



ASSESSMENT REPORT

PROPOSED WEST PIT EXTENSION HUNTER VALLEY OPERATIONS

File No: S02/02690

1. SUMMARY

Coal & Allied Operations Pty Limited (CNA) (the Applicant) owns and operates an existing open cut coal mining complex known as Hunter Valley Operations (HVO). HVO is located mid-way between Singleton and Muswellbrook in the Hunter Valley and lies mostly within the Singleton local government area, although some facilities are located in the Muswellbrook local government area. HVO is bisected by the Hunter River and is serviced by one integrated fleet of equipment and personnel.

HVO's mining activities north of the Hunter River comprise of four coal mining areas (including West Pit, Carrington, North Pit and the Alluvial Lands), three coal preparation plants (CPPs), two rail loading points, two administration areas, two workshops and numerous internal haul roads and conveyors.

The proposed development is based on an extension of activities currently undertaken north of the Hunter River. In doing this, it consolidates the existing 15 approvals for activities undertaken north of the Hunter River. Activities undertaken south of the Hunter River are not part of this proposal.

CNA is proposing to extend mining operations at the West Pit of HVO for 21 years, obtain approval for changes to coal transport activities, modify current approved activities in respect of the integration of coal processing, coal transport and rejects disposal at HVO and the consolidation of 15 existing development consents into a single consent for HVO north of the Hunter River.

The proposal has a capital cost of \$21.8 million, and would provide significant social and economic benefits to NSW. Over 21 years, if market conditions were favourable, it would generate about \$4.42 billion in sales revenue, provide \$219 million in royalties, and inject about \$2.4 billion into the local and regional economy. At its peak, it would employ 1,246 fulltime equivalent persons, an increase of 216 over current employment levels. Of these additional employees, approximately 177 are expected to work principally, or in part, at HVO north of the Hunter River.

Under the NSW *Environmental Planning & Assessment Act 1979* (EP&A Act), it is classified as State significant, integrated and designated development, and the Minister is the consent authority.

The Applicant lodged a Development Application (DA) and Environmental Impact Statement (EIS) for the proposal with the Department on 31 October 2003. The Department subsequently notified and exhibited the DA and EIS in accordance with the relevant requirements of the *Environmental Planning & Assessment Regulation 2000* (EP&A Regulation).

During the exhibition period, the Department received 16 submissions on the proposal: 6 from Government agencies, 2 from special interest groups, 3 from coal companies and 5 from members of the public. These submissions raised concerns about the potential flora and fauna, air, noise, blasting, water, traffic, mine closure, and visual impacts of the proposal and potential interactions with adjacent mining operations.

During the assessment process the Department consulted extensively with the DEC, Singleton and Muswellbrook Shire Councils and the RTA.

The Department has assessed the EIS and various submissions on the proposal, and recommends that the Minister approve the DA, subject to conditions.

2. CURRENT SITUATION

HVO is located in the Upper Hunter Valley of New South Wales (NSW), approximately 18 km north-west of Singleton. HVO is an existing open cut coal mine complex that is wholly owned and operated by CNA (Figures 1 and 2).

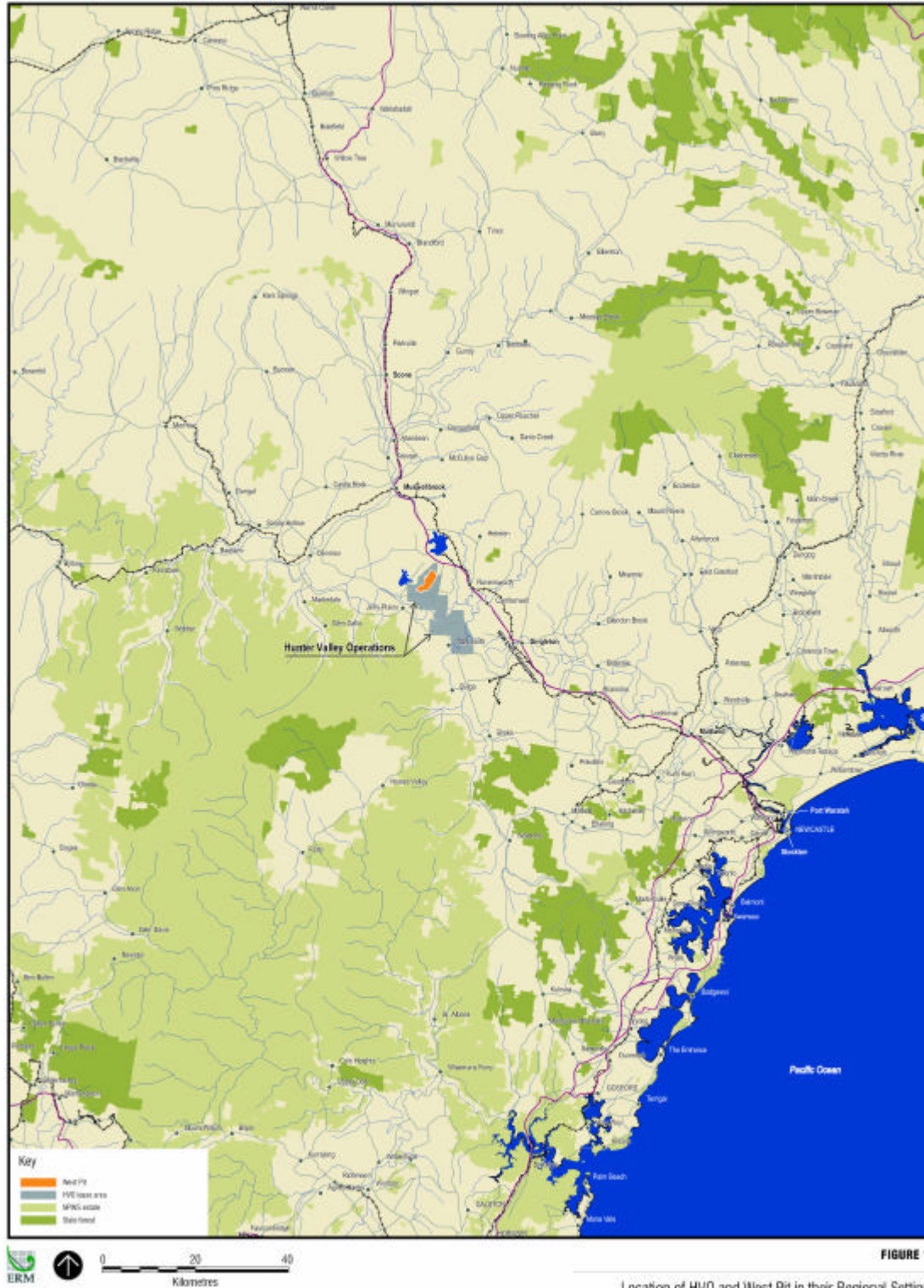


Figure 1: HVO and West Pit in their Regional Context

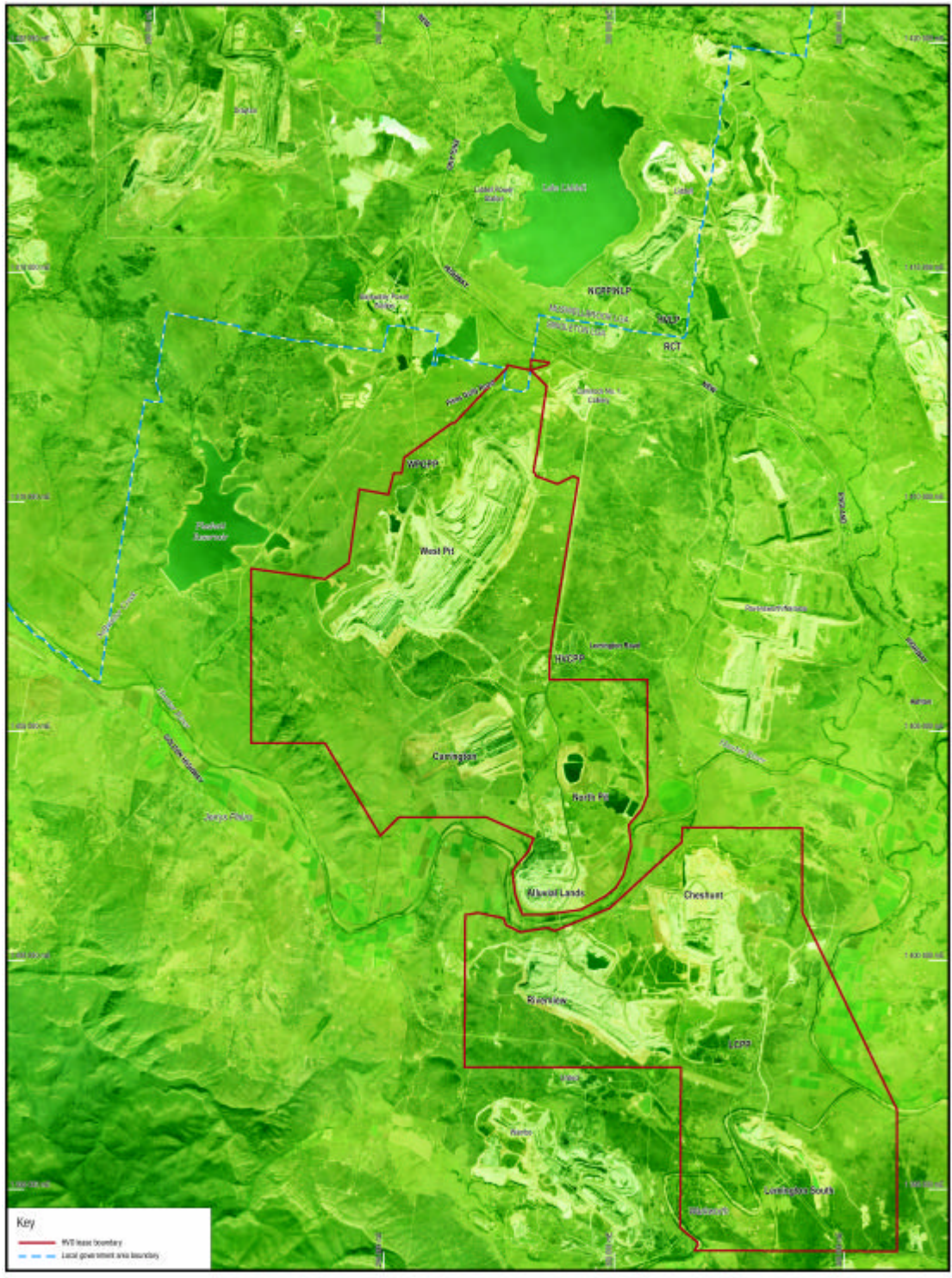


FIGURE 2

Location of HVO and West Pit in their Local Setting

Figure 2: HVO and West Pit in their Local Context.

HVO is bisected by the Hunter River and is serviced by one integrated fleet of equipment and personnel. Equipment and personnel are dispatched to each of the mining areas as required. HVO’s mining activities north of the Hunter River comprise of:

- four coal mining areas, including the West and Mitchell Pits, Carrington, North Pit and the Alluvial Lands; the West Pit Coal Preparation Plant

- (WPCPP), Newdell Coal Preparation Plant (NCPP) and Hunter Valley Coal Preparation Plant (HVCPP);
- the Newdell Loading Point (NLP) and the Hunter Valley Loading Point (HVLP) train loading facilities;
- two administration areas including bathhouses, one adjacent to the HVCPP and one adjacent to the WPCPP;
- two workshops, one adjacent to the HVCPP and one adjacent to the WPCPP; and
- internal haul roads and conveyors.

HVO's mining activities south of the Hunter River currently include three coal mining areas: South Lemington, Riverview and Cheshunt. A Coal Preparation Plant (CPP), workshops, administration buildings and bathhouses are also located south of the Hunter River.

2.1 Mining Lease & Coal Reserves

A resource and reserve statement has been completed for the proposed extension area, which covers Mining Lease (ML) 1406 and Exploration Licence (EL) 5243. The total resource within EL 5243 is estimated at 54.74 Mt, which is made up of indicated resources within and outside the reserve area as well as inferred resource. The indicated resource within the reserve area is 26.92 Mt.

The total resource within ML 1406 is 14.57 Mt, which is made up of indicated resources within and outside the reserve area as well as beneath the endwall batter. The indicated resource within the reserve is 11.70 Mt.

2.2 Major Infrastructure

The major infrastructure at West Pit is predominantly located on the north western edge of the lease adjacent to Pikes Gully Road. The facilities include:

- workshops to provide maintenance and repair services to the mining fleet;
- vehicle washing facilities for both heavy and light vehicles;
- bulk oil and fuel storages;
- WPCPP;
- bathhouse
- general stores; and
- technical services offices.

Site infrastructure for the North Pit and the Alluvial Lands is located to the north of the site and include:

- workshops to provide maintenance and repair services to the mining fleet;
- vehicle washing facilities for both heavy and light vehicles;
- bulk oil and fuel storages;
- general stores;
- bathhouse;
- administration and technical offices; and
- HVCPP.

Carrington uses existing facilities within HVO.

2.3 Mining Operations

Mining at West Pit (formerly known as Howick) began in 1952. A dragline operation started in 1971. In 1986, approval was given to increase production at West Pit to 3.5 Mtpa ROM coal and construct the WPCPP to supply coal to the Bayswater and Liddell Power Stations as well as other domestic markets. An extension towards the south east was granted in 1989.

