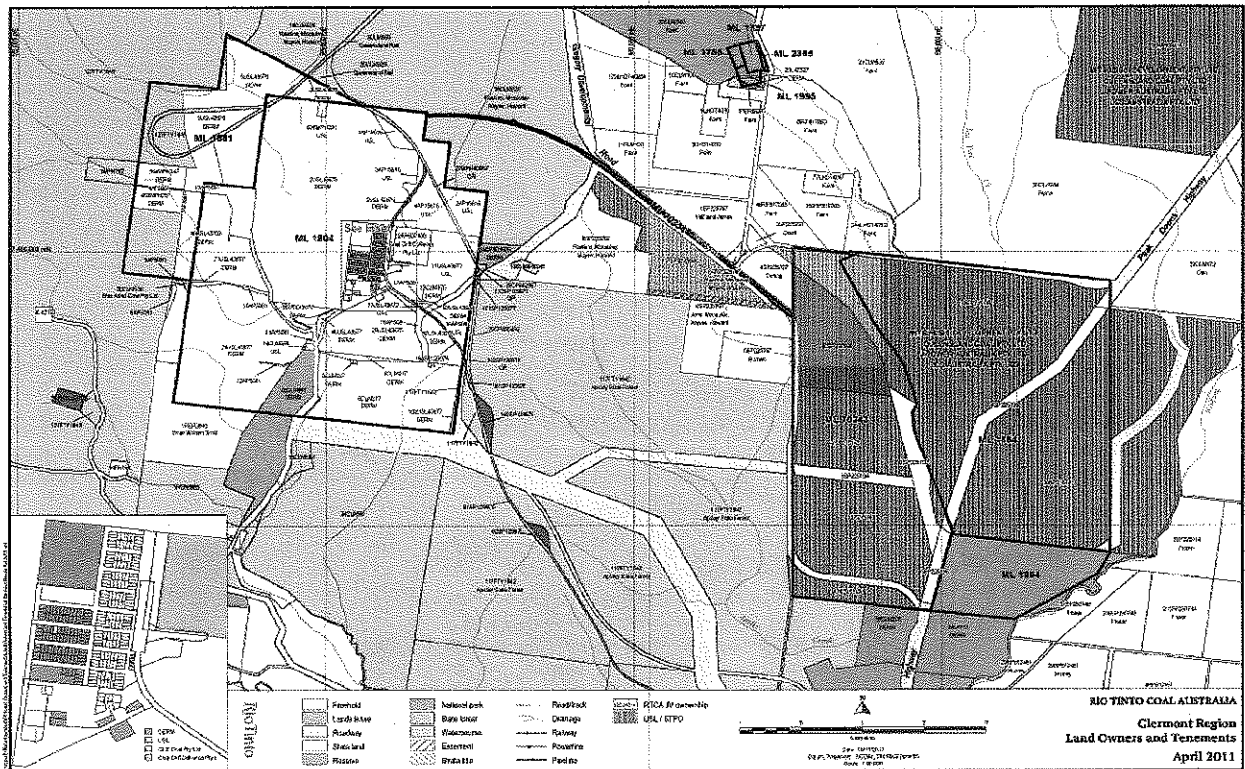


圖3-3 Clermont礦區空照圖



圖3-4 Clermont礦區柱狀圖

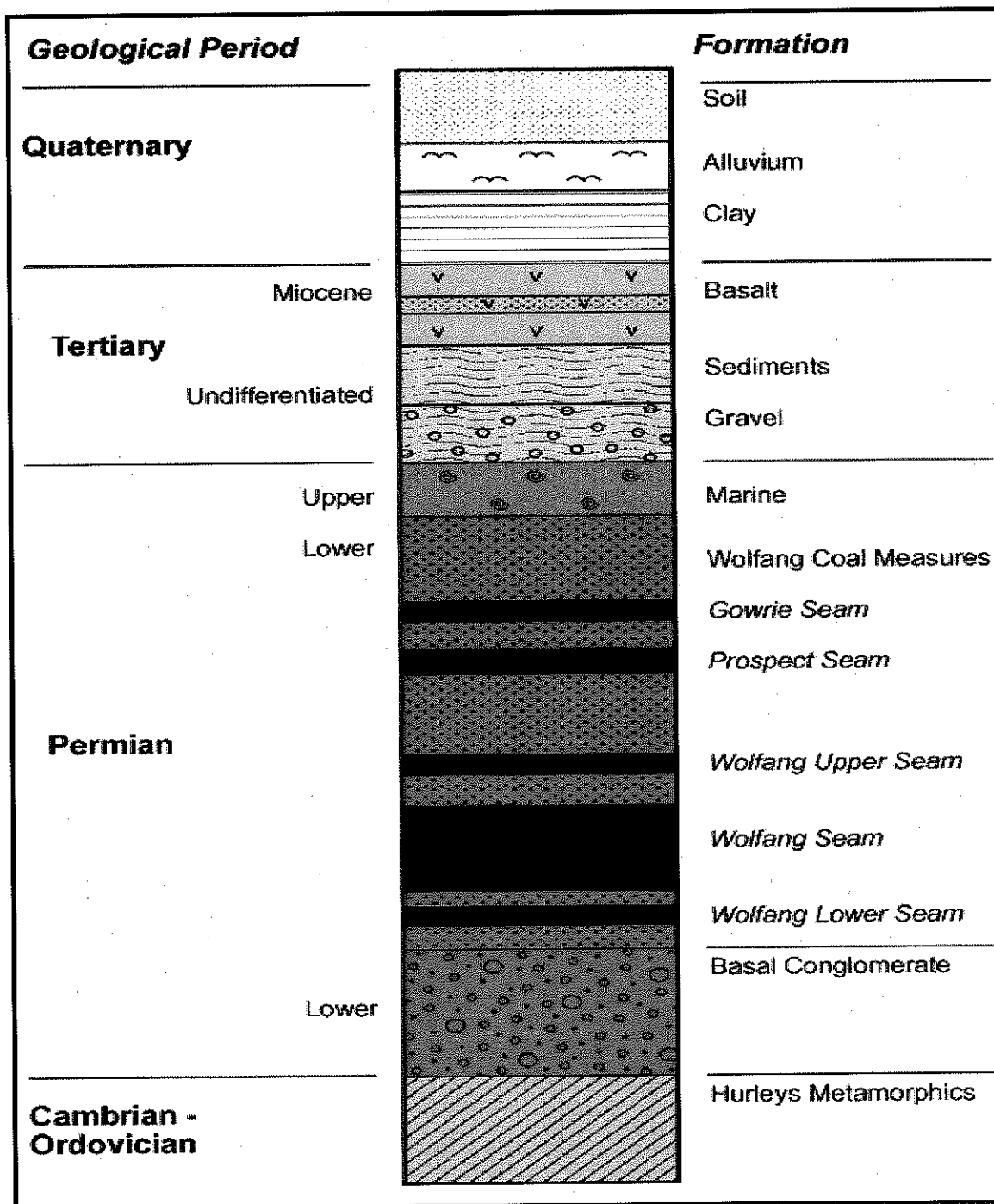


圖3-5 Clermont礦區Cross Section圖

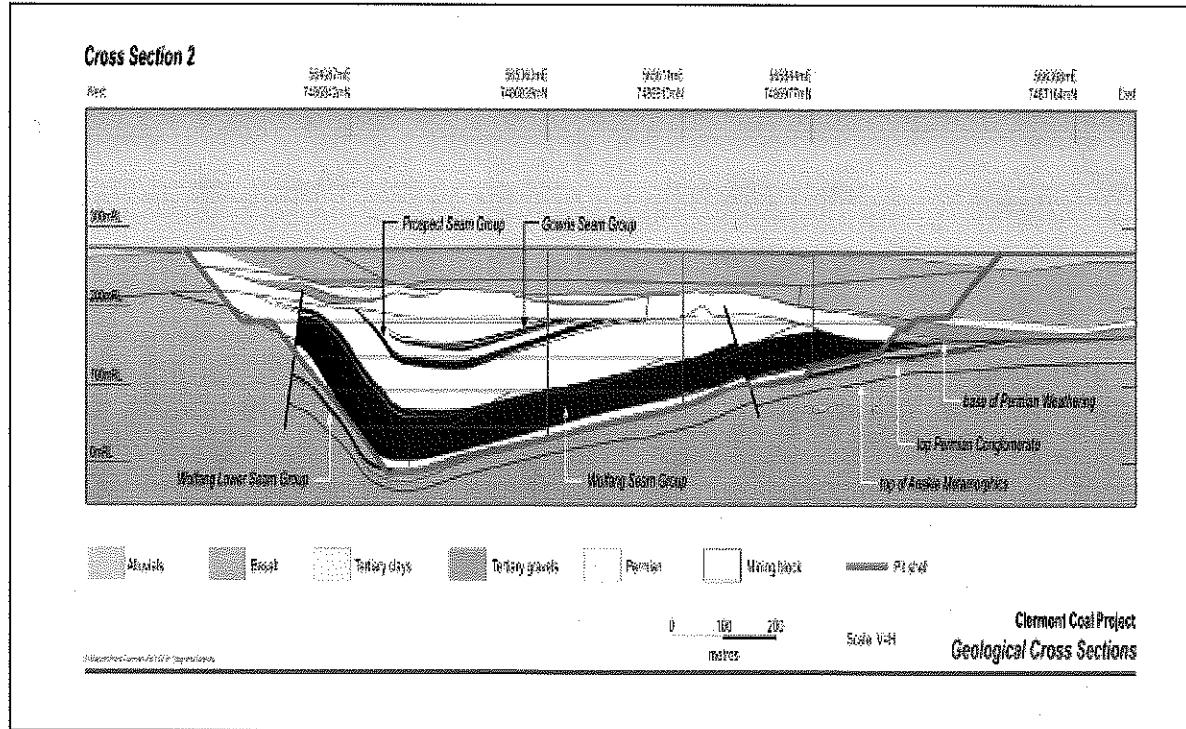


圖3-6 Clermont礦區原煤第一次碎煤



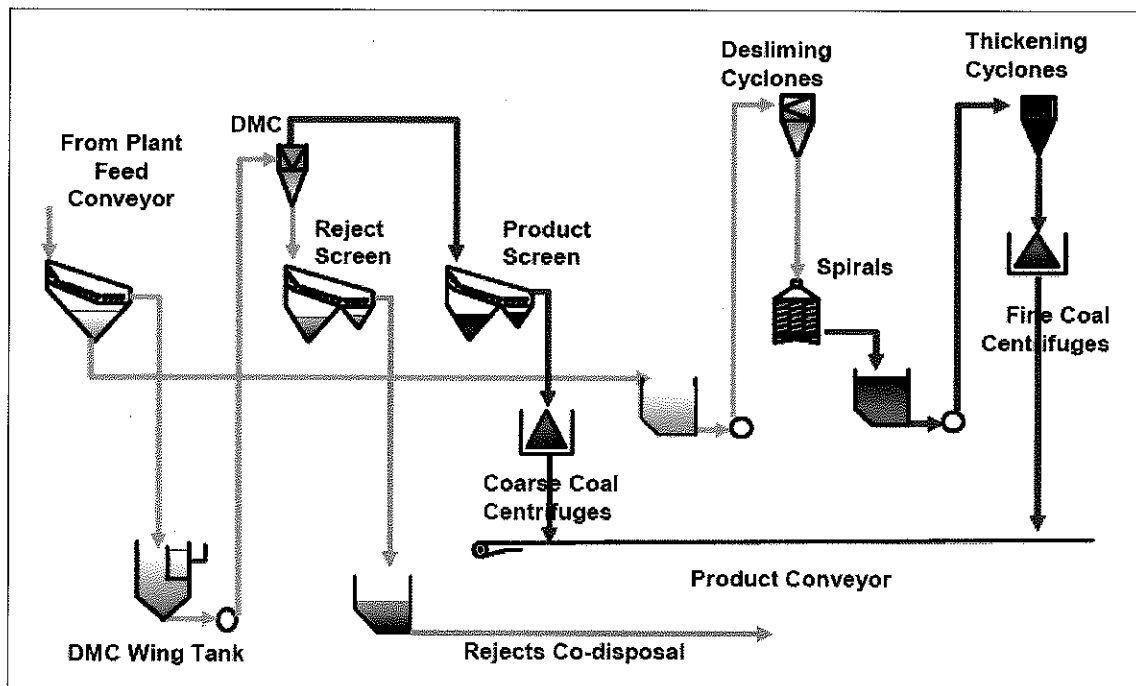
圖3-7 Clermont礦區原煤第二次碎煤



圖3-8 Clermont礦區生產現況圖



圖3-9 Clermont礦區煤質管控圖



RioTinto

Quality Control Process

Coal quality measurements are made at a number of locations along the production chain

