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4.0 EXISTING MINING OPERATIONS

Key points

- The current MCC No. 1 Open Cut coal mine has operated under a succession of mining titles issued under the relevant legislation since operations commenced in 1944;
- The existing No. 2 Open Cut coal mine produces thermal coal for both export and domestic markets. Coal is hauled by highway trucks to the Ravensworth Coal Terminal and then transported by rail to the Port of Newcastle for export. Coal with a higher ash content is hauled from the site to local power stations;
- Current coal production levels are approximately 1.4 Mtpa; but have been as high as 1.7 Mtpa in the past;
- The No. 2 Open Cut is expected to cease mining coal in 2005;
- Coal produced from the Greta Coal Measures by MCC does not require treatment by a coal preparation plant prior to sale;
- The mine currently employs 69 permanent employees with the use of, on average, 39 contracted and casual employees. The size of the workforce is not expected to increase as a result of this proposal;
- Existing operations are being constrained by;
  - cindering of seams to the north west,
  - to the east, coal dips down the eastern side of the Muswellbrook Anticline at angles up to 60 degrees, and,
  - seams to the east are also thin and intersected by the Aberdeen Thrust Fault;
- The existing mine has been designed for minimal environmental impact:
  - environmental monitoring programs measure noise, vibration, dust and water quality.
  - rehabilitation work is actively performed,
  - fuel storages are fully contained by bunds to prevent accidental spillages,
  - blasting is conducted in accord with a recently reviewed blasting protocol,
  - potential spontaneous combustion is treated by correct placement of material prone to spontaneous combustion, monitoring and reporting,
  - waste management practices are being employed, and
  - environmental management systems have been developed and are employed by MCC;
- MCC has developed a comprehensive Mine Safety Management Plan to manage health and safety systems; and
- MCC supports a Community Consultation Committee and provides a 24 hour telephone ‘hotline’ to receive environmental complaints.

4.1 Overview

Current Consents

The MCC platform of planning approvals is shown in **Table 4.1**.

TABLE 4.1
MUSWELLBROOK COAL COMPANY DEVELOPMENT CONSENTS

Date	Development Consent Number	Consent
11 August 1982	Minister for Planning and Environment.	Surface facilities for the Underground Mine (since decommissioned and removed).
16 August 1985	MSC.	Offices, bathhouses, washery and coal handling facilities at the No. 2 Open Cut.
13 April 1989	No. 18/88 (MSC).	Coal Haul Road and road haulage.
14 October 1992	No. 78/92 (MSC).	Eastern area of No. 2 Open Cut.
12 April 1999	No. 86/98 (MSC).	Approval for Sandy Creek Underground Mine.

MCC operates partially under existing use rights, established prior to the enactment of the *EP&A Act 1979*.

Mining Tenements Held By MCC

MCC has operated under a succession of mining titles issued under the relevant legislation since underground mining operations commenced in 1907.

The No. 2 Open Cut and the No. 2 Underground operations were conducted under the existing mining lease and Section 74 of the *EP&A Act 1979*. The No. 1 Open Cut operated under numerous individual mining leases prior to their consolidation into CCL 713.

The following mining tenements are held by MCC and the location of MCC's Colliery Holding is indicated in **Figure 4.1**:

- CCL 713 issued on 5 April 1990 under the *Coal Mining Act 1973* and covers an area of approximately 1,671 hectares; and

- Mining Lease No. 1304 issued on 12 January 1993. MCC also holds, and operates under, the appropriate Open Cut Approvals issued under the *Coal Mines Regulation Act 1982*.

The revised Mining Operation Plan (MOP) was approved in March 2000 and provides open cut approval to mine coal by surface methods.

4.2 Open Cut Operations

4.2.1 Current Mining Areas and Coal Reserves/Resources

The Muswellbrook No. 1 and No. 2 Open Cuts are components of an open cut coal mining operation which produces thermal coal for both export and domestic markets. These mining areas are located on **Figure 4.1** and the aerial photograph of **Figure 1.2**. The No. 1 Open Cut has recently mined the Loder Seam at the base of the pit by open cut and highwall auger mining methods. The No. 2 Open Cut mines several major coal seams. The seams currently mined are, in descending order, the Fleming, Hallet, Muswellbrook, St Heliers and Lewis Seams. The Loder Seam lies beneath the Lewis Seam and is not currently mined in the No. 2 Open Cut.

Mining operations in the No. 1 Open Cut have been suspended. The Existing No. 2 Open Cut has approximately a three year life at current production rates. Overburden removal is expected to be completed in 2004, with extraction of the last coal planned for 2005. The approved underground Sandy Creek Colliery is planned to be accessed at the cessation of mining activities in the No. 2 Open Cut. With the proposed extensions, the No. 1 Open Cut has a lifespan of approximately ten years. Estimated saleable coal reserves/resources for each mining area, within MCC's existing leases are presented in **Table 4.2**.

