Mining of gold ore from Reward and Northern Orebodies adjacent to Mt Charlotte, Kalgoorlie

Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM)

Report and Recommendations of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 919
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Summary and Recommendations

Kalgoorlie Consolidated Gold Mines (KCGM), operator of Mt Charlotte underground gold mine in Kalgoorlie, proposes to mine two pits adjacent to Mt Charlotte. These pits will uncover the floor pillars of the Reward and Northern Orebodies, which are the portions of these orebodies closest to the surface. The underground portions of these orebodies have already been mined as far as is possible from underground.

Once uncovered, these floor pillars can be blasted from beneath and the ore taken to the Fimiston Mill via underground tunnels. The underground voids thus uncovered would then be backfilled with waste rock to stabilise the ground around Mt Charlotte.

KCGM expects the proposed works and the noise bund construction, surface mining, blasting and surface ore recovery will be completed within twelve months. Once waste rock generated from within the pits has been exhausted, backfilling of the voids will continue using waste rock hauled from the Fimiston Open Cut.

Analysis indicates the proposal is likely to exceed the noise levels normally assigned in the *Environmental Protection (Noise) Regulation 1997*

Section 44 of the *Environmental Protection Act 1986* (the Act) requires the Environmental Protection Authority (EPA) to report to the Minister for the Environment 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.

This report provides the EPA's advice and recommendations to the Minister for the Environment on the environmental factors, conditions and procedures relevant to the proposal.

Relevant environmental factors

Although a number of environmental factors were considered by the EPA in the assessment, it is the EPA's opinion that the following are the environmental factors relevant to the proposal, which require detailed evaluation in this report:

(a) Noise - from construction and mining activities;

(b) Dust - from earth moving operations and bare surfaces;

(c) Vibration - ground movement from blasting transmitted to buildings;

(d) Community Consultation - to ensure adequate bilateral understanding.

The EPA has also provided advice in relation to ground stability, road safety and other issues raised in submissions.

Conclusion

The EPA has considered the proposal by KCGM to mine two pits adjacent to Mt Charlotte in Kalgoorlie.

Having particular regard to:

- the proximity of the proposed pits to dwellings and the school in Williamstown and to business and residential premises in the Kalgoorlie central business district (CBD);
- the short duration of the proposal;
- the proponent's commitment to do mining and construction work on the proposal only during weekdays;
- the proponent's commitment to provide a noise control bund to shelter Williamstown residents from noise and dust;

- the proponent's commitment to manage blasting such that ground vibration at affected premises will not exceed 10 millimetres per second peak particle velocity (PPV);
- the proponent's commitment to manage the proposal so as to limit its environmental impact on surrounding dwellings, school and business premises through the development and implementation of an Environmental Management System;
- the proponent's commitment to maintain a public Hotline and ensure prompt resolution of community concerns raised; and
- the computer noise modelling predictions that there would only be a short time at the beginning of the proposal when noise would exceed the assigned levels in the Noise Regulations.

The EPA has concluded that the proposed mining of the pits and associated construction works can be satisfactorily managed, provided that the conditions recommended in Section 4 and set out in formal detail in Appendix 3 are imposed.

The EPA anticipates that the noise from the proposal will be in excess of the levels assigned in the Noise Regulations but considers that the proponent has taken all practicable steps to limit the impact of noise and dust on surrounding noise sensitive premises. The EPA believes that the resultant noise will not be unreasonable and a variation to the allowable noise limits is justifiable.

This would involve an increase in the allowable noise levels for the short duration of this proposal by up to 10 dB[A] in Kalgoorlie CBD and up to 3 dB[A] in Williamstown from the current assigned noise levels. This short term variation could be given effect via Part IV conditions and a corresponding variation to the existing *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) pursuant to the *Environmental Protection Act 1986.*

The EPA also anticipates that high noise levels would occur in both Williamstown and the Kalgoorlie CBD during the two months before mining starts, when the proponent would be constructing a noise barrier in the form of a bund which would provide Williamstown residents with protection from noise during the mining. Because the purpose of the bund is specifically to protect the residents of Williamstown from noise and dust arising from subsequent operations, the EPA is of the view that the higher, short-term noise levels associated with its construction would be tolerable.

Accordingly the EPA has concluded that the proposed mining of the pits and associated construction works can be satisfactorily managed provided that the conditions recommended in Section 4 and set out in formal detail in Appendix 3 are imposed.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

- that the Minister considers this report on the relevant environmental factors of noise, vibration, dust and community consultation as set out in Section 3.
- that the Minister notes that the EPA has concluded that the proposed mining project can be satisfactorily managed, provided there is effective implementation by the proponent of the recommended conditions set out in Appendix 3 Section 4, including the proponent's commitments.
- that the Minister notes the requirement for a variation in the assigned noise levels applying to early parts of the proposal.
- that the Minister imposes the procedures and conditions, including revised assigned noise levels and the Community Consultation Plan, recommended in Appendix 3 of this report.

Conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by KCGM to mine the two pits at Mt Charlotte, Kalgoorlie, is approved for implementation. These conditions are presented in Appendix 3. Matters addressed in the conditions include:

- the proponent shall fulfil the commitments in the consolidated commitments statement set out in Schedule 3 to the recommended conditions in Appendix 3;
- the noise requirements for this proposal which are contained solely within condition 3 and the associated Schedules 2 and 4;
- the requirement for a detailed decommissioning and rehabilitation plan three months before the end of the proposal;
- the requirement for detailed written prescriptions for employee and contractor work practices;
- the requirement for a community consultation plan; and
- the need for revised allowable noise levels for the proposal.

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1. Introduction and Background

Kalgoorlie Consolidated Gold Mines (KCGM), operator of Mt Charlotte underground gold mine in Kalgoorlie, proposes to mine two pits adjacent to Mt Charlotte (Figure 1). These pits will uncover the floor pillars of the Reward and Northern Orebodies (ROB and NOB), which are the areas where the orebodies come to the surface. The underground portions of these and adjacent orebodies have already been mined as far as is practical from underground.

According to detailed computer noise modelling, early phases of the mining part of the proposal are likely to result in noise in excess of applicable assigned levels under the Noise Regulations. The proponent has sought limited relief from obligations under the Noise Regulations.

The general townsite environment is already noisy due to shaft mining at Mt Charlotte, ancillary industrial operations in the Kalgoorlie-Boulder area, vehicular traffic on the Eastern Bypass Road and the operating noise of the Fimiston Superpit.

Williamstown is a suburb of Kalgoorlie to the east of the Eastern Bypass Road. There is a primary school and less than 100 dwellings in Williamstown. The remaining residents of Kalgoorlie-Boulder live west of the Eastern Bypass Road.

The EPA determined that the potential environmental impacts of the proposal were sufficient for the proposal to be formally assessed under the provisions of Part IV of the Environmental Protection Act. The Environmental Review was subject to a four week public comment period.

Further details of the proposal are presented in Section 2 of this Report. Section 3 discusses environmental factors relevant to the proposal. Conditions and procedures to which the proposal should be subject if the Minister determines that it may be implemented are set out in Section 4. The EPA provides other advice in Section 5, Section 6 presents the EPA's conclusion and Section 7 the EPA's recommendations.

A list of people and organisations that made submissions is included in Appendix 1. References are listed in Appendix 2, and recommended conditions and procedures and proponent's commitments are provided in Appendix 3.

The DEP's summary of submissions and the proponent's response to those submissions have been published separately and are available in conjunction with this report.

2. The Proposal

The proposal is a gold mining operation comprising mining of two open pits for the Reward and Northern Orebodies and their associated floor pillars. The proposal involves some underground blasting but no surface blasting. The duration of the project is twelve months. Rehabilitation is also included in the proposal and will extend beyond this time.

Once uncovered, the blasting of the floor pillars is to be initiated from underground. The ore from the open pits will be hauled to the ore stockpile at the Fimiston processing plant via an existing haulage route parallel to the existing overland conveyor. Ore from the floor pillars is to be hauled to the Fimiston processing plant via the Sam Pearce Decline, a tunnel which runs from Mt Charlotte to the Fimiston Open Pit.

The underground voids uncovered by the removal of the two floor pillars are then to be backfilled with waste rock to stabilise the ground around Mt Charlotte. There will be no surface blasting associated with the proposal. The noise bund and road construction, surface mining, underground blasting and surface ore recovery will be completed within twelve months.

According to detailed computer noise modelling, early phases of the mining part of the proposal are likely to result in noise in excess of applicable assigned levels under the Noise Regulations. In seeking limited relief from obligations under the Noise Regulations, the proponent has proposed a range of steps and made commitments to limit the noise produced from the

proposal.

The construction of a noise bund before mining of the pits starts is a key aspect of the noise management plan for the proposal. Other aspects include carrying out mining and construction work on the proposal only during weekdays and using the quietest earthmoving and haulage fleet that is reasonably available in the Kalgoorlie area.

Table 1 sets out a summary of key characteristics of the proposal.

Table 1. Proposal Characteristics Mt Charlotte Pits

Element	Description
Life of project • Phase 1 (Road & Bund Construction) • Phase 2 (Mining of pits) • Phase 3 (Mining of floor pillars) • Phase 4 (Backfilling) * • Phase 5 (Rehabilitation)	 • about 2 months • about 8 months • about 2 months • ongoing • as agreed in consultation
Size of ore reserves • Phase 2 • Phase 3	 • 740,000 tonnes; • 910,000 tonnes.
Area of disturbance (including access)	6.55 Ha
Major components • ROB and NOB pits • ROB and NOB floor pillars	Project uses existing crushing, tailings facilities and infrastructure
Time of operation	0700 to 1700 hours, Monday to Friday
Waste rock disposal from pits	Backfill for underground voids
Transportation requirements during the project (including backfill) • Phase 1 • Phase 2 • Phase 3 • Phase 4 • Phase 5	Greater part of the ore (pillars) - Sam Pearce Decline Remaining portion (open pits) - Mt Charlotte to Fimiston haul road Backfill - Mt Charlotte to Fimiston haul road • 420 truck cycles per week • 950 truck cycles per week • No truck movements • Backfilling from outside pits • as needed

Note: The proponent is already permitted under the conditions of its permits from the Department of Minerals and Energy to haul waste rock for backfilling of pits adjacent to Mt Charlotte. This waste rock haulage has taken place in the past and will proceed after the mining of the proposal has been completed until the underground voids have been filled.

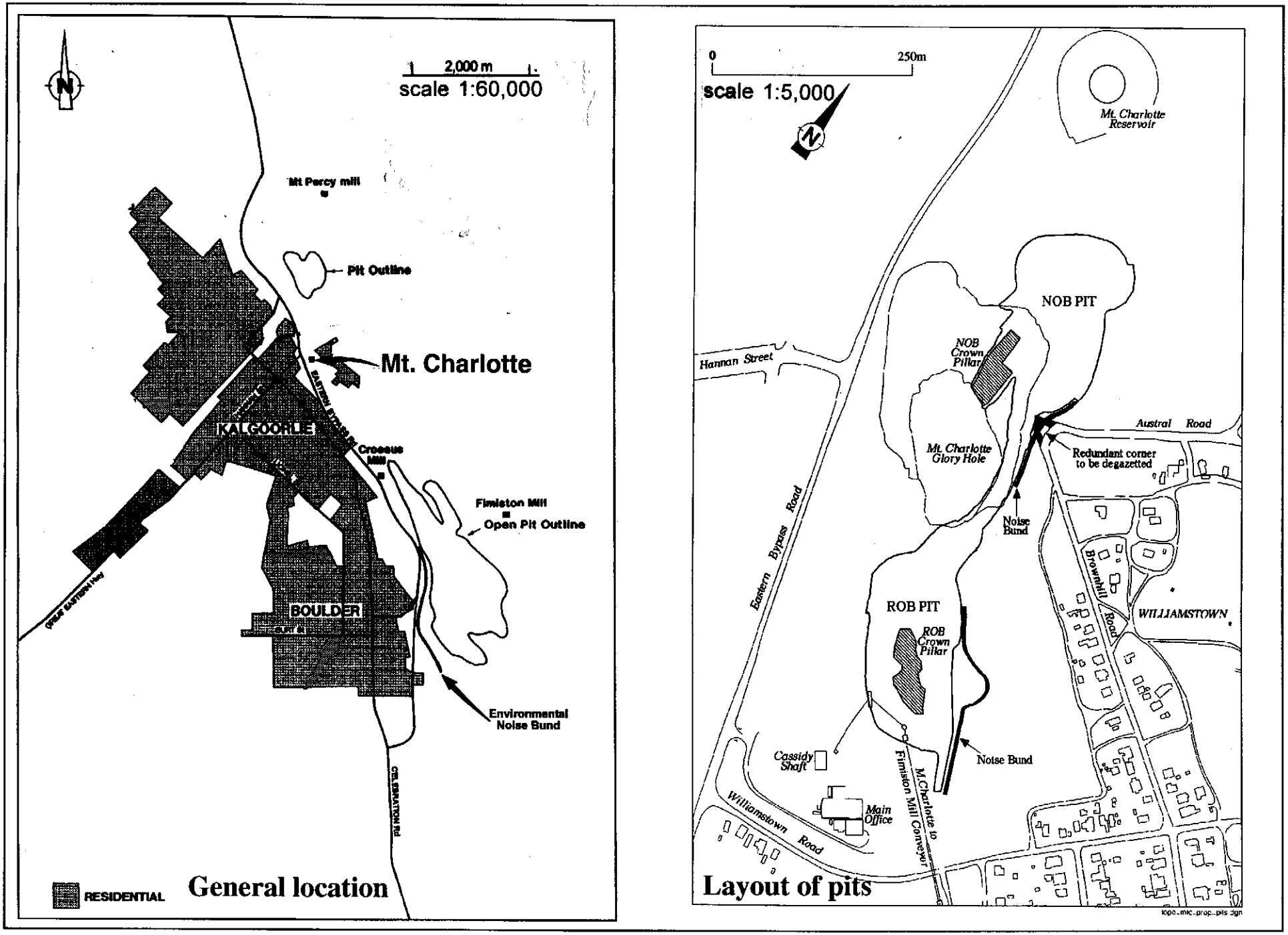


Figure 1. Location of KCGM Mt Charlotte pits proposal.

Stages of Mining

Management measures for noise and dust in particular would be related to the stages of construction and mining of the pits in the proposal.

There would be some preparatory work including surveying, fencing and grade drilling leading up to the proposal. Demolition of parts of some existing facilities will also be done early in the proposal.