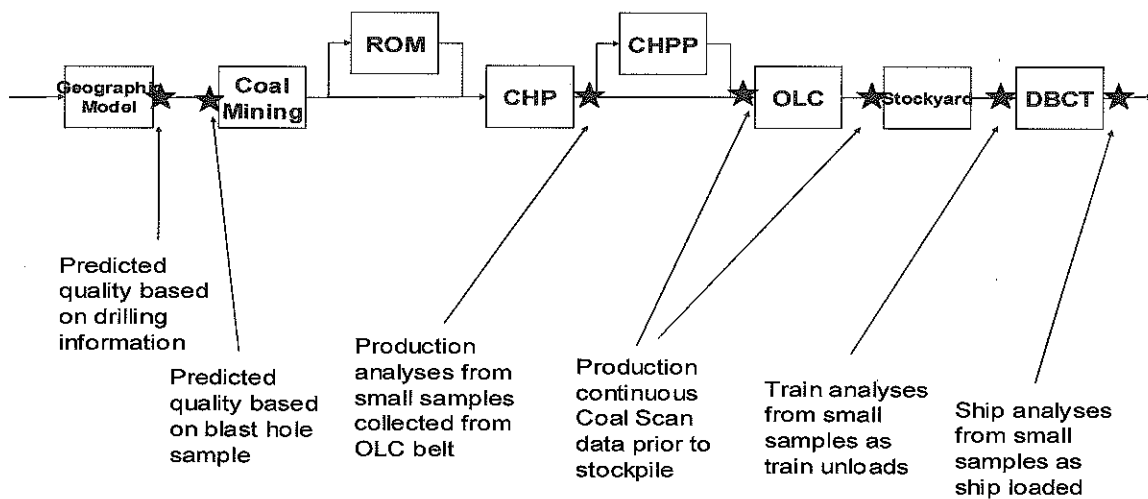


圖3-10 Clermont礦區開採計畫圖-2012

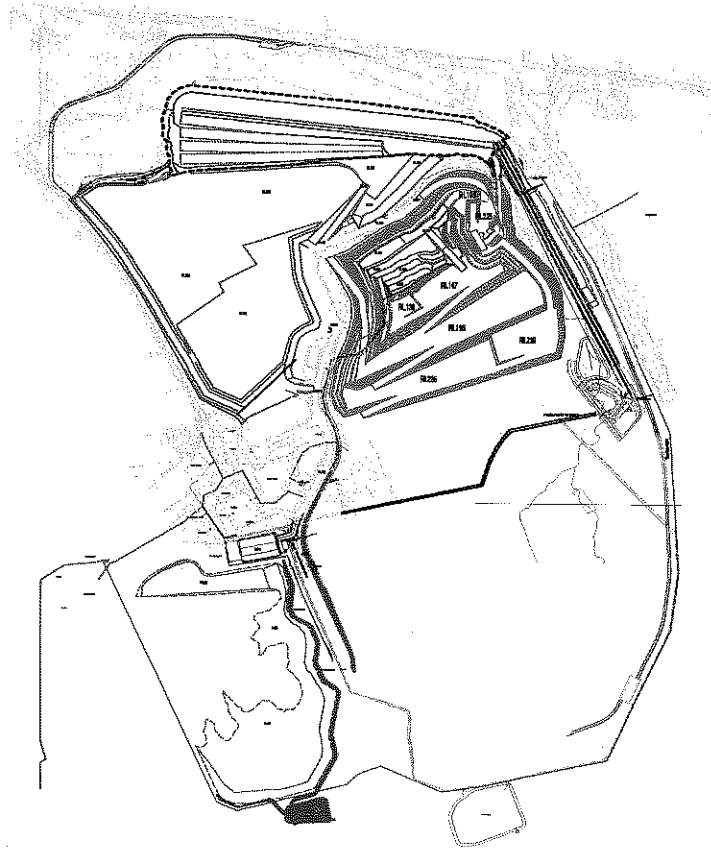


圖3-11 Clermont礦區開採計畫圖-2022

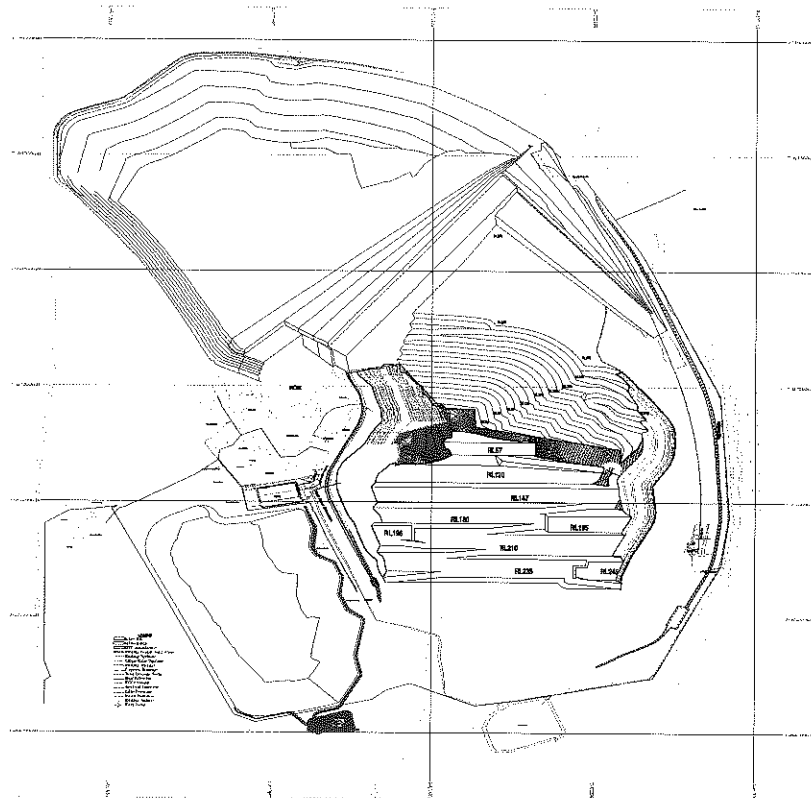
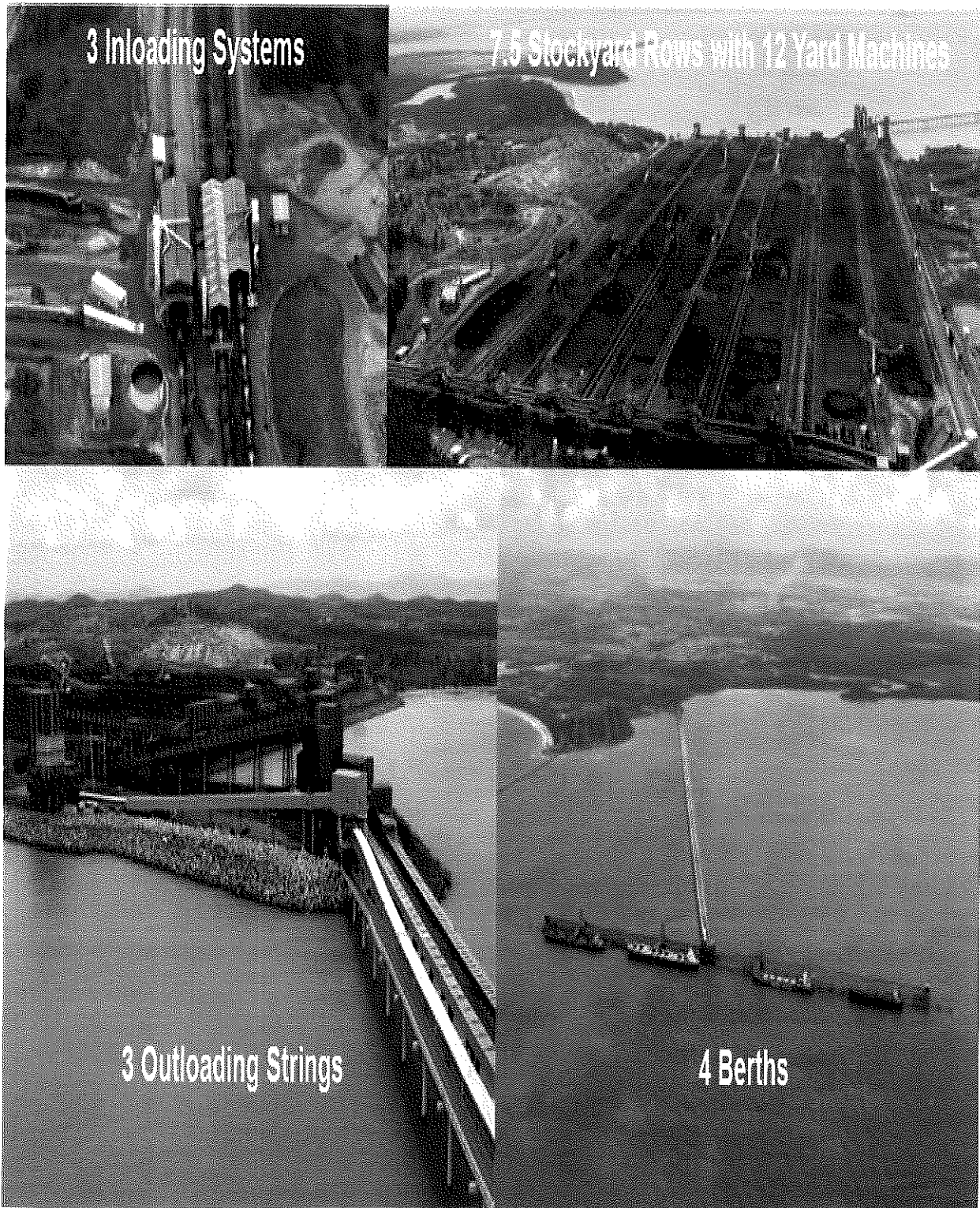


圖3-12 Dalrymple港口空照圖



Attachment A

Quality Specifications for Taipower's Term Tender of General Bituminous Coal –
Quality A

April, 2008

Item	Minimum / Maximum
1. Gross Calorific Value (kcal/kg) A.R.	5,900 Min. (Remark 1)
2. Total Moisture (%) A.R.	15 Max. (Remark 2)
3. Ash Content (%) A.D.	16 Max.
4. Sulphur Content (%) A.D.	1.1 Max.
5. Volatile Matter (%) A.D.	26 Min.
6. Fixed Carbon (%) A.D.	60 Max.
7. Grindability (H.G.I.)	45 Min.
8. Ash Fusion Temperature (reducing, H=W) (°C)	1,150 Min.
9. Size (mm)	>50 mm 5 % Max. < 2 mm 35 % Max.
10. Na ₂ O in Ash (%)	2 Max. (Remark 3)

Remarks:

1. Gross Heating Value greater than 6,900Kcal/Kg will be treated as 6,900 kcal/kg.
2. Total Moisture can be raised to 18% max if Ash Content is less than 10% .
3. If (a).CaO + MgO > Fe₂O₃, and (b).CaO + MgO + Fe₂O₃ > 20% ,
then Na₂O in Ash can be raised to 5.0% max.
4. A.R. means As Received Basis; A.D. means Air Dried Basis.

Attachment B1

Quality Specifications for Taipower's Term Tender of General Bituminous Coal –
Quality B1

April, 2008

Item	Minimum / Maximum
1. Gross Calorific Value (kcal/kg) A.R.	5,500 Min. (Remark 1)
2. Total Moisture (%) A.R.	15 Max. (Remark 2)
3. Ash Content (%) A.D.	16 Max.
4. Sulphur Content (%) A.D.	1.1 Max.
5. Volatile Matter (%) A.D.	26 Min.
6. Fixed Carbon (%) A.D.	60 Max.
7. Grindability (H.G.I.)	45 Min.
8. Ash Fusion Temperature (reducing, H=W) (°C)	1,150 Min.
9. Size (mm)	>50 mm 5 % Max. < 2 mm 35 % Max.
10. Na ₂ O in Ash (%)	2 Max. (Remark 3)

Remarks:

1. Gross Heating Value greater than 6,900Kcal/Kg will be treated as 6,900 kcal/kg.
2. Total Moisture can be raised to 20% max if Ash Content is less than 10% .
3. If (a).CaO + MgO > Fe₂O₃, and (b).CaO + MgO + Fe₂O₃ > 20% ,
then Na₂O in Ash can be raised to 5.0% max.
4. A.R. means As Received Basis; A.D. means Air Dried Basis.

Attachment B2

Quality Specifications for Taipower's Term Tender of General Bituminous Coal - Quality B2

April, 2008

Item	Minimum / Maximum
1. Gross Calorific Value (kcal/kg) A.R.	5,500 Min. (Remark 1 and 3)
2. Total Moisture (%) A.R.	15 Max. (Remark 2)
3. Ash Content (%) A.D.	16 Max.
4. Sulphur Content (%) A.D.	1.1 Max.
5. Volatile Matter (%) A.D.	26 Min.
6. Fixed Carbon (%) A.D.	60 Max.
7. Grindability (H.G.I.)	42 Min.
8. Ash Fusion Temperature (reducing, H=W) (°C)	1,150 Min.
9. Size (mm)	>50 mm 5 % Max. < 2 mm 35 % Max.
10. Na ₂ O in Ash (%)	2 Max. (Remark 3)

Remarks:

1. Gross Heating Value greater than 6,900Kcal/Kg will be treated as 6,900 kcal/kg.
2. Total Moisture can be raised to 20% max if Ash Content is less than 10% .
