Telfer Project, Power Supply and Infrastructure Corridor, Port Hedland to Telfer Gold Mine, Great Sandy Desert

Newcrest Mining Limited

Report and Recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1058
August, 2002

ISBN. 0 7307 6693 4
ISSN. 1030 - 0120
Assessment No. 1444

Contents

Page

Tables

Figures

Appendices

1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment and Heritage on the environmental factors relevant to a proposal by Newcrest Mining Limited to develop a power supply and infrastructure corridor to provide power for its proposed expansion of the Telfer Gold Mine.

The EPA was advised of the proposal in December 2001. Based on the information provided, the EPA considered that while the proposal had the potential to have an effect on the environment, the proposal could be readily managed to meet the EPA's environmental objectives. Consequently it was notified in *The West Australian* newspaper on 10 December 2001 that, subject to preparation of a suitable Environmental Protection Statement (EPS) document, the EPA intended to set the level of assessment at EPS.

The proponent has prepared the EPS which accompanies this report (Newcrest Mining Limited 2002a). The EPA considers that the proposal described can be managed in an acceptable manner subject to the commitments to the proposal being legally binding. The EPS document is also available in hard copy and on CD in the library of the Department of Environmental Protection

The EPA therefore has determined under Section 40 (1) that the level of assessment for the proposal is EPS, and this report provides the EPA advice and recommendations in accordance with Section 44 (1).

This proposal is to supply power to an expanded mining operation at the Telfer Gold Mine. The proposed expansion of the Telfer Gold Mine associated with this proposal is being dealt with separately. That mine expansion is set out in a separate referral to the EPA (Newcrest Mining Limited 2002b). The mine expansion and power supply proposals have been separated because it is likely that the mine and power supply will eventually be operated by different proponents. Nevertheless, the proposals have been developed and assessed in parallel. The EPA has assessed the mine expansion proposal through the Assessment on Referral Information process. The EPA's report and recommendations on the expanded mining proposal is contained in Bulletin 1059 (EPA 2002).

2. The proposal

The proposal is described in detail in Section 2 of the proponent's "Telfer Project, Power Supply and Infrastructure Corridor, Environmental Protection Statement" document (Newcrest Mining Limited 2002a). The proposal involves supplying up to 100 megawatts of power to the Telfer Gold Mine using a 440 km long power supply and infrastructure corridor from Port Hedland (refer to Figure 1).

Two power supply options to meet the required demand for the expansion of the Telfer Gold Mine are proposed. These options are:

(i) Supplying natural gas from the existing Epic Energy Compound in Port Hedland via a buried pipeline to the Telfer Gold Mine for on-site electricity generation at a new open-cycle gas-fired power plant (Option 1a) or an open/combined cycle plant (Option 1b); or

(ii) Generating electricity at the existing Port Hedland Power Station and supplying power via a 220 kV overhead transmission line to the Telfer Gold Mine. Power would be generated by either using existing power generating capacity at the Port Hedland Power Station, should it become available (Option 2a), or by adding up to 100 MW of capacity to the station (Option 2b).

Although approval is being sought for both options, only one would ultimately be constructed.

The main characteristics of the proposal are summarised in Table 1 below.

Table 1. Key Characteristics Table

Option 1

Element	**Quantities/Description**	
	Option 1a	Option 1b
Life of Project	Life of Telfer Project (approximately 25 years)	Life of Telfer Project (approximately 25 years)
Plant	Up to four open cycle gas turbines Reverse osmosis water treatment plant	Combination of up to four combined and open cycle gas turbines Reverse osmosis water treatment plant
Power Station		
Maximum Demand	Up to 100 MW	Up to 100 MW
Presently Installed Capacity	0 MW	0 MW
New Capacity	Up to 160 MW	Up to 160 MW
Fuel	Natural gas (with diesel backup facility)	Natural gas (with diesel backup facility)
Cooling Water		
Consumption	Approximately 200 megalitres per annum	Approximately 1600 megalitres per annum
Source	Telfer Project Borefields and/or mine dewatering	Telfer Project Borefields and/or mine dewatering
Greenhouse Gas Emissions (CO_2)	Approximately 500 000 tonnes per year	Approximately 440 000 tonnes per year
Gas Pipeline		
Vegetation Disturbance	Approximately 1500 hectares during construction Approximately 85 hectares during operations	Approximately 1500 hectares during construction Approximately 85 hectares during operations
Length and Diameter	440 kilometres, 200-250 millimetres diameter	440 kilometres, 200-250 millimetres diameter
Pressure	Maximum 14.8 megapascals at Port Hedland	Maximum 14.8 megapascals at Port Hedland
Alignment	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.