Construction of the noise bunds and initial roadworks within the pits will be done prior to mining work and will take about eight weeks. The construction work would include earthmoving and grading. One outcome of these early works in Phase 1 will be a noise bund which will provide noise and dust amelioration in Williamstown for the mining, hauling and rehabilitation phases of the proposal.

As the pits are made steadily deeper, the sides of the pit will tend to provide an improving barrier against the noise for Kalgoorlie CBD and Williamstown.

Apart from the construction in Phase 1 of the proposal, the noise from which would be governed by the 'unreasonable noise' provisions of the Act and by 'best practice', it is anticipated that noise levels in excess of Noise Regulations would only occur during the first three months of mining. After that stage, the pits would be deep enough to provide quite effective noise shielding from their surroundings.

The stages of mining are shown in the sequence of diagrams in Figure 2.

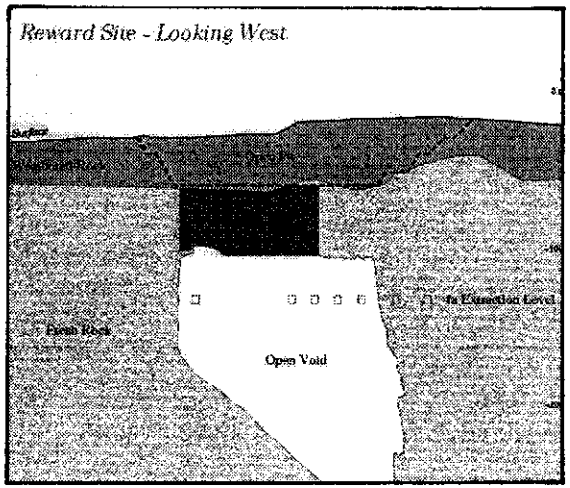
Reward Site - Looking West shows the floor pillar still covered with oxidised (weathered) rock. Once the noise bund is constructed and the haul roads are made, the open pit will be excavated (Phase 1).

Stage 1 (Phase 2) shows the situation after waste rock has been dropped through the fill pass to build up the waste rock to be level with the underground extraction tunnel work. The fill pass is then filled with waste rock and the floor pillar drilled from beneath for explosive placement.

Stage 2 (Phase 3) shows the situation after the blast and before the ore is removed via adjacent tunnels.

Stage 3 (Phases 4 & 5) shows the stabilised and rehabilitated landform once the void has been filled with waste rock.

Figure 2. Stages of Mining - KCGM Mt Charlotte Pits Proposal.



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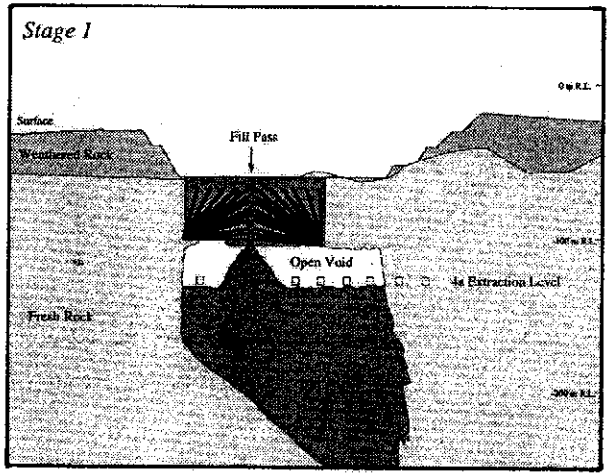
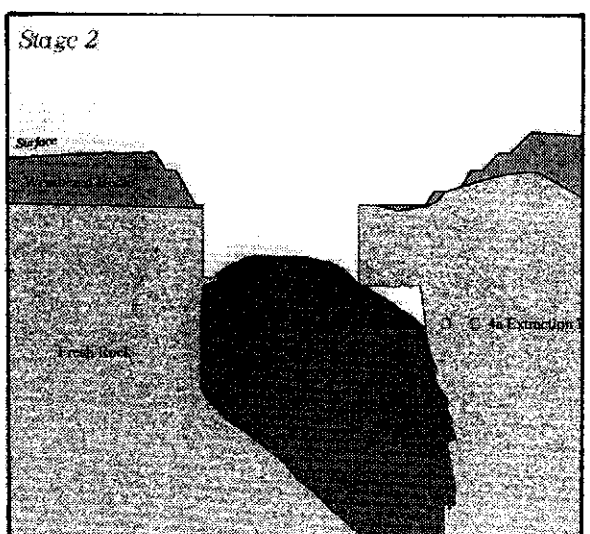
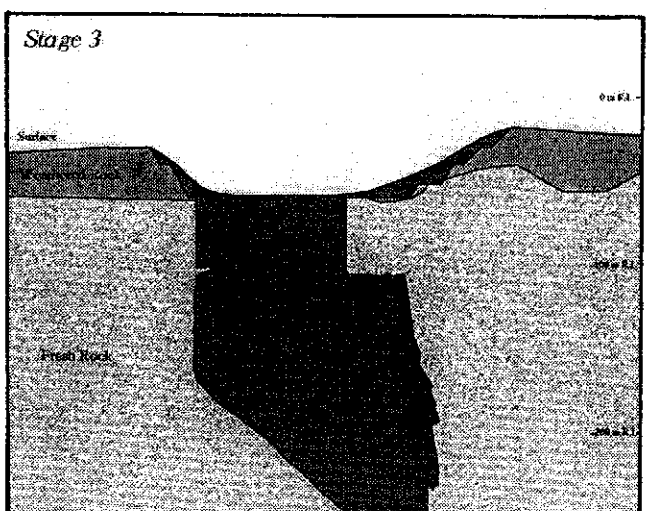


MINE PIT AND BACKFILL STOPE



BLAST FLOOR PILLAR AND ORE



BACKFILL , STOPE STABILIZATION
AND REHABILITATION

not to scale

3. Environmental Factors

3.1 Relevant Environmental Factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment 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.

It is the EPA's opinion that the following are the environmental factors relevant to the proposal, which require detailed evaluation in this report:

(a) Noise - from construction and mining operations;

(b) Dust - from earth-moving operations and bare ground;

(c) Vibration - ground vibration from blasting; and

(d) Community Consultation.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors (preliminary factors) generated from the Environmental Review document and the submissions received, in conjunction with the proposal characteristics (including significance of the potential impacts), the adequacy of the proponent's response and commitments. On this basis, the EPA considers that the preliminary factors: ground stability, flyrock, public safety, public thoroughfares, rehabilitation and ground water and other issues raised in the submissions do not require further evaluation by the EPA. The identification process is summarised in Table 2.

The relevant environmental factors are discussed in Section 3 of this report and are summarised in Table 3.

3.2 Noise

Description - General

Noise is the primary relevant environmental factor because the proposed pits are close to dwellings and business premises. The site of the proposed pits is within 150m of noise sensitive premises at the top end of Hannan Street, the main street of Kalgoorlie. Dwellings in Williamstown are at a similar distance.

Some of the intended earthmoving and mining activities associated with the preparation and exploitation of the gold reserves in the ROB & NOB pillars will be done above ground using open-cut methods. The potential for noise propagation is therefore greater than has been associated with the existing Mt Charlotte underground mining operation.

There are high ambient noise levels present in the vicinity of the proposal due to existing shaft mining at Mt Charlotte, ancillary industrial operations in the Kalgoorlie-Boulder area and vehicular traffic, particularly on the Eastern Bypass Road.

In dealing with the likely noise impacts from the project, noise due to the various different operations will be dealt with separately. The operations with the greatest potential for noise impact on the environment are rockbreaking, waste rock and ore haulage, blasting, drilling, noise bund construction and building of the portion of the haul road within the pits.

The operations of rockbreaking, moving rock with a bulldozer, loading the haul trucks with the face shovel and the haul trucks moving around the site may all occur simultaneously or at irregular intervals. The dominant noise impact will be from the diesel engines in these machines. The lower frequencies will be more audible outside the pits. The quietest available equipment will be used but noise in excess of the assigned daytime levels will be produced

Table 2. Environmental Factors

Preliminary Factor	Description of Factor with Possible Impact	Government Agency and Public Comments	Identification of Relevant Environmental Factors
Noise - Earthmoving	The site of the proposed pits is within 150m of dwellings and business premises at the end of the main street of Kalgoorlie. Dwellings in Williamstown are at a similar distance. A bulldozer will be used to loosen the more friable oxide rock prior to its loading into haul trucks by the face shovel. The loading of the haul trucks by the face shovel and ripping of weathered rock by bulldozers produce noise of an impulsive nature which will be repeated at irregular intervals. The operations of moving rock with a dozer, loading the haul trucks with the face shovel and the haul trucks moving around the site may all occur simultaneously or at irregular intervals. The noise impact will come from the diesel power plants in these machines. The lower frequencies will be more audible outside the pits. The quietest available equipment will be used but noise slightly in excess of the assigned daytime levels will be produced during mining and earthmoving. The noise will diminish towards the end of the proposed nine month project.	Most submissions expressed concerns about the noise impact on Williamstown of proposed earthmoving operations including rockbreaking, rock haulage, drilling and front-end loader operations. DEP has advised that noise is the most important factor and has carefully checked the consultant's computer noise modelling to ensure its validity.	**Considered to be a relevant environmental factor.**
Noise - Rockbreaking	The geological character of the overburden and waste rock is oxidised and partially oxidised Golden Mile dolerite. The gold sulphide ore is found in association with large quartz veins within the dolerite. Although the proponent uses the term 'free-dig' to describe the dislodgment of chunks of waste rock prior to their loading and haulage, the rock tends to be hard and cohesive. It is expected that significant use of a rock-breaker will be required prior to loading. Although a rockbreaker is not as noisy in operation as the loading and haulage fleet, its noise output is impulsive in nature, requiring an upward adjustment to measured levels when assessing impact under the Noise Regulations.	Public submissions highlighted hard local waste rock as being likely to require increased use of rockbreakers and consequent increase in noise disturbance to residents and local businesses.	**Considered to be a relevant environmental factor.**

Table 2. Environmental Factors

Noise - Road & Bund Building	It is the intention of the proponent in their earthworks design to provide as much noise screening as possible, particularly to the east of the proposed works. Short, early phases of the earthworks will be to build the noise bunds themselves. As a result, for a few weeks at the start of the proposed project there will be significant earthworks where the machinery will be above ground level and more readily heard.	Submissions expressed concern that the bunding will not provide the degree of noise screening anticipated. DEP's assessment is that the computer noise modelling is conservative and its assumptions accurate.	**Considered to be a relevant environmental factor.**
Noise - Hauling Waste Rock and Ore	Once the load is in the haul trucks the noise impacts are from engine, transmission and braking noises during manoeuvring and at road intersections as well as pass-by noise to noise sensitive premises along the haul road. The Noise Regulations specifically exclude noise from safety warning sirens at all times. The haul road is a private road, so the haul trucks will be subject to the Noise Regulations Exposure of people to noise from trucks hauling waste rock will vary over the short duration of the proposed project. One of the first phases of the proposed work will be the building of a noise bund to screen Williamstown residents from noise associated with the in-pit operations. After the bund is complete, haul truck loading and manoeuvring noise impacts will be much reduced.	Submissions expressed concern that haul truck traffic would be greater than the ER document stated and would increase as a result of the project proceeding. The DEP's advises that the haulage schedule given by proponent is dependable Proponent may already haul waste rock and ore regardless of this proposal, a proposal which will reduce haulage in the area will benefit adjacent residents.	**Considered to be a relevant environmental factor.**
Noise - Blast Over-pressure	There are expected to be two underground blasts as part of the proposed project. They will produce blast overpressures well within the limits imposed by the Noise Regulations, since the blasts are underground. No personal or property damage is expected.	Noise from blasting was mentioned in submissions as a problem because of the size of the blast and because it was assumed the blasts would be above the ground. The Department of Minerals & Energy will ensure blasting is carried out in accordance with *Mines Safety and Inspection Regulations 1995*	**Considered to be a relevant environmental factor.**

Table 2. Environmental Factors

Vibration - Blasting	There will be only two large blasts during the proposed works. Although the development works to produce the cavities below the Reward and Northern ore bodies for positioning explosives and hauling away ore will involve approx 1000m of tunnelling through dolerite, the blasts involved will be much smaller than the pillar blasts and are mining activities already permitted under existing Department of Minerals and Energy approvals. With the blasts being close to the surface, the rock stress is substantially less than at depth and the likely level of ground vibration is correspondingly reduced. The proponent has explained that careful control of ground vibration is possible by prior computer modelling of proposed blast geometries and careful surveying of actual blast setups. The proponent has also stated that the potential for seismic activity to be induced by the blast is much diminished by the blast being close to the surface.	Submissions have raised concerns that the vibration from blasting would cause damage to buildings directly and may set off seismic events which could cause such damage. The DEP has advised that ground vibration can be kept within limits which have been shown not to cause damage to buildings.	**Considered to be a relevant environmental factor.**
Vibration - Rockbreaking	There will be significant rock-breaking activity in the pits as the waste rock is reduced to sizes suitable for filling existing voids (stopes) or hauling towards Fimiston. It is, however, expected that the impact on residents will be noise and dust rather than ground vibration.	Submissions raised concerns about damage to buildings from ground vibration from all mining-related activities. The DEP has advised that vibration transmitted from the pits from rockbreaking will be imperceptible, even at the nearest residences.	**Not considered to be a relevant environmental factor.**
Dust - from mining and other activities	Dust will be generated during most types of activities where ground is disturbed around Kalgoorlie. Long term mining activities and widespread de-forestation in this very arid climate have left Kalgoorlie amid a large area of fine red surface dust. Proposed mining operations at the proposed pits could create additional free dust which could be blown over dwellings and business premises if winds are unfavourable.	Submissions put noise and dust impacts on their lives as about equal top concerns with the proposed project. The DEP also rates dust as the next most important factor after noise. Unlike noise, dust is usually windborne.	**Considered to be a relevant environmental factor.**