3. If (a).CaO + MgO > Fe₂O₃, and (b).CaO + MgO + Fe₂O₃ > 20% , then Na₂O in Ash can be raised to 5.0% max.
4. A.R. means As Received Basis; A.D. means Air Dried Basis.

附件 1—Moolarben 礦之礦權文件



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Mr Ian Callow
Project Manager
Moolarben Coal Mines Pty Limited
PO Box 1320
NORTH SYDNEY NSW 2060

Our Ref: 06/6795
Contact: Peta Johannessen
Telephone: (02) 4931 6613

Dear Sir

MINING LEASE APPLICATION NO 290

The Minister on 20 December 2007 granted Mining Lease No 1606 (Act 1992) in satisfaction of this application. This authority expires on 20 December 2028. The lease is enclosed for your records.

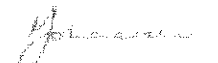
You are reminded of the following:

- Mining operations must be conducted in accordance with a Mining Operations Plan satisfactory to the Director-General. This plan must be lodged before operations commence.
- Before operations commence you must also negotiate an agreement regarding compensation with any affected landholder or have compensation assessed by the Warden.
- Notification of the grant of the lease must be served on each affected landholder not later than 3 months from the date of grant.

As directed by the Minister, the land subject of this lease has been recorded in the Colliery Holding Register as part of Moolarben Colliery Holding.

If you have any queries, please contact me.

Yours faithfully


Peta Johannessen
for Director-General
2 January 2008

NSW DEPT. OF PR. IND.
Postal Address:
PO Box 144 Glen Innes NSW 2145
Phone: 02 4931 6613
Fax: 02 4931 6614
Email: pet.johannessen@dpi.nsw.gov.au

02 4931 6613

02 4931 6614
pet.johannessen@dpi.nsw.gov.au

Office of State Revenue
NSW Treasury
Check No. 1846088 2372
Date: N/A Item: ML 1666
Amount: 0.00

MINING LEASE

MINING ACT 1992

NO 1606

DATED 20 DECEMBER 2007

THE MINISTER FOR MINERAL
RESOURCES

OF THE STATE

OF NEW SOUTH WALES

TO

Moolarben Coal Mines Pty Limited

ACN 108 601 672

and

Solita Moolarben Resources Pty Ltd

ACN 126 287 027

MINING ACT 1992

MINING LEASE

THIS DEED made the Twentieth day of December Two Thousand and Seven, in pursuance of the provisions of the Mining Act 1992 (hereinafter called "the Act") **BETWEEN IAN MACDONALD, MLC, MINISTER FOR MINERAL RESOURCES** of the State of New South Wales (hereinafter called "the Minister" which expression shall where the context admits or requires include the successors in office of the Minister and the person acting as such Minister for the time being) **AND Moolarben Coal Mines Pty Limited ACN 108 601 872 and Söjitz Moolarben Resources Pty Ltd ACN 126 287 027** (which with its successors and transferees is hereinafter called "the lease holder") of Level 14, 213 Miller Street, North Sydney, New South Wales, 2060.