TABLE 4.2
SALEABLE COAL RESERVES/RESOURCES

	Saleable Coal reserves (million tonnes)
No. 2 Open Cut	6.0 Mt Reserve
No. 1 Open Cut Extension A	4.6 Mt Reserve
No. 1 Open Cut Extension B	7.0 Mt Resource
Sandy Creek Colliery	18.0 Mt Reserve
Highwall – auger mining	Reserves yet to be defined
Total	35.6 Mt

4.2.2 Mining Constraints

Existing mining operations are constrained by:

- Cindering of seams to the north west caused by the replacement of coal by volcanic rock;
- Seams in the east dip down the eastern side of the Muswellbrook Anticline at angles up to 60 degrees;
- Seams in the east are also thin and intersected by the Aberdeen Thrust Fault; and

- A high overburden to coal ratio.

4.3 Mining Operations

Mining operations are conducted generally in accord the following sequence:

- Removal of vegetation;
- Top soil stripping;
- Removal of overburden; and
- Extraction of coal from the exposed coal seams.

4.3.1 Removal of Vegetation

Most of the area to be mined has been previously cleared for grazing purposes. Any remaining trees or shrubs on the site are cleared by a bulldozer, as necessary. Only the area that will be mined in the near future is cleared so the length of time between the clearing of vegetation and the commencement of mining is minimised.

4.3.2 Topsoil Stripping

Topsoil is only stripped from areas immediately prior to the mining of those areas, and to depths specified in the MOP. The topsoil is pushed up by tracked dozers into topsoil stockpiles for future use or spread directly onto rehabilitated surfaces. A topsoil stripping plan outlines the procedures to be employed when stripping topsoil.

4.3.3 Removal of Overburden

Overburden is drilled and blasted in 12 m lifts prior to being removed by a P & H 2800 Shovel with a 27 m^3 bucket down to the roof of the first seam (Fleming Seam). It is then hauled to overburden dumps by a fleet of MCC owned 190 t rear dump trucks. Overburden is hauled to the void created by the overburden and coal removal from the previous mining strips.

A hydraulic face shovel or front-end loaders load the remaining interburden. The interburden is broken prior to loading by drilling and blasting or ripped using dozers.

4.3.4 Extraction of Coal from Coal Seams

The coal seams are fragmented by drilling and blasting or by ripping with bulldozers. The coal is then loaded by the hydraulic face shovel or front-end loaders and hauled by contractor owned 77 t rear dump

trucks to the Run of Mine (ROM) coal receival area adjacent to the mine administration office and workshops.

4.3.5 Mine Infrastructure and Equipment

Coal extraction utilises an excavator or front-end loader and haulage of coal and overburden is by large trucks as described in **Sections 4.3.3**. As individual pieces of mining equipment reach the end of their working life they will be replaced. The geological structure prohibits the use of a dragline due to depth of cover to the seams, steep dips and short strike lengths.

Table 4.3 illustrates equipment numbers of fleet machinery currently in use. This machinery list is likely to be reduced as the amount of overburden removed decreases towards the end of the working life of the No. 2 Open Cut.

TABLE 4.3
CURRENT MINING EQUIPMENT NUMBERS (2002)

Equipment	Number
P&H 2800 Shovel with 27 m^3 bucket	1
Cat 5230 Hydraulic face shovel 17 m^3 bucket	1
Cat 992G Loader	1
Cat 922C Loader	1
Cat 988 Loader (Contractor owned)	2
Komatsu WA Loader 13 m^3 bucket (Contractor)	1
Komatsu 730E Trucks	11
Cat 777C Coal Truck (Contractor and MCC)	6
Cat 777C Water Truck	1
Cat 773B Fuel Lube Truck	1
Cat D11R Dozers	3
Cat D10 Dozer (Contractor owned)	1
Cat 140G Grader	1
Cat 16H Grader	1
IR DMM Drill	1
GD 25C Drill	1

4.3.6 Mine Working Hours

The mine produces coal four days per week from Monday to Thursday with limited production on Friday. Two 10.5 hour production shifts per day are worked over 52 weeks per year. Major maintenance occurs on Friday, with minor maintenance conducted from Monday to Thursday as well as Saturday and Sunday if required. Occasionally coal will be produced on weekends to make up production lost due to public holidays.

4.3.7 Workforce

The mine currently employs 69 permanent employees with the use of, on average, 39 contracted and casual employees. This is not expected to increase as a result of the proposal. Over 60% of the MCC workforce resides within Muswellbrook Shire and over 90% resides in the Muswellbrook and Scone Shires combined, as presented in **Table 4.4**.

TABLE 4.4
RESIDENTIAL LOCATION OF THE WORKFORCE – 30 June 2001

Town	Percentage of Employees
Muswellbrook	57 %
Aberdeen	16 %
Scone	14 %
Denman	6 %
Singleton	3 %
Other	4 %
Total	100 %

Source: MCC AEMR 2001.

4.4 Coal Handling and Beneficiation

4.4.1 Crushing

Coal from the mine is dumped into a 250 t receival bin by 77 t rear dump trucks. The bin has a 750 by 750 mm grizzly to prevent coal choking in the chute of the receival bin and blocking the crusher. Coal is fed from the bin by a variable speed controlled chain feeder to a conveyor, which then feeds into two Jaques hammermill crushers that crush the coal to a final product size of minus 50 mm. The crushing system has a rated capacity of 800 t per hour and is equipped with water sprays to minimise dust generation. The feed rate is varied by the chain feeder to allow efficient operation of the crusher when coal qualities and hardness vary. The crushing system is utilised approximately seven shifts per week for 10.5 hours per shift.