Option 2

Element	Quantities/Description	
	Option 2a	**Option 2b**
Life of Project	Life of Telfer Project (approximately 25 years). Note: The Port Hedland power station may continue operation beyond this.	Life of Telfer Project (approximately 25 years). Note: The Port Hedland power station may continue operation beyond this.
Plant	Three 40 MW gas turbines* Reverse osmosis water treatment plant* Three 12.5 metre stacks*	Addition of up to three 40 MW turbines
Power Station		
Maximum Demand	100 MW	100 MW
Installed Capacity	120 MW*	120 MW*
New Capacity	0 MW	100 MW
Fuel	Natural gas	Natural gas
Cooling Water		
Consumption	160 megalitres per annum*	Approximately 360 megalitres per annum
Source	Town water supply*	Town water supply
Plant	Three 40 MW gas turbines* Reverse osmosis water treatment plant* Three 12.5 metre stacks*	Addition of up to three 40 MW turbines
Greenhouse Gas Emissions (CO2)	Approximately 649 000 tonnes per year	Approximately 588 000 tonnes per year
Overhead Transmission Line		
Vegetation Disturbance	Approximately 600 hectares during construction. Approximately 80 hectares during operations.	Approximately 600 hectares during construction. Approximately 80 hectares during operations.
Length and Diameter	Approximately 440 km, 35 m high towers spaced at 400 m intervals.	Approximately 440 km, 35 m high towers spaced at 400 m intervals.
Alignment	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.

* Existing and authorised infrastructure (i.e. no change required for this proposal).

Figure 1 Project Location and Proposed Infrastructure Corridor (Source: Newcrest Mining Limited (2002)

3. Consultation

During the preparation of the EPS, the proponent has undertaken consultation with government agencies and companies with a direct interest in the project and other key stakeholders. Consultation was also undertaken with the local community via a press release made to the local paper inviting comment. The organisations consulted, the comments received and the proponent's response are included in Section 1.6 of the EPS (Newcrest Mining Limited, 2002) a copy of which is included as Appendix 3 of this report.

4. Relevant environmental factors

The summary of all of the environmental factors and their management is outlined in Table ES-2 of the EPS (Newcrest Mining Limited, 2002a). Many of these factors have been investigated and assessed through the EPS document and found not likely to have a significant impact.

In the EPA's opinion the following are the environmental factors relevant to the proposal:

a) Flora and Fauna — the short-term effects of construction clearing for the infrastructure corridor and the longer-term effects of access required for maintenance; and

b) Greenhouse Gas Emissions — from the power station.

4.1 Flora and fauna

The EPA's environmental objective for this factor is to maintain the abundance, diversity, geographic distribution and productivity of flora and fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.

Assessment

The construction of 440 km of either a gas pipeline or an overhead transmission line will result in the temporary disturbance of a relatively large area of vegetation (1500 ha or 600 ha respectively). Most of this area will be rehabilitated as construction proceeds, however, there will be some facilities and access routes that will result in long-term loss of vegetation. These amount to an area of less than 85 ha.

Impacts upon flora and fauna as a result of clearing have been addressed through the EPS process by tiered approach of: choosing an appropriate route; survey work to determine the significance of loss through clearing; and management measures to deal with the construction impacts at the local scale.

A route for the infrastructure corridor has been chosen taking into account environmental constraints. The proponent has considered several potential corridors and carried out a thorough study of two alternative corridors before selecting its preferred option. Both of these routes were chosen to avoid crossings of rivers/creeks/dunes and to parallel existing access routes wherever possible. Paralleling existing access routes reduces the amount of long-term clearing and avoids the introduction of new paths for impacts (such as weed introduction and erosion) into undisturbed areas. Based on environmental criteria there is little difference between the preferred option and the alternative option. Although the alternative route appears to more closely follow existing access routes (particularly the rabbit-proof fence), this is offset by the larger number of dune crossings as the route approaches the mine and the fact

that the existing access would need to be upgraded. As a result the EPA does not have a particular preference for which route is chosen and leaves this decision to the proponent.

Survey work along the preferred route has demonstrated that clearing within this corridor will not have any significant impact at a regional level and has confirmed the identification of sensitive areas where higher level of management would be necessary. An ecological survey has been conducted of both routes. It found that the ecological impact of the corridor is limited because it is very narrow and is mostly in remote areas with widespread vegetation types and habitats. The vegetation is mainly sandplain with shrubs over spinifex, a few stoney hills, and swale/sand dune areas in the desert proper. No declared rare flora occur on the route and no threatened fauna species are dependent on areas that would be disturbed. River/creek crossings and dune crossings are areas where there is a greater potential for erosion impacts. In addition, the swales between sand dunes are a relatively scarce landform that contain populations of priority flora (*Goodenia hartana* ms, Priority 2).

The proponent has set out a number of management measures to reduce the impact at the local level when constructing the pipeline or transmission line. These measures dealing with flora, fauna, soil conservation, erosion, and rehabilitation will be expanded into operating plans prior to construction (Appendix 2, Commitments 1,2,3,4,& 8). A key aspect of the proposed management is to carry out additional pre-clearance surveys along the alignment as construction proceeds. This will allow locally significant areas to be identified and, where possible, avoided by altering the alignment. Where areas cannot be avoided, the proponent will reduced the width of the disturbance through that area. While this will minimise the impact of the construction disturbance, implementation of the rehabilitation plan during construction and for the first few years after construction will be critical in reducing the long-term impact of the corridor.