WHEREAS

- (a) in conformity with the Act application was made for a mining lease over the lands hereinafter described; and
- (b) all conditions and things required to be done and performed before granting a mining lease under the Act have been done and performed NOW THIS DEED WITNESSETH that in consideration of the observance and performance of the covenants contained in this Deed and the payment of royalty by the lease holder, the Minister in pursuance of the provisions of the Act DOES HEREBY demise and lease to the lease holder ALL THAT piece or parcel of land containing by admeasurement 495.4 hectares as shown on Plan No M27112, more particularly described and delineated in the plan attached for the purpose of prospecting and mining for coal.

TO HOLD the said land together with any appurtenances thereon subject to:

- (a) such rights and interests as may be lawfully subsisting therein or which may be reserved by the Act at the date of this Deed; and
- (b) such conditions, provisions and stipulations as are contained in this Deed UNTO the lease holder from and including the date of this Deed for the term twenty-one (21) years for the purpose as stated and for no other purpose.

THAT in this lease except insofar as the context otherwise indicates or requires.

(a) any reference to an Act includes that Act and any Act amending or in substitution for the same; "Director-General" means the person for the time being holding office or acting as Director-General, Department of Primary Industries; the word "mine" has the meaning assigned to it by the Act; words importing the singular number shall include the plural, the masculine gender the feminine or neuter gender and vice versa; and

(b) any covenant on the part of two or more persons shall be deemed to bind them jointly and severally

2. THAT the lease holder shall during the said term pay to the Minister in Sydney in respect of all such minerals as stated, recovered from the land hereby demised, royalty at the rate or rates prescribed by the Act and the Regulations thereunder at the time the minerals are recovered, or at the rate or rates fixed by the Minister from time to time during the term of this demise in exercise of the power in that behalf conferred upon him by the Act.

3. THAT the lease holder shall at all times during the term of this lease keep and preserve the said mine from all avoidable injury or damage and also the levels, drifts, shafts, watercourses, roadways, works, erections and fixtures therein and thereon in good repair and condition and in such state and condition shall on the expiration or sooner determination of the said term or any renewal thereof deliver possession of the land and the premises hereby demised to the Minister or other persons authorised to receive possession thereof.

4. THAT the conditions and provisions set forth in the Schedule of Mining Lease Conditions 2004 herein and numbered: 1-23 (inclusive), 25-27 (inclusive) and 29 are embodied and incorporated within this Deed as conditions and provisions of the lease hereby granted AND that the lease holder shall observe fulfil and perform the same. Condition Nos. 2-8 (inclusive) and 17-24 (inclusive) are identified as conditions relating to environmental management for the purposes of Sections 125(3) and 374A of the Mining Act 1992.

PROVIDED always and it is hereby declared as follows:

- (a) THAT this lease is granted subject to amendment as provided under Section 79 of the Act
- (b) THAT if the lease holder at any time during the term of this demise:
 - (i) fails to fulfil or contravenes the covenants and conditions herein contained; or
 - (ii) fails to comply with any provision of the Act or the Regulations with which the lease holder is required to comply; or
 - (iii) fails to comply with the requirements of any agreement or assessment in relation to the payment of compensation,

this lease may be cancelled by the Minister by instrument in writing and the cancellation shall have effect from and including the date on which notice of the cancellation is served on the lease holder or on such later date as is specified in the notice; and any liability incurred by the lease holder before the cancellation took effect shall not be affected.

- (c) THAT no implied covenant for title or for quiet enjoyment shall be contained herein.
- (d) THAT all the conditions and provisions contained in the Mining Act 1992 and the Regulations thereunder, the Mines Inspection Act 1901 and the Coal Mines Regulation Act 1952 or any other law hereafter to be passed or prescribed shall be incorporated within this Deed as conditions and provisions of the lease granted. The lease holder hereby covenants to observe, fulfil and perform the same.
- (e) THAT such of the provisions and conditions declared and contained in this Deed as requiring anything to be done or not to be done by the lease holder, shall be read and construed as covenants by the lease holder with the Minister which are to be observed and performed.

IN WITNESS WHEREOF the parties hereto have executed this Deed the day and year first abovewritten.

SIGNED AND DELIVERED
BY

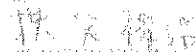
Moolarben Coal Mines Pty Limited
ACN 108 601 672



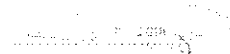
in the presence of


Witness

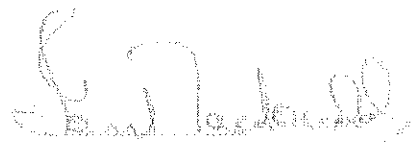
Sqiltz Moolarben Resources Pty Ltd
ACN 126 287 027



in the presence of


Witness

SIGNED AND DELIVERED
BY



in the presence of


Witness



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Mr Ian Callow
Project Manager
Moolarben Coal Mines Pty Limited
PO Box 1320
NORTH SYDNEY NSW 2060

Our Ref: 05/0156
Contact: Peta Johannessen
Telephone: (02) 4931 6613

Dear Sir

MINING LEASE APPLICATION NO 264

The Minister on 20 December 2007 granted Mining Lease No 1605 (Act 1992) in satisfaction of this application. This authority expires on 20 December 2028. The lease is enclosed for your records.

You are reminded of the following:

- * Mining operations must be conducted in accordance with a Mining Operations Plan satisfactory to the Director-General. This plan must be lodged before operations commence.
- * Before operations commence you must also negotiate an agreement regarding compensation with any affected landholder or have compensation assessed by the Warden.
- * Notification of the grant of the lease must be served on each affected landholder not later than 3 months from the date of grant.

As directed by the Minister, the land subject of this lease has been recorded in the Colliery Holding Register as part of Moolarben Colliery Holding.

If you have any queries, please contact me.

Yours faithfully

Peta Johannessen
for Director General
2 January 2008

MINERALS - 18113
Postal Address:
PO Box 114, Orange NSW 2813
Direct Address:
PO Box 114, Orange NSW 2813

ABN 51 735 124 150

Web site: www.dpi.nsw.gov.au
Fax: (02) 4931 6613

Office of State Revenue	
NSW Treasury	
Chest No: 1846688	2372
Date: N/A	Page No: 19-10-07
Add details: OXAL	

MINING LEASE

MINING ACT 1992

NO 1605

DATED: 20 DECEMBER 2007

THE MINISTER FOR MINERAL
RESOURCES

OF THE STATE

OF NEW SOUTH WALES

TO

Moolarben Coal Mines Pty Limited

ACN 108 601 672

and

Solitz Moolarben Resources Pty Ltd

ACN 126 287 027

MINING ACT 1992

MINING LEASE

THIS DEED made the Twentieth day of December Two Thousand and Seven, in pursuance of the provisions of the Mining Act 1992 (hereinafter called "the Act") BETWEEN IAN MACDONALD, MLC, MINISTER FOR MINERAL RESOURCES of the State of New South Wales (hereinafter called "the Minister" which expression shall where the context admits or requires include the successors in office of the Minister and the person acting as such Minister for the time being) AND Moolarben Coal Mines Pty Limited ACN 108 601 872 and Sojitz Moolarben Resources Pty Ltd ACN 126 287 027 (which with its successors and transferees is hereinafter called "the lease holder") of Level 14, 213 Miller Street, North Sydney, New South Wales, 2060.

WHEREAS

- (a) in conformity with the Act application was made for a mining lease over the lands hereinafter described; and
- (b) all conditions and things required to be done and performed before granting a mining lease under the Act have been done and performed NOW THIS DEED WITNESSETH that in consideration of the observance and performance of the covenants contained in this Deed and the payment of royalty by the lease holder, the Minister in pursuance of the provisions of the Act DOES HEREBY demise and lease to the lease holder ALL THAT piece or parcel of land containing by admeasurement 1098 hectares as shown on Plan No. M27050, more particularly described and delineated in the plan attached for the purpose of prospecting and mining for coal.

TO HOLD the said land together with any appurtenances thereon subject to:

- (a) such rights and interests as may be lawfully subsisting therein or which may be reserved by the Act at the date of this Deed; and
- (b) such conditions, provisos and stipulations as are contained in this Deed UNTO the lease holder from and including the date of this Deed for the term twenty-one (21) years for the purpose as stated and for no other purpose.

1 THAT in this lease except insofar as the context otherwise indicates or requires:

(a) any reference to an Act includes that Act and any Act amending or in substitution for the same, "Director-General" means the person for the time being holding office or acting as Director-General, Department of Primary Industries, the word "mine" has the meaning assigned to it by the Act; words importing the singular number shall include the plural, the masculine gender the feminine or neuter gender and vice versa; and

(b) any covenant on the part of two or more persons shall be deemed to bind them jointly and severally.

2. THAT the lease holder shall during the said term pay to the Minister in Sydney in respect of all such minerals as stated, recovered from the land hereby demised, royalty at the rate or rates prescribed by the Act and the Regulations thereunder at the time the minerals are recovered, or at the rate or rates fixed by the Minister from time to time during the term of this demise in exercise of the power in that behalf conferred upon him by the Act.

3. THAT the lease holder shall at all times during the term of this lease keep and preserve the said mine from all avoidable injury or damage and also the levels, drifts, shafts, watercourses, roadways, works, erections and fixtures therein and thereon in good repair and condition and in such state and condition shall on the expiration or sooner determination of the said term or any renewal thereof deliver possession of the land and the premises hereby demised to the Minister or other persons authorised to receive possession thereof.