In 1996, consent was granted for the Howick Coal Mine Expansion Project that included mining Mitchell Pit located to the south west of the original mine. This consent allowed coal production to increase to 12 Mtpa ROM coal. In 1998, Novacoal and CNA merged and West Pit became part of HVO. West Pit was integrated into HVO over the next two years with the construction of the Western Haul Road and bridge over Lemington Road and the granting of consent to transport and process coal from West Pit at HVCPP.

Excluding West Pit, mining within HVO north of the Hunter River began in the North Pit in 1979 with a production rate of 1.5 Mtpa ROM coal. In 1980, approval was obtained to expand coal production to 4 Mtpa ROM coal and in 1988, approval was given to mine in the southern extension. Production rates were increased to 4.2 Mtpa ROM coal in 1993 when approval was obtained to mine the Alluvial Lands. Coal from North Pit was initially transported to the Liddell CPP for processing and rail loading. In 1981, the HVCPP was constructed and coal processing occurred at both facilities until 1989. The HVLP was constructed in 1982 and has been used since that time for the transfer of coal for export through the Port of Newcastle. In August 2000 approval was granted to commence mining within the Carrington Pit. This mine has an approved production rate of 6 Mtpa ROM coal that is processed at either HVCPP or WPCPP.

The general sequence of mining in these pits involves: removing vegetation; stripping topsoil; drilling, blasting, removing, and dumping overburden; and extracting coal.

2.4 Coal Processing & Transport

After extraction, the raw (ROM) coal is taken to the either HVCPP or WPCPP for processing.

The mine produces a combination of primary and secondary clean coal products for export, and coal to fuel the local Bayswater and Liddell Power Stations.

The clean coal from the HVCPP is transported approximately 7.4 km by overland conveyor to the HVLP for transport to the Port of Newcastle. The HVLP consists of two 200,000 t stockpiles and a train loading facility with a capacity of 4,000 tph. Trains of varying capacity from 2,000 to 8,000 t transport the coal to ship loading facilities in Newcastle.

The clean coal from the WPCPP is either transported to the Bayswater and Liddell Power Stations by a conveyor with a capacity of 2.5 Mtpa or to the NLP via Pikes Gully Road. The NLP consists of 400,000 t of product stockpiles and a train loading facility with a capacity of 3,500 tph. Figure 3 shows a flowchart of existing coal processing and transport operations.

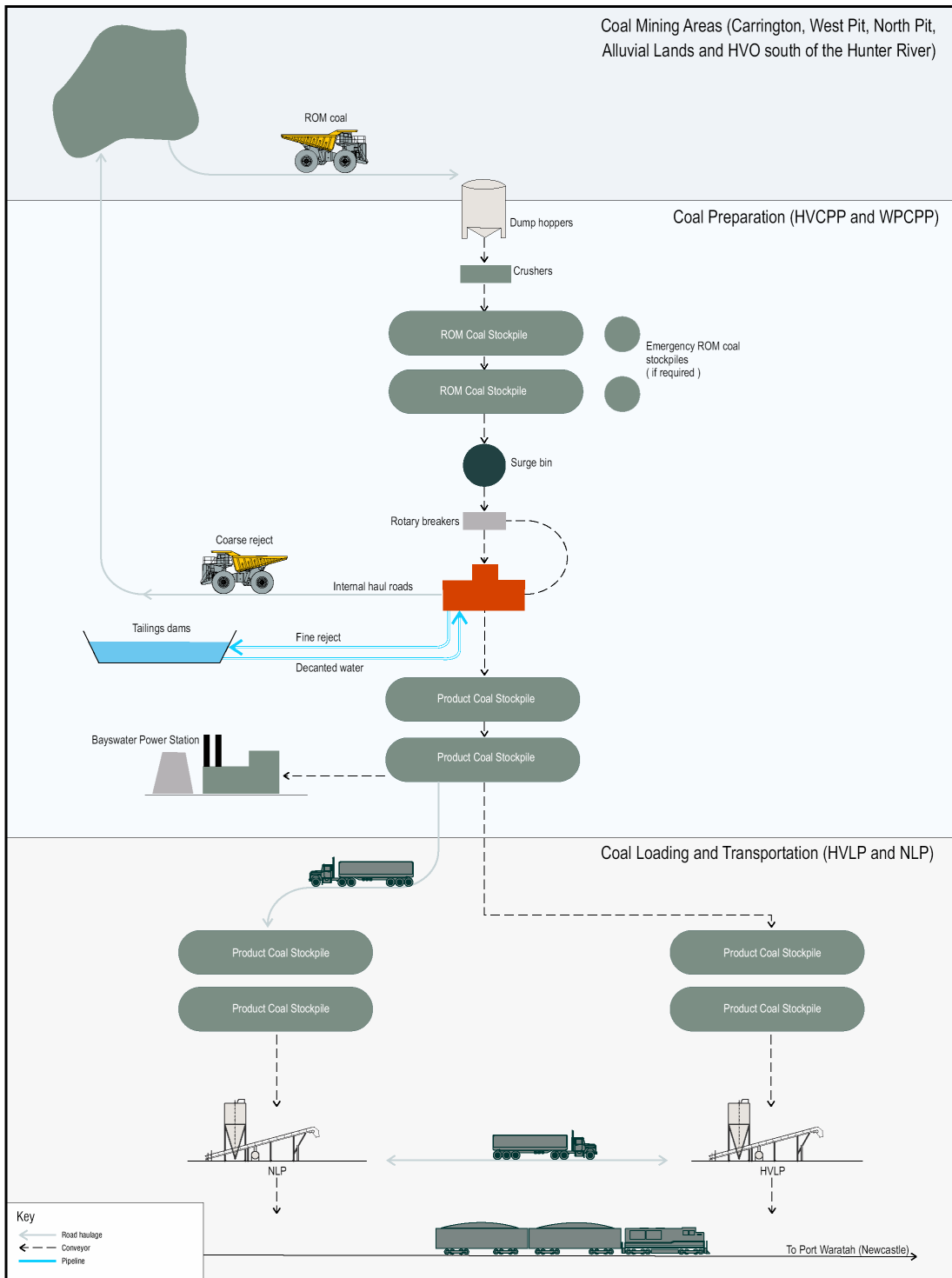


FIGURE 3



Flowchart of Existing Operations

Figure 3: Flowchart of Existing Operations

2.5 Coarse and Fine Rejects Disposal

Coal processing produces coarse and fine rejects.

Coarse rejects from both CPPs are transported by rear dump trucks to overburden dumps and buried in West Pit (from WPCPP and HVCPP) or North Pit (from

HVCPP). The rejects are covered by at least 2 m of inert material. Under the existing approval, only coarse rejects from the HVCPP, which resulted from the processing of West Pit coal, may be transported along the Western Haul Road for disposal in West Pit. All other coarse rejects from HVCPP must be disposed of in North Pit emplacement areas.

Fine rejects from the WPCPP is pumped through a pipeline to the Bobs Creek Dump Tailings Dam, located in the north of West Pit and from the HVCPP to a tailings dam located in North Pit. After settling the fine rejects, water decants into a series of sedimentation ponds where it is combined with mine water to form the water supply for the respective CPP and for dust suppression.

2.6 Water Management

2.6.1 Overview

The water management system for HVO, including West Pit, operates through the separation of clean and dirty water circuits. The objective of the system is to minimise disruptions to site operations and minimise any potential off-site impacts. The system involves:

- maximising beneficial reuse of mine water;
- controlling water quality and quantity at its source wherever possible;
- segregating water of different quality;
- reusing the lowest quality of water first;
- ongoing maintenance and review of the system; and
- disposing of excess water in accordance with the relevant guidelines and regulations.

2.6.2 Water Supply and Use

Water supply requirements for HVO differ depending on whether the area is a net user or producer of water. At West Pit, supplies collected from run-off into the Parnells Creek catchment are supplemented with water pumped from Dam 13 at Liddell Colliery.

North Pit and Carrington are predicted to be net water producers as a result of mine dewatering operations.

HVO generally requires water for the following:

- coal preparation;
- dust suppression;
- potable purposes; and
- vehicle washdown.

2.6.3 Mine Water Management

The mine water management system can be divided into three distinct water management units in HVO north of the Hunter River, including:

- West Pit;
- HVLP; and
- Carrington and North Pit.

West Pit

West Pit is divided into four catchments:

1. In the east, undisturbed land exists in advance of mining. Run off from this catchment is captured by Sediment Dams 16 and 17 West which settle sediment and then release water to Farrells Creek;
2. The second catchment consists of a large area of land disturbed by mining operations in the active pit and advancing overburden emplacements behind the active pit. Water from these areas is treated as mine water and is collected for eventual release from Parnells Dam through a series of drains and a pump over the intervening ridgeline;
3. The third catchment area is made up of disturbed and undisturbed lands located to the west of the advancing pit. This land is predominantly covered by natural vegetation or mining rehabilitation and drains, or is pumped, to Parnells Dam; and
4. The final catchment is made up of undisturbed land and is located on the western edge of the operation. A contour drain system diverts clean runoff from the undisturbed catchment in a south westerly direction into Parnells Creek. If necessary, excess water is discharged from Parnells Dam to Parnells Creek and ultimately the Hunter River under the Hunter River Salinity Trading Scheme (HRSTS).

North Pit and Carrington

North Pit catchments are separated into east and west along a central ridgeline of rehabilitated land. Clean and dirty waters are separated with clean waters discharging off-site via sediment dams. Water directed into Carrington Pit becomes mine water.

Two large catchments surround the HVCPP and two dams, Dam 15 N and 16 N, store mine water and run-off. This dam system can contain up to a 1 in 20 year runoff event, but would overflow in a 1 in 100 ARI 24 hour rainfall event.

Mine water from the active pit at North Pit is directed to Dam 11 N and Carrington Pit mine water is directed to Dam 9 N in advance of mining. Water from Dam 9 N is distributed to the East Sump and to Dam 11 N. Water from Cheshunt and Riverview may also be brought via a pipeline across the Hunter River to Dam 11 N. This dam is used to supply water for reuse in the HVCPP and dust suppression. It also discharges excess water to the Hunter River under the HRSTS.

HVLP & NLP

Surface water capture and reuse for dust suppression are the main focus of water management at HVLP and NLP. NLP can also draw saline water from Dam 13 at Liddell. The HVLP holds a licence under the *Water Act 1912* to draw water from Bayswater Creek.

2.7 Rehabilitation

Rehabilitation designs for the final landform in HVO north of the Hunter River follow the principles and strategies outlined in the DMR's *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales*. Rehabilitation will be undertaken in consultation with the DMR.

The aims of rehabilitation will be to:

- rehabilitate all mined land to its original land capability class or better;
- restore 70% of mined land for grazing with native or introduced pasture crops, which will provide some biodiversity values for native fauna species that are able to persist in grazed or disturbed areas;

- restore 30% the landscape to a state that provides potential habitat for populations of threatened species that are currently known to occur in and around HVO; and
- create an area of woodland vegetation that links with existing remnants, adding to a more uniform cover of vegetation throughout the Hunter Valley floor. Specifically, the aim will be to link up the rehabilitated and regenerated woodland in HVO north of the Hunter River with a patch of remnant woodland east of HVO and with the north south regional corridor outlined in the *Synoptic Plan*.

2.8 Workforce

HVO currently has nearly 600 employees, with additional contractor resources of approximately 400 people. Of these, approximately 250 people work in West Pit and the WPCPP. HVO, including West Pit, operates 24 hours a day, seven days a week. The mine currently employs 437 people fulltime.

2.9 Operating Hours

The mine currently operates 3 shifts, 24 hours a day, 7 days a week.

3. PROPOSED DEVELOPMENT

The proposal continues all aspects of HVO's current activities undertaken north of the Hunter River and extends them in the manner described. It also includes the consolidation of the existing 15 development approvals for activities undertaken north of the Hunter River. Activities undertaken south of the Hunter River are not part of this proposal.

The proposal that is the subject of this EIS includes the extension of mining at West Pit. West Pit currently operates within Coal Mine Lease (CML) 4. It is proposed to extend mining operations to the east into ML 1406, EL5243 and portions of ML 1468 and CML 4. The West Pit extension area is the only mining area in this proposal that does not have current development consent.

To fully integrate the extension of West Pit into existing operations, as well as maximise resource recovery and ensure best practice environmental management, it is proposed to consolidate the 15 approvals into one. Consequently the proposal also seeks approval for the following minor activities:

- upgrading the Belt Line Conveyor from the Hunter Valley Coal Preparation Plant to the Hunter Valley Loading Point;
- constructing a conveyor between the Hunter Valley Loading Point and the Newdell Loading Point;
- hauling coal, on an intermittent basis, from the Hunter Valley Loading Point and Newdell Loading Point to the Ravensworth Coal Terminal;
- hauling coal, on an intermittent basis, from the Hunter Valley Coal Preparation Plant to the Hunter Valley Loading Point along a private haul road;
- constructing temporary crossings of the Hunter River to allow the relocation of heavy mining equipment; and
- consolidating 15 existing development approvals, applying to Hunter Valley Operations north of the Hunter River, into a single consent.