The transmission line option results in less than half (600 ha versus 1 500 ha) the disturbance of the gas pipeline, but this difference is not considered by the EPA to be significant given the regional scale of the proposal and the widespread vegetation types involved.

The EPA notes that since proper consideration has been given to route selection and management of construction impacts, the environmental impacts would be local and temporary, and thus meet its objective. Therefore, the EPA considers that its environmental objective for this factor can be met through implementation of the proponent's commitments for either option.

4.2 Greenhouse gas emissions

The EPA's objective for this factor is to ensure that best available efficient technologies are used in Western Australia to minimise greenhouse gas emissions.

Assessment

The principle greenhouse gas produced by the power station will be carbon dioxide. Up to 649 000 tonnes per annum of carbon dioxide would be produced by the burning of fuel in the power station. This is equates to approximately 0.12% of Australia's net greenhouse gas emissions in 1990. Predicted emissions for the various options are presented in the table below.

Table 2. Predicted greenhouse gas emissions from the power supply

Option	Description	CO_2 emissions
Option 1a	Open-cycle gas-fired power plant at Telfer	500,000 tonnes/annum
Option 1b	Open/combined cycle gas-fired power plant at Telfer	440,000 tonnes/annum
Option 2a	Using existing power plant at Port Hedalnd	649,000 tonnes/annum
Option 2b	Open-cycle gas-fired power plant at Port Hedland	588,000 tonnes/annum

The proposal will use natural gas as the fuel source to generate electrical power. Gas is one of the more economical fuels in regard to greenhouse gas emissions per unit of electrical energy. However, at this time the proponent wishes to mainly use open-cycle gas turbines rather than closed-cycle gas turbines (a closed-cycle system recovers waste heat and uses this to generate additional electrical energy, thus improving efficiency with regard to greenhouse gas emissions). The EPA notes that the proponent's reasons for not favouring combined-cycle turbines at this time include.

- Combined cycle turbines need up to 25 times the amount of high quality water than open cycle turbines and the ability of the site to provide additional good quality water is a problem.
- Combined cycle turbines generally perform well with constant loads, but the variable loads associated with a mine site are much less conducive to the use of combined cycle machines.
- Combined cycle machines require highly skilled operators to be present on site continuously, whereas open cycle machines do not.
- Depending on the actual power demand for the project, the benefit of using open cycle machines may outweigh the greenhouse gas benefits associated with using combined cycle gas turbines which, in addition to the greater capital costs, also induce operational implications associated with balancing steam and power outputs.

Although the current choice is for mainly open-cycle turbines, the proponent will require that combined cycle gas turbines are considered by independent power providers during the tendering process for the Telfer Project.

Taking into account the estimated scale of greenhouse gas emissions the EPA would prefer that combined-cycle turbines were used, however, given the relatively small scale the EPA accepts in this case that other technical and economic considerations may result in the use of only open-cycle turbines. Nevertheless, the EPA expects that further consideration will be given to the type and configuration of the gas turbines before a final choice is made. The EPA has recommended that a Greenhouse Gas Management Plan be prepared before construction of the power station (Condition 6, Appendix 2). As part of this plan the proponent will need to demonstrate, based on the final detailed power requirements for the mine, that the use of combined cycle systems have been thoroughly investigated as an alternative. This approach is consistent with the tendering process that the proponent has set out.

The EPA therefore considers that its environmental objective for this factor can be met through implementation of the recommended conditions.

5. Conclusions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA concludes that impacts upon flora and fauna as a result of clearing have been addressed through a tiered approach of: route selection at a regional scale, survey work at an intermediate scale to identify any additional constraints, and specific management measures at the local scale. This approach gives the EPA confidence that the environmental impacts would be local and temporary, and thus meets its objectives.

The EPA notes that while this proposal would not be one of the larger contributors to increases in Western Australia's greenhouse gas emissions it will nevertheless not be a trivial contributor. Taking this into account, the EPA would prefer that combined-cycle gas turbines were used to generate the electrical power, but accepts that other technical and economic considerations may result in the use of open-cycle turbines given the relatively small scale of the project. Even so, the EPA believes, that as the energy requirements of the proposal are refined, a combined-cycle power station may emerge as a reasonable alternative. Further consideration of this alternative and reporting on the basis for the final decision will be provided in the Greenhouse Gas Management Programme to be prepared before construction of the power supply.

6. Recommendations

The EPA considers that the proponent has demonstrated, in the EPS document, that the proposal can be managed in an environmentally acceptable manner and provides the following recommendations to the Minister for the Environment and Heritage:

1. That the Minister notes that the proposal being assessed is for the Telfer Project, Power Supply and Infrastructure Corridor, Port Hedland to Telfer Gold Mine, Great Sandy Desert.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 4.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions and proponent commitments as set out in Appendix 2.
4. That the Minister imposes the conditions and procedures recommended in Appendix 2 of this report.