4.4.2 Classification

After crushing the coal passes under a Coalscan Model 3500 through-belt ash analyser. The ash analyser enables immediate feed back on coal quality and provides the ability to classify the coal. If the Coalscan detects high ash coal it is directed to a high ash stockpile while low ash coal is directed to a bypass bin of 300 t capacity. The cut point of the diversion depends upon product specification of MCC's customers.

4.4.3 Coal Preparation

Since 1994 coal produced by MCC has not required beneficiation and this is demonstrated in **Table 4.5**. Accordingly, the coal preparation plant (CPP) has not been utilised since 1994 and MCC has no foreseeable need to increase the quality of its saleable coal by the use of a CPP.

TABLE 4.5
ANNUAL ROM AND SALEABLE COAL PRODUCTION

Year	Rom coal (Mt)	Saleable coal (Mt)
1982	505,000	505,000
1983	575,000	575,000
1984	575,000	575,000
1985	675,000	675,000
1986	765,000	740,000
1987	810,000	765,000
1988	810,000	770,000
1989	980,000	960,000
1990	1,045,000	1,000,000
1991	1,060,000	1,020,000
1992	1,065,000	1,045,000
1993	1,200,000	1,165,000
1994	1,221,000	1,217,000
1995	1,380,000	1,380,000
1996	1,580,000	1,580,000
1997	1,700,000	1,700,000
1998	1,700,000	1,700,000
1999	1,550,000	1,550,000
2000	1,400,000	1,400,000
2001	1,400,000	1,400,000

4.4.4 Rejects Disposal

MCC does not operate a CPP and, accordingly, does not generate coal rejects. Any coal that fails to pass through the 750 mm by 750 mm grizzly at the ROM bin is removed from the grizzly and stockpiled for crushing by a contractor. This procedure ensures that no coal rejects are generated during the crushing of the ROM coal.

4.4.5 Stockpiling

Product coal is hauled from the product bin in a 77 t truck to stockpiles. There are five stockpiles of domestic and export quality coal with a total capacity of 300,000 t.

4.4.6 Transport

All product coal is transported by highway trucks along the private Coal Haul Road to Muscle Creek Road and then onto the New England Highway. The use of this route by-passes the town of Muswellbrook. Highway trucks of 25 t or 38 t capacity haul coal for export to the RCT or coal for domestic use to the local power stations. MCC purchased 11% of the RCT in September 1997 allowing all export coal to be transported by rail from RCT to the Port of Newcastle. Approximately 70% of saleable coal is exported, primarily to Asian markets, with the remainder of coal sold to Macquarie Generation.

4.4.7 Coal Production

MCC currently produces around 1.4 Mtpa, but has previously maintained production levels at around 1.7 Mtpa as presented in **Table 4.5**.

4.5 Surface Facilities

Surface facilities at MCC include:

- Administration offices;
- Engineering and production offices;
- Bathhouse facilities;
- Workshop facilities and store;
- Coal crushing facilities;
- Conveyors;
- Stockpiles;
- Water management dams; and,
- Private haul roads.

4.5.1 Existing Mine Water Management System

MCC Mine is a minimal discharge site. MCC does not operate a CPP, which in comparison to most other mines, reduces demands on the site for industrial water. Potable water is supplied to the mine via a pipeline connected to MSC water supply.

Both the No. 1 and No. 2 Open Cut mines intercept groundwater and collect rainwater. This water is pumped from the pits and used as an industrial water supply at the mine and for dust suppression.

The mine manages fluctuations in relation to water collection and demand via a series of on-site dams and in-pit water storage areas. MCC is currently licensed by the EPA to discharge a maximum of one megalitre (1 ML) per day, under Flood Flow conditions of the HRSTS, into a tributary of Muscle Creek.

4.6 Environmental Management

4.6.1 Environmental Monitoring Programmes

MCC is committed to maintaining high levels of management and compliance. Extensive monitoring over many years has established that the mine generally operates within its environmental goals. Dust and noise impacts are substantially contained within the mine site and the surrounding lands owned by MCC.

Regular monitoring and data collection at various sites is conducted using both MCC and external resources. Monitoring is conducted to measure dust impacts, water quality and noise and vibration associated with blasting, to ensure compliance with statutory requirements and to identify issues for feedback to MCC personnel.

Detailed reporting is provided on environmental issues such as:

- Dust emissions;
- Blasting, noise and vibration;
- Water management;
- Compliance details with licence obligations, statutes and local authority requirements; and
- Greenhouse gas emissions.

AEMR's are prepared and submitted to the DMR, DLWC and the MSC, and an Annual Report is submitted to the EPA.