Approval to modify current approved activities is also sought, including:

- continuing production at West Pit at the rate of up to 12 Mtpa ROM coal;
- increasing the approved capacity of the HVCPP from 13 Mtpa to 20 Mtpa ROM coal;
- increasing approved coal haulage from mining areas south of the Hunter River to HVCPP from 8 to 16 Mtpa ROM coal;
- moving coal and coal rejects between mining areas and facilities of HVO, including mining areas and facilities located south of the Hunter River;
- upgrading the Belt Line Conveyor which transfers coal from the HVCPP to the HVLP along the Belt Line Road; and
- increasing approved production capacity of the Carrington Pit from 6 Mtpa to 10 Mtpa.

Figure 4 shows a flowchart of the proposed operations associated with this development.

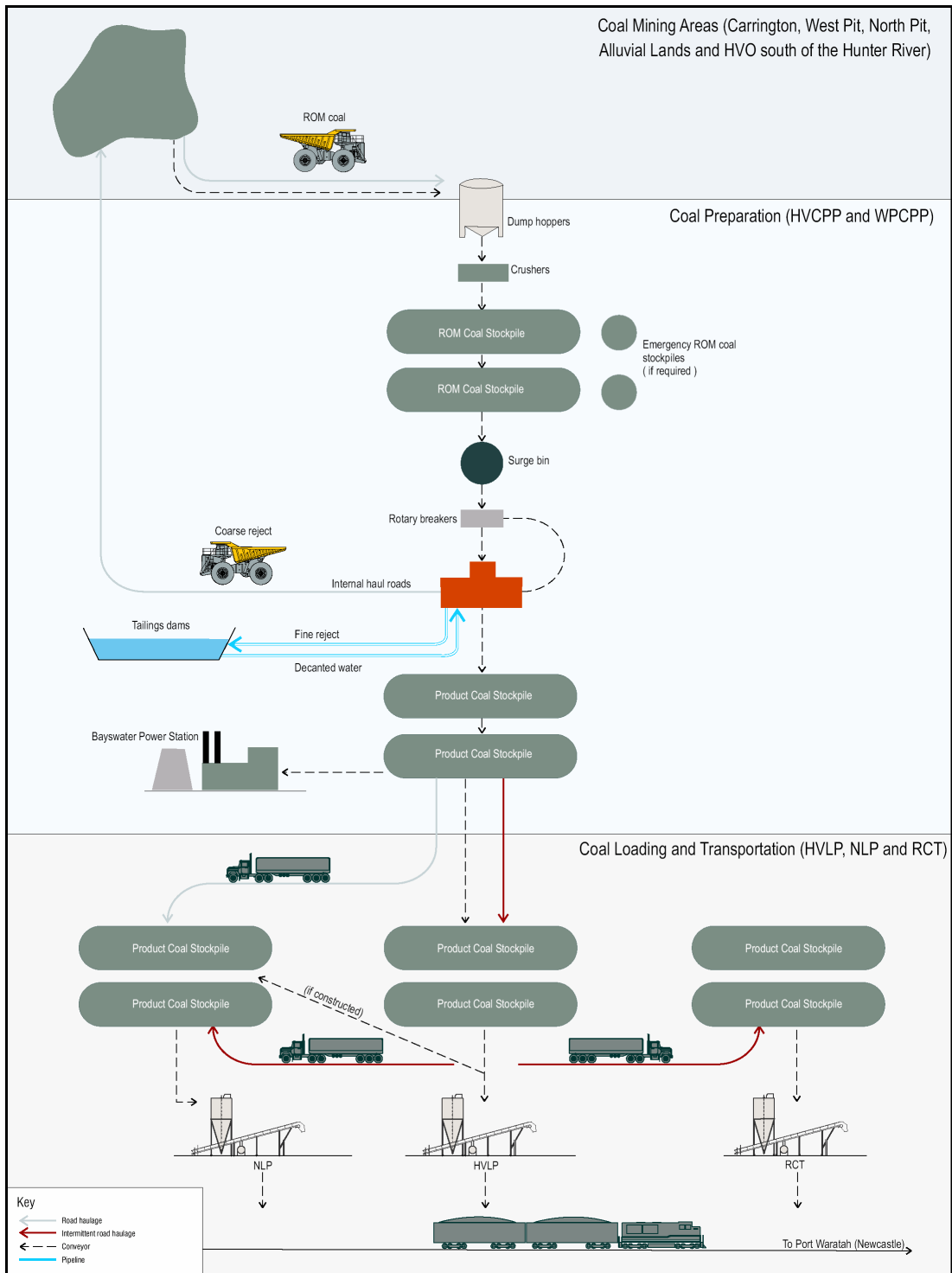


Figure 4: Flowchart of Proposed Operations

3.1 Mining Lease

The proposal would occur in the existing mining lease areas and a proposed new mining lease that will incorporate ML 1406, EL 5243 and parts of Authorisation 72.

3.2 Infrastructure

The proposal relies mostly on the mine’s existing infrastructure, but it will require relatively minor additional infrastructure works.

The HVCPP will be upgraded to increase coal processing capacity from 13 Mtpa to 20 Mtpa. The increase in capacity will be achieved by internal modification, including installation of larger centrifuges and the replacement of pairs of low head screens with a single larger banana screens.

A coal conveyor will be constructed between the HVLP and NLP. The Belt Line Conveyor that transfers coal from the HVCPP to the HVLP will be upgraded.

3.3 Mining Operations

An indicative schedule of production for pits within HVO north of the Hunter River is shown in Figure 5. Mining operations will require a new mining lease that will include ML1406, EL 5243 and parts of Authorisation 72.

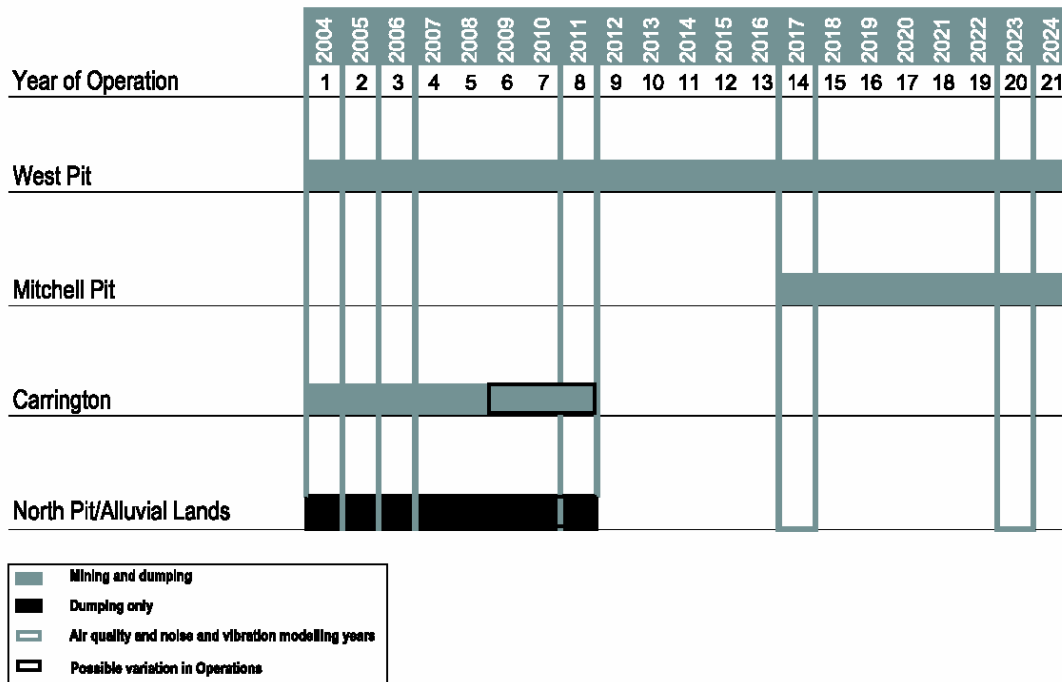


Figure 5: Indicative Timeline for Mining Operations

Mining methods would remain the same. Mobile equipment used across HVO north will remain the same, with the exception the purchase of two haul trucks required for the increase in mining rate at Carrington. Figure 6 indicates the planned ROM production rates from HVO north of the Hunter River.

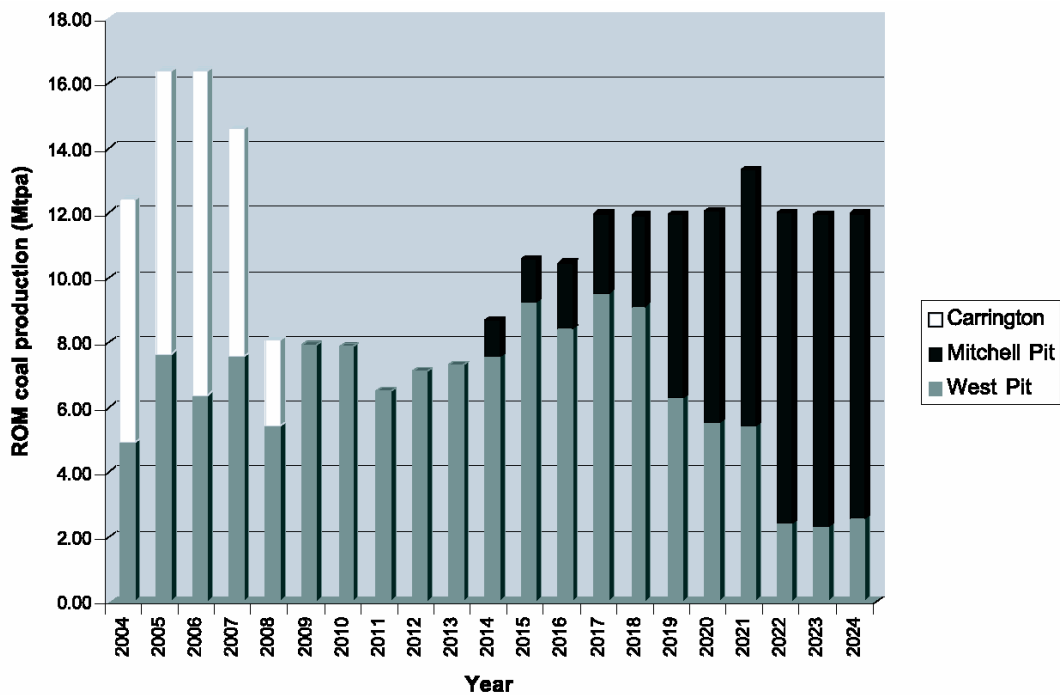


Figure 6: ROM Production Rates

3.4 Coal Processing & Export

Raw coal will continue to be processed at either the HVCPP or the WPCPP. The HVCPP will continue to operate at 6 Mtpa while the HVCPP will increase its capacity from 13 Mtpa to 20 Mtpa. The increase in annual processing capacity of the HVCPP will be achieved by the installation of larger, more modern versions of processing equipment.

New teeter bed separators, tailings thickener and extensions to Stockpile 3 may be required in the future, but would leave the footprint of the HVCPP largely unaffected.

3.5 Haulage of ROM Coal, Overburden and Reject

Coarse rejects and tailings will continue to be treated in a similar manner to existing practices.

To fully integrate the operations within HVO north of the Hunter River, and HVO as a whole, it is proposed that ROM coal, overburden and reject be able to be hauled between any pit, CPP and reject emplacement area within HVO. Existing private haul roads will be used. In addition, it is proposed to increase the limit on the haulage of coal between mining areas south of the Hunter River and the HVCPP from 8 to 16 Mtpa.

All overburden and waste haulage will be conducted using the existing truck fleet on existing private haul roads within HVO. ROM coal may also be transported from mining areas south of the Hunter River to the HVCPP via a conveyor, not yet constructed, that has been approved under a development consent for the Riverview and Cheshunt Pits.

3.6 Water Management

Essentially, the proposal would follow current practice: clean water would be diverted around the mine into local watercourses via sediment basins, and dirty water would be stored in the mine water system until it is used or discharged to the Hunter River under the Hunter River Salinity Trading Scheme.

As it moves east, the mine will consume up to 1,486 ha of the upper reaches of the three first and second order creeks (Davis Creek, Emu Creek, and Farrells Creek) that drain to Bayswater Creek, and then to the Hunter River, and one creek that drains to the south west (Parnells Creek). However, as the mine moves east, previously mined areas would be rehabilitated, and by the completion of mining 2,835 ha of catchment area will be restored. The net result is that surface runoff to the Hunter River is likely to increase. Drainage lines within these catchment areas are ephemeral with catchment losses restricted to the headwaters, resulting in negligible impacts on aquatic systems.

Runoff from the creeks would pass through sediment basins before being discharged to the local watercourses, and discharges from the sediment basins would be monitored regularly to ensure the water is clean.

During mining, the mine would capture and store dirty water runoff and groundwater seepage.

The mine will continue to use water for coal processing, dust suppression, stockpile watering, and cleaning trucks.

Excess water would be transferred to on-site water storages, or discharged to the Hunter River under the Hunter River Salinity Trading Scheme at a maximum rate of 100 ML/day.

During shortages, the mine would transfer water from Liddell Colliery's Dam 13 and extract water from the Hunter River.

3.7 Rehabilitation

The active mining areas would be progressively rehabilitated as mining progresses westwards. However, the development of the Carrington Pit would be accelerated so the rehabilitation of this area could be accelerated.

3.9 Workforce

Employment rates would vary over the 21 years, but at its peak, the proposal would employ up to 858 people full time, an increase of 139 employees and contractors.