Table 2. Environmental Factors

Community Consultation	The proposal is close to residential premises and a primary school in Williamstown. There are also residences in Kalgoorlie-Boulder, west of the Eastern Bypass Road. The EPA notes that the proponent has been undertaking activities to inform the community about its operations and that the proponent has made commitments to continue these activities. Proposals which are close to residences clearly have an increased potential for disturbance. An effective mechanism for consultation in such cases can help alleviate community concerns. The proponent has made commitments to put in place community consultation mechanisms including a community enquiry line (Hotline).	Many submitters indicated they believed it had been difficult to obtain information they desired in response to questions about mining-related matters during the enquiry period associated with the proposal.	**Considered to be a relevant environmental factor because of community concern**
Blasting Gases	The blast for each floor pillar will be large but the proponent's blast design data shows the fumes will be contained underground and dispersed through the mine ventilation system.	Residents are concerned that there will be an uncontrolled release of blast gases above the ground during the pillar blasts. The DEP is of the opinion that the dispersal of blast gases via the mine ventilation system will prevent irritant effects on residents from large concentrations of blast gases all released at the same time.	**Not Considered to be a relevant environmental factor because of community concern**
Flyrock	Flyrock can be generated from surface blasting activities. There will be no surface blasting during the proposed works.	Submissions stated that the blast design outlined in the original Notice of Intent would potentially produce flyrock. There would be no flyrock generated by the most recent blast design proposed as this would be entirley underground..	**Not considered to be a relevant environmental factor as no flyrock will be produced from the proposed underground blasting.**

Table 2. Environmental Factors

Public Thoroughfares	Recent mining activities in the Mt Charlotte area and the construction of the Eastern Bypass Road made it necessary to cut off part of Austral Road which was formerly an alternative vehicular and pedestrian access to the central business district (CBD) of Kalgoorlie. Since then, an unpaved track leading past the northern edge of the Glory Hole has been used by Williamstown residents and residents of the Aboriginal settlement to the east of Mt Charlotte to gain access to Kalgoorlie CBD. The so-called "goat track" is uneven and poses a threat to users' safety as they cross the Eastern Bypass Road.	The continuing use of the walk track was raised in submissions.	**Not considered to be a relevant environmental factor.**
Rehabilitation	The proponent operates in a physical environment scarred and denuded from years of mining activity along the Golden Mile. KCGM has been actively improving the environment in Kalgoorlie-Boulder by landforming and cultivating native vegetation on previously cleared land. The proponent will consult with local residents' groups, environmental groups and expert advisers to evolve appropriate rehabilitation plans and carry them out in a timely manner.	Some submissions wished the proponent's rehabilitation plans clarified because of conflicting stories in the media. The DEP has advised that this issue can be managed through proponent commitment to develop a rehabilitation and de-commissioning plan.	**Not considered to be a relevant environmental factor.**
Ground Stability	One of the prime reasons cited for the proposed mining project was to allow local post-mining ground stabilisation. The proposal would open up large underground voids, allowing surface access for filling them with waste rock. The earthworks prior to extraction of gold ore will also generate significant waste rock for filling these voids. The waste rock from within the pits will only part fill the voids. Additional waste rock from the Fimiston Open Cut (Superpit) will be used to fill the voids and there will significant saving of fuel otherwise required to haul waste rock from the Superpit. Aditional noise and dust would be generated in the area if these longer haul routes were required	Concern over the size of the underground voids was expressed in submissions. The view was that, with continuing disturbance due to blasting and seismic activity, underground rockfalls could result in ground subsidence at the surface. The DEP has advised that the proponent's undertaking to fill voids and stabilise the ground should alleviate these concerns.	**Not considered to be a relevant environmental factor.**

Table 2. Environmental Factors

Road Safety	Because of the haul road crossing the main vehicular access to Williamstown there is a potential hazard introduced to vehicles using the Williamstown Road.	Submissions raised concerns about road safety. Residents are concerned that there may be accidents at the crossing, particularly during times when children are being taken to and from school. Road crossing safety issues will be regulated by the Department of Minerals and Energy.	**Not considered to be a relevant environmental factor.**
Ground Water	Current and historical mining activity at Mt Charlotte has resulted in the water table being several hundred metres below the ground, so no impact on ground water is expected from the proposed pits.	Waters & Rivers Commission indicated they expect no impact to underground water from the proposal	**Not considered to be a relevant environmental factor.**

Table 3. Relevant Environmental Factors

Relevant Factor	Relevant Area	EPA Objective	EPA assessment	EPA Advice
Noise	Williamstown & Kalgoorlie CBD	The EPA's general objective in regard to noise is to protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring that noise levels meet statutory requirements and acceptable standards. Where a proponent seeks relief from the Noise Regulations it must be demonstrated that all practicable steps have been taken to reduce noise and that noise levels will not be unreasonable.	Some of the intended earthmoving and mining activities associated with the preparation and exploitation of the gold reserves in the ROB & NOB pillars will be done above ground using open-cut methods. The potential for noise and dust propagation is far greater than has been associated with the existing Mt Charlotte underground mining operation. The general local townsite environment is very noisy due to shaft mining at Mt Charlotte, ancillary industrial operations in the Kalgoorlie-Boulder area, vehicular traffic on the Eastern Bypass Road and the operating noise of the Fimiston Superpit. Relief from full compliance with noise levels prescribed in the new Noise Regulations will be required for operations associated with the proposed open pit works. The Noise Regulations limit the airblast level resulting from any blasting between 0700 hrs - 1800 hrs on any weekday to 120dB $L_{linear\ Peak}$ when received at any other premises. The proponent has undertaken to limit blast overpressure in the blasts which form part of his proposal by the use of appropriate delays and careful control of charge weight per delay.	Having particular regard to: • the practice in Kalgoorlie in the past to put noise-producing mining equipment adjacent to residences; • the proposed project being short term; and • the commitments the Proponent has made to manage the noise; it is the EPA's opinion that the proposal can be satisfactorily managed, provided that KCGM adheres to the commitments. Access to and response to community complaints through the Hotline are to be subject to the quality assurance mechanisms as per the Proponent commitments. • Work will take place during weekdays only (0700 - 1700, Monday to Friday). No work will be done outside these hours, on Saturdays, on Sundays or on Western Australian gazetted public holidays. • A noise bund of appropriate dimensions will be built prior to other mining-related activities in the proposed project to protect residents of Williamstown from excess noise and dust. • All of the oxide rock will be ripped by bulldozer prior to its loading into haul trucks by the face shovel. • All of the blasting and ore haulage, where practicable, will be done underground to reduce noise and dust impact on people. • All mining work associated with the proposal will be completed within ten months of starting.

Table 3. Relevant Environmental Factors

Vibration - Blasting	Williamstown & Kalgoorlie CBD	Ensure that vibration from blasting does not cause damage to buildings.	Supervision of the blasting will be carried out by qualified officers of the Department of Minerals & Energy. There are expected to be two blasts in the proposed project. Each can produce ground vibration and could set off a rock fall underground. It is possible to manage blasting by the use of benching and delays so that the maximum ground vibration level is controlled to within predictable limits. The literature and DEP experience indicates that ground vibration resulting in peak particle velocities of less than 10 mm/s is unlikely to result in building damage in the long term. Computer modelling and accurate down-hole surveying make predictions of ground vibration very reliable.	Having particular regard to: • there will be approximately two underground blasts, which form part of the proposed works; • the underground pillar blasts, being close to the surface, will produce less potentially damaging ground vibration than a deep blast where geological stresses in surrounding rock are substantial; • the blast design with staged, accurate charge detonation and charge weight control will limit peak ground vibration levels; and, • the proponent's commitment that ground vibration from the pillar blasts will not exceed 10mm/s peak particle velocity; it is the EPA's opinion that the proposal can be managed to meet the EPA's objective.
Dust	Williamstown & Kalgoorlie CBD	Ensure that dust levels generated during mining and associated do not adversly impact on the welfare and amenity of surrounding dwellings, public buildings and business premises	The EPA notes that the proponent has made a commitment to produce a dust management plan prior to commencement of the proposed works. The Plan will detail how operations would be started and stopped as environmental conditions liable to exacerbate dust impacts on people come to act on the site. Weather criteria for suspension of works should be included. Maximum times to suspend operations are to be specified when conditions move outside proper operating range.	Having particular regard to: • the short-term nature of the proposed project; • commitments to restrict dust-producing activities to wetter seasons and less windy times of day; • ongoing dust-producing mining and earthmoving activity in the vicinity, unrelated to the proposed works; and • the implementation, prior to starting the project, of an approved Dust Management Plan, it is the EPA's opinion that the proposal can be managed to meet the EPA's objective.

Table 3. Relevant Environmental Factors

Community Consultation	Williamstown, Kalgoorlie CBD and other stakeholders	Ensure informative two-way communication occurs between the proponent and stakeholders about issues of concern.	During the EPA's discussions in Kalgoorlie it became evident that there was a desire for increased community consultation in regard to the proponent's activities. The EPA members came to the view that open dialogue can best be facilitated between the proponent and stakeholders by putting in place a mechanism to ensure effective consultation occurs. The opportunity exists for communication with local people potentially most affected by the proposal to be improved so that the proponent's operating constraints can be clearly understood by affected members of the local community and the concerns of the community over loss of amenity and other issues are understood by the proponent.	Having particular regard to; • commitments by the proponent to continue the timely delivery of relevant information to the community and relevant agencies; and • the proponent's commitment to establish an enquiry line ("Hotline") and to respond to community complaints; it is the EPA's opinion that the proposal can be satisfactorily managed provided that the Minister for the Environment imposes a Condition on the proponent requiring development and implementation of a community consultation plan, which complements the proponent's existing commitments on community consultation, to the requirements of the EPA.

during mining and earthmoving. The noise impacts will diminish towards the end of the proposal as the pits become progressively deeper.

Rockbreaking

The geological character of the overburden and waste rock is oxidised and partially oxidised Golden Mile dolerite. The gold sulphide ore is found in association with large quartz veins within the dolerite.

Although the proponent uses the term 'free-dig' to describe the dislodgment of chunks of waste rock prior to their loading and haulage, the rock tends to be hard and cohesive. It is therefore expected that significant use of a rockbreaker will be required prior to loading.

Although, according to spectral data in the proponent's environmental review document (KCGM, 1998), a rockbreaker is not as noisy in operation as the loading and haulage fleet, its noise output is impulsive in nature, which therefore requires an upward adjustment to measured levels when it is assessed.

As the pits progress through the surface oxide layer and the rock becomes less fragmented, it is anticipated that greater use will be made of the rockbreaker. There will be better attenuation of the noise from the rockbreaker as the pits get deeper during mining.

Road & Noise Bund Building

The proponent has designed the noise bunds to provide as much noise screening as possible, particularly to the east of the proposed works. The early phases of the earthworks will be to build the noise bunds themselves. As a result, for about eight weeks at the start of the proposed project, the earthmoving machinery will be above or near ground level and producing significant noise.

The early stages of the proposal consist of construction work as defined in Regulation 13(1)(f) of the *Environmental Protection (Noise) Regulations 1997* and is non-mining activity. As a result, the noise would not be subject to the assigned levels for the area which would be stipulated in the Noise Regulations but the work may only proceed on weekdays and Saturdays between 0700 and 1900. Work will also be governed by industry best practice and the use of the quietest equipment reasonably available in the Kalgoorlie area - that is: it will be done in accordance with Noise Regulation 13(2).

Ore and Waste Rock Haulage

The EPA notes that KCGM already has approval from the Department of Minerals and Energy for underground mining and ore haulage activities at Mt Charlotte.

Once the ore and waste rock is in the haul trucks the noise impacts are from engine, transmission and braking noises during manoeuvring and at road intersections as well as pass-by noise to noise sensitive premises along the haul road. The Noise Regulations specifically exclude noise from propulsion and braking systems of transport vehicles on public roads and noise from safety warning sirens at all times. However, the haul road is a private road, so the haul trucks would be subject to the Noise Regulations.

Exposure of people to noise from trucks hauling waste rock will vary over the short duration of the proposed project. One of the first phases of the proposed work will be the building of a noise bund to screen Williamstown residents from noise associated with the in-pit operations. After the bund is complete, haul truck loading and manoeuvring noise impacts will be much reduced.

Blast Over-pressure

There are expected to be two underground blasts as part of the proposed project. They will produce airblasts well within the limits imposed by the Noise Regulations, since the blasts are underground. No personal or property damage should occur as a result of these blasts.

The Noise Regulations limit the airblast level resulting from any blasting between 0700 hrs - 1800 hrs on any weekday to 120dB Linear Peak when received at any other premises. A lower limit applies when a blast is necessary outside these hours and is carried out in accordance with regulation 8.28 (4) of the *Mines Safety and Inspection Regulations 1995.*

The proponent has undertaken to blast only between 0700 and 1700 hours and to limit airblast overpressure by the use of appropriate delays and careful control of charge weight per delay to ensure compliance with the Noise Regulations.

The Department of Minerals and Energy will ensure blasting is carried out in accordance with *Mines Safety and Inspection Regulations 1995.*

Drilling

The main types of drilling done in mining are grade control drilling and long hole percussion drilling (LHPD). Grade control drilling is done routinely and on an ongoing basis by the proponent to establish the limits of its ore reserves. A core is produced for later analysis. Long hole percussion drilling is used for drilling into rock to place charges for blasting. The proponent is permitted to use drilling machinery for both types of drilling under existing permits they have from the Department of Minerals and Energy. There will be no surface blasting, so no drilling will occur on the surface to place explosives. Grade control drilling is a quieter process and is subject to the Noise Regulations at all times.

Submissions

Submissions and letters about the proposal highlighted concerns about impact on Williamstown of noise from a variety of sources related to the proposed work. These included earthmoving, rockbreaking, drilling, waste rock and ore haulage, front-end loader operations and airblast overpressure.

Noise from blasting was mentioned in submissions as a problem because of the size of the blasts and because it was assumed the blasts would be above the ground. Above ground blasting was part of the blast plan in the Notice of Intent document (KCGM, 1997) but is not part of the current blast plans.

Public submissions further pointed out that hard local waste rock is likely to require increased use of rockbreakers, and a consequent increase in noise disturbance to residents and local businesses. Submissions also expressed concern that the bunding will not provide the degree of noise screening anticipated by the proponent.

Assessment

The area considered for assessment of this factor is the suburb of Williamstown and Kalgoorlie CBD areas. The EPA's general objective in regard to noise is to protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring that noise levels meet statutory requirements and acceptable standards. Where a proponent seeks relief from the Noise Regulations, it must be demonstrated that all practicable steps have been taken to reduce noise and that noise levels will not be unreasonable.

Figures 3 and 4 on the following pages show the modelled noise levels expected during the project at two representative locations in comparison with the assigned noise levels.