4.6.2 Blasting

Blasting generates the majority of environmental enquiries and complaints for MCC and is an area that is closely managed to minimise exceedances. As a requirement of its EPL issued under the *Protection of the Environment Operations Act 1997*, MCC is required to monitor all blasts. MCC has installed a permanent blast monitor, located adjacent to the nearest non-company owned residence on Sandy Creek Road, approximately 1.5 km to the north of the No. 2 Open Cut as shown in **Figure 3.15**. Blasts are monitored for air overpressure and ground vibration by the monitor, which is connected by modem to the mine office for instant feedback on blasting. Under normal circumstances, MCC only blast between the hours of 9.00 am to 5.00 pm, Monday to Friday. MCC has installed a second relocatable blast monitor on Company land in the vicinity of Queen Street, Muswellbrook. This blast monitor became operational in May 2002.

Blasts are designed as far as is practicable to achieve efficient blasts consistent with safety, environmental obligations and the required fragmentation and muckpile digability to optimise equipment efficiencies. The blast design takes into account the effects of the geology, ground water and surrounding structures where these matters affect safety or environmental concerns.

With respect to environmental considerations, the aim of the blast design is to minimise the generation of dust, noise and vibration and ensure that MCC operations remain within EPL Conditions.

Consideration is given to wind conditions, cloud cover, inversion potential and time of blast initiation.

The various components and checks of the blast design process include the following:

- Check that loading machinery is allocated to excavate the blast block;
- Check blast block size and location;
- Check results of previous blasts in similar/materials and locations;
- Check material type of rock in blast block;
- Check for potential of geological discontinuities;
- Check for potential of blast hole water;
- Blast hole diameter;
- Blast hole burden and spacing;
- Field checks of the true/actual burden on face holes and adjustment of explosive charge as required;

- Check of blast hole locations in the bench above to ensure that blast holes are not collared in blast hole butts;
- Blast hole subgrade drilling or amount of standoff above coal;
- Check of potential for hot/reactive ground;
- The type of explosive primer and blast hole initiation;
- The type and loading density of the explosive;
- Check powder factor hole-by-hole and overall powder factor;
- Check for any potential requirement for deck loading of blast holes;
- The stemming column length;
- The type of stemming material;
- The type of blast initiation sequencing;
- The blast initiation delay timing;
- Check blast initiation sequencing relative to explosives charge weight per delay for blast vibration considerations; and,
- Check requirements for the protection of final walls.

Monitoring up to December 2001 indicated that MCC had not exceeded the maximum limits of its EPL for overpressure and ground vibration PPV. ANZECC guidelines for blasting refer to 120 decibels linear (dB(L)) as the maximum limit for air blast overpressure at any residence and no more than 5% of blasts are to exceed 115 dB(L). From January to December 2001 the maximum air blast overpressure reading at the MCC monitor was 116.1 dB(L) with an average of 100.7 dB(L). Two blasts were recorded in excess of 115 dB(L), which equates to 1.4 % of the total number of blasts.

A blast was monitored on 22 February 2002 with a measured overpressure of 122.2 dB(L). This exceeded EPL limits and a report on the circumstances of the blast was compiled and forwarded to the EPA. Actions have been put in place to minimise the possibility of overpressure exceedances.

The ANZECC guidelines recommend no more than 5% of blasts are to exceed five millimetres per second (mm/s) as PPV, with the maximum being 10 mm/s. During the period from January to December 2001, the average PPV at the MCC monitor was 0.59 mm/s with the maximum being 1.21 mm/s.

4.6.3 Waste Management

MCC's objective with regard to waste management is to minimise the amount of waste generated, and to ensure the responsible management of all wastes.

Sewerage Treatment/Disposal

Wastewater from the bathhouse, office and workshop is collected by the on-site sewage holding tank system. The collected wastewater is pumped out at regular intervals into tanker trucks for transport to the MSC's sewage treatment works for treatment and disposal.

Waste

Domestic waste is collected by a contractor and disposed off-site at MSC's Waste Management Facility.

Recycling

Where possible waste items are collected and recycled. Scrap metal is collected into a container supplied by a local scrap metal dealer and regularly removed off site for recycling.

Oil and grease containment and disposal

Waste oil from the workshop is directed into an oil arrester and oily water runoff from the re-fuelling bay drains into a sub-surface 20,000 L tank. A three-stage silt trap and oil/water separator is located at the hardstand washdown bay. The collected silt is regularly cleaned out and EPA approved contractors are employed to remove waste oil and oily water, as required, for reprocessing and disposal off site. An oil spill barrier has also been erected in the Final Settling Pond Dam.

4.6.4 Fuel Containment and Dangerous Goods Storage

Fuel containment is stored in above ground storage tanks. Diesel is contained in five Class C1 above ground tanks with a capacity of 110,000 L each. These above ground tanks are located approximately 100 m from any major building and are bunded with earth walls. The tanks are currently listed under MCC's Licence for Keeping Dangerous Goods No. 35/021999, issued by WorkCover NSW.

MCC uses the Australian Health Company's Chem Alert system to manage chemicals used on the mine site. Chem Alert is a computer based chemical hazard management system, which coordinates the storage, transportation and disposal of hazardous chemicals. A computer database of chemicals is maintained on the MCC computer network server and is regularly updated. The MCC Occupational Health and Safety Committee undertake regular audits of chemical use and storage on site.