4. THAT the conditions and provisions set forth in the Schedule of Mining Lease Conditions 2004 herein and numbered: 1-25 (inclusive) and 26-27 (inclusive), are embodied and incorporated within this Deed as conditions and provisions of the lease hereby granted AND that the lease holder shall observe fulfil and perform the same. Condition Nos. 2-8 (inclusive) and 17- 24 (inclusive) are identified as conditions relating to environmental management for the purposes of Sections 125(3) and 374A of the Mining Act 1992.

PROVIDED always and it is hereby declared as follows:

- (a) THAT this lease is granted subject to amendment as provided under Section 79 of the Act.
- (b) THAT if the lease holder at any time during the term of this demise
 - (i) fails to fulfil or contravenes the covenants and conditions herein contained; or
 - (ii) fails to comply with any provision of the Act or the Regulations with which the lease holder is required to comply; or
 - (iii) fails to comply with the requirements of any agreement or assessment in relation to the payment of compensation.

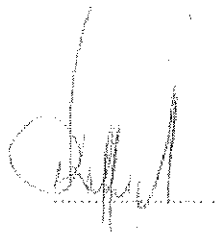
this lease may be cancelled by the Minister by instrument in writing and the cancellation shall have effect from and including the date on which notice of the cancellation is served on the lease holder or on such later date as is specified in the notice; and any liability incurred by the lease holder before the cancellation took effect shall not be affected.

- (c) THAT no implied covenant for title or for quiet enjoyment shall be contained herein.
- (d) THAT all the conditions and provisions contained in the Mining Act 1982 and the Regulations thereunder, the Mines Inspection Act 1981 and the Coal Mines Regulation Act 1982 or any other law hereafter to be passed or prescribed shall be incorporated within this Deed as conditions and provisions of the lease granted. The lease holder hereby covenants to observe, fulfil and perform the same.
- (e) THAT such of the provisions and conditions declared and contained in this Deed as requiring anything to be done or not to be done by the lease holder, shall be read and construed as covenants by the lease holder with the Minister which are to be observed and performed.

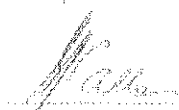
IN WITNESS WHEREOF the parties hereto have executed this Deed this day and year first abovesigned.

SIGNED AND DELIVERED
BY

Moolarben Coal Mines Pty Limited
ACN 108 601 672



in the presence of


Witness

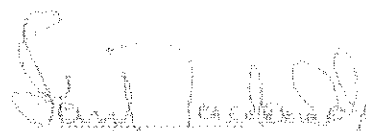
Scijitz Moolarben Resources Pty Ltd
ACN 126 287 027



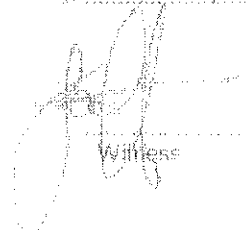
in the presence of


Witness

SIGNED AND DELIVERED
BY



in the presence of


Witness

附件 2—Mandalong 礦之礦權文件

NOTE: THIS DOCUMENT IS TO
BE FILED IN THE MINING ACT 1992
FILE NO. 1543

MINING LEASE

MINING ACT 1992

NO. 1543

DATED 25 November A.D. 2003

THE MINISTER FOR MINERAL RESOURCES
OF THE STATE
OF NEW SOUTH WALES
TO

Centennial Mandalong Pty Limited
A.C.N. 101 508 892

RECORDED in the Department of Mineral
Resources at Sydney, this
1st day of December
A.D. 2003, at the hour of 2
o'clock in the afternoon.


for Director General

MINING ACT 1992

MINING LEASE

NEW STAMP DUTY
CL. No. 1043000 COAL MINING LEASE
2000-2001-2002

THIS DEED made the 25th day of November Two Thousand and Three, in pursuance of the provisions of the Mining Act 1992 (hereinafter called "the Act") BETWEEN KERRY HICKEY, MINISTER FOR MINERAL RESOURCES of the State of New South Wales (hereinafter called "the Minister" which expression shall where the context admits or requires include the successors in office of the Minister and the person acting as such Minister for the time being) AND Centennial Mandaiong Pty Limited A.C.N. 101 508 892 (which with its successors and transferees is hereinafter called "the lease holder") 4th Floor, 140 Sussex St SYDNEY 2000 in the state of NSW.

WHEREAS

- (a) in conformity with the Act application was made for a mining lease over the lands hereinafter described; and
- (b) all conditions and things required to be done and performed before granting a mining lease under the Act have been done and performed NOW THIS DEED WITNESSETH that in consideration of the observance and performance of the covenants contained in this Deed and the payment of royalty by the lease holder, the Minister in pursuance of the provisions of the Act DOES HEREBY demise and lease to the lease holder ALL THAT piece or parcel of land containing by admeasurement 172.5 Hectares and more particularly described and delineated in the plan Catalogue No. M26936 attached for the purpose of prospecting and mining for coal.

TO HOLD the said land together with any appurtenances thereon subject to:

- (a) such rights and interests as may be lawfully subsisting therein or which may be reserved by the Act at the date of this Deed; and
 - (b) such conditions, provisos and stipulations as are contained in this Deed UNTO the lease holder from and including the date of this Deed for the period of 21 years for the purpose as stated and for no other purpose.
- 1 THAT in this lease except insofar as the context otherwise indicates or requires:
- (a) any reference to an Act includes that Act and any Act amending or in substitution for the same; "Director General" means the person for the time being holding office or acting as Director General, Department of Mineral Resources, Sydney; the word "mine" has the meaning assigned to it by the Act; words importing the singular number shall include the plural, the masculine gender the feminine or neuter gender and vice versa; and
 - (b) any covenant on the part of two or more persons shall be deemed to bind them jointly and severally.
- 2 THAT the lease holder shall during the said term pay to the Minister in Sydney in respect to of all such minerals as stated, recovered from the land hereby demised, royalty at the rate or rates prescribed by the Act and the Regulations thereunder at

the time the minerals are recovered, or at the rate or rates fixed by the Minister from time

to time during the term of this demise in exercise of the power in that behalf conferred upon him by the Act.

- 3 THAT the lease holder shall at all times during the term of this lease keep and preserve the said mine from all avoidable injury or damage and also the levels, drifts, shafts, watercourses, roadways, works, erections and fixtures therein and thereon in good repair and condition and in such state and condition shall on the expiration or sooner determination of the said term or any renewal thereof deliver possession of the land and the premises hereby demised to the Minister or other persons authorised to receive possession thereof.
- 4 THAT the conditions and provisions set forth in the Schedule of Conditions of Authority herein and numbered:- 1, 2, 3, 19, 20, 22, 23, 27, 31, 41, 44 to 51 inclusive, are embodied and incorporated within this Deed as conditions and provisions of the lease hereby granted AND that the lease holder shall observe fulfil and perform the same.

PROVIDED always and it is hereby declared as follows:

- (a) THAT this lease is granted subject to amendment as provided under Section 79 of the Act.
- (b) THAT if the lease holder at any time during the term of this demise -
 - (i) fails to fulfil or contravenes the covenants and conditions herein contained; or
 - (ii) fails to comply with any provision of the Act or the Regulations with which the lease holder is required to comply; or
 - (iii) fails to comply with the requirements of any agreement or assessment in relation to the payment of compensation,

this lease may be cancelled by the Minister by instrument in writing and the cancellation shall have effect from and including the date on which cancellation is served on the lease holder or on such later date as is specified in the notice; and any liability incurred by the lease holder before the cancellation took effect shall not be affected.

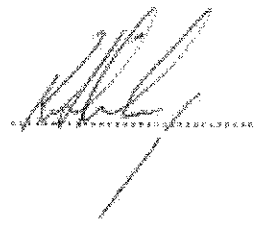
- (c) THAT no implied covenant for title or for quiet enjoyment shall be contained herein.
- (d) THAT all the conditions and provisions contained in the Mining Act 1992 and the Regulations thereunder, the Mines Inspection Act 1901 and the Coal Mines Regulations Act 1982 or any other law hereafter to be passed or prescribed shall be incorporated within this Deed as conditions and provisions of the lease granted. The lease holder hereby covenants to observe, fulfil and perform the same.
- (e) THAT such of the provisions and conditions declared and contained in this Deed as requiring anything to be done or not to be done by the lease holder, shall be read and

construed as covenants by the lease holder with the Minister which are to be observed and performed.

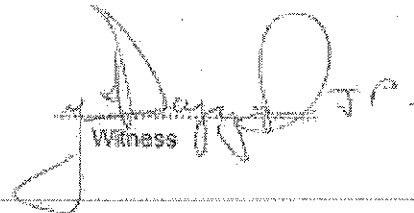
IN WITNESS WHEREOF the parties hereto have executed this Deed this day and year first abovesigned.

SIGNED AND DELIVERED
BY THE HONOURABLE
KERRY HICKEY,

as such Minister as aforesaid



in the presence of

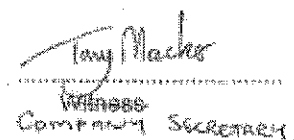

Witness

SIGNED ^(TM) ~~SEAL~~ AND DELIVERED
by the said

Centennial Mandalong Pty Limited
A.C.N. 101 508 892


D. Cameron

in the presence of


Witness
Company Secretary

N.S.W. STAMP DUTY	
CL No. 18-10080	COLL. IN WHOLESALE
1997 - 1998 - 1999	2.5.99
MINING LEASE	

MINING ACT 1992

NO. 1443

DATED 1 MARCH A.D. 1999

THE MINISTER FOR MINERAL RESOURCES
OF THE STATE
OF NEW SOUTH WALES
TO

POWERCOAL PTY LTD
A.C.N. 052 533 070

RECORDED in the Department of Mineral
Resources at Sydney, this
2nd day of March
A.D. 1999 at the hour of 12
o'clock in the noon.