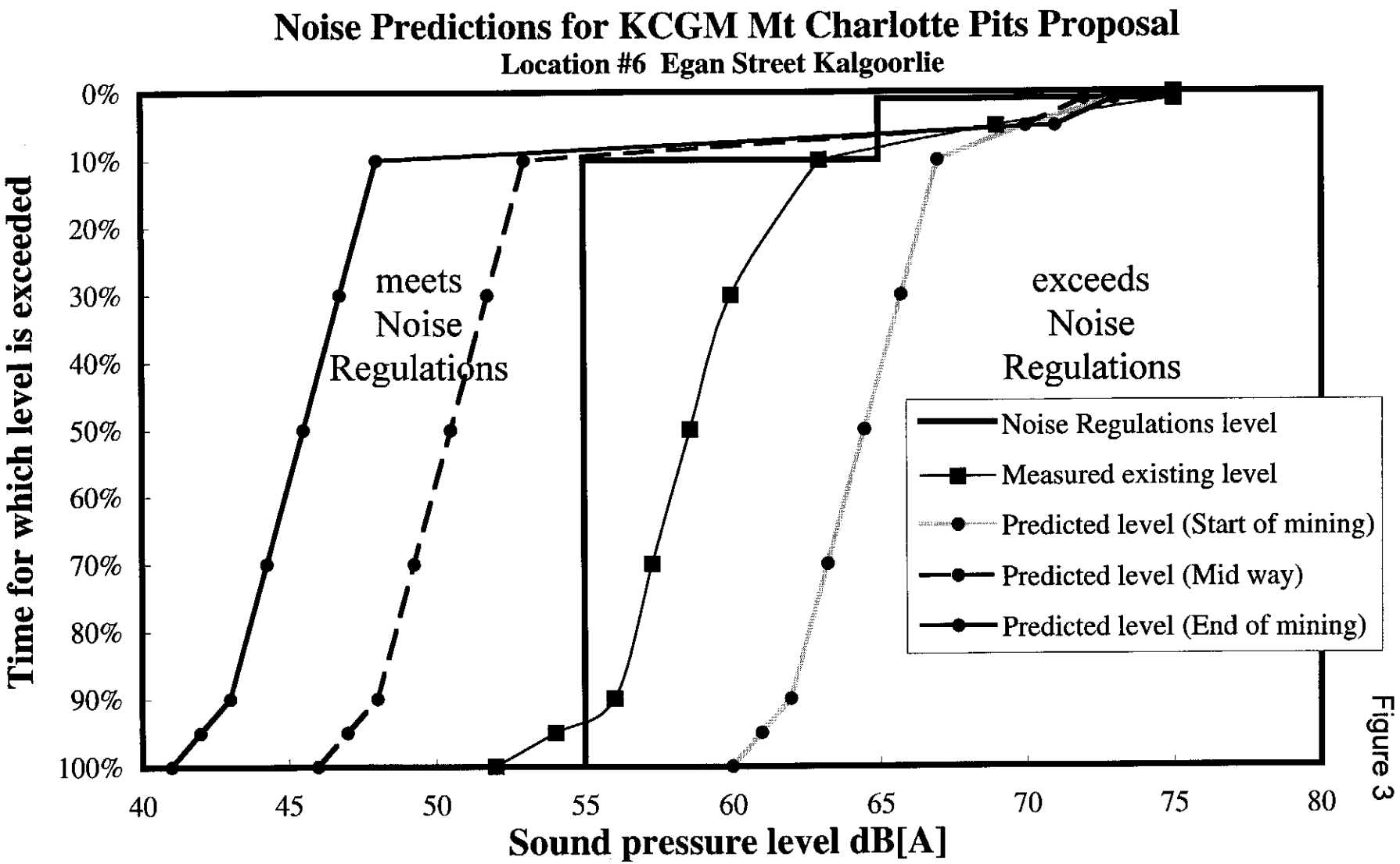

Noise Predictions for KCGM Mt Charlotte Pits Proposal
Location #6 Egan Street Kalgoorlie
Time for which level is exceeded
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
meets Noise Regulations
exceeds Noise Regulations
Noise Regulations level
Measured existing level
Predicted level (Start of mining)
Predicted level (Mid way)
Predicted level (End of mining)
40
45
50
55
60
65
70
75
80
Sound pressure level dB[A]

Figure 3

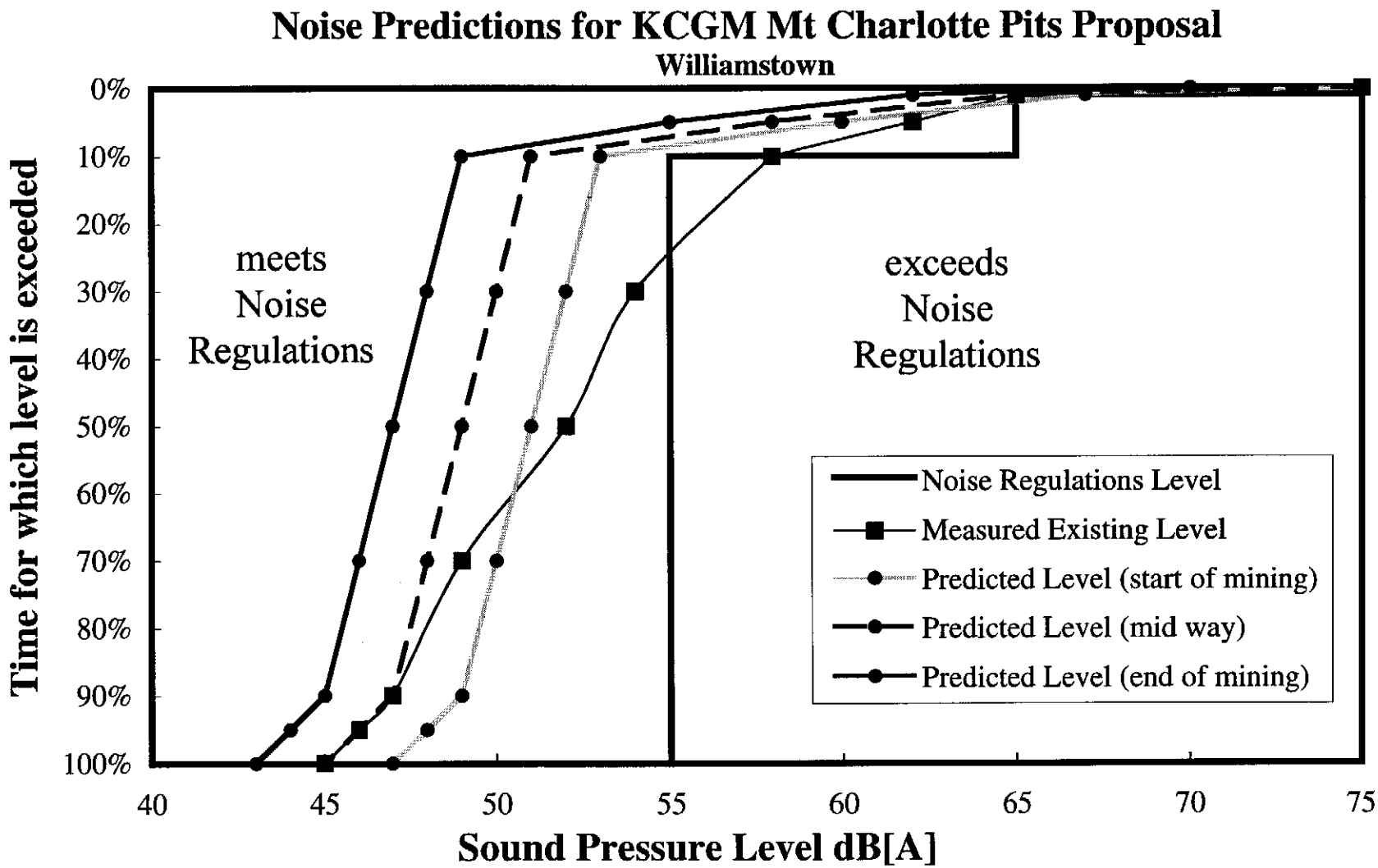

Noise Predictions for KCGM Mt Charlotte Pits Proposal
Williamstown
Time for which level is exceeded
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
meets
Noise
Regulations
exceeds
Noise
Regulations
Noise Regulations Level
Measured Existing Level
Predicted Level (start of mining)
Predicted Level (mid way)
Predicted Level (end of mining)
40
45
50
55
60
65
70
75
Sound Pressure Level dB[A]

Figure 4

Figure 3 relates to the east end of Egan Street in Kalgoorlie CBD. The Egan Street location is the site previously used by a KCGM acoustical consultant and is known as "location 6". Figure 4 relates to the noise sensitive premises in Williamstown which are closest to the pits.

The three curves on Figures 3 and 4 show the noise to be expected at the start, half way through and at the end of mining. The figures also show the assigned noise levels which would be applicable to Mt Charlotte under the Noise Regulations.

The Noise Regulations make reference to the assigned levels which apply for certain proportions of the time - for example they would stipulate that a level of 65 dB[A] may not be exceeded for more than ten percent of the time and allow higher levels for short periods. This is why the line showing the assigned levels has three different values.

On Figures 3 and 4 , a noise level which is to the left of vertical segments of the line representing the assigned level is below the assigned level. A noise falling in the area to the right of the vertical line is above the assigned level.

The figures show the predicted noise levels for the proposal at the start, the middle and the end of mining. Before the noise bund is completed the noise levels are high, but noise bund construction is done first so that there is a substantial noise reduction for residents of Williamstown after the two months of construction. Figure 3 shows that, for the first three months of mining after the noise bund is completed, the noise levels will be up to 65 dB[A] in Kalgoorlie CBD, which is 10 dB[A] higher than the assigned level under the Noise Regulations. In Williamstown, Figure 4 shows that the mining noise is likely to comply with the Noise Regulations at all times during the mining.

As the pits progress and the machinery is operating lower in the ground, steadily reducing noise levels can be expected in Kalgoorlie CBD and Williamstown. After the first three months of mining it is expected that the noise emissions from the pit will be less than the assigned levels for both Kalgoorlie CBD and Williamstown, which is 55 dB[A] during the day.

There are many means by which the proponent would manage the proposal in order to reduce the noise impact on people adjacent to the Mt Charlotte pits. However, during some early phases, noise levels significantly higher than assigned levels for the area would be produced. It is anticipated that businesses and residents at the top of Hannan Street - Kalgoorlie's CBD will be most affected, with noise impact on residents and school children in Williamstown being much less noticeable.

The EPA notes the DEP's assessment that the computer noise modelling in the Environmental Review is conservative and its assumptions accurate, except for drilling. No detailed noise data was supplied for drilling but drilling would continue to be subject to the Noise Regulations

The general townsite environment is already noisy due to shaft mining at Mt Charlotte, ancillary industrial operations in the Kalgoorlie-Boulder area, vehicular traffic on the Eastern Bypass Road and the operating noise of the Fimiston Open Cut.

The EPA notes the proponent's commitments to monitor noise levels during the proposal and that the proponent has made further commitments as follows:

- Commitment 2 details the Environmental Management System (EMS) which will be in place prior to the start of ground-disturbing activities associated with the proposal. The EMS will include plans for management of specific relevant environmental factors such as noise, vibration, dust and blasting gases. An important management tool which will be used as part of these plans is the incorporation of ongoing public input into operational decisions related to the day-to-day running of the proposal.
- An enquiry line which will be set up to allow members of the public to contact KCGM personnel with the authority to quickly change operations on the proposal. This would be called the Hotline. A person affected by noise or dust pollution or other concerns arising

from the proposal could make contact with a senior KCGM officer with authority to change operations to address their concerns. The proponent has supplied a flow chart showing how this Hotline would operate. It is shown on the next page (Figure 5).

- Other details of the way that the Inquiry Line Flowchart would operate will be integrated into the above EMS. Access to and response to community complaints through the Hotline are to be subject to the quality assurance mechanisms as per proponent commitment 7.

- Management will consist of allowing daytime operations only, providing a noise bund to reduce impacts on noise-sensitive premises in Williamstown and lowering the floor level of the pits and the level of the start of the haul road as soon as operations permit, so as to limit noise in Kalgoorlie CBD and Williamstown. The EPA notes the space constraints which prevented the construction of a noise bund on the Kalgoorlie CBD side of the proposal.

- Work will take place during weekdays only (0700 - 1700, Monday to Friday). No work will be done outside these hours or on Western Australian gazetted public holidays.

- A noise bund of appropriate dimensions will be built prior to other mining-related activities in the proposed project to protect residents of Williamstown from excess noise and dust.

- All of the oxide rock will be ripped by bulldozer prior to its loading into haul trucks by the face shovel.

- All of the blasting and where practicable ore haulage will be done underground to reduce noise and dust impact on people.

- All mining work associated with the proposal will be completed within ten months of starting.

Computer noise modelling predicts that, in spite of these management measures being in place, noise from the proposal will exceed the assigned levels for the area in the Noise Regulations by up to 10 dB[A] in Kalgoorlie CBD. The EPA is of the view that the excess noise is tolerable for the few months it will be present.

Some of the intended earthmoving and mining activities associated with the preparation and exploitation of the gold reserves in the ROB & NOB pillars will be done above ground using open-cut methods. The potential for noise and dust propagation is greater than has been associated with the existing Mt Charlotte underground mining operation.

It appears that the haulage schedule given by KCGM is reasonable. Given it is already KCGM's lawful prerogative to haul waste rock and ore from existing operations regardless of this new proposal, the effect of this proposal, which will reduce haulage in the area, will benefit adjacent residents.