4.6.5 Water Management System

The existing mine water management system is illustrated in **Figure 4.2** and implements the following strategies:

- Separating clean water runoff produced by undisturbed catchments from dirty (sediment-laden) and contaminated runoff from disturbed catchments;
- Recycling and reusing dirty and contaminated mine water for dust suppression and wash-down activities;
- Using clean water for fire-fighting supplies and sensitive equipment where required;
- Using disused open cuts and underground mines as mine water storages where possible, and where mine safety permits; and
- Minimising any offsite discharge of saline mine water to within the amount allowed by the existing EPA EPL No. 656 (1 ML/day when the Hunter River is in flood flow) under the HRSTS.

4.6.6 Drainage and Erosion Control

Stormwater runoff from disturbed areas is directed to settling ponds built with a capacity to retain maximum runoff from a 1 in 10 year storm event. These structures are regularly cleaned out to maintain maximum volume and ensure efficient settlement of solids from stormwater.

Runoff management is the basis of effective erosion and sediment control for MCC. The basic principles used for managing stormwater runoff at the mine site are:

- Controlling the flow volume;
- Controlling the flow path; and,
- Reducing runoff velocity.

Erosion and sediment control on the mine site spoil dumps include:

- Radial and peripheral waterways stabilised in some areas with rip rap and UV stabilised erosion blankets;
- “In dump” detention ponds with underground pipes being utilised as primary spillways;
- Major and minor graded banks diverting runoff to water disposal areas; and
- Sediment control dams at the base of dumps to improve quality of discharged water.

MCC has an Erosion and Sediment Control Plan, which conforms with the "Guidelines for Establishing Stable Drainage Lines on Rehabilitation Mine Sites" produced by DLWC.

4.6.7 Air Quality Control

MCC currently undertakes a range of measures to reduce the generation of dust from the site. These measures include:

- The use of water carts to keep haul roads damp;
- Water sprays to reduce dust emissions at coal transfer and crushing locations;
- Care with blast design in terms of correct loading of holes and the use of high quality stemming materials to reduce the dust generated from each blast; and
- All coal trucks leaving the site have their loads covered.

An air-monitoring program has been carried out in the area surrounding the No. 2 Open Cut since 1983 and has been submitted to the relevant authorities in the MCC AEMR. The location of all gauges is shown in **Figure 3.15**. The results from these gauges are provided in **Section 3.15**, including the measured background levels of TSP and dust deposition and calculated levels of PM_{10} dust concentrations.

4.6.8 Spontaneous Combustion

The Greta Coal Measures mined at MCC, have a propensity to self-heat. **Figure 4.3** shows the effects of spontaneous combustion encountered on MCC's Colliery Holding. **Figure 4.4** provides an indication of the size and form of subsidence "potholes". These cause difficulty in the treatment of spontaneous combustion by allowing air access to previously mined coal seams, as discussed in **Section 3.9**. The potential for spontaneous combustion is addressed by way of a specific management plan. This plan covers all aspects of spontaneous combustion relevant to the mining of coal and the emplacement of reject material. Integral to this plan is the mapping and recording of outbreaks, prevention of spontaneous combustion through correct placement of material, monitoring and reporting.

Some elements of MCC's Spontaneous Combustion Management Plan are:

- A higher recovery of carbonaceous material in the mining process. Domestic sales of higher ash coal to Macquarie Generation has led to a greater recovery of coal that would have previously been considered waste and incorporated within spoil piles. Consequently, the risk of spontaneous combustion is reduced as there is less carbonaceous material within the spoil piles to support heating;
- Operation of the mine so that the amount of time carbonaceous material is left in spoil piles before being treated is minimised;

- Transport of product coal from the site prior to the (historically determined) spontaneous combustion incubation period of 4 to 6 months for coal stored in stockpiles; and

- Treatment of subsidence occurring above the workings of the former No. 1 Underground Mine to minimise air ingress and the risk of spontaneous combustion.

MCC has previously assisted with, and currently assists with, research projects investigating spontaneous combustion. Personnel from MCC are currently on the advisory committee for two projects investigating spontaneous combustion.

The company has had success to date in managing and controlling the spontaneous combustion in overburden dumps by the following methods:

- 15 m lifts of overburden, placed over dumps;

- Shaping surface by bulldozer;

- Compaction by a 15 t pad foot vibrating roller; and

- Top dressing and seeding.

4.6.9 Environment Protection Licence Compliance

MCC operates under licences issued by the EPA and environmental conditions specified in the Mining Lease approvals, which impose stringent controls to avoid environmental pollution.

MCC holds a EPL No. 656 issued under the *Protection of the Environment Operations Act 1997*. It is a condition of the EPL that an annual report is to be submitted to the EPA which contains a statement of compliance and a monitoring summary report, including a report on the number of complaints in relation to pollution.

The AEMR addresses the controls used for the protection of the environment with respect to water, air, noise and vibration.

MCC is committed to maintaining high levels of environmental management and compliance. Extensive monitoring over many years has established that the mine generally operates within its environmental goals. Dust and noise impacts are substantially contained within the mine site and the surrounding MCC-owned property.