Appendix 1

References

Newcrest Mining Limited 2002 (a), *Telfer Project, Power Supply and Infrastructure Corridor, Environmental Protection Statement.* Prepared by Resource Strategies for Newcrest Mining Limited, July 2002.

Newcrest Mining Limited 2002 (b), *Telfer Project, Notice of Intent — Additional Referral Information.* Prepared by Resource Strategies for Newcrest Mining Limited, July 2002.

EPA 2002, *Telfer Project, Expansion of Telfer Gold Mine, Great Sandy Desert: Report and recommendations of the Environmental Protection Authority*, Bulletin 1059

Appendix 2

Recommended Environmental Conditions and Proponent's Commitments

Statement No.

RECOMMENDED CONDITIONS AND PROCEDURES

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

TELFER PROJECT, POWER SUPPLY AND INFRASTRUCTURE CORRIDOR, PORT HEDLAND TO TELFER GOLD MINE, GREAT SANDY DESERT

Proposal:	Supply of electrical power to the Telfer Gold Mine along a 440 kilometre infrastructure corridor from Port Hedland, as documented in schedule 1 of this statement. The corridor will contain either a natural gas pipeline to supply a power station at the mine, or an overhead electrical transmission line delivering power from a power station located at Port Hedland.
Proponent:	Newcrest Mining Limited
Proponent Address:	Level 9, 600 St Kilda Road, MELBOURNE VIC 3004
Assessment Number:	1444

Report of the Environmental Protection Authority: Bulletin 1058

The proposal referred to above may be implemented subject to the following conditions and procedures:

Procedural Conditions

1 Implementation and Changes

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of the conditions in this statement.

3 Proponent Nomination and Contact Details

3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment and Heritage has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.

3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment and Heritage will determine any dispute as to whether the proposal has been substantially commenced.

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment and Heritage prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

- the environmental factors of the proposal have not changed significantly;
- new, significant, environmental issues have not arisen; and
- all relevant government authorities have been consulted.

Note: The Minister for the Environment and Heritage may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

Environmental Conditions

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program in consultation with and submit compliance reports to the Department of Environmental Protection which address:

- the implementation of the proposal as defined in schedule 1 of this statement;
- evidence of compliance with the conditions and commitments; and
- the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement. Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposal is implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

6 Greenhouse Gas Emissions Management Plan

6-1 Prior to commencement of construction of the power station, the proponent shall prepare a Greenhouse Gas Emissions Management Plan to:

- ensure that "greenhouse gas" emissions from the project are adequately addressed and best available efficient technologies are used to minimise total net "greenhouse gas" emissions and / or "greenhouse gas" emissions per unit of product; and

- mitigate "greenhouse gas" emissions in accordance with the Framework Convention on Climate Change 1992, and consistent with the National Greenhouse Strategy;

to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

This Plan shall include:

1 calculation of the "greenhouse gas" emissions associated with the proposal, as indicated in "Minimising Greenhouse Gas Emissions, Guidance for the Assessment of Environmental Factors, No. 12" published by the Environmental Protection Authority;

2 specific measures to minimise the total net "greenhouse gas" emissions and/or the "greenhouse gas" emissions per unit of product associated with the proposal;

3 monitoring of "greenhouse gas" emissions;

4 estimation of the "greenhouse gas" efficiency of the project (per unit of product and/or other agreed performance indicators) and comparison with the efficiencies of other comparable projects producing a similar product;

5 analysis of the extent to which the proposal meets the requirements of the National Greenhouse Strategy using a combination of:

- "no regrets" measures;
- "beyond no regrets" measures;
- land use change or forestry offsets; and
- international flexibility mechanisms;

6 a target set by the proponent for the reduction of total net "greenhouse gas" emissions and/or "greenhouse gas" emissions per unit of product over time, and annual reporting of progress made in achieving this target.

Note: In part 5 above, the following definitions apply:

(1) "no regrets" measures are those that can be implemented by a proponent which are effectively cost-neutral and provide the proponent with returns in savings which offset the initial capital expenditure that may be incurred; and

(2) "beyond no regrets" measures are those that can be implemented by a proponent which involve some additional cost that is not expected to be recovered.

6-2 The proponent shall implement the Greenhouse Gas Emissions Management Plan required by condition 6-1 to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

6-3 The proponent shall make the Greenhouse Gas Emissions Management Plan required by condition 6-1 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7 Closure Plans

7-1 At least six months prior to the anticipated date of closure, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Closure Plan designed to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The Final Closure Plan shall address:

1 removal or, if appropriate, retention of plant and infrastructure in consultation with relevant stakeholders;

2 rehabilitation of all disturbed areas to a standard suitable for the agreed new land use(s); and

3 identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities.

7-2 The proponent shall implement the Final Closure Plan required by condition 7-1 until such time as the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, that the proponent's closure responsibilities are complete.

7-3 The proponent shall make the Final Closure Plan required by condition 7-1 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Procedures

1 Where a condition states "to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority", the Chief Executive Officer of the Department of Environmental Protection will obtain that advice for the preparation of written advice to the proponent.