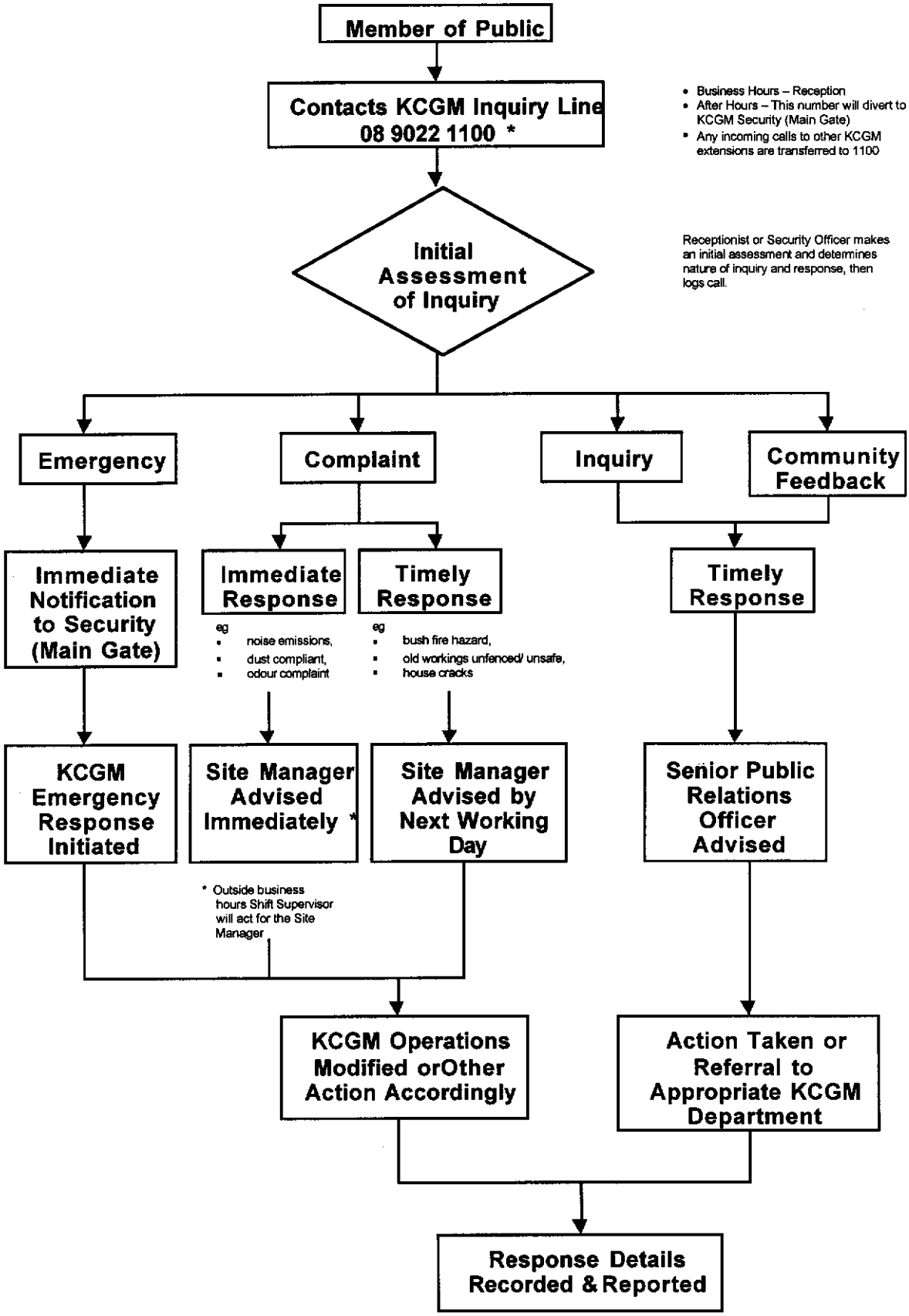
The EPA considers that the early phases of the proposal, including noise bund construction, must be completed as soon as practicable. The EPA believes the noise bund construction noise will be more tolerable because it is associated with the construction of the protective noise bund which will provide screening of noise for the remainder of the proposed project. There will be a further gradual reduction in the noise emissions during the course of the proposed project as the first part of the haul road will be progressively lowered as the pits become deeper.

Having particular regard to:

- the proposed project is short term (approximately twelve months in duration);
- the proponent's commitments to manage the noise by a variety of means including a noise bund;

Figure 5

KCGM ENQUIRY LINE PROCEDURE



- the proponent's commitment to regularly monitor noise and dust emissions from the site;
- the proponent's commitment to do mining and construction work on the proposal only during weekdays; and
- the EPA's recommendation for a Ministerial Condition on community consultation (see Section 3.5),

it is the EPA's opinion that the proponent has taken all reasonable steps to ameliorate the noise contribution of the proposal and that the proposal can be satisfactorily managed.

The EPA recommends that the proposal be permitted to operate under alternate higher noise limits which would be given effect under Part IV conditions. A variation to the existing Noise Regulations is recommended, pursuant to the *Environmental Protection Act 1986,* for some mining activities. No variation is required for drilling and blasting.

3.3 Dust

Description

It is the aim of the dust management plan (proponent commitments 2 & 6) to maintain amenity of residents and business operators in Williamstown and the Kalgoorlie CBD from inconvenience and loss of amenity caused by uncharacteristically high dust levels during mining and associated earthmoving.

Dust will be generated during most types of activities where ground is disturbed around Kalgoorlie. It is also understood that proposed mining operations at Mt Charlotte could create free dust which could be blown over dwellings and business premises if winds are unfavourable.

Submissions

Submissions from the public put noise and dust impacts as about equal top concerns for the proposed project.

Management Measures

Prior to commencement of the proposed works, a dust management plan would be prepared.

The plan would detail how operations would be started and stopped as environmental conditions liable to exacerbate dust impacts on people come to act on the site.

Assessment

The area considered for assessment of this environmental factor is Williamstown and the Kalgoorlie CBD area. The EPA's objective in regard to this environmental factor is to maintain the amenity of residents and business operators from inconvenience and amenity problems caused by uncharacteristically high dust levels during mining and associated earthmoving.

Having particular regard to:

- the short-term nature of the proposed project;
- the project site being amid an arid environment historically denuded of vegetation and with ongoing disturbance to the ground;
- the operation of other dust-producing mining and earthmoving activity in the vicinity, unrelated to the proposed works;
- the proponent's commitments to have in place a dust management plan to the requirements of the EPA prior to commencing the works including restricting dust-producing activities in dry and windy weather conditions; and
- the view of some residents that dust is the next most important factor after noise.

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for dust, provided that KCGM adheres to operating procedures which will form part of the Environmental Management System required under proponent's commitment 2 in Appendix 3.

3.4 Vibration

Description

There are two main potential sources of ground vibration associated with this project. These are ground movement due to blasting, including blast-triggered seismicity and vibration from the use of mining machinery.

Submissions

The majority of submissions related to concerns that one or both of the planned pillar blasts would set off an underground rockfall and consequent seismic activity. In particular, submissions raised concerns about potential damage to buildings from ground vibration from all mining-related activities.

Management Measures

There are two blasts planned in the proposed project. Each can produce ground vibration and (potentially) could set off a rock fall underground. It is possible to manage blasting by the use of delays so that the maximum ground vibration level is controlled to within specified limits.

Computer modelling and accurate down-hole surveying make predictions of ground vibration very reliable. It is therefore possible to be more certain that neither vibration from blasting, nor from potential seismic events triggered by blasting, are likely to cause damage to dwellings, public buildings or utilities.

Assessment

The area considered for assessment of this environmental factor is the Williamstown and Kalgoorlie CBD area. The EPA's objective in regard to this environmental factor is to ensure that ground vibration from blasting operations does not cause damage to buildings.

According to undertakings by the proponent in their document (KCGM, 1998), there will be only two significant blasts during the proposed works. Although the development works to produce the cavities below the Reward and Northern orebodies for positioning explosives and hauling away ore will involve significant distances of tunnelling through dolerite, the underground blasts involved will be much smaller than the pillar blasts and are mining activities already permitted under existing Department of Minerals and Energy approvals.

There will be significant rockbreaking activity in the pits as the waste rock and ore is reduced to sizes suitable for filling existing voids (stopes) or hauling to Fimiston Mill, as appropriate.

With the blasts being close to the surface, the rock stress is substantially less than at depth and the likely level of ground vibration is correspondingly reduced.

The EPA is of the view that vibration transmitted from the pits from rockbreaking will be imperceptible at the nearest residences and that ground vibration can be kept within limits which have been shown not to cause damage to buildings. The literature and DEP advice indicates that ground vibration resulting in peak particle velocities of less than 10 mm/s is unlikely to result in building damage in the long term.

Careful control of ground vibration is possible by computer modelling of proposed blast geometries, careful surveying of actual blast setups and appropriate choice and placement of charges.

Having particular regard to:

- public concerns that ground vibration may result in damage to buildings;
- blasting safety is subject to the *Mining Act 1978*, administered by the Department of Minerals & Energy;
- there are expected to be only two blasts, both underground;
- the underground pillar blasts, being close to the surface, will produce less potentially damaging ground vibration than a deep blast where geological stresses in surrounding rock are substantial;
- the blast design with staged, accurate charge detonation and charge weight control will limit peak ground vibration levels; and
- the proponent's commitment that ground vibration from each of the pillar blasts will not exceed 10mm/s peak particle velocity;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective.

3.5 Community Consultation

Description

The proposal is close to residential premises and a primary school in Williamstown. There are also residences in Kalgoorlie-Boulder, west of the Eastern Bypass Road.

The EPA notes that the proponent has been undertaking activities to inform the community about its operations and that the proponent has made commitments to continue these activities.

Proposals which are close to residences clearly have an increased potential for disturbance. An effective mechanism for consultation in such cases can help alleviate community concerns.

Submissions

Many submitters indicated they believed it had been difficult to obtain responses about mining-related matters during the submission period associated with the proposal.

Management Measures

It is anticipated that there will be ongoing information flow consequent on the proponent's commitment to continue to provide pertinent information to the local community and to interested government and non-government agencies.

The proponent has undertaken to quickly alter operating methods which are producing excess noise and dust impacts on people nearby in response to community complaints through a Hotline. The Inquiry Line Flowchart (Figure 5) shows the way that KCGM proposes to operate this Hotline. The operating details of the Hotline and how its performance will be monitored will form part of the Environmental Management System (EMS) for the proposal (Commitment 2). Handling of community feedback is also addressed in Commitment 7.

Assessment

The area with respect to the relevant factor "Community Consultation" is Williamstown and that part of the Kalgoorlie CBD potentially affected by the proposal. The EPA's objective with respect to the relevant factor "Community Consultation" is to ensure informative two-way communication occurs between the proponent and stakeholders about issues of concern.

The Chairman and Deputy Chairman of the EPA visited Kalgoorlie to consult with the proponent and the local residents' group in relation to this proposal.

During the EPA's discussions in Kalgoorlie it became evident that there was a desire for increased community consultation in regard to the proponent's activities. The EPA members came to the view that open dialogue can best be facilitated between the proponent and stakeholders by putting in place a mechanism to ensure effective consultation.

The opportunity exists for improved communication with people potentially most affected by the proposal so that the proponent's operating constraints can be clearly understood the local community and the concerns of the community over loss of amenity and other issues are understood by the proponent.

Having particular regard to:

- the desire for increased community consultation by local people;
- commitments by the proponent to continue the timely delivery of relevant information to the community and relevant agencies; and
- the proponent's commitment to establish an enquiry line ("Hotline") and to respond to community complaints;

it is the EPA's opinion that the proposal can be satisfactorily managed provided that the Minister for the Environment imposes a Condition on the proponent requiring development and implementation of a community consultation plan, to complement the proponent's existing commitments on community consultation, to the requirements of the EPA.

3.6 Other Concerns of Submitters

Submissions and letters about the proposed pits at Mt Charlotte have raised some other issues which were either not environmental issues or were not seen by the EPA as so important as to be considered relevant factors. These included:

- Ground stability
- Post mining rehabilitation
- Flyrock - potentially generated by blasting
- Pedestrian access to Hannan Street
- Blasting Gases - potential respiratory irritation if gases escape in an uncontrolled manner
- Public Safety
- Ground water
- Land Zoning and Future Mining

Other issues raised included doubts expressed about noise and dust computer modelling results and other information presented in the proponent's environmental review document.

Ground Stability

One of the stated justifications for the proposed mining project is to allow local post-mining ground stabilisation. The proposed project would open up two large underground voids, allowing surface access for filling them with waste rock. The proposed earthworks prior to extraction of gold ore will also generate significant waste rock for filling these voids, saving fuel otherwise required to haul waste rock from the Superpit. Noise and dust generated from these potentially longer haul routes is also reduced by using local waste rock.

Concern over the size of the underground voids was expressed in submissions. The view was that, with continuing disturbance due to blasting and seismic activity, underground rockfalls could result in ground subsidence at the surface.

The EPA concludes that the proponent's undertaking to fill voids and stabilise the ground should alleviate these concerns.

Rehabilitation

The proponent has inherited a physical environment scarred and denuded from years of mining activity along the Golden Mile. KCGM has been actively improving the environment in Kalgoorlie-Boulder by landforming and cultivating native vegetation on previously cleared land.

In landscaping the Mt Charlotte area after mining, there is some choice about the desirable finished landform. As an historical mining area which attracts special interest tourists, it may be appropriate to retain a significant portion of the features of past mining activity.

The proponent has indicated in Commitment 8 a willingness to consult with local residents' groups and environmental groups. This is seen as most useful in expediting appropriate rehabilitation after mining. Recommended condition 5 imposes requirements for implementing appropriate rehabilitation plans in a timely manner.

Flyrock

There is potential for flyrock to be generated from surface blasting activities. However, contrary to information contained in earlier information outlined in the proponent's NOI document (KCGM, 1997), there will be no surface blasting during the proposed project. Flyrock has been addressed because of public concern.

Submissions stated that the blast design outlined in the NOI could potentially produce flyrock.

Only underground blasting will be carried out in connection with the proposed project and there will therefore be no flyrock produced.

Given that blast plans contained in the NOI document having been superseded by underground blasting and underground blasting tends not to release flyrock the EPA is of the opinion that the proposed project can be managed to meet its environmental objective.

Pedestrian Access to Town

Recent mining activities in the Mt Charlotte area and the construction of the Eastern Bypass Road made it necessary to cut off part of Austral Road which was formerly an alternative vehicular and pedestrian access to the central business district of Kalgoorlie. Since then, an unpaved track leading past the Northern edge of the Glory Hole has been used by Williamstown residents and residents of the Aboriginal settlement to the east of Mt Charlotte to gain access to Kalgoorlie CBD. This so-called "goat track" is uneven and poses a threat to user's safety as they cross the Eastern Bypass Road.

It is possible that more even ground for a track may become available to the north of the proposed pits but crossing the Eastern Bypass Road is still seen as hazardous. Providing alternative pedestrian access to the Kalgoorlie CBD is not seen as the responsibility of the proponent.

Blast Gases

The blast for each floor pillar will be large but the proponent's blast design data shows the fumes will be contained underground and dispersed through the mine ventilation system. Blast gases have been addressed, because of public concern.

Residents are concerned that there will be an uncontrolled release of blast gases above the ground during the pillar blasts. The DEP has advised that the dispersal of blast gases will prevent irritant effects on residents from large concentrations of blast gases all released at the same time.

All blasting will be underground and therefore blast gas release can be controlled by dispersion through the mine ventilation system in the same way as is currently the case for all Mt Charlotte underground blasting.

The EPA finds that the public concerns about the possibility of blast gases being released above ground in an uncontrolled manner during the project are based on a superseded blast design.