4.7 Rehabilitation

Over 175 ha of mine site rehabilitation has been completed at MCC. Methods of rehabilitation follow guidelines recommended by DLWC. Topsoil is stripped to depths specified in the MOP in areas to be immediately mined. The topsoil is temporarily stockpiled then loaded into trucks by front end loaders, hauled to reshaped areas and spread. D11 tracked dozers undertake bulk shaping of the surface. Topsoil is spread in a uniform layer of approximately 10 cm and to reduce erosion on steeper areas, slopes are ripped along the contour. Any emerging rocks are raked and the topsoil is spread with gypsum prior to seeding.

Progressive rehabilitation performance is incorporated into MCC's AEMR. During July 2000 to June 2001 two seeding programs were carried out. These programs included a combination of pasture seeding and direct seeding of trees. Due to good rainfall, areas seeded have shown promising growth.

MCC has continued to conduct a program in conjunction with the consultants Global Soil Systems to determine the best mix of pasture seed for the conditions encountered at this site. The program included the study of appropriate grass types for use in topsoil and trials involving the direct seeding of tree seeds into spoil piles. The results of both studies have been promising and this method of revegetation will continue be utilised.

The objective of the MCC rehabilitation program is to bring the land back to its former use, which is primarily for stock grazing. Trees are also being sown for use as shade for stock and to provide forest for native animal corridors, in accordance with the MOP.

At the end of 2001 the estimated area which will be rehabilitated at No. 2 Open Cut is 130 ha. In addition to yearly rehabilitation works, MCC provides for ultimate mine closure costs as provisions in its financial accounts.

4.8 Mine Safety Management System

MCC have developed a comprehensive Mine Safety Management Plan (MSMP) to manage health and safety systems at the mine. The MSMP complies with the *Coal Mines (General) Regulation 1999*, *Coal Mines (Open Cut) Regulation 1999, Occupational Health and Safety Act 1983, Coal Mines Regulation Act 1982, Dangerous Goods Act 1975* and all other subordinate legislation applicable to open cut mining in NSW. The following systems, rules and standards have been developed and conform to the prescribed elements mentioned above:

- Mine Safety Management Plan;
- Shot Firing And Explosives Systems;
- Fire Control and Emergency Systems;

- Inspection System;
- Defect Management System;
- First Aid System;
- Transport Rules;
- Airborne Dust Rules; and,
- Standards of Mechanical and Electrical Engineering Practice.

A full review of these systems and procedures is to be undertaken during 2002 to ensure the systems are effective, and, where possible, to initiate improvements in the systems and associated outcomes.

4.8.1 Safety Philosophy

The responsibility for safety on the mine site is shared among management, staff and workforce. This philosophy is reinforced through the MSMP is communicated daily via the Positive Attitude Safety System (PASS). The PASS system that forms the basis of proactive safety management at MCC provides a means of educating, sharing and communicating the principles of safety. The PASS system is used at the start of each shift to focus on identifying workplace hazards with both mine management and workforce to eliminate or control hazards. This tool encourages responsibility and accountability throughout all levels on the mine site.

4.8.2 Health and Safety Policies

MCC is a safety conscious mining company, committed to maintaining the highest standards of occupational health and safety in the industry. MCC maintains the following policies and procedures:

- Occupational Health and Safety Policy;
- Drug and Alcohol Policy;
- Smoking Policy;
- Contractor Management Policy; and
- Worker Rehabilitation Policy.

These policies outline the employees' duty to present for work in a state that will not impede their ability to perform their normal work duties.

4.8.3 Hazard and Risk Analysis

MCC manage risk by enlisting the support of the workforce to identify and eliminate or control mine site hazards. MCC supports the following eight principal strategies for hazard and risk control:

- Management;
- Training;
- Elimination;
- Substitution;
- Segregation;
- Engineering Design;
- Work Practices; and,
- Personal Protective Equipment.

Where a job has been identified as involving risk it will not be carried out until a Job Safety Analysis has been undertaken and a Safety Operating Procedure has been developed.

The primary role of MCC's MSMP is to maintain the highest standards of occupational health and safety in the industry. MCC has also appointed persons whose functions involve the issuing of instructions with respect to the management or working of the mine that relate to the safety or health of people employed at the mine. The hazard and risk management systems will be reviewed during 2002.

4.9 Community Consultation

A Complaints Register is used to record information in regard to any incident, hazard or risk related to health, safety or the environment. Complaints from the public and government agencies are recorded, responded to promptly and used in developing and modifying systems. Reports recorded in the Complaints Register are reviewed monthly by senior management and discussed at the MCCCCC. All complaints and reports are detailed in the AEMR which documents the follow-up action undertaken. A 24 hour telephone "hotline" has been established to receive environmental complaints.

Table 4.6 indicates the number and type of environmental complaints received by MCC from 1995 to 2002.