2 The Environmental Protection Authority may seek advice from other agencies, as required, in order to provide its advice to the Chief Executive Officer of the Department of Environmental Protection.

Notes

1 The Minister for the Environment and Heritage will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.

2 The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

Schedule 1

The Proposal (Assessment No. 1444)

The proposal involves supplying up to 100 megawatts of power to the Telfer Gold Mine using a 440 kilometre long power supply and infrastructure corridor from Port Hedland (see Figure 1).

Two power supply options to meet the required demand for the expansion of the Telfer Gold Mine are proposed. These options are:

1. Supplying natural gas from the existing Epic Energy Compound in Port Hedland via a buried pipeline to the Telfer Gold Mine for on-site electricity generation at a new open-cycle gas-fired power plant (Option 1a) or an open/combined cycle plant (Option 1b); or
2. Generating electricity at the existing Port Hedland Power Station and supplying power via a 220 kV overhead transmission line to the Telfer Gold Mine. Power would be generated by either using existing power generating capacity at the Port Hedland Power Station, should it become available (Option 2a), or by adding up to 100 MW of capacity to the station (Option 2b).

Although approval is being sought for both options, only one would ultimately be constructed.

The main characteristics of the proposal are summarised in the table below.

Key Characteristics Table

Option 1

Element	Quantities/Description	
	Option 1a	Option 1b
Life of Project	Life of Telfer Project (approximately 25 years)	Life of Telfer Project (approximately 25 years)
Plant	Up to four open cycle gas turbines Reverse osmosis water treatment plant	Combination of up to four combined and open cycle gas turbines Reverse osmosis water treatment plant
Power Station		
Maximum Demand	Up to 100 MW	Up to 100 MW
Presently Installed Capacity	0 MW	0 MW
New Capacity	Up to 160 MW	Up to 160 MW
Fuel	Natural gas (with diesel backup facility)	Natural gas (with diesel backup facility)
Cooling Water		
Consumption	Approximately 200 megalitres per annum	Approximately 1600 megalitres per annum
Source	Telfer Project Borefields and/or mine dewatering	Telfer Project Borefields and/or mine dewatering
Greenhouse Gas Emissions (CO_2)	Approximately 500 000 tonnes per year	Approximately 440 000 tonnes per year
Gas Pipeline		
Vegetation Disturbance	Approximately 1500 hectares during construction Approximately 85 hectares during operations	Approximately 1500 hectares during construction Approximately 85 hectares during operations
Length and Diameter	440 kilometres, 200-250 millimetres diameter	440 kilometres, 200-250 millimetres diameter
Pressure	Maximum 14.8 megapascals at Port Hedland	Maximum 14.8 megapascals at Port Hedland
Alignment	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.

Option 2

Element	Quantities/Description	
	Option 2a	**Option 2b**
Life of Project	Life of Telfer Project (approximately 25 years). Note: The Port Hedland power station may continue operation beyond this.	Life of Telfer Project (approximately 25 years). Note: The Port Hedland power station may continue operation beyond this.
Plant	Three 40 MW gas turbines* Reverse osmosis water treatment plant* Three 12.5 metre stacks*	Addition of up to three 40 MW turbines
Power Station		
Maximum Demand	100 MW	100 MW
Installed Capacity	120 MW*	120 MW*
New Capacity	0 MW	100 MW
Fuel	Natural gas	Natural gas
Cooling Water		
Consumption	160 megalitres per annum*	Approximately 360 megalitres per annum
Source	Town water supply*	Town water supply
Plant	Three 40 MW gas turbines* Reverse osmosis water treatment plant* Three 12.5 metre stacks*	Addition of up to three 40 MW turbines
Greenhouse Gas Emissions (CO2)	Approximately 649 000 tonnes per year	Approximately 588 000 tonnes per year
Overhead Transmission Line		
Vegetation Disturbance	Approximately 600 hectares during construction. Approximately 80 hectares during operations.	Approximately 600 hectares during construction. Approximately 80 hectares during operations.
Length and Diameter	Approximately 440 km, 35 m high towers spaced at 400 m intervals.	Approximately 440 km, 35 m high towers spaced at 400 m intervals.
Alignment	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.	Principally parallel to existing road and rail easements between Port Hedland and Telfer, via the old mining townships of Goldsworthy and Shay Gap.

* Existing and authorised infrastructure (i.e. no change required for this proposal).