3.10 Operating Hours

The mine would continue to operate 24 hours a day, 7 days a week.

3.11 Surrender of Existing Consents

The Applicant will surrender its existing consents, so that all development at HVO north of the Hunter River would be covered by one comprehensive development consent.

4. STATUTORY CONTEXT

The proposal requires approvals under State legislation.

4.1 *Environmental Planning & Assessment Act 1979*

4.1.1 *State Significant Development*

The proposal is classified as State significant development, under Section 76(7) of the EP&A Act, because it involves coal-mining related development associated with a development approval previously given by the Minister after 4 July 1987.

Consequently, it meets the criteria in the Minister's State significant declaration, dated 29 June 2001, and the Minister is the consent authority for the DA.

4.1.2 *Integrated Development*

The proposal is classified as integrated development, under Section 91 of the EP&A Act because it requires additional approvals from the:

- the Department under the *Water Act 1912* and the *Rivers & Foreshores Improvement Act 1948*;
- Department of Environment and Conservation under the *Protection of the Environment Operations Act 1997* and the *National Parks & Wildlife Act 1974*;
- Singleton Shire Council under the *Roads Act 1993*; and
- Mine Subsidence Board under the *Mine Subsidence Compensation Act 1961*.

4.1.3 *Designated Development*

The proposal is classified as designated development, under Section 77A of the EP&A Act, because it meets the criteria for an open cut coal mine in Schedule 3 of the EP&A Regulation.

4.1.4 *Permissibility*

The proposal is permissible with consent under the *Singleton Local Environmental Plan 1996* and the *Muswellbrook Local Environmental Plan 1995*.

4.1.5 *Environmental Planning Instruments*

The following environmental planning instruments and policies are relevant to the proposal:

- *State Environmental Planning Policy No. 11 – Traffic Generating Developments*;
- *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*;
- *State Environmental Planning Policy No. 44 – Koala Habitat*;
- *Hunter Regional Environmental Plan 1989*;
- *Hunter Regional Environmental Plan 1989 (Heritage)*;
- *Singleton Local Environmental Plan 1996*; and
- *Muswellbrook Local Environmental Plan 1985*.

The Department is satisfied that the proposal satisfies the relevant requirements of the applicable environmental planning instruments.

5. CONSULTATION

The Applicant lodged a DA and EIS for the proposal with the Department on 31 October 2003.

The Department subsequently:

- notified in writing all residents who could be affected by the proposal;
- notified Singleton and Muswellbrook Councils and all the relevant State Government agencies;
- advertised the exhibition of the DA and EIS in the Newcastle Herald and Singleton Argus on 2 separate occasions; and
- exhibited the DA and EIS at 4 locations between 4 November 2003 and 5 December 2003.

This satisfies the requirements for public participation in the EP&A Regulation.

During the exhibition period, the Department received 16 submissions on the proposal, 5 of them objecting the proposal:

- 6 from Government agencies (Roads and Traffic Authority, Mine Subsidence Board, Department of Mineral Resources, Department of Environment and Conservation, Muswellbrook and Singleton Councils);
- 2 from special interest groups (Hunter Catchment Management Trust, Hunter Environment Lobby);
- 3 from adjacent coal mining operations; and
- 5 from members of the public.

These submissions raised several concerns about the proposal (see Table 1 below):

Issues	Submissions
Traffic	6
Air quality	5
Residential amenity	5
Visual	5
Flora & fauna	5
Noise	5
Water management	4
Social issues	3
Mining interactions	3
Rehabilitation	2
Blasting	2
Greenhouse	2
Health	1

Table 1: Summary of Issues Raised In Submissions

The Department has assessed these concerns in detail in Section 6 of this report.

During the assessment process, the Department consulted with Department of Environment and Conservation over concerns about potential flora and fauna impacts and noise impact criteria and with Singleton and Muswellbrook Councils over local road issues.

6. CONSIDERATION OF KEY ISSUES

The Department has assessed the proposal, EIS, and submissions on the proposal, and believes that the following issues require further consideration.

The DEC requested the following additional information:

- Data analysis to provide a more rigorous justification of the calibration of dispersion model predictions for PM₁₀; and
- Specific details about the best management practices that will be applied to the development for dust mitigation.

The additional information requested by the DEC is discussed in this report.

6.1 ECONOMIC

6.1.1 Economic Impact Assessment

Environmental Resources Management Australia (ERM) has assessed the potential economic impacts of the proposal.

This assessment concludes that the proposal would have significant economic benefits for New South Wales in general, and for the Hunter Valley region in particular.

Mining is Australia's largest export earner, earning about \$40 billion a year, or about a third of Australia's exports.

At present, about 94 Mt of raw coal production comes from the Hunter Coalfields, or about 65% of the State's production. In 2002, HVO, including West Pit had a saleable production of 12.6 Mt. This proposal would increase the maximum production rate of HVO operations north of the Hunter River from 18 to 22 Mtpa of ROM coal, and therefore increase the mine's contribution to Australia's coal exports.

Over the next 21 years, the increased coal production would generate significant revenues for the company, increased royalties and taxes for government and increased spending in both the Singleton and Hunter Valley economies (see Table 2).

Item	2004 -2025
Sales Revenue	\$4.42 billion
Injection into local economy	\$2.4 billion
Royalties	\$219 million
Taxes	\$234 million
Capital	\$21.8 million
Labour	\$2.35 billion

Table 2: Economic Contribution Estimates, HVO Mine

In addition, HVO would offer continued employment for the 600 direct employees and 400 contract employees at the mine. Of these workers about 720 owe their employment to operations north of the Hunter River. Provided that market conditions are favourable, at its peak in 2020, HVO's total workforce is expected to be 1,246, an

increase of 216. Of the potential 216 additional employees, 139 are expected to work principally or partly north of the Hunter River, making a total of 858.

According to the Minerals Council, 1 job in the mining sector creates 3 jobs in associated sectors.

Using this as a guide, the proposal could generate (or support) about 2,150 jobs in the short term, and about 2,570 jobs in the long term.

6.1.2 Issues Raised in Submissions

The Department received one submission questioning CNA's economic record and its fairness in dealing with workers.

6.1.3 Conclusion

The Department is satisfied that the proposal would have significant benefits for the people of NSW by generating export revenue for Australia, generating royalties and taxes for government spending, creating and sustaining up to 2,570 jobs in the longer term, and providing an important impetus to the Hunter Valley region.

In short, there would be significant opportunity costs if the proposal does not proceed. Mining operations at HVO north of the Hunter River would cease in 2017 instead of 2025, with the loss of 750 jobs at the mine and in the surrounding community.

6.2 FAUNA AND FLORA

6.2.1 Impact Assessment

The Applicant has assessed the potential flora and fauna impacts of the proposal, using database searches, literature reviews, consultation with government agencies and ecologists, and field survey work. The survey effort for the proposal is shown in Table 3.

Survey Technique	Survey Period					Total
	27 Oct	18-22 Nov	9-10 Dec	8 Jan	25 Feb	
Targeted search for threatened plants	5 person hours	16 person hours	1 person hour	2 person hours		24 person hours
Flora quadrats		12 person hours	3 person hours	5 person hours		20 person hours
Habitat assessment		3 person hours				3 person hours
Bird censuses		8 person hours				8 person hours
Ground Elliott tapping		400 trap nights				400 trap nights
Tree Elliott trapping		200 trap nights				200 trap nights
Ground hair funnels		2100 funnel nights				2100 funnel nights
All-night Anabat recording		8 recording nights				8 recording nights
Spotlighting		8 person hours				8 person hours
Owl call playback		4 person hours				4 person hours
Reptile and amphibian searches		7.3 person hours				7.3 person hours
Assessment of Box-Gum Woodlands		5 person hours			5 person hours	5 person hours

Table 3: Summary of Survey Work

The condition of native vegetation in the project area is generally poor. Remaining natural vegetation has been subject to clearing, grazing and regeneration.

Habitats range from regrowth woodland with microhabitats for a wide range of fauna, to woodland, to open pasture dominated by introduced plant species. Site 2 contains some sparse mature and dead trees with hollows and fallen logs and branches.

The flora and fauna assessment in the EIS identifies vegetation clearing and the loss of habitat and potential habitat for several threatened fauna species as the most

significant impacts of the proposal, but concludes that the proposal would not have a significant impact on any threatened species, population, or ecological community, or its habitat.

Vegetation clearing

The EIS estimates that, over 20 years, approximately 79.2 ha of remnant vegetation would be removed by the proposal. Vegetation clearing would be associated with the open cut operations and development of mine site infrastructure. Native vegetation communities within and surrounding the project area is listed in Table 4 with the clearing that would be required as a result of the proposal.

Vegetation Community	Vegetation Clearing (ha)		
	Site 1	Site 2	Total
Narrow-leaved Ironbark / Grey Box Woodland	3.3		3.3
Narrow-leaved Ironbark / Grey Box Woodland (regrowth)	3.7	52.7	56.4
Narrow-leaved Ironbark / Kurrajong Woodland	0	13.3	13.3
Rough Barked Apple / Narrow-leaved Ironbark Woodland	2.6		2.6
Swamp Oak Woodland	1.0		1
Bullock Woodland (regrowth)		2.6	2.6
Native vegetation sub-total	10.6	68.6	79.2
Native pasture	220.4		220.4
Cleared land		6.8	6.8
Total	231	75.5	306.5

Table 4: Summary of native vegetation clearing

Mitigation measures include a vegetation and habitat clearance protocol (delineation of vegetation to be cleared, pre-clearance surveys, reuse of habitat features, etc), progressive rehabilitation and regeneration of specific areas. The EIS considers that these measures would mitigate or minimise potential impacts (including cumulative impacts) of the proposal on flora and fauna.

Threatened species

Four threatened species are known, and 20 more species have the potential to occur, on the subject site and in the study area. Threatened species known to occur are:

- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*);
- Speckled Warbler (*Pyrrholaemus sagittata*);
- Little Bentwing-bat (*Miniopterus australis*);
- Eastern Freetail-bat (*Mormopterus norfolkensis*);

Threatened species that have the potential to occur are:

- Lobed Blue Grass (*Bothriochloa biloba*);
- Illawarra Greenhood Orchid (*Pterostylis gibbosa*);
- *Diuris tricolor* (syn. *D. sheaffiana*) (an orchid);

- Glossy Black-cockatoo (*Calyptorhynchus lathamii*);
- Masked Owl (*Tyto novaehollandiae*);
- Brown Treecreeper (*Climacteris picumnus victoriae*);
- Painted Honeyeater (*Grantiella picta*);
- Swift Parrot (*Lathamus discolor*);
- Black-chinned Honeyeater (*Melithreptus gularis gularis*);
- Diamond Firetail (*Stagonopleura guttata*);
- Regent Honeyeater (*Xanthomyza phrygia*);
- Large-eared Pied Bat (*Chalinolobus dwyeri*);
- Eastern Falsistrelle (*Falsistrellus tasmaniensis*);
- Large Bentwing-bat (*Miniopterus schreibersii oceanensis*);
- Large-footed Myotis (*Myotis adversus*);
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*);
- Green and Golden Bell Frog (*Litoria aurea*);
- Pale-headed Snake (*Hoplocephalus bitorquatus*); and
- Pink-tailed Worm Lizard (*Aprasia parapulchella*).

The EIS assessed the potential impacts of the proposal on these species in accordance with Section 5A of the EP&A Act (eight part tests). The EIS concluded that the proposal would be unlikely to significantly affect any threatened flora.

Regional habitat fragmentation and connectivity

The EIS notes that the vegetation to be removed has the potential to fragment vegetation corridors and have a cumulative impact on habitat loss in the region. However, the EIS considers that the progressive nature of clearing would minimise impacts associated with fragmentation. The EIS considers that mitigation measures, including rehabilitation and regeneration, would minimise the cumulative impacts of the proposal.

Rehabilitation and regeneration of native woodland

Rehabilitation of the open cut operations area would be undertaken progressively as described in the EIS. The EIS indicates that progressive rehabilitation would aim to establish 30% the study area for biodiversity habitat. Other areas would be rehabilitated for grazing, which would also provide biodiversity value.

As part of the proposal, areas that will not be cleared for mining would be allowed to naturally regenerate. The regeneration areas will be managed to increase biodiversity values.

Appendix G of the Flora and Fauna Technical Paper provides an indication of rehabilitation and regeneration for the study area. This is described in Table 5.

Land use	Study Area, Year 10 (ha)	Study Area, Year 20 (ha)
Rehabilitated woodland (biodiversity)	3.9	4.6
Rehabilitated woodland (grazing)	0	0
Regenerated woodland (biodiversity)	383.7	171.8
Regenerated woodland (grazing)	34.8	36.2
Total	422.4	212.6

Table 5: Area of the proposed rehabilitation and regeneration in the study area.

6.2.2 Issues Raised in Submissions

The Department received 5 submissions on the potential flora and fauna impacts of the proposal, including 2 submissions from the Department of Environment and Conservation, 2 submissions from non-governmental groups (Hunter Catchment Management Trust and Hunter Environment Lobby) and 1 submission from the general public.

These submissions raised concerns about the:

- adequacy of the flora and fauna survey work;
- lack of consideration of alternatives;
- adequacy of the proposed offset strategy;
- impact of the proposal on fragmentation of remnant vegetation; and
- impact of prior clearing for mining operation at HVO.