J. Beattie
for Director General

MINING ACT 1992

MINING LEASE

THIS DEED made the ^{15th} day of ~~MARCH~~ One thousand nine hundred and ninety-nine, in pursuance of the provisions of the Mining Act 1992 (hereinafter called "the Act") BETWEEN THE HONOURABLE Robert Douglas Martin MP, Minister for Mineral Resources of the State of New South Wales (hereinafter called "the Minister" which expression shall where the context admits or requires include the successors in office of the Minister and the person acting as such Minister for the time being) AND Powercoal Pty Ltd, A.C.N. 052 533 070 (which with its successors and transferees is hereinafter called "the lease holder").

WHEREAS

- (a) in conformity with the Act application was made for a mining lease over the lands hereinafter described; and
- (b) all conditions and things required to be done and performed before granting a mining lease under the Act have been done and performed NOW THIS DEED WITNESSETH that in consideration of the observance and performance of the covenants contained in this Deed and the payment of royalty by the lease holder, the Minister in pursuance of the provisions of the Act DOES HEREBY demise and lease to the lease holder ALL THAT piece or parcel of land containing by admeasurement about 3648 hectares and more particularly described and delineated in the plan Catalogue No. M26872R, attached for the purpose of prospecting and mining for coal.

TO HOLD the said land together with any appurtenances thereon subject to:

- (a) such rights and interests as may be lawfully subsisting therein or which may be reserved by the Act at the date of this Deed; and
- (b) such conditions, provisos and stipulations as are contained in this Deed UNTO the lease holder from and including the date of this Deed for the period of twenty-one years for the purpose as stated and for no other purpose.

1 THAT in this lease except insofar as the context otherwise indicates or requires:

- (a) any reference to an Act includes that Act and any Act amending or in substitution for the same; "Director General" means the person for the time being holding office or acting as Director General, Department of Mineral Resources, Sydney; the word "mine" has the meaning assigned to it by the Act; words importing the singular number shall include the plural, the masculine gender the feminine or neuter gender and vice versa; and
- (b) any covenant on the part of two or more persons shall be deemed to bind them jointly and severally.

2 THAT the lease holder shall during the said term pay to the Minister in Sydney in respect to of all such minerals as stated, recovered from the land hereby demised, royalty at the rate or rates prescribed by the Act and the Regulations thereunder at the time the minerals are recovered, or at the rate or rates fixed by the Minister from time

to time during the term of this demise in exercise of the power in that behalf conferred upon him by the Act.

- 3 THAT the lease holder shall at all times during the term of this lease keep and preserve the said mine from all avoidable injury or damage and also the levels, drifts, shafts, watercourses, roadways, works, erections and fixtures therein and thereon in good repair and condition and in such state and condition shall on the expiration or sooner determination of the said term or any renewal thereof deliver possession of the land and the premises hereby demised to the Minister or other persons authorised to receive possession thereof.
- 4 THAT the conditions and provisions set forth in the Schedule of Conditions of Authority herein and numbered:- 1-3 inclusive, 9, 11, 14-15 inclusive, 18-27 inclusive, 30-33 inclusive, 37, 41, 43-56 inclusive, are embodied and incorporated within this Deed as conditions and provisions of the lease hereby granted AND that the lease holder shall observe fulfil and perform the same.

PROVIDED always and it is hereby declared as follows:

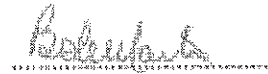
- (a) THAT this lease is granted subject to amendment as provided under Section 79 of the Act.
- (b) THAT if the lease holder at any time during the term of this demise -
 - (i) fails to fulfil or contravenes the covenants and conditions herein contained; or
 - ~~(ii) fails to comply with any provision of the Act or the Regulations with which the lease holder is required to comply; or~~
 - (iii) fails to comply with the requirements of any agreement or assessment in relation to the payment of compensation,

this lease may be cancelled by the Minister by instrument in writing and the cancellation shall have effect from and including the date on which cancellation is served on the lease holder or on such later date as is specified in the notice; and any liability incurred by the lease holder before the cancellation took effect shall not be affected.

- (c) THAT no implied covenant for title or for quiet enjoyment shall be contained herein.
- (d) THAT all the conditions and provisions contained in the Mining Act 1992 and the Regulations thereunder, the Mines Inspection Act 1901 and the Coal Mines Regulations Act 1982 or any other law hereafter to be passed or prescribed shall be incorporated within this Deed as conditions and provisions of the lease granted. The lease holder hereby covenants to observe, fulfil and perform the same.
- (e) THAT such of the provisions and conditions declared and contained in this Deed as requiring anything to be done or not to be done by the lease holder, shall be read and construed as covenants by the lease holder with the Minister which are to be observed and performed.

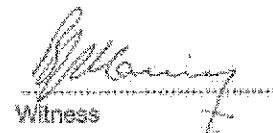
IN WITNESS WHEREOF the parties hereto have executed this Deed this day and year first
abovewritten.

SIGNED AND DELIVERED
BY THE HONOURABLE
ROBERT DOUGLAS MARTIN MP



as such Minister as aforesaid

in the presence of

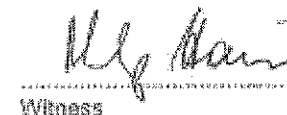


Witness

SIGNED SEALED AND DELIVERED
by the said
Powercoal Pty Ltd
A.C.N. 052 533 070



in the presence of



Witness

燃料處燃煤組-林盈德

寄件者: Linh Bui [linh.bui@centennialcoal.com.au]
寄件日期: 2011年5月10日星期二 下午 2:56
收件者: o161810@taipower.com.tw
副本: o163339@taipower.com.tw; Brendon Wilson
主旨: fw: 2011 Taipower term coal tender PQ documents (Mandalong)
郵件標籤: 待處理
標頭狀態: 紅色

Dear Stanley,

Please see answer to question 1 and 2.

I am hoping to send you the rest of the information for Question 3 and 4 by this week and thank you for your patience.

Question 1:

Is the ML 1543 an extension for ML1443? Who is the holder of ML 1443 now, is it Centennial Coal Company Limited or Centennial Mandalong Pty Ltd?

Answer:

At the time ML1443 was granted title to the area that was to become ML1543 was held by a neighbouring mining company as part of Authorisation A405.

ML1543 was granted several years after ML1443 although the coal within ML1543 was always recognised as part of the Mandalong Mine Project.

ML1543 is an extension to the coal reserves in ML1443 and both titles are held by Centennial Mandalong Pty Limited.

Question 2:

Could you explain the relationship between Centennial Coal Sales and Marketing Pty Ltd and Centennial Mandalong Pty Ltd?

Answer:

Centennial Mandalong Pty Ltd and Centennial Coal Sales and Marketing Pty Ltd are both 100% fully owned subsidiaries of Centennial Coal Company Limited and therefore Centennial Coal Company Limited is the parent company of both and Centennial Mandalong Pty Ltd and Centennial Coal Sales and Marketing Pty Ltd. Centennial Mandalong Pty Ltd is the operating mine.

Centennial Coal Sales and Marketing Pty Ltd is acting as agent for and on behalf of Centennial Mandalong Pty Ltd.

Kind regards

Linh Bui
Marketing Office Manager & Logistics
☎ 9266 2700
☎ 0400 368 065
✉ linh.bui@centennialcoal.com.au
🌐 www.centennialcoal.com.au

2011/5/16

CC/L/0020

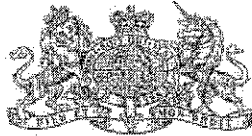
PART 7
Form Shrovet II

QUEENSLAND
MINERAL RESOURCES ACT 1989

Section 234

Volumes 107
Folio 26

ML 1884
Formerly :
ML 1874
Clermont



MINING LEASE

ELIZABETH THE SECOND, by the Grace of God, Queen of Australia,
and Her other Realms and Territories, Head of the Commonwealth:

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

The Governor in Council, with the advice of the Executive Council of Our State of Queensland, and pursuant to the Mining Act 1968 -1982 Granted, Demised and Leased as a Mining Lease unto CLERMONT COAL MINES PTY LIMITED the land described in Schedule 1 for the term of Twenty-one years commencing on the First day of April, 1983 at a rental at the rate of \$15.00 per hectare per annum, for the purpose of mining for Coal. Upon commencement of the Mineral Resources Act 1989, the Mining Lease was deemed to be a Mining Lease under that Act for the remainder of its term subject to the general conditions and reservations described in Schedule 2 and subject to the special covenants and conditions specified in Schedule 3.

I, THE HONOURABLE STEPHEN ROBERTSON, MINISTER FOR NATURAL RESOURCES AND MINISTER FOR MINES for the State of Queensland, pursuant to the Mineral Resources Act 1989, hereby issue this Instrument of Lease.

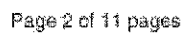
Dated at Brisbane this 16th day of January, 2002.

A handwritten signature in dark ink, appearing to read 'S. Robertson'.

for Minister for Natural Resources and Minister for Mines

DESCRIPTION OF LAND

Deleted or inhibited plants may be rejected - please keep the seed



Mining Lease No. 1884

ENDORSEMENTS

Pursuant to Section 44(3) of the Mining Act 1988-1982, the Governor in Council on 31st day of March, 1983 approved the disturbance of those parts of the surface of the Peak Downs Highway included in the Mining Lease, the Main Roads Department having the care and management of the Reserve having no objection.

[Signature]
for Minister

This is to certify that the assignment of 45.0% interest in the within lease from Clermont Coal Mines Pty Limited to MITSUBISHI DEVELOPMENT PTY LTD was approved on the 4th day of July, 1986.