Abbreviations

MW	Megawatt
km	kilometre
m	metre

Figures

1. Project Location and Proposed Infrastructure Corridor

Schedule 2

Proponent's Environmental Management Commitments

31 July 2002

Telfer Project, Power Supply and Infrastructure Corridor, Port Hedland to Telfer Gold Mine, Great Sandy Desert
(Assessment No. 1444)

Newcrest Mining Limited

Proponent's Environmental Management Commitments — Power Supply and Infrastructure Corridor (Assessment No. 1444)

Number	Topic	Objective	Action	Timing	Whose Advice
1.	Environmental Management Plan.	To ensure construction, operation and decommissioning phases of the power station and gas pipeline/OTL and managed to reduce unnecessary impacts. To ensure unavoidable impacts are managed to an acceptable level.	1.1 Prepare an EMP to manage environmental impacts during the construction, operational and decommissioning phases of the project. The EMP will describe how the proponent will promote the following: • minimisation of disturbance areas; • protection of environmentally sensitive areas; • minimisation of impacts on native fauna and flora; • prevention of weed and pest infestations; • preservation and management of soil resources; • minimisation of dust and noise impacts; • control of erosion and sedimentation from disturbed areas; • protection of archaeological and anthropological sites/features; • rehabilitation of disturbed areas; and • management of traffic impacts. 1.2 Implement the EMP.	Prior to construction. During construction and operations.	CALM, WRC
2.	Flora and Fauna Management Plan	Maintain the abundance, diversity, geographical distribution and productivity of flora and fauna at species and ecosystems levels through the avoidance or management of adverse impacts and improvement in knowledge.	2.1 Prepare a Flora and Fauna Management Plan that addresses the following measures: • Pre-clearance surveys to be conducted along the actual miscellaneous licence corridor (prior to disturbance). • An environmental advisor will be employed to manage the implementation of environmental control measures. • Clearing of native vegetation will be limited to the practicable minimum required to safely construct the power supply. • Rehabilitation of disturbed areas will be performed as soon as practicable. • Open trenches or holes will be inspected each day and trapped fauna removed and relocated. • Workforce inductions will include flora and fauna protection. • Weed and pest management procedures. 2.2 Implement the Flora and Fauna Management Plan.	Prior to land disturbance (pre-clearance surveys) Construction phase.	CALM.

Proponent's Environmental Management Commitments (Continued)

Number	Topic	Objective	Action	Timing	Whose Advice
3.	Soil Conservation and Management Plan.	To maintain the integrity, ecological functions and environmental values of soils and landforms.	3.1 Prepare a Soil Conservation and Management Plan that: • documents management procedures for soil stripping, stockpiling and replacement/rehabilitation. 3.2 Implement the Soil Conservation and Management Plan:	Prior to construction. During construction	CALM.
4.	Erosion and Sedimentation Control Plan	To minimise the potential for unacceptable rates of erosion and/or sedimentation in high risk parts of the corridor, such as areas with steeper gradients, river crossings, dune crossings and erosion-susceptible soils.	4.1 Prepare an Erosion and Sedimentation Control Plan that: • documents management procedures for erosion and sedimentation control in high risk areas (such as river/creek crossing and dune crossings). 4.2 Implement the Erosion and Sedimentation Control Plan.	Prior to construction. During construction	WRC, CALM.
5.	Noise and Dust Management Plan	To ensure that noise or dust emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	4.1 Prepare a Noise and Dust Management Plan that: • documents procedures for managing noise and dust emissions 4.2 Implement the Noise and Dust Management Plan.	Prior to construction. During construction	CALM.

Number	Topic	Objective	Action	Timing	Whose Advice
6.	Waste Management Plan	Ensure that wastes are contained and isolated and that recycling and reuse are maximised.	6.1 Develop a Waste Management Plan addressing: • appropriate procedures for collecting, containing and disposing wastes. 6.2 Implement the Waste Management Plan.	Prior to construction. During construction and operation.	WRC, CALM.
7.	Aboriginal heritage.	To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation.	Aboriginal monitors will be employed to survey the corridor prior to construction activities and assist with the management of any sites that are found. The Proponent will ensure that its workforce and contractors are made aware of the requirements of the Aboriginal Heritage Act, 1972 not to damage or interfere with Aboriginal sites via an induction programme. Consultation with Aboriginal groups with an interest in the Project will continue in order to address Aboriginal heritage issues that may arise.	During construction.	CALM, DIA, Aboriginal Communities.
8.	Rehabilitation Plan	To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values.	8.1 Develop a Rehabilitation Plan addressing: • procedures for the progressive rehabilitation of disturbed areas; • monitoring of rehabilitation progress for the length of the corridor; and • remedial works at locations with sub-optimal rehabilitation success. 8.2 Implement the Rehabilitation Plan.	Prior to construction. During construction and operation.	CALM, DMPR.
9.	Bushfire Protection Plan	Prevent bushfires resulting from construction or operational activities.	9.1 Develop a Bushfire Protection Plan that: • documents procedures for managing bushfire hazards. 9.2 Implement the Bushfire Protection Plan.	Prior to construction. During construction	CALM, DMPR.