6.2.3 Consideration of Key Issues

Adequacy of survey effort

The Department considers the flora and fauna survey work undertaken to be of a high quality. Adequate survey work has been carried out to determine the extent and condition of vegetation communities and habitat within and surrounding the study area. The Department supports ongoing flora and fauna survey as proposed by the Applicant as part of the Flora and Fauna Management Plan and ongoing monitoring programme.

The DEC raised concerns that the Hunter Lowland Redgum Forest endangered ecological community (EEC) may be present on the site and not have been identified during the ecological surveys conducted for the EIS.

The Applicant provided an assessment of the presence of the Hunter Lowland Redgum Forest EEC undertaken by ERM (dated 12 January 2004). The assessment indicated that, although Forest Red Gum did occur as isolated trees in open paddocks and in Narrow-leaved Ironbark/ Grey Box Woodland on Site 1, no vegetation communities on Site 1 are characteristic of Hunter Lowland Redgum Forest EEC.

The Department's view is that neither the White Box Yellow Box Blakleys Red Gum EEC (considered in the EIS and assessed as not being present) nor the Hunter Lowland Redgum Forest EEC occur on the site in the areas that will be cleared of vegetation as the result of proposed mining operations.

The Hunter Catchment Management Trust (HCMT) considered that the ecological surveys were poorly timed and likely to be affected by drought conditions, especially in respect of assessing the presence of terrestrial orchids on the site.

The Applicant responded by indicating that the EIS acknowledged drought conditions as affecting some of the ecological surveys but that the survey conducted in February 2003 would have been undertaken under suitable conditions to identify the presence of terrestrial orchids. The EIS contained eight-part tests for the orchids in question and determined that the development would not have a significant impact on those species.

Vegetation clearing and rehabilitation/regeneration

Vegetation clearing for the open cut would occur progressively. The Department considers that this provides an important opportunity to collect seed for immediate use in rehabilitation efforts. Another critical opportunity is the re-use of cleared vegetation for rehabilitation purposes (habitat features, propagules, mulching and chipping). The re-use of cleared vegetation as a habitat and ecosystem resource would add value to the limited topsoil resource available for rehabilitation. Procedures to identify and control weeds would be important during re-use. Additionally, the Department recommends that no burning of cleared vegetation be permitted.

The clearing of up to 80 ha of native vegetation represents a significant short-term loss of biodiversity and habitat, particularly given the occurrence of four threatened species. However, the Department considers that the revegetation and regeneration proposed as part of the proposal would offset this short-term impact and provide a long-term biodiversity benefit.

The DEC expressed concerns that HVO north of the Hunter River would have, over its full historical extent, cleared much more native vegetation than the 80 ha identified as being impacted by the extension of the West Pit in the EIS. The DEC is concerned over the loss of native vegetation from the floor of the Hunter Valley over time and the fragmentation of the remnant vegetation. The development was viewed as contributing to loss and fragmentation of important vegetation and not offering adequate offsets for the vegetation clearing that has occurred over a combined area of approximately 5,000 ha.

The HCMT and Hunter Environment Lobby expressed similar views to the DEC on loss of biodiversity, vegetation fragmentation and the need to provide adequate offsets for vegetation clearing that has occurred on the site.

The Applicant has proposed to establish regeneration areas where remnant vegetation exists that will be unaffected by mining. These areas will be managed to promote the improvement of biodiversity values. These areas will be linked by woodland areas of rehabilitation to existing habitat corridors identified in the *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales (DMR 1999)*. At the completion of rehabilitation works, a greater area of the site will be covered by native vegetation than existed at the start of the development.

The EIS does not propose formal protection, such as re-zoning or a deed of agreement, of the proposed rehabilitation and regeneration areas for the study area of the HVO north of the Hunter River.

The Department acknowledges that proposed biodiversity areas could be threatened in the future by development. However, any such proposal would be subject to environmental impact assessment under the EP&A Act, and would need to meet the relevant standards of the day. The current development proposal and rehabilitation/regeneration package minimises the risk of future development by placing native vegetation in temporary conservation and actively enhancing ecological values.

Impacts on threatened species

The Department concurs with the conclusions of the eight part tests for threatened species in that the proposal would be unlikely to significantly affect any threatened species. The Department notes that mitigation and rehabilitation/regeneration measures proposed as part of the project are critical in justifying this conclusion.

Notwithstanding, the implementation of a Flora and Fauna Management Plan would be critical in minimising impacts on known threatened species, particularly woodland birds.

The Department would expect the Flora and Fauna Management Plan to contain a number of management strategies to minimise the potential impacts of the proposal. These strategies should include:

- delineating areas of disturbance;
- protecting of areas of vegetation outside the disturbance area;
- pre-clearance surveys for fauna;
- collecting seed for use in the rehabilitation programme;
- timing vegetation clearance to avoid nesting/breeding activities;
- capturing and releasing fauna;
- relocating any bat roosts;
- providing nest and roosting boxes in suitable habitat; and
- relocating habitat features salvaged from felled trees.

In addition to the Flora and Fauna Management Plan, the Applicant would also incorporate a Weed and Pest Control Plan.

The HCMT suggested that eight-part tests should have been considered for 3 species. None of the species were identified during the ecological surveys and the Department does not expect that the site would provide suitable habitat for the species. The Department is satisfied that eight-part tests for these 3 species are not required.

Overall, the Department supports the proposed mitigation strategies and commitments outlined in the EIS. Notwithstanding, a number of key strategies require detailed description and investigation in consultation with the proposed Hunter Coalfields Flora and Fauna Advisory Group.

Conclusion

The Department has assessed the key issues relating to the potential flora and fauna impacts of the proposal. The proposal would have certain short and long-term impacts on a regionally significant vegetation remnant and threatened species listed under the TSC Act. The proposed mitigation and environmental management of the site would ameliorate those impacts to some degree. More important, however, is

the suite of proposed rehabilitation/regeneration measures that would provide compensatory habitat for displaced species and provide real long-term conservation outcomes. The Department considers that these mitigation measures adequately balance the residual flora and fauna impacts of the project and therefore believes that the proposal would be unlikely to affect the long-term viability, or contribute to the extinction, of any threatened species of ecological community.

To ensure that flora and fauna impacts are appropriately managed, the Conditions of Consent require the Applicant to:

- contribute to the establishment and reasonable costs for the Hunter Coalfields Flora and Fauna Advisory Committee;
- conduct a detailed flora and fauna monitoring program;
- provide long-term biodiversity benefits through rehabilitation/regeneration;
- develop a Flora and Fauna Management Plan in cooperation with the Hunter Coalfields Flora and Fauna Advisory Committee;
- re-use cleared vegetation for rehabilitation efforts and no burning of cleared vegetation;
- regularly review and report on the success of flora and fauna management and the offset strategy; and
- ensure long-term conservation outcomes.

6.3 AIR QUALITY

6.3.1 Air Quality Impact Assessment

Holmes Air Sciences has assessed the potential air quality impacts of the proposal in accordance with the Environment Protection Authority's guideline: *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW*.

In this assessment, Holmes Air Services used the USEPA Industrial Source Complex (ISC) dispersion model along with a site-representative particulate matter emissions inventory and meteorological data from HVO (1 year of hourly average data spanning the period 1 January 2002 to 31 December 2002) to predict the ground level concentrations of annual average dust deposition rate, total suspended particulate matter (TSP), and PM₁₀; and the 24 hour average PM₁₀ at mine and non-mine owned residences for mining operational years 1, 3, 8, 8 (with Carrington operating – termed "Alternative" in Table 6), 14 and 20.

These predictions suggest the proposal would exceed (shown in bold) the impact assessment criteria for particulate matter at several residences over the 21 years (see Tables 6 & 7). All residences are privately-owned, but are subject to acquisition on request by the owner as a condition of an existing consent or are subject to a private agreement between the owner and a mining company.

Year	Residence	Annual average dust deposition rate (g/m ² /month) ^{1,2}	Annual average TSP (µg/m ³) ^{1,2}	Annual average PM ₁₀ (µg/m ³) ^{1,2}	24 hour average PM ₁₀ (µg/m ³) ^{1,2}
		Impact Assessment Criteria³			
		2 ⁴ (4) ⁴	90	30	50 (150)
Predictions					
1	8	0.9 (1.6)	21 (44)	18 (35)	53 (63)
1	9	0.4 (1.2)	23 (48)	21 (39)	124 (139)
1	10	0.0 (0.8)	7 (31)	7 (25)	59 (75)
1	12	1.2 (7.4)	25 (165)	20 (120)	47 (232)
3	8	0.9 (1.6)	21 (44)	17 (35)	46 (60)
3	9	1.7 (2.5)	53 (78)	41 (60)	187 (197)
3	10	0.0 (0.5)	0 (32)	8 (26)	93 (107)
3	12	1.1 (7.4)	24 (165)	20 (120)	43 (232)
8	12	0.2 (6.4)	4 (144)	3 (103)	11(231)
8(Alternative)	8	0.9 (1.6)	21 (43)	18 (34)	43 (62)
8(Alternative)	9	2.3 (3.1)	63 (89)	49 (69)	245 (259)
8(Alternative)	10	0.0 (0.7)	8 (34)	8(27)	66 (82)
8(Alternative)	12	1.2 (7.4)	26 (166)	21 (121)	46 (232)
14	12	0.5 (5.3)	12 (142)	10 (104)	10 (226)
20	9	1.0 (1.8)	21 (48)	17 (37)	77 (86)
20	10	0.1 (0.9)	12 (38)	11 (31)	59 (70)
20	12	0.8 (7.0)	18 (158)	15 (115)	43(232)

Table 6: Predicted air quality impacts

¹Value outside parentheses is the incremental impact of the HVO north of the Hunter River alone.

²Value inside parentheses is the cumulative mining impact (incremental plus background) including the HVO south of the Hunter River, Wambo, United, Ravensworth-Narama and an allowance for remote mines and non-mining sources.

³NSW EPA, 2001, *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW with the exception of the 150µg/m³ criterion which has been sourced from the USEPA for cumulative impacts. The NSW EPA (DEC) utilise the 50 µg/m³ non-cumulative criterion for assessment purposes.*

⁴Insoluble solids as defined by AS 3580.10.1-1991.

Criterion	Averaging period	Residential Location ¹
Dust deposition	Annual	8, 12
TSP	Annual	12
PM ₁₀	Annual	8, 9, 10, 12
PM ₁₀	24 hour	8, 9, 10, 12
All	All	8, 9, 10, 12

Table 7: Receptor locations where annual average dust deposition rate, TSP and PM₁₀ and 24-hour average PM₁₀ are exceeded

¹Residential locations are already within in existing zone of affection or have private agreements in place with CNA or other mining companies.

The air quality impact assessment in the EIS predicts that air quality for all residences will significantly improve upon the completion of mining in the Carrington Pit.

Holmes Air Services assessed the effects of best management practices for dust mitigation qualitatively. These best management practices include dust mitigation on haul roads, works areas, dumps, dragline operations, drilling operations, blasting and coal handling facilities.

While many of these dust mitigation measures have been considered in the air quality impact assessment, some are difficult to incorporate in the dispersion model. The air quality impact predictions are therefore probably conservative, and better performance is likely to be achieved in practice.

6.3.2 Additional Information Requested

The DEC requested the following additional information:

- a review of factors utilised for particulate matter emissions;
- data analysis to provide a more rigorous justification of the calibration of dispersion model predictions for PM₁₀;
- details on whether the four residences predicted to experience exceedances of air quality criteria were occupied and/or residents informed of health effects; and
- specific details about the best management practices that will be applied to the development for dust mitigation.

The Applicant provided the requested information to the satisfaction of the DEC. The DEC was then able to issue General Terms of Approval for the development in terms of air quality.

6.3.2 Issues Raised in Submissions

Six submissions raised concerns about the potential air quality impacts of the proposal. The key issues raised in these submissions were:

- general amenity issues of increased dust at residences within the existing HVO zone of affectation;
- cumulative impacts on air quality;
- data analysis to justify the calibration of dispersion model predictions for PM10; and
- health impacts of dust.

6.3.3 Consideration of Key Issues

General Amenity Issues

The submissions from residents located within the current zone of affectation for HVO or the Ravensworth-Narama mine were of a very general nature and expressed concern that the levels of dust being experienced at their homes would increase as a result of the development.

These residents have the existing protection of access to a mechanism that will allow their properties to be purchased upon request and assistance to relocate to another property within the Singleton local government area.

Residential locations 8, 9, 10 and 12 have been predicted to receive air quality impacts greater than the relevant DEC air quality criteria. If not already subject to private agreements or an obligation under conditions of development consent, the Applicant would be placed under an obligation to purchase these properties upon request by the owner as a result of the impacts of the proposed development.

The Department will continue the obligation by the Applicant to purchase any of these four residences upon request by the owner. However, the Applicant will be required to implement best available practicable dust mitigation measures to ensure that any resident that remains at the identified residences will be subject to the lowest level of dust impact that is practicable. The Applicant will be required to produce and implement an Air Quality Management Plan to set out the dust mitigation measures and monitoring that it will undertake to meet this obligation. A component of this plan will be to provide all affected residents with the latest available information from the literature on the potential and known health impacts of dust likely to be produced by mining operations.