[Signature]
for Minister

This is to certify that CLERMONT COAL PROPERTIES PTY LIMITED has been recorded as the holder of 55.0% interest of the within lease the name of the Company Clermont Coal Mines Pty Limited having been changed to CLERMONT COAL PROPERTIES PTY LIMITED.

Date Recorded: 14th day of May, 1990.

[Signature]
for Minister

This is to certify that the assignment of 55.0% interest in the within lease from Clermont Coal Properties Pty Limited to THE COAL CLIFF COLLIERIES PTY LIMITED and ARCO RESOURCES LIMITED in the interests of 35.5004% and 19.4996% respectively was approved on the 21st day of June, 1994.

[Signature]
for Minister

This is to certify that QUEENSLAND COAL PTY LIMITED has been recorded as the holder of 35.5004% interest of the within lease the name of the Company The Coal Cliff Collieries Pty Limited having been changed to QUEENSLAND COAL PTY LIMITED.

Date Recorded: 23rd day of August, 1995.

[Signature]
for Minister

This is to certify that the assignment of 19.4996% interest in the within lease from Arco Resources Limited to QUEENSLAND COAL PTY LIMITED was approved on the 15th day of November, 1999.

[Signature]
for Minister

4.9%

QUEENSLAND COAL PTY LIMITED

EPDC (AUSTRALIA) PTY LTD

15%

JANUARY 2004

NATHAN BROWN

104%

MITSUBISHI DEVELOPMENT PTY LTD

EPDC (AUSTRALIA) PTY LTD

15%

JANUARY 2004

NATHAN BROWN

Mining Lease No. 1884

ENDORSEMENTS

Pursuant to the provisions of Section 286 of the *Mineral Resources Act, 1989* and after consideration of the standard criteria set out under the *Environmental Protection Act, 1994* the Governor in Council on the 25th day of November, 2004 renewed the within lease for a term of 21 years, commencing on the 1st day of April, 2004 subject to only those conditions prescribed by the *Mineral Resources Act, 1989*. For the purpose of clarification, from the date the lease was renewed on the 25th day of November 2004, the special covenants and conditions contained in Schedule 3 to the lease ceased to apply.

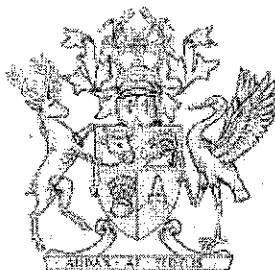

for Minister

This is to certify that the assignment of 3.5% interest in the within lease from Mitsubishi Development Pty Limited to JCD AUSTRALIA PTY LIMITED was approved on the 27th day of June, 2007.


for Minister

QUEENSLAND
MINERAL RESOURCES ACT 1989
Section 234

ML 70343



MINING LEASE

The Governor in Council for the State of Queensland pursuant to the *Mineral Resources Act 1989* ("the Act"), hereby grants to the person described at Item 1 below as the Holder, a lease over the land described in Schedule 1 (the "Mining Lease"). The Mining Lease is subject to the terms and conditions indicated hereunder, the general conditions and reservations specified in Schedule 2, the special conditions and reservations specified in Schedule 3 and the native title conditions specified in Schedule 4.

- | | | |
|---|---|------------------------------------|
| 1. Holders: | QUEENSLAND COAL PTY LIMITED
MITSUBISHI DEVELOPMENT PTY LTD
EPDC (AUSTRALIA) PTY LIMITED | Share (%)
50.1%
34.9%
15% |
| 2. Tenancy Type: | Tenancy in Common | |
| 3. Purposes of Mining Lease (specify the Mineral sought): | Coal | |
| 4. Term of Mining Lease: | 21 years | |
| 5. Date of commencement of Mining Lease: | First of December 2008 | |
| 6. Date of expiry of Mining Lease: | Thirtieth of November 2027 | |
| 7. Rental payable by holder: | The amount of rental shall be the amount prescribed in respect of the year which the rental period falls subject to section 290 of the Act. | |

I, THE HONOURABLE STEPHEN ROBERTSON, MINISTER FOR MINES AND ENERGY for the State of Queensland, pursuant to the *Mineral Resources Act 1989*, hereby issues this Instrument of Lease.

Dated at EMERALD this Nineteenth of May, 2010


for Minister for Mines and Energy

SCHEDULE 1

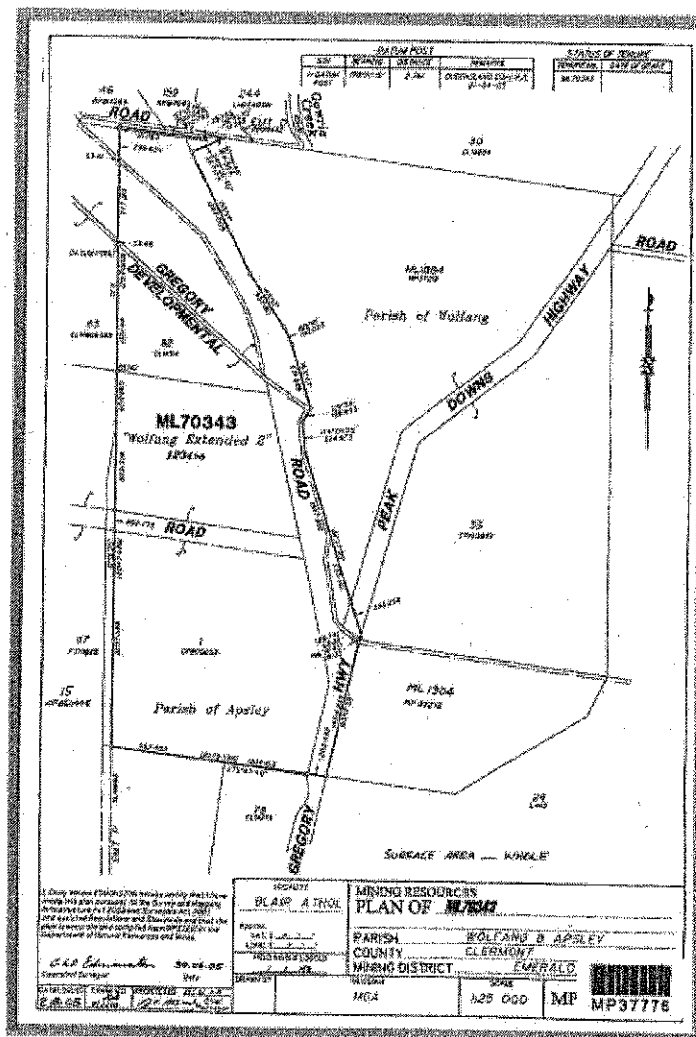
DESCRIPTION OF LAND

Name of Mining Lease: Wolfgang Extended #2

Area: 1234 ha

Surface Area: 1234 ha

Description by survey of the land granted is shown on the diagram endorsed on these Presents and survey plan catalogue number MP37776 held at the Department of Mines and Energy, Brisbane.



ENDORSEMENTS

This is certify that J-Power Australia Pty Ltd has been recorded as the holder of 15 % interest of the written lease, the name of the Company EPDC (Australia) Pty Ltd having been changed to J-Power Australia Pty Ltd.

Date recorded: 11th Day of October 2005.



This is to certify that the assignment of 3.5% interest in the within lease from Mitsubishi Development Pty Ltd to JCD Australia PTY LTD was approved this 27th day of June 2007.



Our Ref: ML 70334
Contact: Angela McCarthy
Telephone: (07) 4987 9372
Facsimile: (07) 4987 9333



27 November 2006

Queensland Coal Pty Ltd
Level 3 – West Tower
410 Anne Street
BRISBANE QLD 4000

Dear Sir/Madam

MINING LEASE NUMBER LEASE NO 70334

The Governor in Council on 23 November, granted Mining Lease Number 70334 for a term 21 years commencing from 1 December 2006.

Please find the following attached:-

- Register printout.
- Graphic sketch showing the boundaries of the lease.
- Plain English version of the conditions of the *Mineral Resources Act 1989 and Regulations*.

If you have any queries, please contact the Mining Registrar at the above address.

Pursuant to Section 288 of the *Mineral Resources Act 1989* you must notify each owner of land covered by the mining lease of the grant of the lease. Such notice must be given within 20 business days after you have received advice of the grant of the mining lease.

Pro rata rent is now due from the commencement of the term of the mining lease to 31 December 2006. An amount of \$97.61 (includes GST of \$8.87), is payable within 20 business days of the date of this letter.

Also, rent for the end 2007 amounting to \$1219.40 (includes GST of \$110.85) is payable before 31 December 2006.

Environmental Authority Number MIN100340805 has been issued in respect of this mining lease in accordance the provisions of the *Environmental Protection Act 1994*.

Also, pursuant to the *Environmental Protection Act 1994* you must submit a Plan of Operations for the Environmental Authority prior to carrying out, or allowing the carrying out, of an activity under the relevant mining lease.