Abbreviations

ER Environmental Report
EMP Environmental Management Plan
AER Annual Environmental Report
CALM Department of Conservation and Land Management
DMPR Department of Mineral and Petroleum Resources
DIA Department of Indigenous Affairs
OTL Overhead Transmission Line
WRC Water and Rivers Commission

Appendix 3

Summary of outcomes of consultation

Key Issues Raised by Government Agencies (Central Offices)

Issue	Issue Raised By Who/When	Summary of Issue Resolution
Type of approval process applicable to the project	All (Sept 2001, Jan 2002, May 2002)	Following a briefing meeting between Newcrest and the EPA Chairman, EPA formally advertised its intention to use the EPS process to assess the project. The Proponent has conducted an environmental impact assessment, comprehensive stakeholder consultation and issue resolution prior to lodgement of this EPS report.
Integration of power supply with existing network and other users	Office of Major Projects (Sept 2001, Feb 2002)	Power demand is greater than excess capacity in the current network. Although not proposed at this stage, off-takes could potentially be installed at a later date to supply other users in the region if commercial agreements were negotiated.
Environmental Protection and Biodiversity Conservation Act, 1999 (EPBC Act)	DEP (Sept 2001)	The project will be referred to Environment Australia if necessary. A bilateral agreement with EA has not been enacted for WA. It is generally up to the Proponent to decide whether to refer a project, however EPA would be involved in discussions with EA regarding integration of impact assessment if the project is deemed to be a controlled action.
Assessment of concentrate pipeline and de-watering facility at Port Hedland	DEP (Jan 2002, May 2002)	The meetings involved some discussion of the assessment of this option for concentrate transport. Based on feasibility assessments, a decision was made by Newcrest in June 2002 to truck the concentrate from the mine to Port Hedland (ie. the concentrate pipeline is no longer part of the proposal). The concentrate trucking operation has been assessed as part of the NOI/ARI.
Assessment and management of potential impacts on significant flora and fauna	DEP CALM (Jan 2002)	Specific environmental management measures are proposed, including employment of an environmental advisor to oversee the construction phase. Although the EPS survey did not find any significant flora and fauna species, the corridor is located within the range of several State and Federally listed species. Government agencies suggested the Proponent employ a person during the construction phase as an environmental advisor to conduct pre-clearance surveys and to check the trench/construction areas each morning.
Greenhouse gas emissions and thermal efficiency of the power station	DEP (Jan 2002, May 2002)	Newcrest has undertaken an assessment of alternative natural gas power generation technologies. Given the configuration of the Telfer Project and proposed demand, open cycle gas turbines were considered to be more likely to be more favourable on a resource efficiency, technical and economic basis.

Key Issues Raised by Government Agencies (Regional Offices)

Issue	Issue Raised By Who/When	Summary of Issue Resolution
Employment and contracting opportunities for local residents and businesses (including Aboriginal communities)	Town of Port Hedland, Pilbara Development Commission, Port Hedland Port Authority	Construction of the project (mine and power supply) will generate significant benefits to the State and regional economy. The power supply alone will result in approximately 130 new jobs during the 7 month construction phase. Various contractors will also be employed. Local people and businesses will be given the opportunity to apply for the work. The Proponent will provide training and work opportunities for local Aboriginals, in cooperation with regional organisations.
Possibility of fly-in fly-out services to regional centres	Town of Port Hedland, Pilbara Development Commission	The Proponent is considering a fly-in fly-out service to the mine from Port Hedland as part of the feasibility study. The decision to include this service would depend on its commercial viability and number of regional employees.
Potential for several projects occurring at the same time and all requiring temporary accommodation	Town of Port Hedland, Pilbara Development Commission	Whilst working on the section of the route nearest Port Hedland the Proponent will utilise the accommodation camp site located near the Port Hedland airport, if practicable. Town of Port Hedland has advised that this site was previously used during the construction of BHP's HBI plant and could be used whilst construction activities are near Port Hedland.
Proximity of the route to the South Hedland Rural Estate (SHRE)	Town of Port Hedland	In response to concerns raised by local residents, the preferred route has been moved into the area north of Road 432 and is now a minimum of 300 m from the nearest occupied dwelling at the SHRE. Town of Port Hedland confirmed that moving the route into this area would not conflict with any of its current long-term development plans for South Hedland.
Location and size of evaporation pond at the concentrate de-watering facility	CALM, Town of Port Hedland, Port Hedland Port Authority, DEP	The meetings involved discussion of the potential size and location of the proposed evaporation pond. Based on feasibility assessments, a decision was made by Newcrest in June 2002 to truck the concentrate from the mine to Port Hedland (ie. the concentrate pipeline is no longer part of the proposal and hence the evaporation pond is not required).
Vegetation clearing practices	CALM	Vegetation clearing would be limited to the practicable minimum required to safely construct the power supply. Clearing would be conducted in a manner that maximises the retention of the seed bank and root stock contained in the upper horizons of the soil.
Management of activities within the De Grey River Water Reserve	WRC	Construction activities within the De Grey River Water Reserve would be conducted in accordance with the relevant Water Source Protection Plan (WRC, 2000) in order to minimise the potential for contamination.
Permitting of watercourse crossings	WRC	Permits would be obtained from WRC for all watercourse crossings prior to the commencement of construction activities in the vicinity of the river or creek.
Integration of power supply with existing network and other users	DEP, CALM	Power demand is greater than excess capacity in current network. Although not proposed at this stage, off-takes could be installed to supply other users in the region if commercial agreements were negotiated.
Type of river/creek crossings	CALM DEP, WRC	Specific environmental management measures are proposed for creek and river crossings. Other pipelines and infrastructure corridors have been constructed across the rivers/creeks in question. CALM indicated that trenching has been successfully used in the past and should be suitable for this project if appropriately managed.
Assessment and management of potential impacts on significant flora and fauna	DEP CALM	Specific environmental management measures are proposed, including employment of an environmental advisor to oversee the construction phase and conduct pre-clearance surveys. Sightings of significant fauna are known for Shay Gap (Bilbies), Mt Cecelia (Marsupial Moles) and the Great Sandy Desert (Mulgaras, Bilbies and Marsupial Moles). These sightings are not, however, recorded on the official CALM significant fauna record database. There are only two declared rare plant species that could possibly occur in the corridor, but these are generally restricted to the Pilbara and the likelihood of encountering them is considered by CALM to be low.
Installation of pipeline or powerline in road reserves	Main Roads WA	The preferred route would be located just outside, but parallel to the 200 m wide Great Northern Highway easement. The alternative route would be located within the easement. Although Main Roads would prefer the power supply to be located outside the easement, it confirmed it would be possible to construct within the easement if necessary (subject to an acceptable agreement being in place to cover issues such as indemnity against damage by third parties).