Given that blasting is underground and therefore blast gas release is controllable by dispersion through the mine ventilation system and scrubbers on some fans and that blasting operations are subject to safety regulations administered by the Department of Minerals and Energy, the proposed project can be satisfactorily managed.

Road Safety

Because the haul road crosses the main vehicular access to Williamstown, there is a potential hazard introduced to vehicles and pedestrians using the Williamstown Road. Submissions raised concerns about road safety.

Submissions stated that collisions between haul trucks and passenger vehicles using the Williamstown Road could occur. Residents are concerned that there may be accidents at the crossing, particularly during times when children are being taken to and from school.

The spotter nominated by the proponent will manage haul truck movements across Williamstown Road.

The haul road between the proposed pits at Mt Charlotte and the Fimiston Mill is a private road and its use is governed by the Department of Minerals and Energy (DoME). Road safety issues associated with the proposed project will therefore be managed by the DoME.

Groundwater

The Kalgoorlie region is so dry that the water table is several hundred metres below the ground at the site of the proposal. No impacts are expected from these quite shallow proposed pits. The Water and Rivers Commission indicated in their submission that it expects no impact to underground water from the proposed project.

Land Zoning and Future Mining

Williamstown is within KCGM's mining lease and it is known there are other gold deposits around Mt Charlotte, including beneath Williamstown and Kalgoorlie CBD. KCGM has advised the EPA that they cannot discount the possibility of future mining in the Mt Charlotte area.

An aspect of the proposal which has made the prospect of increased noise and dust impacts more tolerable is the short duration of the mining works in the proposal. If this proposal comes to be seen as part of an ongoing process of mineral exploitation in the vicinity of Mt Charlotte, then the impacts on residents and businesses in close proximity to such future proposals will need to be assessed on this basis.

4. Conditions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment 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.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal, and following discussion with the proponent the EPA may seek additional commitments.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for and commitment to continuous improvement in environmental performance. The commitments, modified if necessary to ensure enforceability, then form part of the conditions to which the proposal should be subject if it is to be implemented.

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions which it recommends be imposed if the proposal by Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM) to mine the Reward and Northern Orebodies adjacent to Mt Charlotte in Kalgoorlie, is approved for implementation. These conditions are presented in Appendix 3.

Matters addressed in the conditions include:

(a) the proponent shall prepare a Community Consultation Plan

(b) variations to noise limits for a limited duration

(c) the environmental management plans for noise and dust require the proponent to cease operations when weather conditions are unfavourable for proper control of their impacts on surrounding residents and business premises.

Advice to Minister

The EPA recommends that the Minister approve this proposal subject to the conditions to be found in Appendix 3 - Recommended Environmental Conditions

5. Other Advice

Additional Noise Considerations

There are existing KCGM mining activities which may be producing noise in excess of the levels prescribed in the *Environmental Protection (Noise) Regulations 1997*. Excess noise in this area could also be contributed by activities outside the control of KCGM such as traffic on the Eastern Bypass Road and light industry in the area. It is EPA's view that noise from these existing operations should be subject to separate review. There would be the potential for an application by KCGM to the Minister for relief from the Noise Regulations where it is impracticable for KCGM to comply with these Regulations.

6. Conclusions

The EPA has considered the proposal by KCGM to mine two pits adjacent to Mt Charlotte in Kalgoorlie.

Having particular regard to:

- the proximity of the proposed pits to dwellings and the school in Williamstown and to business and residential premises in the Kalgoorlie central business district (CBD);
- the short duration of the proposal;
- the proponent's commitment to do mining and construction work on the proposal only during weekdays;
- the proponent's commitment to provide a noise control bund to shelter Williamstown residents from noise and dust;

- the proponent's commitment to manage blasting such that ground vibration at affected premises will not exceed 10 millimetres per second peak particle velocity (PPV);
- the proponent's commitment to manage the proposal so as to limit its environmental impact on surrounding dwellings, school and business premises through the development and implementation of an Environmental Management System;
- the proponent's commitment to maintain a public Hotline and ensure prompt resolution of community concerns raised; and
- the computer noise modelling predictions that there would only be a short time at the beginning of the proposal when noise would exceed the assigned levels in the Noise Regulations,

the EPA has concluded that the proposed mining of the pits and associated construction works can be satisfactorily managed, provided that the conditions recommended in Section 4 and set out in formal detail in Appendix 3 are imposed.

The EPA anticipates that the noise from the proposal will be in excess of the levels assigned in the Noise Regulations but considers that the proponent has taken all practicable steps to limit the impact of noise and dust on surrounding noise sensitive premises. The EPA believes and that the resultant noise will not be unreasonable and a variation to the allowable noise limits is justifiable.

This would involve an increase in the allowable noise levels for the short duration of this proposal by up to 10 dB[A] in Kalgoorlie CBD and up to 3 dB[A] in Williamstown from the current assigned noise levels. This short term variation could be given effect via Part IV conditions and a corresponding variation to the existing *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) pursuant to the *Environmental Protection Act 1986.*

The EPA also anticipates that high noise levels would occur in both Williamstown and the Kalgoorlie CBD during the two months before mining starts, when the proponent would be constructing a noise barrier in the form of a bund which would provide Williamstown residents with protection from noise during the mining. Because the purpose of the bund is specifically to protect the residents of Williamstown from noise and dust arising from subsequent operations, the EPA is of the view that the higher, short term noise levels associated with its construction would be tolerable.

Accordingly the EPA has concluded that the proposed mining of the pits and associated construction works can be satisfactorily managed provided that the conditions recommended in Section 4 and set out in formal detail in Appendix 3 are imposed.

7. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

- that the Minister considers this report on the relevant environmental factors of noise, vibration, dust and community consultation as set out in Section 3.
- that the Minister notes that the EPA has concluded that the proposed mining project can be satisfactorily managed, provided there is effective implementation by the proponent of the recommended conditions set out in Appendix 3 Section 4, including the proponent's commitments.
- that the Minister notes the requirement for a variation in the assigned noise levels applying to early parts of the proposal.
- that the Minister imposes the procedures and conditions, including revised assigned noise levels and the Community Consultation Plan, recommended in Appendix 3 of this report.

The following organisations made submissions about KCGM's proposed pits at Mt Charlotte:

- Kalgoorlie-Boulder Chamber of Commerce;
- Aboriginal Affairs Department; and
- Water and Rivers Commission.
- Health Department of WA
- Water Corporation

There were also submissions received from about 70 individuals from the Kalgoorlie area. The EPA and the DEP received letters expressing opinions about the proposal and raising issues of concern. The issues raised in these letters have been taken into consideration in formulating the Summary of Submissions and elsewhere as appropriate in the formal assessment process. Due to requests for confidentiality by writers of these letters and submissions, they are not individually identified.

- KCGM 1998 Environmental Review and Regulation 17 Application Mt Charlotte Reward and Northern Orebody Open Pits and Floor Pillars.

- KCGM 1997 Mt Charlotte Operations Notice of Intent Mt Charlotte Reward & Northern Orebody Open Pits & Floor Pillars.

- *Environmental Protection (Noise) Regulations 1997 (WA)*

- *Environmental Protection Act 1986 (WA)*

Appendix 3

Recommended Environmental Conditions

Statement No.

Recommended Environmental Conditions

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

MOUNT CHARLOTTE GOLD MINE REWARD AND NORTHERN OREBODY OPEN PITS AND FLOOR PILLARS, KALGOORLIE.

Proposal: A gold mining operation comprising mining of the two open pits for the Reward Orebody and Northern Orebody and their associated floor pillars and including backfilling operations within the two pits. The proposal involves some underground blasting but no surface blasting. Rehabilitation is also included in the proposal, which is further documented in Schedule 1 of this Statement.

Proponent: Kalgoorlie Consolidated Gold Mines Pty Ltd

Proponent Address: PMB 27
KALGOORLIE WA 6430

Assessment Number: 1191

Report of the Environmental Protection Authority: Bulletin 919

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

1 Implementation

1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 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 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 determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 Proponent Commitments

2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 3 of this statement.

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

3 Community Consultation Plan

3-1 In order to manage the potential environmental impacts of the proposal on the community, prior to ground-disturbing activities, the proponent shall develop a Community Consultation Plan to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

This Plan shall form part of the Environmental Management System to which the proponent is committed under Schedule 3 - Commitment 2, and shall include:

1 a company consultation statement for the proposal including a commitment to liaison with proposal stakeholders;

2 a summary of consultation objectives, including identification of stakeholders;

3 details of the implementation and operation of stakeholder consultation;

4 methods of measurement and evaluation of stakeholder consultation performance;

5 systems for review and improvement of the stakeholder consultation process and outcomes; and

6 all elements of the community consultation and information programme to which the company is already committed (Schedule 3 - Commitment 9).

3-2 The proponent shall implement the Community Consultation Plan required by condition 3-1.

3-3 The proponent shall make the Community Consultation Plan required by condition 3-1 publicly available, to the requirements of the Environmental Protection Authority.

4 Noise

4-1 The proponent shall carry out construction activities such as road works, bund construction, earth works or other similar site works or reclamation in accordance with industry best practice.

Note 1 : "industry best practice" means work carried out between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday if the occupier of the premises or public place, shows that —

the equipment used on the premises was the quietest reasonably available; and

the work was carried out in accordance with control of environmental noise practices set out in section 6 of Australian Standard 2436-1981 'Guide to Noise Control on Construction, Maintenance and Demolition Sites';

Note 2 : The noise requirements of this proposal are contained solely within this condition and the associated Schedules attached.

4-2 The proponent shall carry out mining and related activities in accordance with the noise limits given in Schedule 2.

5 Decommissioning and Rehabilitation Management Plan

5-1 At least three months prior to concluding mining, the proponent shall prepare a Decommissioning and Rehabilitation Management Plan for the proposal to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection and the Department of Minerals and Energy.

This Plan shall address:

1 removal or, if appropriate, retention of plant and infrastructure if any;

2 rehabilitation of all disturbed areas to a standard suitable for agreed new land uses; and

3 identification of contaminated areas, including provision of evidence of notification to relevant statutory authorities.

5-2 The proponent shall implement the Decommissioning and Rehabilitation Management Plan required by condition 5-1 until such time as the Minister for the Environment determines that decommissioning and rehabilitation are complete.

5-3 The proponent shall make the Decommissioning and Rehabilitation Management Plan required by condition 5-1 publicly available, to the requirements of the Environmental Protection Authority.

6 Work Practices

6-1 Prior to commencement of work related to this proposal, the proponent shall prepare a written prescription for employee and contractor work practices covering rock haulage, road safety, blasting, earthmoving as well as noise and dust control to ensure that work practices are carried out at the level of international best practice, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection and the Department of Minerals and Energy.

6-2 The proponent shall ensure that all works and operations comply with the prescription referred to in condition 6-1.

7 Proponent

7-1 The proponent for the time being nominated by the Minister for the Environment 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 has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.

7-2 Any request for the exercise of that power of the Minister referred to in condition 7-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.

7-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

8 Commencement

8-1 The proponent shall provide evidence to the Minister for the Environment within two years of the date of this statement that the proposal has been substantially commenced.

8-2 Where the proposal has not been substantially commenced within two years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.

8-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond two years from the date of this statement at least six months prior to the expiration of the two year period referred to in conditions 8-1 and 8-2.

8-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding two years for the substantial commencement of the proposal.

9 Compliance Auditing

9-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.

9-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal clearances.

9-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment.

Note: The assigned noise levels and other conditions relating to noise in these conditions are subject to the operation of an exemption pursuant to the *Environmental Protection Act 1986*.

Schedule 1

Definition of the Proposal (Assessment 1191)

The proposal is to mine two pits adjacent to Mt Charlotte underground gold mine in Kalgoorlie. These pits will uncover the floor pillars of the Reward and Northern Orebodies (ROB and NOB), which are the areas where the orebodies come to the surface. The underground portions of these and adjacent orebodies have already been mined as far as is possible from underground.

Once they are uncovered, the implosion of these floor pillars is to be initiated from underground. The ore from the open pits will be hauled to the ore stockpile at the Fimiston processing plant via an existing haulage route parallel to the existing overland conveyor. Ore from the floor pillars is to be hauled to the Fimiston processing plant via the existing decline which runs below the surface from Mt Charlotte to the Fimiston Open Pit.

The underground voids exposed by the removal of the two floor pillars are then to be backfilled with waste rock to stabilise the ground around Mt Charlotte. There will be no surface blasting associated with the proposal. The noise bund and road construction, surface mining, blasting and surface ore recovery will be completed within twelve months. Post- mining rehabilitation is part of the proposal.

Table 1 - Key Proposal Characteristics

Element	Description
Life of project • Phase 1 (Road & Bund Construction) • Phase 2 (Mining of pits) • Phase 3 (Mining of floor pillars) • Phase 4 (Backfilling)	 • about 2 months • about 8 months • about 2 months
Size of ore reserves • Phase 2 • Phase 3	 • 740,000 tonnes; • 910,000 tonnes.
Area of disturbance (including access)	6.55 Ha
Major components • ROB and NOB pits • ROB and NOB floor pillars	See below Project uses existing crushing, tailings facilities and infrastructure
Time of operation	0700 to 1700, Monday to Friday
Waste rock disposal from pits	Backfill for underground voids
Transportation requirements during the project (including backfill) • Phase 1 • Phase 2 • Phase 3 • Phase 4	Greater part of the ore (pillars) - Sam Pearce Decline Remaining portion (open pits) - Mt Charlotte to Fimiston haul road Backfill via Mt Charlotte - Fimiston haul road • 420 truck cycles per week • 950 truck cycles per week • No truck movements • Backfilling from outside

Note: The proponent is already permitted under the conditions of their permits from the Department of Mines to haul waste rock for backfilling of pits adjacent to Mt Charlotte. This waste rock haulage has taken place in the past and will proceed after the mining of this proposal has been completed and until the underground voids have been filled.

Schedule 2 - Part A

ASSIGNED NOISE LEVELS APPLICABLE TO PROPOSAL

(1) The Assigned Noise Levels applicable to this proposal are to be determined with reference to the Table 2 with adjustments applied as per Part B, Table 3

TABLE 2

Type of premises receiving noise	Time of day	Assigned level dB[A]		
		LA_{10} (slow)	LA_{1} (slow)	LA_{max} (slow)
Noise sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use in the **Kalgoorlie CBD**	0700 to 1900 hours Monday to Friday, not including public holidays.	65	75	85
	1900 to 2200 hours all days and 0900 to 2200 hours Sunday and public holidays	50	60	75
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	45	55	65
Noise sensitive premises at locations within 15 metres of a building directly associated with a noise sensitive use in **Williamstown**	0700 to 1900 hours Monday to Friday, not including public holidays.	58	68	78
	1900 to 2200 hours all days. and 0900 to 2200 hours Sunday and public holidays	50	60	75
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	45	55	65

(2) The adjustments to measured noise levels where there are intrusive or dominant noise characteristics shall be made according to Part B of this Schedule

(3) Noise level measurements will be done in accordance with Schedule 4 of this Statement (Rules for Sound Level Measurement).