TABLE 4.6 SUMMARY OF ENVIRONMENTAL COMPLAINTS MUSWELLBROOK COAL COMPANY							
Complaint	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Dust	1	0	2	0	0	1	7
Odours/Fume	0	0	0	1	0	1	4
Blasting Noise/Vibration	3	0	1	1	5	12	11
Highway Truck Noise	0	0	1	4	1	0	1
Highway Truck Driver Behaviour	0	0	0	0	2	0	0
Subsidence	0	0	0	0	0	1	0
Water Quality	0	0	0	0	2	0	0
Condition of Muscle Creek Road	0	0	0	0	2	0	0
TOTAL	4	0	4	6	12	15	23

4.10 Greenhouse Emissions

The mine maintains an inventory of greenhouse gas emissions. MCC has reported on its emissions and abatement projects under the Greenhouse Challenge, which was signed in 2000.

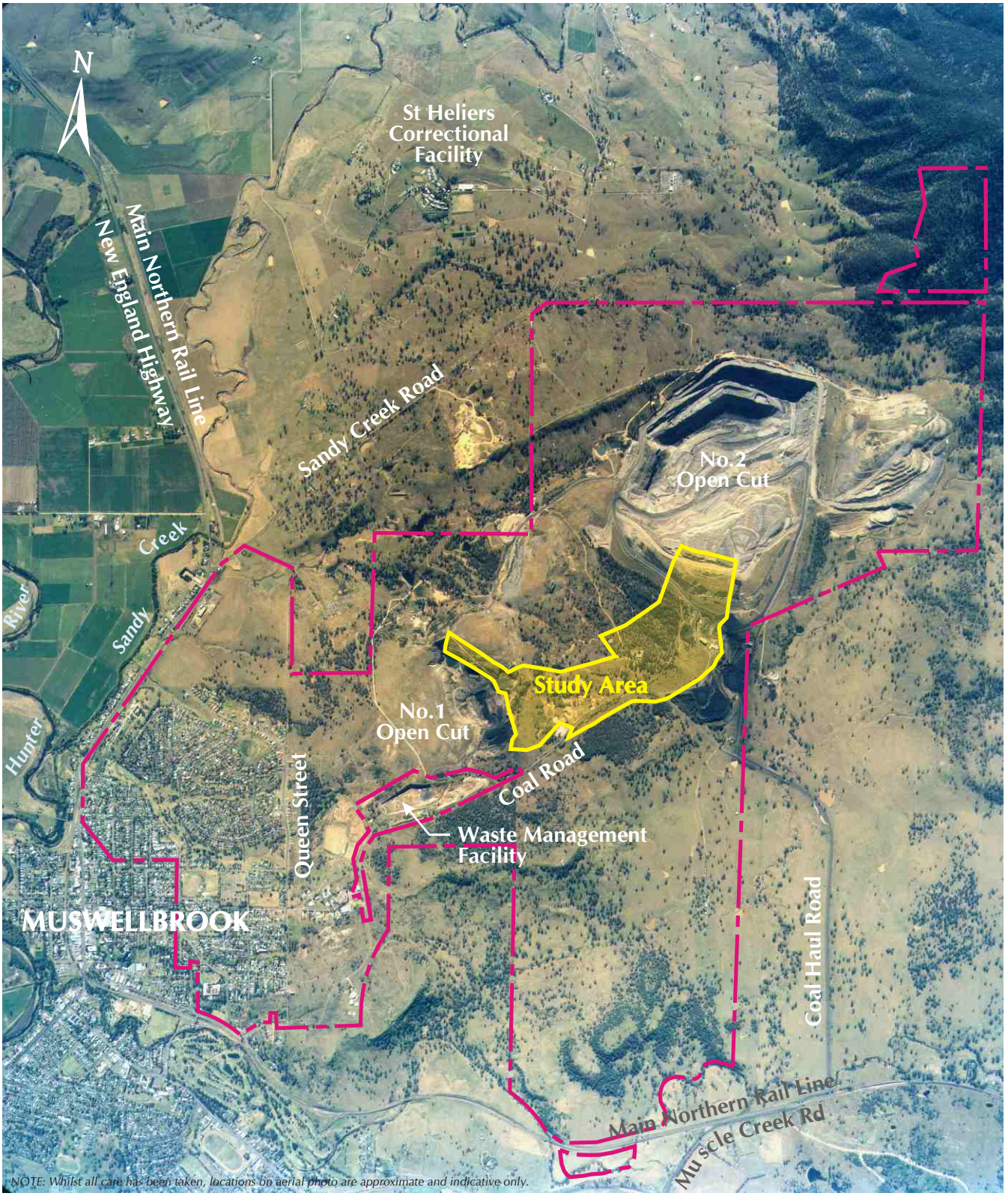
For the year 2000 it was estimated that MCC's mining operations would contribute greenhouse emissions shown in **Table 4.7**.

TABLE 4.7 GREENHOUSE GAS EMISSIONS (2000)	
Emission Source	Tonnes CO_2 Equivalent
Electricity	5,618
Diesel	24,575
Explosives	868
Total	31,061

Source: MCC Greenhouse Challenge Cooperative Agreement (2000).

The action that has had the greatest effect in controlling greenhouse emissions was the decision of MCC in 1997 to utilise the RCT as a loading facility and the transport of export coal from the RCT to the Port of Newcastle by rail. It has been estimated (MCC 2000) that the use of the RCT and rail transport has reduced greenhouse emissions from 4.44 t of CO_2 per kt of coal transported to Newcastle to 1.54 t per kt.