Proximity of the proposed power supply route to the Junction of the Marble Bar Road and the Great Northern Highway	Main Roads WA	Main Roads indicated that it would prefer the power supply route to be located at least 200 m south of the intersection between the Marble Bar Road and the Great Northern Highway in order to allow possible intersection upgrades in the future. Based on the above, Newcrest's Miscellaneous Licence Application was widened to 500 m in the vicinity of the intersection in order to provide the necessary buffer distance.
Design details and Traffic Management Plans for road crossings	Main Roads WA	Detailed design drawings and Traffic Management Plans for all major road crossings would be provided to Main Roads for approval prior to construction.
Option of attaching the gas pipeline to the De Grey and Strelley River bridges	Main Roads WA	During the consultation process, Main Roads indicated that they would not like the gas pipeline attached to the road bridges over the De Gray or Strelley Rivers, unless no other alternative was available. If the Proponent decides to pursue this construction option (ie. rather than directional drilling or open trenching) a formal application to Main Roads WA would be made. Particular emphasis on design modifications to address public safety issues and emergency response procedures would be required as part of the application.
Potential dust impacts in Port Hedland	DEP	The construction phase of the project will be for a short duration (approximately 7 months) and will involve a relatively narrow corridor (up to 30 m wide). Dust impacts are expected to be minor. Notwithstanding, watering of exposed surfaces will be undertaken if necessary.
Weed management	CALM	A weed control programme would be developed to the requirements of CALM and would be included in the EMP.
Minimise the ongoing requirement to trim vegetation	CALM	Vegetation regrowth along the corridor would be monitored during operations and control works undertaken if necessary (eg. trimming or removal of individual trees) in order to maintain specified safety distances and minimise bushfire hazard. Due to the predominance of grass dominated vegetation communities, limited ongoing regrowth maintenance is anticipated.

Issues Raised at Public Information Days, Telephone or Post

Issue	Summary of Issue Resolution
Employment and contracting opportunities	Local people and businesses will be given the opportunity to apply for the work. The Proponent will provide training and work opportunities for local Aboriginals in cooperation with regional organisations.
Possibility of fly-in fly-out services from Port Hedland	Newcrest is considering a fly-in fly-out service to the mine from Port Hedland as part of the feasibility study. The decision to include this service would depend on its commercial viability and number of regional employees.
Proximity of overhead powerline option to South Hedland Rural Estate (SHRE) residential areas (visual and electromagnetic effects).	As a result of concerns raised by the SHRE residents, the preferred route for the corridor has been adjusted by moving it several hundred metres to the north. The residents stated that they would have few concerns if the buried pipeline option were chosen (even if it were to follow the closer Road 432 alignment).
Potential disturbance to, and/or relocation of, fences, gates and access tracks.	Prior to the commencement of construction activities, the Proponent would consult with, and agree on, management measures to restrict disruptions to pastoral and other leaseholders directly impacted by the proposal. If necessary, these measures would include repair and or relocation of fences, gates or access tracks to, as a minimum, a condition equivalent to that which existed pre-disturbance.
Mount Burgess Mining NL raised the issue of the proposed corridor potentially sterilising prospective ground along the northern side of Telfer Road within their tenements.	The proposed route has been located on the southern side of the Telfer Road and would therefore not impact the area of concern.
Minimising the area to be cleared during construction and potential impacts on significant plant species.	Comprehensive environmental management measures will be adopted to minimise the width of the corridor that requires clearing and impacts on significant flora and fauna. Integral to enactment of these measures is the employment of an environmental advisor to undertake pre-clearance surveys and monitor construction activities.