(3) Noise is taken to be free of the characteristics of tonality, impulsiveness and modulation if —

- the characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of the noise emission; and
- the noise emission complies with the Part A, Table 2 after the adjustments according to Table 3 are made to the noise emission as measured at the point of reception.

TABLE 3 Adjustments for Tonality, Modulation and Impulsiveness

Adjustment: cumulative to a maximum of 15 dB.		
Where tonality is present	Where modulation is present	Where impulsiveness is present
+5 dB	+5 dB	+10 dB

Schedule 2 - Part B

INTRUSIVE OR DOMINANT NOISE CHARACTERISTICS

In this Statement --

"Kalgoorlie CBD" means those dwellings and business premises forming part of the City of Kalgoorlie-Boulder within 1200 metres of Hannan Street and west of the Eastern Bypass Road and those dwellings on the Williamstown Road between the Eastern Bypass Road and the Overland Conveyor.

"Williamstown" means those dwellings and other premises forming the suburb of the City of Kalgoorlie-Boulder known as Williamstown and within 800 metres east of the Eastern Bypass Road.

"impulsiveness" means a variation in the emission of a noise where the difference between LA peak and L A Max slow is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that —

- is more than 3 dB LA Fast or is more than 3 dB LA Fast in any one-third octave band;
- is present for at least ten percent of the representative assessment period; and
- is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between —

- the A-weighted sound pressure level in any one-third octave band; and
- the arithmetic average of the A-weighted sound pressure levels in the two adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as LAeq,T levels where the time period T is greater than ten percent of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as LA Slow levels.

"LA Fast" means the reading in decibels (dB) obtained using the "A" frequency-weighting characteristic and the "F" time-weighting characteristic as specified in Australian Standard 1259.1-1990 with sound level measuring equipment that complies with the requirements of Schedule 4;

"LA peak" means the maximum reading in decibels (dB) obtained using the "A" frequency-weighting characteristic and "P" time-weighting characteristic as specified in Australian Standard 1259.1-1990 with sound level measuring equipment that complies with the requirements of Schedule 4;

"LAeq,T" means the equivalent continuous A-weighted sound pressure level in decibels (dB) as specified in Australian Standard 1055.1-1989 determined over measurement time period T with sound level measuring equipment that complies with the requirements of Schedule 4;

"LA Max slow" means the maximum reading in decibels (dB) obtained using the "A" frequency weighting characteristic and the "S" time-weighting characteristic as specified in Australian Standard 1259.1-1990 with sound level measuring equipment that complies with the requirements of Schedule 4;

"one-third octave band" means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20 000 Hz inclusive as incorporated in a filter that complies with the requirements of Schedule 4.

Schedule 3

CONSOLIDATED ENVIRONMENTAL MANAGEMENT COMMITMENTS.

As indicated above, the proponent's commitments are not always written in a form which makes them readily enforceable. There is a commitment by the proponent to produce an Environmental Management System for the relevant environmental factors prior to starting the project. This will include a Noise Management Plan and a Dust Management Plan. These plans will collect and systematise the environmental management methods for these potential impacts contained in the Environmental Review document and in the Response to Submissions.

The Noise Management Plan will contain such measures as:

- Working during weekdays only.
- Using the quietest mechanical equipment that is reasonably available.
- Building a suitable noise containment bund prior to mining.
- Monitoring and reporting noise levels continually during the work.

The Dust Management will contain measures such as:

- Running the project so as to avoid the drier periods.
- Watering the dust producing activities in the pits / haul road.
- Stopping work if the wind conditions send excess dust offsite
- Regular dust monitoring over 24 hour intervals between the pits and Williamstown.
- Community Hotline for community concerns during operations.

The Environmental Management System is subject to DEP approval through the Part IV Performance and Compliance Report,

Commitments from the Environmental Review document have been edited for clarity and to incorporate elements which make them auditable.

The revised Proponent Commitments Table follows.

Summary of Proponent's Commitments

Schedule 3

Mt Charlotte Gold Mine ROB & NOB Pits and Floor Pillars Assessment: **1191**

Table 4

Commitment (Who/What)	**Objective** (Why)	**Action** (How/Where)	**Timing** (When)	**Whose Advice** (to Whom)	**Measurement Criteria** (Audit verification)
1. The provisions of the *Environmental Protection Act 1986* and the *Environmental Protection (Noise) Regulations 1997* as they apply to proposal will be complied with	To ensure that the amenity of residential and business areas are not unduly affected by noise from the operations	Mining will only occur between 0700 hours and 1700 hours, Monday to Friday. Noise bunding will be constructed along the sides of the main works. Employees and contractors will receive formal induction and training covering procedures for noise control	Operating Phase Prior to works commencing	DEP Part V	Part IV Performance and Compliance Report
2. An approved Environmental Management System will be implemented.	Ensure the sound environmental management of the project and its impacts	Prepare operational procedures which address the relevant conditions and commitments of the project including: • noise; • vibration from blasting; • dust; • blasting gases; • flyrock; • public safety.	Prior to the commence-ment of ground disturbing activities associated with the proposal	DEP Part V	Part IV Performance and Compliance Report
3. Noise levels adjacent to the operations will be monitored	To ensure neighbouring residents and businesses are not unduly affected by mining noise	Continual noise monitoring will occur at a location between the operations and Williamstown	During works	DEP Part V	Part IV Performance and Compliance Report
4. Short-duration high-intensity noise impacts will be minimised	To ensure neighbouring residents and businesses are not unduly affected by high intensity noise	Rock breakers will be used near the base pits and in periods of the day when high levels of ambient noise prevail to reduce the contrast.	During works	DEP Part V	Part IV Performance and Compliance Report

Summary of Proponent's Commitments

Schedule 3

Mt Charlotte Gold Mine ROB & NOB Pits and Floor Pillars Assessment: **1191**

Commitment (Who/What)	**Objective** (Why)	**Action** (How/Where)	**Timing** (When)	**Whose Advice** (to Whom)	**Measurement Criteria** (Audit verification)
5. An industry best practice Mining Plan will be prepared and implemented for the underground mining of the ROB and NOB crown pillars.	To reduce potential impacts from blast vibration, fly rock and blast gases.	Recognised experts in underground mining methods including the State Mining Engineer will be consulted to develop and approve an underground mining method for the crown pillars in the proposal. Research and modelling will be undertaken by industry experts in underground blasting practice during the course of the proposal to ensure impacts from the crown pillar mining are equal to or less than those for the two 'one off' underground pillar blasts described in the Environmental Review document. Underground pillar blasting will be conducted so that vibration from a single blast does not exceed 10 millimetres per second peak particle velocity (PPV). Underground pillar blasting will be advertised in advance and will occur at specified times Vibration of underground pillar blasts will be monitored	During works and prior to undertaking drilling, blasting and mining of the crown pillars.	Dept of Minerals & Energy Mines Safety and Inspection Regulations 1995 DEP Part V	Part IV Performance and Compliance Report on "Crown Pillar Blasting and Mining Plan" and on vibration PPV limit.

Summary of Proponent's Commitments

Schedule 3

Mt Charlotte Gold Mine ROB & NOB Pits and Floor Pillars Assessment: **1191**

Commitment (Who/What)	**Objective** (Why)	**Action** (How/Where)	**Timing** (When)	**Whose Advice** (to Whom)	**Measurement Criteria** (Audit verification)
6. Production of dust from mining operations will be monitored and managed to reduce its impact.	To ensure that the amenity of residential and business areas is not unduly affected by dust from the operations	• Water trucks and water cannons will water areas that could form dust, including haul roads, mining areas and pillar blast areas • Mining will be scheduled so as to avoid the drier periods • During potential periods of dust formation, visual checks for dust will be made on a regular basis • Options will be examined for modifying the existing on-line wind monitoring system so as to trigger a warning for wind conditions that might lead to dusty conditions • The site superintendent shall take action to control dust levels or suspend mining activity in response to complaints or where it is viewed that dust levels may have adverse effects • For the pillar blasts, dust formation will be minimised through implementation of quality control procedures during hole drilling and charging • As no surface blasting will occur, physical methods including ripping and use of rock breakers will be employed • Employees and contractors will receive formal induction and training covering procedures for dust control • A high-volume dust monitor will regularly monitor dust levels over 24-hour intervals at a location between the operations and the Williamstown area	Prepare plan prior to works, implement during works	Proponent advice to DEP Goldfields regional office of its methods of dust control and these will be subject to DEP inspection.	Part IV Performance and Compliance Report

Summary of Proponent's Commitments

Schedule 3

Mt Charlotte Gold Mine ROB & NOB Pits and Floor Pillars Assessment: **1191**

Commitment (Who/What)	**Objective** (Why)	**Action** (How/Where)	**Timing** (When)	**Whose Advice** (to Whom)	**Measurement Criteria** (Audit verification)
7 Mechanisms will be administered to record and respond to public concerns or complaints.		A public 'Hotline' will be maintained to enable local residents to register concerns. A register of complaints will be maintained Procedures will be maintained to ensure prompt problem resolution should issues arise	During works	DEP Part V	Public complaints register shall be reviewed in Part IV Performance and Compliance Report
8. A public consultation and information programme will be implemented.	To keep the public informed about key aspects of the proposal	Information will be provided to the Williamstown Residents Committee and other interested parties and feedback will be sought Information articles will be published in local newspapers Company and relevant contract personnel will be kept informed of plans and procedures for the project Information will be disseminated to and/or meetings will be held with representatives from the Williamstown Resident's Committee, Williamstown residents, relevant trade unions, local print, radio and television media, company personnel, Kalgoorlie–Boulder community representative bodies, DEP, DoME, Western Power, DRD, Water Corporation, CALM, local and state politicians as required	During works	DEP Part V	Copies of information to be provided to DEP, Perth. Log of information events to be in Part IV Performance and Compliance Report
9. All runoff will be retained within the site, with the exception of extreme rainfall events and will direct runoff away from the pits	To ensure that areas adjacent to the mine are not contaminated by site runoff and the pits are not inundated with water compromising the safety of the pit	Mt Charlotte water drainage systems will be modified to incorporate new hardstand and road areas into existing drainage network	During construction and preparatory works	DEP Part V	Proponent to advise in writing of any improvements needed. DEP inspection will follow. Part IV Performance and Compliance Report

Key to abbreviations:

DEP Department of Environmental Protection
EPA Environmental Protection Authority
DoME Department of Minerals and Energy
DRD Department of Resources Development
CALM Department of Conservation and Land Management
KCGM Kalgoorlie Consolidated Gold Mines Pty Ltd, the proponent.

Schedule 4

RULES FOR SOUND LEVEL MEASUREMENT

1. Sound level measuring instruments

(1) Sound level measuring instruments must meet or exceed the requirements of the relevant sections of Australian Standard 1259.1-1990 Sound Level Meters Part 1: Non-integrating for type 0, type 1 or type 2 meters.

(2) In addition to the requirements of subclause (1), sound level measuring instruments which include integrating functions must meet or exceed the requirements of the relevant sections of Australian Standard 1259.2-1990 Sound Level Meters Part 2: Integrating for type 0, type 1 or type 2 meters, as applicable to the integrating functions.

(3) Sound level measuring instruments not covered by subclauses (1) and (2), including magnetic tape recorders, level recorders, spectrum analysers and computers, must meet or exceed the relevant performance requirements of a type 2 sound level meter.

(4) Filter sets used with any sound level meter must meet or exceed the requirements specified in clauses 7 and 8.1 (a) of Australian and New Zealand Standard 4476:1997, Acoustics — Octave-band and fractional-octave-band filters.

(5) Standard sound sources (acoustic calibrators and piston phones) used for field performance checks must meet or exceed the relevant requirements of International Electrotechnical Commission (IEC) Standards Publication 942-1988 for class 2 sound sources.

2. Calibration of sound level measuring instruments

(1) In this clause —

"approved calibration laboratory" means a calibration laboratory —

(a) registered with the National Association of Testing Authorities ("NATA") for the calibration of sound level measuring instruments in accordance with the relevant provisions of Australian Standard 1259-1990, Australian and New Zealand Standard 4476:1997, Acoustics — Octave-band and fractional-octave-band filters and IEC Standards Publication 942-1988; or

(b) approved by the Chief Executive Officer of the Department of Environmental Protection for calibration of sound level measuring instruments in accordance with the relevant provisions of Australian Standard 1259-1990, Australian and New Zealand Standard 4476:1997, Acoustics — Octave-band and fractional-octave-band filters and IEC Standards Publication 942-1988 or for calibration of instruments used for the measurement of airblast under clause 5.

(2) A sound level measuring instrument must not be used for the purposes of this Schedule unless —

(a) the instrument has been calibrated in an approved calibration laboratory within the 2 year period immediately preceding the date of its use; and

(b) the owner or a person in control of the laboratory has issued a certificate —

(i) identifying the laboratory undertaking the calibration;

(ii) identifying the instrument by type, manufacturer and serial number;

(iii) recording the date of calibration;

(iv) certifying that the calibration procedures followed were in accordance with the terms of the NATA registration of the laboratory or the procedures specified in the approval of the laboratory by the Chief Executive Officer;

(v) certifying that the sound level measuring instrument complies with the relevant provisions of Australian Standard 1259-1990, Australian and New Zealand Standard 4476:1997, Acoustics — Octave-band and fractional-octave-band filters and IEC Standards Publication 942-1988; and

(vi) specifying the standard or standards, and the clause numbers of the standard or standards, against which the instrument has been calibrated.

(3) The certificate referred to in subclause (2) (b) is not required to give detailed results of individual tests but must provide sufficient information to indicate that the instrument has met the relevant requirements of the standards against which it was calibrated.

3. Field performance checks

(1) A sound level measuring instrument —

(a) must be subjected to field performance checks using a standard sound source that complies with clause 2 (5) as nearly as practicable immediately prior to, and immediately after, a measurement or set of measurements is to be, or has been, made using the instrument;

(b) must indicate, after adjustment of its sensitivity if necessary and before it is used to make measurements, the stated level of the standard sound source within + or - 0.5 dB; and

(c) must indicate, without further adjustment of its sensitivity, the stated level of the standard sound source within + or - 0.5 dB after the instrument is used.