The Department considers that best available air quality monitoring should be employed to measure the impacts of the development on residents living in the current zone of affectation and in areas that are predicted to be impacted to a lesser degree (that is; dust levels are predicted to be below the relevant EPA criteria but an increase in dust levels are still predicted by the air quality modelling undertaken in the EIS). The Department considers that a network of real-time dust monitors should be established to provide information on the dust impacts from the commencement of, and throughout the life of, the development.

The network of real-time dust monitors should supplement the existing dust monitoring network of high-volume air samplers (both TSP and PM₁₀) and dust deposition gauges. The monitoring network should be capable of identifying the air quality impacts attributable to the development, provide a record of air quality over

the life of the development and be capable of establishing trends in air quality that provide a check on the air quality modelling predictions made in the EIS. This will provide an early warning if dust impacts prove to be greater than predicted, and equally, will provide an indication if the predictions made in the EIS prove to be conservative (that is; over-predict the air quality impacts).

Cumulative Impacts on Air Quality

The cumulative impact of the development on air quality has been assessed in the EIS. Only those residences located within an existing zone of affectation, or where an agreement exists with a mining company, are predicted to receive cumulative air quality impacts that exceed the relevant air quality criteria. Table 7 indicates those locations where cumulative impacts are predicted to exceed the relevant air quality criteria. All locations where cumulative impacts exceed the criteria are within an existing zone of affectation or are subject to a private agreement between the owner and a coal company.

Calibration of Dispersion Model Predictions for PM₁₀

Dispersion model predictions for 24-hour average PM₁₀ for HVO north of the Hunter River were adjusted by reducing the predicted modelled values by a factor of 2.6. The factor of 2.6 was obtained from the air quality impact assessment in the EIS for the nearby Warkworth mine. In those studies predictions were made at each of the three monitoring sites where either direct measurements of PM₁₀ or indirect measurements of PM₁₀ (i.e. inferred from measurements of TSP) were available. The predictions were made for 365 24 hour periods. A representative particulate matter emissions inventory for the year 2000 at the Warkworth mine was prepared assuming ROM coal production of 8.8 Mtpa. Particulate matter emissions from the Wambo, Mount Thorley and Bulga mines were also included. Based on the results of the dispersion model calibration study, dispersion model predictions have been adjusted by a factor of 2.6. This is a sound approach for calibrating and adjusting dispersion model predictions.

The DEC requested the Applicant to provide a more rigorous justification supporting the derivation and the use of the Warkworth mine calibration factor and to address the difficulties in predicting dispersion of particulates under calm conditions and windy conditions. Alternatively, the Applicant could choose to derive a site-specific calibration factor.

The Applicant addressed this request by providing a more rigorous justification of the calibration factor utilised. A recent study commissioned by ACARP, and undertaken by the University of Newcastle, was referenced which found that, in areas where mining would expect to be the dominant source of dust, model predictions tended to overestimate the soil component of PM₁₀ by a factor of 2.5. This factor is consistent with the figure of 2.6 independently derived for the Warkworth EIS.

The Applicant provided data on measured and predicted dust levels for HVO for 2002. In terms of PM₁₀ for the top-5 24-hour PM₁₀ concentrations at the Cheshunt and Wandewoi monitoring locations, the average over-prediction factor was 4.0. It is the conclusion of the information supplied by the Applicant, and the Department, that the use of a calibration factor of 2.6 is unlikely to have underestimated the PM₁₀ air quality impacts.

Health Impacts

One of the submissions questioned the lack of data in the EIS identifying the various mineral components of dust particulate, the effects of long-term exposure and the possible links with respiratory disease in the Upper Hunter. The potential effects of free silica in dust and very fine particles on human health are assessed in the two following sections.

Health Impacts of Silica Dust

Silicosis is a lung disease resulting from overexposure to respirable crystalline silica dust. Respirable dust is described by particles with an aerodynamic equivalent diameter of less than 10 microns (PM_{10}). Silicosis generally occurs through occupational exposure in dusty environments (e.g. mines, quarries, masonry and construction industries). Silicosis is prevented by reducing exposure to respirable crystalline silica dust in the work environment.

While silicosis is not normally associated with health effects from ambient air, studies have been conducted to determine whether observed ambient levels of silica pose a significant health risk to the public (USEPA, 1996, *Ambient Levels and Noncancer Health Effects of Inhaled Crystalline and Amorphous Silica: Health Issue Assessment, United States Environment Protection Agency, Washington, USA*). A range of epidemiological studies were analysed from the USA, Canada, and South Africa. These studies deal with silicosis associated with continuous inhalation of crystalline silica dust in a mining environment. The USEPA analysis conservatively assumes that ambient air quality concentrations of PM_{10} in the community are comparable to occupational exposures in a mining environment. The study indicates that the risk of silicosis to an otherwise healthy population continuously exposed for 70 years to the highest silica levels anticipated by the USEPA standards for PM_{10} would be less than 1% (USEPA, 1996). The USEPA standard for annual average PM_{10} is $50 \mu\text{g}/\text{m}^3$.

Since the USEPA concludes that the annual average PM_{10} standard of $50 \mu\text{g}/\text{m}^3$ provides adequate protection from silicosis for the general population, it is considered that the proposal is unlikely to present unacceptable health risks at all non-mine owned residences. Even the residences identified as being affected by dust impacts greater than some DEC air quality criteria meet the $50 \mu\text{g}/\text{m}^3$ criteria in respect of predicted impacts from HVO, while residences 9 and 12 fail to meet this criteria when all predicted contributions to dust impact are considered.

Health Impacts of $PM_{2.5}$

The EPA currently has ambient air quality goals for annual and 24 hour average PM_{10} . Recent studies in Australia and overseas indicate that the $PM_{2.5}$ fraction of these particles is likely to be the most significant in terms of health effects (NEPC, 2002a, *Discussion Paper – Setting a $PM_{2.5}$ standard in Australia, National Environment Protection Council, Adelaide, 2002*). The National Environment Protection Council is currently developing an air quality standard for $PM_{2.5}$. The Draft National Environment Protection (Ambient Air Quality) Measure, released for comment in October 2002, provides some indication of possible future standards for $PM_{2.5}$ (see Table 8). This measure, if adopted by the relevant governments, would establish advisory reporting standards and a protocol for monitoring $PM_{2.5}$ (NEPC, 2002b, *Variation to the National Environmental Protection (Ambient Air Quality) Measure, National Environment Protection Council, Adelaide, 2002*).

Annual average PM _{2.5} (µg/m ³)	24 hour average PM _{2.5} (µg/m ³)
8	25

Table 8: Draft NEPM advisory reporting standards for PM_{2.5}

The air quality assessment in the EIS provides predictions of PM_{2.5} in the form of contour plots of particulate concentration for Years 1, 3, 8, 8 (Alternative), 14 and 20. These figures show that none of the residents outside of the current zone of affectation for existing mining operations is predicted to exceed the draft advisory reporting standards for PM_{2.5}. Residences 9 and 12 are predicted to exceed the criteria for most years of the development.

6.3.4 General Terms of Approval

The DEC reviewed the air quality assessment in the EIS and the additional information provided by the applicant at the DEC's request. It agreed that that the information presented demonstrates that no residences other than those already within an existing zone of affectation or have already made agreements with either CNA or with other mining companies are predicted to be impacted by particulate emissions exceeding the DEC's air quality goals.

The DEC's GTAs in relation to air impact assessment require the installation of an additional dust monitoring point for PM₁₀ at a location representative of most affected residences in Jerrys Plains.

6.3.5 Conclusion

The proposal is predicted to exceed the air quality impact assessment criteria for four privately-owned residences (residences 8, 9, 10 and 12) that are either located within an existing zone of affectation or are subject to a private agreement with CNA or other coal companies. All other residences are predicted to experience impacts that are less than the relevant DEC air quality criteria.

To address these impacts, the Applicant should be required to:

- Comply with the air quality impact assessment criteria;
- Carry out real time ambient air quality monitoring for dust deposition rate, TSP and PM₁₀ at residences 4, 9 and 12, and at least 3 other locations approved by the DEC. Alternatively, the Applicant may obtain the requested monitoring data from third party sources for the specified locations, if they are available and unhindered access to the data is negotiated;
- Mitigate the impacts using real time dust mitigation measures, or acquire any privately-owned residences, including residences 8, 9, 10 and 12, if unacceptable air quality impacts occur; and
- Advise the owners and/or tenants of residences 8, 9, 10 and 12 that unacceptable air quality impacts could occur at these locations.

6.4 NOISE

6.4.1 Noise Impact Assessment

Environmental Resources Management Australia Pty Ltd (ERM) conducted a detailed noise impact assessment of the proposal, in accordance with the Environment Protection Authority's *NSW Industrial Noise Policy*.

In this assessment, ERM used the Environmental Noise Model along with local sound power level, topographical and meteorological data to predict noise levels at 14 representative locations around the mine under calm and adverse meteorological conditions for mining operational years 1, 3, 8, 8 (alternative option), 14 and 20 (see Table 9). These data were compared to Project Specific Noise Levels (PSNLs).

No	Acquisition Goal dB(A)	PSNL dB(A)	Operational L _{Aeq} (15 minute) noise levels dB(A)					
			Year 1	Year 3	Year 8	Year 8 (Alt)	Year 14	Year 21
1	41	36	38	37	35	38	38	41
2	41	36	38	38	34	39	36	38
3	41	36	38	38	34	39	36	37
4	41	36	40	40	34	41	34	35
5	41	36	29	29	28	30	27	27
6	41	36	29	29	27	30	26	27
7 ¹	42	37	40	40	36	40	36	37
8 ¹	43	38	46	46	42	46	42	42
9 ²	41	36	54	54	40	54	42	46
10 ²	43	38	48	48	39	48	40	42
11 ²	43	38	39	39	34	39	35	35
12 ²	42	37	53	53	52	53	52	52
13 ³	41	36						41
14 ³	41	36						41

Table 9: Predicted Noise Levels Under Adverse Meteorological Conditions

¹Private residences subject to a private land holders agreement with mines other than HVO.

²Private residences that are inside a current HVO zone of affectation or subject to a private land holders agreement.

³Residences in Jerrys Plains included for Year 20 when impacts are predicted to increase in the vicinity of Jerrys Plains.

Shading indicates exceedances of acquisition goals.

Typically, the EPA considers a 2dB(A) exceedance of the PSNLs to be minor, a 3 to 5 dB(A) exceedance to be marginal, and a 5dB(A) or greater exceedance to be significant.

Using this as a guide, the predictions show that:

- the proposal would comply with the PSNLs at all locations during calm meteorological conditions, with the exception of residences currently within a zone of affectation;
- residential locations 9, 10 and 12, within the current zones of affectation, are predicted to experience noise levels above the DEC goals. The noise levels

would remain relatively unchanged from those levels currently experienced at these locations.

- the proposal would comply with the sleep disturbance noise criteria at all locations during calm and adverse meteorological conditions, with the exception of residences 9 and 12 which are located within an existing zone of affectation;
- under adverse INP weather conditions, noise at most residences is predicted to be below the DEC noise goals or result in minor (up to 2 dB(A)) exceedances of the DEC's noise goals
- residences in the vicinity of Residences 1 and 4 are predicted to experience marginal (up to 5 dB(A)) exceedances of the DEC's noise goals.

To extend this assessment beyond the 14 representative locations, ERM produced a set of noise contours for the proposal, representing the potential noise impacts at **all** locations in the vicinity of the mine (see Figure 7).