Opportunities to improve the efficiency of energy use in MCC's mining operations are under regular consideration, especially at times when operating equipment is considered for replacement. In recent years, the overall use of energy for each tonne of coal mined has increased. This has been due to an increase in the amount of overburden that has to be blasted and removed as the No. 2 Open Cut approached its economic limit of mining.



LEGEND

MCC Colliery Holding

SCALE

0 1 2

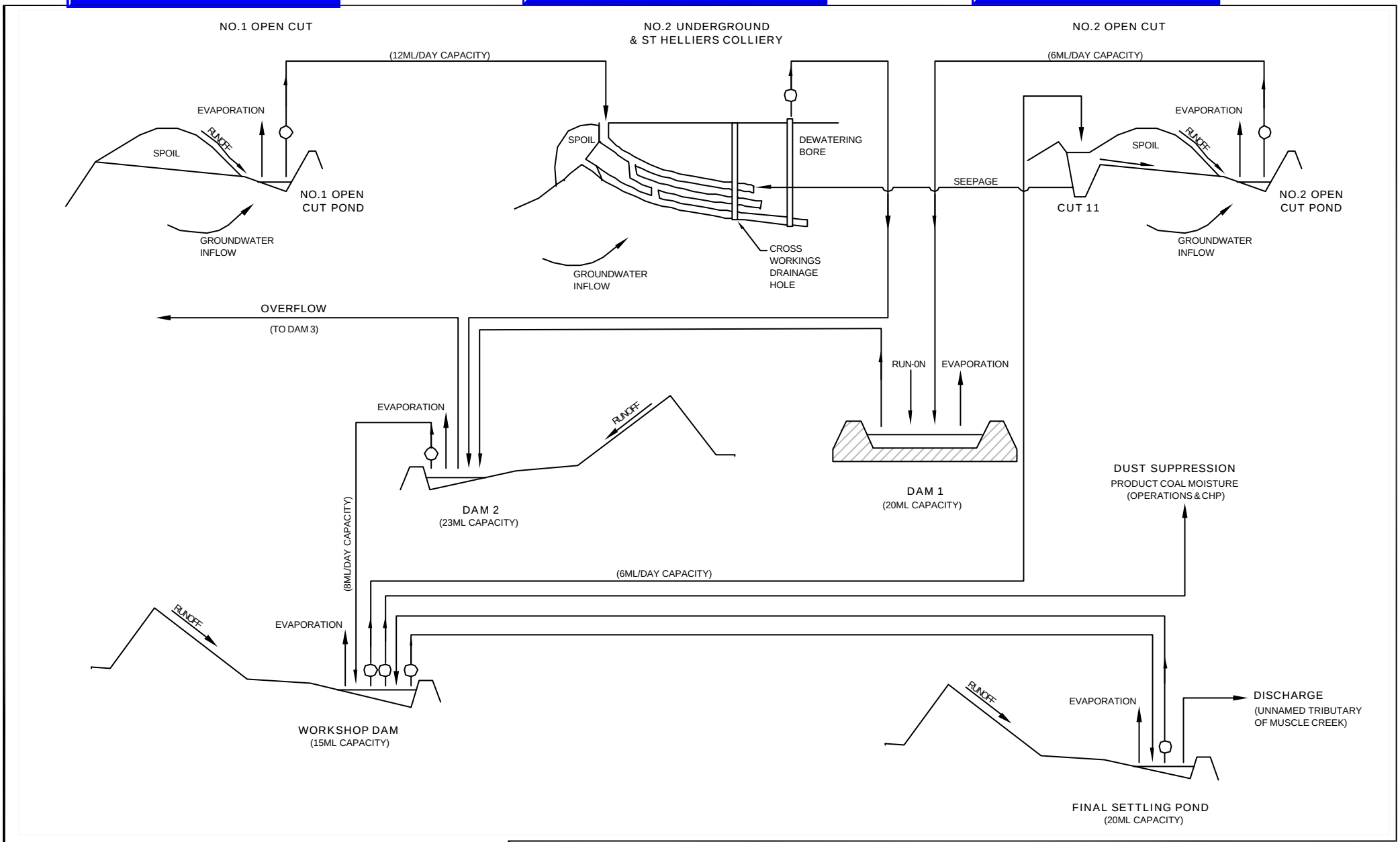
Kilometres

File Name: MCC HOLDINGS.CDR

MUSWELLBROOK COAL COMPANY LIMITED

MCC Colliery Holdings

FIGURE 4.1



KEY

PUMP

HLA-Envirosciences Pty Limited
55-65 Grandview Street
Pymble, NSW
61 2 9988 4422

CURRENT WATER MANAGEMENT
Muswellbrook Coal Company Ltd
MCC Environmental Impact Statement
No.1 Open Cut Extension, Muswellbrook NSW

FIGURE 4.2

DRAWN	PROJECT-FILE NAME	APPROVED	DATE	REVISED DATE
LJE	U888-021		June 2002	

FIGURE 4.3. Spontaneous combustion supported by air flowing through cracks and potholes.

FIGURE 4.4. A pothole caused by collapse of the ground surface.