Part 7AA - MINERAL RESOURCES ACT 1989 - PROVISIONS FOR COAL SEAM GAS

Limited entitlement to mine coal seam gas

Section 318CL of the *Mineral Resources Act 1989* provides that the mining lease holder may mine coal seam gas in the area of the lease only if:

- The mining happens as a necessary result of coal or oil shale mining carried out under the mining lease; or

Emerald District Office
P O Box 19
EMERALD QLD 4720
Telephone +61 7 4987 9300
Facsimile +61 7 4987 9333
Website www.nrm.qld.gov.au
ABN 83 705 537 586



Queensland Department of Mines and Energy
Mining Lease Report - Public

24 Nov 2006 01:58 pm

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MLR_470 2.2.5

Tenure Id: ML 70334

District: EMERALD

Previous Id:

Name of Lease: WOLFANG EXTENDED #3

Status: GRANTED

Sub-Status:

NT Process: EXCLUSIVE LAND

Impact: HIGH IMPACT

Pre-requisite Tenure Ids

S316

Principal Holder

QUEENSLAND COAL PTY LIMITED

LEVEL 3 - WEST TOWER

410 ANN STREET

BRISBANE

QLD

4000

<u>Holder Names</u>	<u>Share %</u>	<u>Status</u>	<u>Deal In</u>	<u>Date Appv</u>	<u>Deal Out</u>
J-POWER AUSTRALIA PTY LTD	15.0000	Current	1005427	11-OCT-2005	
QUEENSLAND COAL PTY LIMITED	50.1000	Current	0	29-JUL-2004	
MITSUBISHI DEVELOPMENT PTY LTD	34.9000	Current	0	29-JUL-2004	
EPDC (AUSTRALIA) PTY LTD	15.0000	Former	0	29-JUL-2004	1005427

Marked Out Date and Time: 29-JUL-2004 01:00 PM

Lodged Date and Time: 29-JUL-2004 02:00 PM

Term Sought: 21 years

Certificate of Application Issued: 04-AUG-2004

Situated Within at Date Lodged

Area: 25.9708 Ha

Surface Area: 25.9708 Ha

Local Authorities

BELYANDO

Minerals / Purpose

CONVEYOR BELT

TRANSPORT-VEHICULAR-HAUL ROAD

Locality

11KM NORTH OF CLERMONT



Queensland Department of Mines and Energy
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MLR_470 2.2.5

Tenure Id: ML 70334

Date of Grant: 23-NOV-2006

Act Granted Under: MINERAL RESOURCES ACT 1989

Plan Number Previous Plan Number Volume Folio

General Remarks

Renewal Processes

Notice Issued:

Lodged:

Approved:

Term History

<u>Commenced</u>	<u>Expiry</u>	<u>Years</u>
01-DEC-2006	30-NOV-2027	21

Background Tenures

	<u>Land Usage</u>	<u>Compensation Required</u>	<u>Finalised</u>
LOT 18 ON CLM628 GHPL 12/2525 PAR APSLEY CO CLERMONT	Mining	Y	17-JAN-2006
LOT 83 ON CLM806555 GHPL 12/2210 PAR APSLEY CO CLERMONT	Mining	Y	17-JAN-2006
LOT 84 ON CP901140 GHPL 12/2210 PAR APSLEY CO CLERMONT	Mining	Y	17-JAN-2006
ROAD RESERVE BLAIR ATHOL CONNECTION ROAD PAR APSLEY CO CLERMONT	Mining	Y	31-JAN-2006

<u>Dealing Name</u>	<u>Dealing Number</u>	<u>Action Initiated</u>	<u>Expected Completion</u>	<u>Actual Completion</u>
ASSIGNMENT INDICATION	1004847	18-JUL-2005	31-JUL-2005	20-JUL-2005
Remarks: ASN - 3.5% INTEREST FROM MITSUBISHI DEVELOPMENT P/L TO J.C.D.AUSTRALIA P/L				
ASSIGNMENT INDICATION	1007825	01-SEP-2006	30-SEP-2006	01-SEP-2006
Remarks: PROPOSED ASSIGNMENT OF 3% OF MITSUBISHI DEVELOPMENT PTY LTD'S INTEREST TO J.C.D. AUSTRALIA PTY LTD				

CC/L/0019

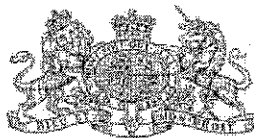
Part 1
Form Number 5

QUEENSLAND
MINERAL RESOURCES ACT 1989

Section 234

Volume 197
Folio 27

ML 1904
Formerly :
ML 1960
Clermont



MINING LEASE

ELIZABETH THE SECOND, by the Grace of God, Queen of Australia,
and Her other Realms and Territories, Head of the Commonwealth.

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

The Governor in Council, with the advice of the Executive Council of Our State of Queensland, and pursuant to the Mining Act 1968 -1982 Granted, Demised and Leased as a Mining Lease unto CLERMONT COAL MINES PTY LIMITED the land described in Schedule 1 for the term of Twenty-one years commencing on the First day of April, 1983 at a rental at the rate of \$15.00 per hectare per annum, for the purpose of Overburden Disposal, Railway and Loading Facilities, Workshops, Administration and Employee Facilities, Water Storage and Pipelines, Roadways, Power Transmission, Stockpiling Coal and Fencing associated with the winning of Coal from Mining Lease 1884 (Formerly ML 1874 Clermont) Upon commencement of the Mineral Resources Act 1989, the Mining Lease was deemed to be a Mining Lease under that Act for the remainder of its term subject to the general conditions and reservations described in Schedule 2 and subject to the special covenants and conditions specified in Schedule 3.

I, THE HONOURABLE STEPHEN ROBERTSON, MINISTER FOR NATURAL RESOURCES AND MINISTER FOR MINES for the State of Queensland, pursuant to the Mineral Resources Act 1989, hereby issue this Instrument of Lease.

Dated at Brisbane this 16th day of January, 2002.

A handwritten signature in dark ink, appearing to read 'D. Robertson'.

for Minister for Natural Resources and Minister for Mines

Mining Lease No. 1904

ENDORSEMENTS

Pursuant to Section 44(3) of the Mining Act 1968-1982, the Governor in Council on 31st day of March, 1983 approved the disturbance of those parts of the surfaces of Stock Route and R80 - Stock Trucking Reserve, the Balyando Shire Council having the care and management, and the Peak Downs Highway, Gregory Highway and Gregory Developmental Road included in the Mining Lease, the Main Roads Department having the care and management, both having no objection.


for Minister

Pursuant to Section 44(3) of the Mining Act 1968-1983, the Governor in Council on the 14th day of March, 1985 approved the disturbance of those parts of the surface of State Forest 117 included in the Mining Lease, the Department of Forestry having the care and management of the Reserve having no objection subject to certain conditions.

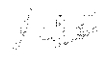

for Minister

Pursuant to Section 32A of the Mining Act 1968-1983, the Governor in Council on the 14th day of March, 1985 approved that the Special Conditions to which this Lease is presently subject be varied by the inclusion of the following Special Conditions, the agreement of the Lessees to such variation having been obtained.

27. The Lessee shall inform the local Forestry Officer of any sampling operation not less than 21 days prior to the commencement thereof.
28. The Lessee shall ensure that unnecessary damage is not caused to trees of commercial timber species.
29. The Lessee shall pay to the Conservator of Forests the assessed value of any damaged commercial timber species on State Forest 117 as determined by the Conservator.
30. Prior to the commencement of sampling operations the Lessee shall lodge with the Conservator of Forests a deposit of \$1,000.00 to be held for the duration of such operations as security against loss or damage which may be occasioned to the State Forest and as a guarantee for the observance of conditions 27, 28 and 29 hereof.


for Minister

This is to certify that the assignment of 45.0% interest in the within lease from Clermont Coal Mines Pty Limited to MITSUBISHI DEVELOPMENT PTY LTD was approved on the 4th day of July, 1986.


for Minister

This is to certify that CLERMONT COAL PROPERTIES PTY LIMITED has been recorded as the holder of 55.0% interest of the within lease the name of the Company Clermont Coal Mines Pty Limited having been changed to CLERMONT COAL PROPERTIES PTY LIMITED.

Date Recorded: 14th day of May, 1990.


for Minister

Mining Lease No. 1904

ENDORSEMENTS

This is to certify that the assignment of 55.0% interest in the within lease from Clermont Coal Properties Pty Limited to THE COAL CLIFF COLLIERIES PTY LIMITED and ARCO RESOURCES LIMITED in the interests of 35.5004% and 19.4996% respectively was approved on the 21st day of June, 2004.


for Minister

This is to certify that the assignment of 10.1% interest in the within lease from Mitsubishi Development Pty Limited to EPDC (AUSTRALIA) PTY LIMITED was approved on the 15th day of January, 2004.


for Minister

This is to certify that QUEENSLAND COAL PTY LIMITED has been recorded as the holder of 35.5004% interest of the within lease the name of the company The Coal Cliff Collieries Pty Limited having been changed to QUEENSLAND COAL PTY LIMITED.

Date Recorded: 23rd day of August, 1995.


for Minister

Pursuant to the provisions of Section 288 of the *Mineral Resources Act, 1989* and after consideration of the standard criteria set out under the *Environmental Protection Act, 1994* the Governor in Council on the 25th day of November, 2004 renewed the within lease for a term of 21 years, commencing on the 1st day of April, 2004 subject to only those conditions prescribed by the *Mineral Resources Act, 1989*. For the purpose of clarification, from the date the lease was renewed on the 25th day of November 2004, the special covenants and conditions contained in Schedule 3 to the lease ceased to apply.


for Minister

This is to certify that the assignment of 19.4996% interest in the within lease from Arco Resources Limited to QUEENSLAND COAL PTY LIMITED was approved on the 15th day of November, 1999.


for Minister

This is to certify that the assignment of 4.9% interest in the within lease from Queensland Coal Pty Limited to EPDC (AUSTRALIA) PTY LIMITED was approved on the 15th day of January, 2004.

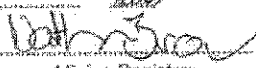

for Minister

Mining Lease No. 1904

ENDORSEMENTS

Surrender of 1233.9608 hectares from
the mining lease in favour of the grant of
Mining Lease Number 70343 accepted on
23 November 2006.


for Minister

This is to certify that the assignment of	
3.5%	interest in the within lease
from MISSOURI DEVELOPMENT	
Pty. Ltd.	
to J.C.D. AUSTRALIA Pty. Ltd.	
was approved on the 22nd day	
of June 2007	
	
Nathan Brown	Mining Registrar