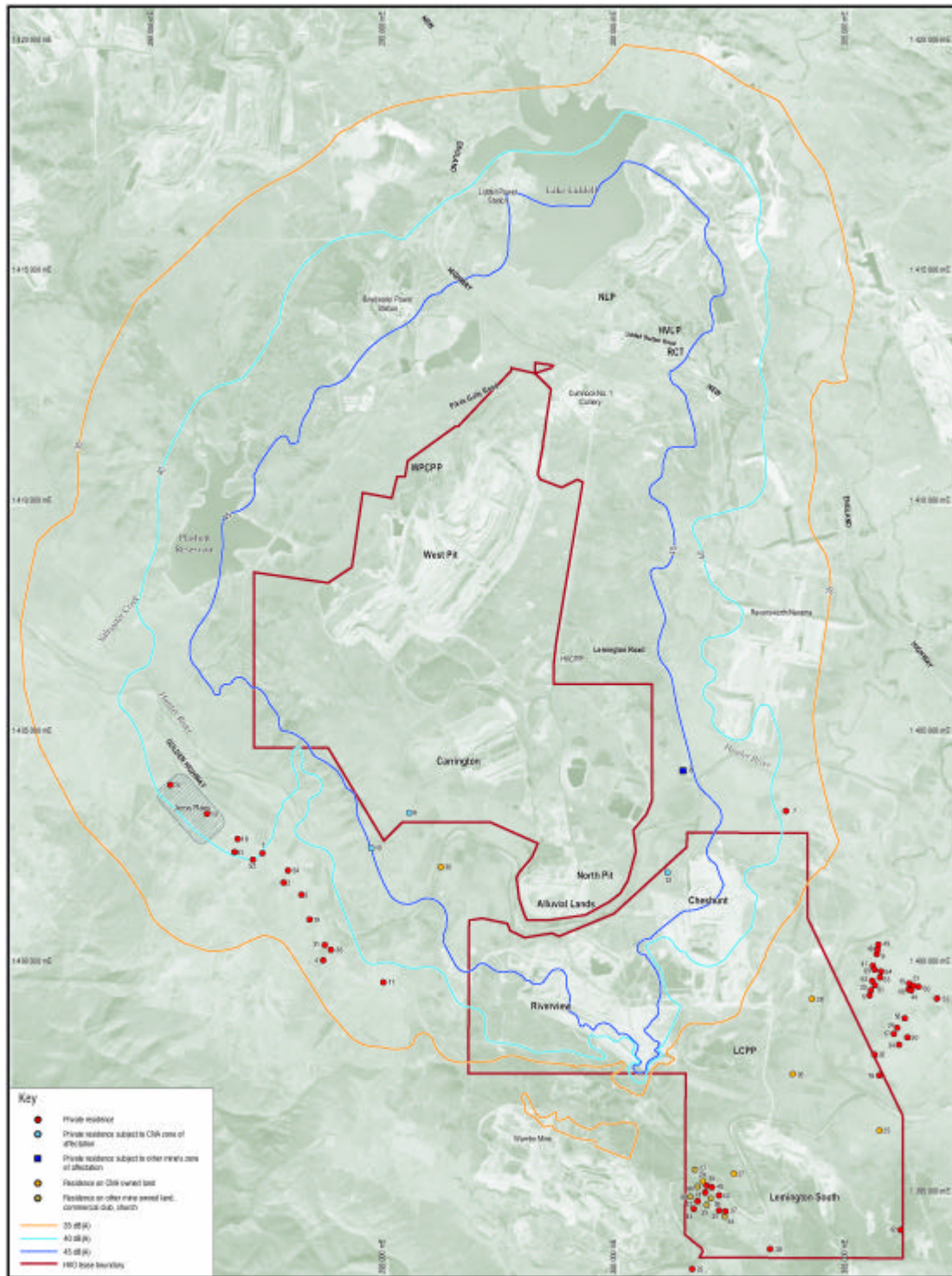


FIGURE 38

All Years Night Time L_{eq} 15 Minute Operational INP Weather dB(A)

Figure 7: Noise Contours for all Years at Night Under INP Weather Conditions

6.4.2 Issues Raised in Submissions

Five submissions raised concerns about the potential noise impacts of the proposal. The key issues raised in these submissions were:

- residential amenity, including sleep arousal; and
- cumulative impacts with other mining operations.

6.4.3 Consideration of Key Issues

Adequacy of the Noise Assessment

The assessment by the DEC of the noise assessment in the EIS:

- supports the presented noise sensitive receiver locations;
- considers that the presented background noise levels are reasonable;
- supports the presented PSNLs;
- agrees with the presented sleep disturbance criteria and the predicted outcomes;
- agrees with the predicted noise levels under night-time adverse meteorological conditions;
- agrees with the presented blasting criteria; and
- considers that Environment Protection Licence 640 contains appropriate blast limits.

On review of the EIS, the DEC considered that the combined noise impacts of HVO north of the Hunter River have been well-covered and adequately assessed. Locations 1 to 6, 7, 11, 13 and 14 have been incorporated into the DEC's GTAs for compliance purposes. Locations 8, 9, 10 and 12 are predicted to have adverse impacts from both operational noise and sleep disturbance effects. These locations are within current zones of affectation for coal mining operations.

Residential Amenity

Two of the 3 submissions that relate to residential noise amenity relate to residences that are within a current zone of affectation of coal mining operations, while the third submission was from a resident in the vicinity of Jerrys Plains Road. All are predicted to experience noise levels above the PSNL at some time during the development.

The Applicant will be required to undertake all practical measures to reduce noise impacts at these residences. The residents living within the current zone of affectation have recourse, upon their request, to acquisition by a coal company. It is reasonable that the Applicant be required to undertake additional noise mitigation measures at those residences where monitoring indicates that the PSNL is exceeded.

Noise impacts at many residences are predicted to vary significantly over the course of the development. Much of the variation in noise impact is due to the cessation of mining operations in the Carrington Pit that is predicted to occur at Year 5 in the preferred mine schedule, and Year 8 in the alternative mine schedule. Noise levels in the vicinity of Residence 4 (Muller) are predicted to reduce at this time and it is appropriate that stricter (lower) noise criteria apply at the cessation of mining in the Carrington Pit.

Alternatively, noise levels are predicted to increase in the vicinity of Jerrys Plains at around Year 20 when mining operations in the West Pit are planned to be concentrated in the south of that Pit. The Department considers that lower noise criteria should apply in these areas up to Year 19, and that monitoring results be carefully considered before setting higher criteria for Year 20 and later. These measures have been incorporated into the conditions of consent.

Residential locations in the vicinity of Jerrys Plains Road (The Golden Highway) and in the village of Jerrys Plains are predicted to experience noise levels above their respective PSNLs. For the village of Jerrys Plains the exceedance of the PSNL is not

predicted to occur under calm weather conditions or adverse INP weather conditions until Year 20. The EIS indicates that the conservative nature of the model used to predict noise impacts under adverse weather conditions may mean that the predicted exceedances will not occur.

The 20 year time period until the predicted exceedances of PSNLs at Jerrys Plains offers an excellent opportunity to monitor the received noise impacts of the West Pit as mining operations progress to the south and towards the village. The Department considers that real-time noise monitoring is required to measure the impact of HVO's operations in the 20 years prior to the predicted exceedances of the PSNL. The monitoring will measure the actual impact of the West Pit and compare this to the impact predicted in the EIS. The long lead-time before impacts are predicted to exceed the PSNL will enable noise mitigation measures to be considered well-before the exceedances are predicted to occur.

Adequacy of Cumulative Impact Assessment

The Department, and the DEC, consider that the cumulative noise impacts of the development and surrounding coal mines, both operational and planned, has been appropriately assessed and adequately reported in the EIS.

6.4.4 General Terms of Approval

The DEC considers that locations 8, 9, 10 and 12 will have adverse noise impacts and sleep arousal effects and that these receivers will need to have a negotiated agreement with CNA. The DEC relied on the existing Environment Protection Licence 640 to provide for noise monitoring and criteria for blasting, rather than provided specific GTAs for inclusion in this consent. The DEC's GTAs have provided noise limits for residential locations outside the current zone of affectation.

The EPA has granted its GTAs for the development, which include:

- noise limits at properties 1 to 7, 11, 13 and 14; and
- the need to make a separate application to vary Environment Protection Licence 640.

6.4.5 Conclusion

The proposal is predicted to adversely affect properties 8, 9, 10 and 12, within existing zones of affectation, and to exceed PSNLs for certain years at residences in Jerrys Plains and certain residences in the vicinity of Jerrys Plains Road.

To address these impacts, the Applicant should be required to:

- Comply with the noise impact assessment criteria;
- Carry out real-time noise monitoring at a minimum of 5 locations, including residences 4, 9, and 12, whilst privately-owned, and locations representative of the most-affected residences in Jerrys Plains and Maison Dieu; and
- Mitigate the noise impacts using real-time noise mitigation measures, or acquire any privately-owned residences, if unacceptable noise impacts occur.

6.5 BLASTING & VIBRATION

6.5.1 *Blasting Noise and Vibration Impact Assessment*

ERM assessed the potential blasting and vibration impacts of the proposal.

Blasting would occur typically more than once a day between 7am and 6pm. The precise time of blasting would vary depending on meteorological conditions.

To a significant extent, the blasting impacts depend on the blast design.

Using monitoring data from mines in the Hunter Valley (see Table 10), ERM has calculated the basic design parameters required to ensure the mine complies with the ANZECC guidelines.

Property distance (m)	Airblast overpressure limit 115dB(Lin Peak) 95% of the time	Peak particle velocity limit 5 mm/s 95% of the time
2,000	386	1,324
3,000	1,302	2,980
4,000	3,088	5,299
5,000	6,031	8,279
6,000	10,422	11,922

Table 10: Predicted MIC (kg) to meet ANZECC airblast overpressure and peak particle velocity (ppv) limits

The highest maximum instantaneous charge (MIC) to be used at West Pit is unlikely to exceed 3,000 kg. As most residential locations are greater than 3 km from blast locations, blast ground vibration and overpressure impacts from the West Pit are unlikely. The exceptions are residential locations 9 and 10 that may be as close as 1,800 and 2,200 metres respectively. Both these residences are within an existing zone of affectation.

6.5.2 *Issues Raised in Submissions*

The Department received 3 submissions raising concerns about the potential blasting impacts of the proposal. One of the submissions raised the potential for ground vibrations to damage buried irrigation mains of fibro construction that extend 1.3 km closer to the blast locations than the residential location.

6.5.3 *Consideration of Key Issues*

Impacts on Residential Locations

With the exception of two residences, within the current zone of affectation, there is little likelihood that the relevant ANZECC criteria for ground vibration and overpressure will be exceeded by blasting operations of the development.

The Department considers that it is important that the current blast monitoring program be continued, and refined, as the location of mining operations changes over the 21 years of the development.

Impacts on Rural Infrastructure

The EIS did not consider the potential impacts of blasting (particularly ground vibration) on rural infrastructure, such as irrigation mains. Modern irrigation mains are usually constructed of polythene that is unlikely to be affected by ground vibration. However, many older irrigation mains are constructed of fibrous cement that is susceptible to damage by ground vibration. There may be other items of rural infrastructure not considered in this report that may be in closer proximity to the blasting locations than the residences considered in the EIS.

The Department considers it prudent to include in the conditions of consent a mechanism that would allow land owners who consider that blasting may have an impact on rural infrastructure to request the Applicant to provide an independent inspection and assessment of the infrastructure for damage attributable to blasting. If damaged by blasting, the Applicant will be required to repair the affected infrastructure.

6.5.4 General Terms of Approval

The DEC did not provide specific GTAs to regulate blasting at the development, but in the covering letter indicated that the existing Environment Protection Licence 640 contains appropriate blasting limits for the development.

6.5.5 Conclusion

The Department is satisfied that the Applicant can comply with the ANZECC criteria for airblast overpressure and ground vibration.

The Applicant should be required to:

- comply with the ANZECC criteria for airblast overpressure and ground vibration at any residence on privately-owned land;
- carry out all blasting between 7am and 6pm, Monday to Saturday; with no blasting on Sundays or public holidays;
- carry out a property inspection, at the request of any landowner within 2 km of the site;
- monitor overpressure and ground vibration at residential locations 9 (Dallas) and 10 (Moses) while privately-owned;
- commission an independent property investigation if any landowner within a 2 kilometre radius of the site claims that his/her property or rural infrastructure has been damaged as a result of blasting at the development.

6.6 SURFACE WATER QUALITY

6.6.1 *Surface Water Impact Assessment*

Mackie Environmental Research (MER) assessed the potential surface water impacts of the proposal using a computer-based simulation model.

This assessment concludes that the proposal would have a negligible impact on the runoff to local water courses as;

- The creeks that would be consumed by mining are all ephemeral or minor creeks (1st or 2nd order);
- The loss of runoff from the creeks draining to the Bayswater Creek and then to the Hunter River (Davis Creek, Emu Creek, and Farrells Creek) would be compensated by the return of runoff from parts of these creeks that would be progressively rehabilitated;
- The loss of runoff from the Parnells Creek catchment would be minor;
- The proposed mine water management system would perform adequately under a range of wet and dry weather conditions during the next 21 years as the site water balance is predicted to be in near balanced conditions providing HRSTS discharges (high and flood flows) are utilized and make up water remains available from Liddell Dam 13 or from the Hunter River; and
- The open cut pits would be kept in a generally dewatered state 95% of the time, but could be required to store up to 2000 ML of water during extreme wet weather conditions.

6.6.2 *Issues Raised in Submissions*

The Department received 3 submissions on the potential surface water impacts of the proposal, of which only the submission from the Hunter Catchment Management Trust raised a specific issue, being the loss of catchment area of Emu and Farrells Creeks.

6.6.3 *Assessment of Key Issues*

Surface Water

The Department considers the surface water assessment in the EIS to be adequate.

The Department is satisfied that the capacity of the proposed mine water management system should be sufficient to accommodate the water captured under extreme wet weather conditions.

Temporary Crossing of the Hunter River

The Department is satisfied that the issues associated with the temporary crossing of the Hunter River have been accurately presented in the EIS. The Applicant was able to draw upon its experience with a previous temporary crossing of the river at the same location to demonstrate that the potential environmental impacts are well-known and practical methods to mitigate impacts are available and known to be effective.

6.6.4 General Terms of Approval

The DEC did not provide specific GTAs in respect of surface water quality and monitoring for the development, but in the covering letter indicated that the existing Environment Protection Licence 640 contains appropriate provisions for surface water quality, monitoring and requirements for participation in the HRSTS.

The Department provided GTAs for the temporary crossing of the Hunter River that has been incorporated into the conditions of consent. These provide that all works shall be:

- undertaken in accordance with the permit application;
- designed and constructed not to cause sedimentation, erosion or permanent diversion of waters; and
- constructed in accordance with the EIS and the Statement of Environmental Effects prepared for the previous temporary crossing of the Hunter River.

6.6.5 Conclusion

The Department is confident that the proposed mine water management system would perform adequately under a range of dry and wet weather conditions.

The Applicant should be required to establish a site Water Management Plan that includes;

- the predicted site water balance;
- an Erosion and Sediment Control Plan;
- a Surface Water Monitoring program;
- a Groundwater management plan; and
- a strategy for the decommissioning of water management structures on the site.

The Department is confident that the temporary crossings of the Hunter River can be undertaken in a manner that minimises the potential for impacts on the water quality within the river and aquatic ecosystems.

The Applicant should be required to obtain a Part 3A Permit under the *Rivers and Foreshores Improvement Act 1948* prior to undertaking construction activities for the temporary crossing.

6.7 GROUNDWATER

6.7.1 Groundwater Impact Assessment

Mackie Environmental Research (MER) assessed the potential ground water impacts of the proposal using a computer-based simulation model.

This assessment predicts the proposal would:

- reduce aquifer pressures within a radius of 2-3 kilometres from the West Pit, and up to 3.5 kilometres as a result of cumulative depressurisation with the Carrington mine over the next 200 years; and
- have a nett effect of a relatively flat water table over the mined area at a maximum elevation of about 50 m AHD.

It concludes that:

- leakage losses from the Hunter River alluvium will not occur;
- the proposal would not affect any existing water supply bores or wells;
- groundwater quality is not expected to change as a result of continuing mining and coal measures groundwater may exhibit a drop in salinity;
- water quality in the final void will be more saline than existing pitwater due to leaching of salts from spoil and evaporative processes; and
- run-off levels to the final void will be small enough to ensure that evaporation dominates and the void remains a groundwater sink.

6.7.2 Issues Raised in Submissions

The Department received 4 submissions on the potential groundwater impacts of the proposal; 2 from adjacent mining companies highlighting the need for consultation in respect of coordination of mining activities to avoid groundwater impacts on planned mining activities, and submissions from the Hunter Catchment Management Trust and the Hunter Environment Lobby requesting that attention be paid to groundwater impacts and adequate groundwater monitoring.

6.7.3 Consideration of Key Issues

The Department's view is that groundwater issues have been adequately addressed in the EIS. The final void will be a groundwater sink and will therefore limit the possibility of off-site impacts during, and following, mining.

6.7.4 General Terms of Approval

The Department has issued its GTAs for the proposal under Part 5 of the *Water Act 1912*.

These GTAs require the Applicant to:

- prepare an assessment of the natural variability of groundwater quality and quantity;
- establish trigger levels for inclusion in contingency plans; and
- prepare and implement a Groundwater Management Plan for the development.

The Department has incorporated these GTAs into the proposed conditions of consent.

6.7.5 Conclusion

The Department is confident that groundwater issues have been adequately assessed in the EIS and that there is a minimal potential for impact on existing groundwater users or alluvial aquifers.

The Applicant should be required to:

- review the site water balance for the development against predictions made in the EIS;
- prepare and implement a Groundwater Management Plan; and
- prepare and implement a Final Void Management Plan for each planned final void, in consultation with the DMR, the Department and Council, and to the satisfaction of the Director-General at least 5 years before the planned cessation of mining activities.

6.8 ABORIGINAL CULTURAL HERITAGE

6.8.1 *Aboriginal Cultural Heritage and Archaeological Impact Assessment*

Aboriginal archaeology and cultural heritage studies were undertaken by Australian Archaeological Survey Consultants Pty Limited in consultation with the following local Aboriginal stakeholders:

- Ungooroo Aboriginal Corporation;
- Upper Hunter Tribal Council;
- Lower Wonnarua Tribal Consultancy Pty Limited;
- Wanaruah Local Aboriginal Land Council;
- Combined Council Hunter Valley Aboriginal Corporation;
- Wonnarua Nations Aboriginal Corporation; and
- Lower Hunter Wonnarua Council Incorporated.

An archaeological assessment of the West Pit Extension area was undertaken by Australian Museum Business Services. This study indicated that a number of Aboriginal archaeological sites and associated landform zones will be either partially or completely removed by the proposed extension of West Pit. The majority of sites are considered of low conservation significance, consisting of open artefact scatters, many of which are already in disturbed contexts. The artefacts were of locally derived raw materials and generally did not contain any attributes that make them unique or rare in the Upper Hunter Valley.

However, the overall impact on Aboriginal cultural significance was considered in the EIS to be substantial given the destructive nature of open cut coal mining. Whilst the in-situ conservation of a number of sites is not feasible due to the relative positions within the extension area, appropriate management in consultation with the local Aboriginal community, including salvage operations and exclusion zones, will minimise the impacts upon the conservation significance of the area.

The cumulative destruction of archaeological sites in the local area as a consequence of mining, particularly within the proposed consent area and areas immediately south of the Hunter River, effects both the social (Aboriginal cultural) and archaeological value of the region. In the surrounding area, archaeological sites have been destroyed by mining at Ravensworth-Narama, Cheshunt and Riverview Pits (HVO south of the Hunter River) and Wambo. The destruction of sites by mining activities is limited to discreet mine pit areas. Areas adjacent to these are likely to contain similar archaeology.

Cumulative destruction of sites may therefore have a limited impact on archaeological value of the region as representative samples of different types of terrain or landforms are extant and may be used to address regional research questions.

6.8.2 *Issues Raised in Submissions*

No submissions were received in respect of cultural heritage or archaeological matters. The Aboriginal Cultural Heritage Study contained letters from three of the Aboriginal community groups that supported the recommendations of the study and/or endorsed the account of consultation contained within that study.

6.8.3 Consideration of Key Issues

The Aboriginal Cultural Heritage and Archaeological Studies did not identify any sites which require to be permanently protected. Both studies made recommendations concerning:

- the salvage of material from sites that will be destroyed by the proposed development;
- the fencing of sites to provide protection until salvage is undertaken;
- consultation with the local Aboriginal community to determine the extent and scope of salvage work;
- CNA continuing liaison with the Aboriginal Stakeholder Representatives on issues identified during the studies; and
- The involvement of senior Aboriginal men with any heritage works proposed in the far north western portion of the West Pit Extension area.

6.8.4 General Terms of Approval

The DEC has granted its GTAs for the proposal.

These GTAs require the Applicant to:

- obtain section 90 consents to destroy for the following Aboriginal sites and artefacts:
 - WPE 1
 - WPE 2
 - WPE 3
 - WPE 4
 - WPE 5
 - WPE 6
 - WPE 7
 - WPE 8
 - WPE 9
 - WPE 10
 - WPE 11
 - 37-2-1964
 - 37-2-1965
 - 37-2-1966
 - 37-2-1967
 - 37-2-0038
 - 37-2-0144
 - 37-2-0894
 - 37-2-0896
 - 37-2-0805
- develop a salvage program for the above sites in consultation with the DEC;
- allow local Aboriginal groups input to the salvage program to ensure that cultural sensitivities are satisfactorily met; and
- undertake the management recommendations in respect of sites addressed in existing consents that will be amalgamated into a consolidated consent.

The Department has incorporated these GTAs into the proposed conditions of consent.

6.8.5 Conclusion

The Department is satisfied with the extent of consultation undertaken with local Aboriginal community groups and the archaeological studies conducted for the development.

The Applicant should be required to:

- actively protect and conserve the Aboriginal sites located on lands unaffected by mining activities;
- contribute \$50,000 to the Hunter Aboriginal Cultural Heritage Trust Fund for further investigations into Aboriginal cultural heritage;
- prepare and implement an Archaeology and Cultural Heritage Management Plan, in consultation with the DEC and local Aboriginal groups, to the satisfaction of the Director-General; and
- fulfil the obligations, in respect of Aboriginal cultural heritage and archaeology, contained in existing consents and proposed to be incorporated into the consolidated consent for HVO north of the Hunter River.

6.9 TRAFFIC AND TRANSPORT

6.9.1 Traffic Impact Assessment

The EIS assessed the potential traffic impacts of the proposal.

Vehicle movements associated with proposed construction activities are not expected to have a noticeable impact on the surrounding road network. While additional flows on Lemington Road, Pikes Gully Road and the West Pit Access Road represent between 3.7 and 9 % of existing flows, the existing level of service on these roads will be maintained. These roads currently carry only small volumes of traffic and have the capacity to cater for much larger volumes of traffic.

Additional traffic movements generated by additional employees on the New England and Golden Highways, represents less than 1% of existing flows. While additional flows on Lemington Road, Pikes Gully Road and the West Pit Access Road represent between 5 and 11.9% of existing flows, the existing level of service on these roads will be maintained.

Intermittent haulage will increase flows to approximately 1,598 vehicle movements on Pikes Gully Road and approximately 1,358 vehicle movements on Liddell Station Road. While these movements will increase traffic flows on these roads by 66% and 89%, they will have little effect on the operation and level of service of these roads, particularly as these flows will be intermittent. The roads currently carry small amounts of traffic (almost entirely mine-related) and have the capacity to cater for significantly greater volumes of traffic.

6.9.2 Issues Raised in Submissions

The Department received 6 submissions on the potential traffic impacts of the proposal, mostly objecting to the impact of traffic on local roads. Two of the submissions were from local residents, with one each received from Singleton and Muswellbrook Councils, the RTA and DMR.

6.9.3 Consideration of Issues Raised in Submissions

The issues raised by both Councils concerns roads in the Newdell area that, while owned by the respective Council, are maintained by either CNA or Xstrata, both coal companies. There is no through traffic on these roads not associated with coal operations. As the increase in traffic on these roads will not hinder or inconvenience the general public and the roads will be maintained at the expense of coal companies, there will be minimal impact on public road infrastructure from the proposed development.

The RTA requested that the intersection of Lemington Road and the Golden highway be upgraded.

6.9.4 General Terms of Approval

The RTA has issued its GTA for the proposal.

This GTA requires the Applicant to:

- upgrade the intersection of the Golden Highway/Lemington Road to a type 'BAR' intersection with a sealed shoulder to RTA requirements.

The Department has incorporated this GTA into the proposed conditions of consent.

6.9.5 Conclusion

The Department is satisfied that the proposal would have little or no impact on the road network.

The Applicant should be required to:

- obtain approval from the relevant road authority before it closes any public roads to traffic to enable road works or blasting at the mine to be undertaken;
- investigate the closure of public roads in the Newdell area and their conversion to private roads, where these roads are almost exclusively used by coal companies;
- upgrade the intersection of the Golden Highway and Lemington Road.

6.11 OTHER IMPACTS

ERM has assessed the potential visual (see Section 14 of the EIS), waste (see Section 16 of the EIS) and risk (hazard) (see Section 17 of the EIS) impacts of the proposal.

These impacts remain largely unchanged from previous operations.

Consequently the Department is satisfied that the proposal is unlikely to have other than minimal adverse visual, waste or risk impacts.

Nevertheless, it believes CNA should be required to comply with a number of standard conditions of consent to ensure that these matters receive appropriate attention during the development.

6.12 CONSOLIDATION OF CONSENTS

The Department, DEC, Council and the Applicant reviewed the 15 existing development consents that are to be surrendered as a component of the development application. Specific conditions of consent that are required to be continued for HVO north of the Hunter River were identified and incorporated into the conditions of the consolidated consent. These conditions relate to:

- consents to destroy or damage Aboriginal sites under section 90 of the *NPWS Act*;
- the development of a Cultural Heritage Indigenous Management Agreement;
- the protection of archaeological site CM-CD1 from mining operations;
- the closure of Lemington Road during certain blasting operations at the Carrington Pit;
- alternative arrangements for the re-instatement of the Mitchell Line Of Road in the West Pit area;
- ensuring that all section 94 contributions from existing consents have been made.

The Department, Council the Applicant are all satisfied that all relevant conditions from the existing consents that have on-going application have been included in the conditions of the consolidated consent, or are addressed by other conditions contained within the consolidated consent.

7. SECTION 79C CONSIDERATIONS

Section 79C of the EP&A Act sets out the matters that a consent authority must take into consideration when it determines a DA.

The Department has assessed the proposal against these matters, and is satisfied that:

- The proposal is generally consistent with the provisions of the relevant planning instruments;
- The potential impacts of the proposal can either be mitigated or managed; and
- The proposal is generally in the public interest.

8. RECOMMENDED CONDITIONS OF CONSENT

The Department has prepared recommended Conditions of Consent for the proposal.

These conditions are required to:

- Prevent, minimise and/or offset adverse environmental impacts;
- Set standards and performance measures to monitor environmental performance;
- Require regular monitoring and reporting; and
- Provide for the ongoing environmental management of the development.

The Applicant does not object to these recommended conditions.

9. CONCLUSION

The proposal would provide significant social and economic benefits to the people of NSW.

The proposal represents a continuation of existing operations at the HVO north of the Hunter River and as such the likely impacts of the proposal are well-known and can be predicted with confidence.

There will be significant air quality and noise impacts on 4 residences. However, all residences are currently in a zone of affectation or have agreements with CNA or another coal company in respect of these impacts. Consequently, the proposal will not increase the number of residences significantly affected by mining operations. The Department is confident that all other impacts can be mitigated and managed.

The Department has assessed the EIS and various submissions on the proposal, and recommends that the Minister approve the DA subject to conditions.

RECOMMENDATION

It is RECOMMENDED that the Minister:

- (1) Consider the findings and recommendations of this report;
- (2) Approve the DA under Section 80 of the Act; and
- (3) Sign the attached Instrument of Consent.

David Kitto
Manager Extractive Industries

Sam Haddad
Deputy Director-General

Report prepared by Colin Phillips