(2) If the sound level measuring instrument does not comply with subclause (1) the results of the measurement made by the instrument must not be used.

4. Instrument used for measurement of air blast levels

(1) For the purposes of regulation 11, air-blast levels resulting from blasting must be measured using sound level measuring instruments having the capability to measure in linear peak hold (L Linear peak) mode.

(2) Sound level measuring instruments which are used for measuring air blast levels from blasting must, in addition to being calibrated in accordance with clause 3 and checked in accordance with clause 4 —

(a) be calibrated to establish that their sensitivity remains within + 0 dB and - 3 dB of the sensitivity at 100 Hz when tested at selected frequencies within the range 2 Hz to 10 Hz; and

(b) have an upper frequency response of at least 500 Hz.

(3) Sound level measuring instruments which do not meet the requirements of subclause (2) must not be used for air-blast measurements.

5. Place of measurement of noise

(1) In this Statement —

"boundary", in relation to premises, means the apparent or reputed boundary of the premises.

"noise-sensitive premises" means premises —

(a) referred to in Part A of Schedule 5; and

(b) that are not premises, or part of premises, referred to in Part B or Part C of Schedule 5.

(2) For the purposes of Schedule 4, unless otherwise provided in section 7, measurement of noise on premises must be made —

(a) if the premises comprise a building or buildings and surrounding land, within the boundary of the surrounding land, but is not to be made inside a building unless —

(i) the use of the building is directly associated with the type of premises receiving the noise; and

(ii) the building is of a type of construction that is typical of buildings so used;

(b) where the premises comprise a building or part of a building without surrounding land, inside the premises;

6. Measurement of noise at premises

(1) This regulation does not apply to the measurement of airblast levels.

(2) Noise measurement must be made with the measuring microphone located at least 1.2 metres above the ground or floor plane.

(3) Outdoor noise measurements should be made with the measuring microphone located at least 3 metres from any substantial sound reflecting surface (other than the ground plane).

SCHEDULE 5

CLASSIFICATION OF PREMISES

PART A - NOISE SENSITIVE PREMISES

1. Premises occupied solely or mainly for residential or accommodation purposes.

2. Rural premises.

3. Premises used for the purpose of —

   (a) a caravan park or camping ground;

   (b) a hospital having accommodation for less than 150 in-patients;

   (c) a sanatorium, home or institution for care of persons, a rehabilitation centre, home or institution for persons requiring medical or rehabilitative treatment;

   (d) education — school, college, university, technical institute, academy or other educational centre, lecture hall or other premises used for the purpose of instruction;

   (e) public worship;

   (f) a tavern, hotel, club premises, reception lodge or other premises which provides accommodation for the public;

   (g) aged care;

   (h) child care;

   (i) a prison or detention centre.

KCGM

Mt Charlotte Reward and Northern Orebody Pits

Environmental Review and Regulation 17 Application

(Assessment number 1191)

Summary of Submissions

The public submission period for the Environmental Review of the Mt Charlotte Reward and Northern Orebody Pits proposed by Kalgoorlie Consolidated Gold Mines (KCGM) started on 17 August 1998 and closed on 18 September 1998.

Five submissions were received by the Environmental rotection Authority (EPA) from public bodies. These were Water and Rivers Commission, Kalgoorlie-Boulder Chamber of Commerce & Industry Inc., Health Department of Western Australia., Water Corporation and the Aboriginal Affairs Department. There were more than sixty submissions from members of the public about the proposed project. In addition to these formal submissions, the EPA received letters of concern and letters of support of the proposal from members of the public which have also been treated as submissions.

The proponent is asked to address all issues and questions raised in submissions.

In summary, the principal issues are:

1. General

Many submissions expressed concerns about the disclaimer offered by Kinhill Pty Ltd, who assisted KCGM to prepare their ER document. People felt this disclaimer undermined the validity of the document.

1.1 Constraints on Kinhill

Were there any constraints placed on Kinhill Pty Ltd which may have caused them to reach conclusions in your ER document which you believe would have been materially altered if these constraints were not in place?

2. Noise

2.1 Durations of Operation Phases

Please provide a plan of the proposed mining operation in sufficient detail so that the durations of each modelled phase are given. It must be possible to see the total duration of the project and the duration of each phase (modelled scenario), so that the impact on groups of residents can be estimated. A plan should be made available which shows the operations intended for the life of mining in the Mt Charlotte area. The plan should show activities associated with the ROB & NOB pits as a part of the overall plan so that the proposal is placed in perspective.

2.2 Equipment Modelled

Have KCGM's intended equipment complement or individual equipment noise characteristics changed since the noise modelling was done.

2.3 How Does Bund Work?

Please explain how the proposed noise bund along the Eastern edge of the proposed pits will operate, given that it is not continuous.

2.4 How Does Noise Model Work?

Please outline the basic assumptions of the noise modelling, its reliability as a predictor of real world conditions and how it will be used to help manage noise pollution.

2.5 Noise impact on the Primary School

In view of the pass-bys of waste rock hauling trucks for the duration of the project of at least eight months, please provide detailed information about the nature and management of the impact of truck noise on the East Kalgoorlie Primary School.

3. Dust

People making submissions claim that the impact of dust on them will be higher than the ER states.

3.1 Dust Modelling - Phase of Operation

Please highlight any part of the planned operations which will produce more dust than was assumed in the specialist consultant's report on dust impacts in the ER. Ensure that it is possible to determine from your answer which are the dust-producing phases of the proposed works, in relation to dust producing operations which are already part of the long term plans for mining in the vicinity of Mt Charlotte.

3.2 Model Assumptions

Please outline the basic assumptions of the dust modelling, its reliability as a predictor of real world dust impacts and how it will be used to manage dust pollution during the proposed works.

Scheduling for minimum dust generation

In the ER it says "Mining will be scheduled to avoid the dry and windy periods when dust is more likely to be generated."[1]

3.3 Control Criteria for Dusty Operations

Is this undertaking one based on which season the earthmoving will be done in or is there a plan to modulate these activities with conditions on a day-by-day or hour-by -hour basis? If activities are to be controlled in the latter fashion, what will be the control criteria and what will the control mechanism be?

3.4 Other Activities/Other Days

Although Environmental commitment 5 indicates mining activity will only occur from 7am to 5pm on weekdays, please indicate whether any other activity which could produce noise, dust and other pollutants will be carried on outside these hours. Will work be carried on during public holidays?

Dust Health Hazards

There is no mention in Section 5.5 of the ER of any potential for adverse health impacts arising from the dust exposure that the proposed mining activity will produce. The dust modelling dwells on the quantity of dust and the particulate size grading insofar as it affects airborne propagation.

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[1] KCGM Environmental Review and Regulation 17 Application Mt Charlotte Reward and Northern Orebody Open Pits and Floor Pillars August 1998. §2.6 Committment 3.

3.5 Health Concerns

Is there any increased health risk associated with special physical or chemical attributes of dust which may be generated in the proposed ROB & NOB mining operation?

4. Waste Rock Backfill

It is understood from recent discussions that the proposed project is part of ongoing mining activities at Mt Charlotte. As such, lawful activities before and after the proposed project and not made necessary as a consequence of the project are sanctioned under KCGM's current operating conditions. Of particular concern to those making submissions was the ore/waste haul truck traffic along the route of the overland conveyor past Williamstown. The extent of the haul truck movement made necessary by the proposed project needs to be distinguished from similar activities occurring as a result of ordinary mining activities.

Many Williamstown residents state in submissions that they are particularly disturbed by the noise and dust produced by movement of trucks on this haul road.

4.1 Quantity of Waste Rock During Project

Please quantify the anticipated haulage of ore and backfill along the Mt Charlotte - Fimiston Mill haul road in the lead-up to the project, during the course of the project and after the project has concluded. Include the durations of these phases, the intended tonnage and the capacity of the vehicles to be used. In view of the short anticipated remaining life of the Mt Charlotte gold resource, the post-project phase should include all anticipated haulage to the end of any intended post-mining site remediation operations. It is intended that you establish the contribution of the proposed ROB & NOB mining operation to the total intended Mt Charlotte operations.

4.2 Use of Overland Conveyor

What part will the overland conveyor from Mt Charlotte to Fimiston Mill play in mineral haulage during the proposed works?

5. Blasting / Vibration

Vibration Damage from Blasting

Many submissions raised the issue of ground vibration transmitted from regular underground blasting to buildings and other structures.

5.1 Expected Ground Vibration

Please indicate, with comparative quantitative estimates, the extent of any ground vibration to be expected from firing the roof pillars, from the tunnelling in preparation for the shot

and activity connected with ore/waste removal after the pillar blasts. Please give your estimates of ground vibration (GV) to be expected from the proposed pillar blasts and detail how the blast design (benches and delays) will be arranged to restrict GV to the usual license condition limits consistent with minimising damage to dwellings (viz GV< 5mm/s).

5.2 System for Fixing Blast Damage

Please outline the system to be used to quantify and remedy damage to private structures if any arises from blasting associated with the proposed project.

Ground Subsidence due to Blasting

People are concerned that the recent pillar blasting, notably on 27 June 1998, has caused earthquakes (seismic events) which led to significant property damage on the surface.

Mr Shipp is quoted as saying "there are voids the size of Saint Paul's Cathedral" [2]under the ground in the vicinity of Mt Charlotte. This statement in conjunction with stories of underground rockfalls has caused people to ask in their submissions whether their housing lots may cave in beneath them as a result of the proposed pillar blasts.

5.3 Building Damage from Seismic/Blasting

Please comment on the threat posed to dwellings, business premises and public infrastructure of an underground collapse triggered by KCGM blasting or natural seismic activity, to which the area is said to be prone.

5.4 Ground Subsidence into COB

Is their sufficient set-back to guard against hazards associated with subsidence once the NOB crown pillar above the COB void is removed?

Blast Design

Writers of some submissions were unable to assure themselves that any required blasting would be underground because the only reference to the blast plan was a report from ICI contained in the Notice of Intent[3].

It detailed two proposed blast designs, both of which produced gas and/or flyrock hazards above the ground.

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[2] City of Kalgoorlie-Boulder General Purpose Committee in Council Chambers 17 August 1998 7.00pm

[3] KCGM Mt Charlotte Operations Notice of Intent Mt Charlotte Reward & Northern Orebody Open Pits & Floor Pillars 3 December 1997.

5.5 Blast Design and Estimated Impacts

Please supply sufficient details of the intended blast design and methodology, including diagrams, to assure concerned people of minimal hazards or adverse environmental impacts above ground. Assessments of risks to public health and safety such as potential mine collapse, triggering of seismic events as well as potential losses of life and infrastructure damage should be included.

Other blast hazards

Other hazards of blasting in this proposed project have also been highlighted in submissions. Blast overpressure, flyrock and explosive gas escape can all adversely affect the environment and safety of nearby residents.

5.6 Other blast hazards

Please outline, if not already included in your answers to previous questions, how hazards such as damage from blast overpressure, ground vibration, flyrock and explosive gas escape will be managed during the proposed ROB & NOB pillar ore mining project.

6. Social / Other Impacts

Aboriginal Consultation

The NOI[4] stated that consultation will include representatives of Aboriginal community groups but the public consultation programme outlined in the ER[5]contains no reference to these groups. It is understood that a copy of the ER document has been received by the Aboriginal Affairs Department in Perth. In their letter of reply they said "...[KCGM] is advised to contact the original Aboriginal consultants [for the Fimiston project] as well as the Goldfields Regional Commission of Elders and the Goldfields Land Council. This will ensure that the Aboriginal community concerned with this area is aware of this development and that any new matters can be addressed prior to the commencement of construction."

6.1 Aboriginal Consultation

What was KCGM's Aboriginal consultation process for this project?

Safety

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[4] Ibid. Section 5.1 Social Impacts.

[5] KCGM Environmental Review and Regulation 17 Application Mt Charlotte Reward and Northern Orebody Open Pits and Floor Pillars August 1998. Section 5.9.1 Public consultation and information program.

[6] from public submission

Submissions have said that the planned section of the haul road to the North of the Williamstown Road may slope towards the intersection and that when water is used for dust suppression, the road surface may be too slippery for the haul trucks to stop safely before they proceed across Williamstown Road and onto the other section of the haul road.

During periods of the morning and afternoon there will be children going to and from East Kalgoorlie Primary School and parents providing them transport in the vicinity of the haul road crossing Williamstown Road. Concern has been expressed for their safety.

6.2 Safety and Haul Trucks - Road Crossing

Please detail how the safety of all road users in the vicinity of the haul road crossing on Williamstown Road will be managed during the proposed project.

6.3 Jurisdiction

Which authority has jurisdiction over the haul road?

6.4 Management of Truck Emergency

How would you manage a dump truck tyre fire or other truck accident on the haul road, particularly near the primary school?

Whilst not all of the above are strictly environmental issues, these concerns and your responses will be passed by the EPA to other forums for attention.

Community "Hot-Line"

The DEP has commented that an auditable two-way communication system between KCGM and the affected community is necessary.

This system would give the Department CEO or those to whom these functions are delegated a way to ensure that a reasonable and timely mechanism for information and feedback continues to be available to those affected by the proposed works from day to day.

6.5 KCGM Response to Inquiries and Complaints

Please supply detailed information about the inquiry line (hotline) management system in place at KCGM, particularly any provision for external reporting and verification.

Access to KCGM representatives at times of concern must be reliable, immediate and available during all working times. These representatives must be empowered to bring about immediate operational changes where there is a reasonable likelihood that pollution is in excess of assigned levels and is due to activities within KCGM control.

In addition to Commitments 9 and 10 of the ER, additional information of a procedural nature will be required so that a sufficient degree of auditability can be established and

measures designed to ensure continuity of availability of these systems is detailed more fully.

6.6 Public Access to KCGM Controller

Please indicate in detail how continuity of access to empowered KCGM representatives for affected people will be maintained so that appropriate immediate changes can be made in operating procedures in the event that excess pollution is found to be resulting from activities within KCGM's control.

Environmental Monitoring Equipment

Much of the hard data used to determine the levels of noise, blast and dust pollution is derived from instrumentation owned by KCGM and operated by KCGM employees. Continuous, reliable and accurate measures of magnitude of noise events, daily particulates deposited, prevailing winds and ground vibration are an important part of protecting residents from excesses in these pollutants.

6.7 Instrument Care and Availability

Outline the calibration, maintenance and repair routines for the noise, dust, weather and blast monitors and give auditable availability targets for each instrument type.

6.8 Noise and Dust Data Reliability

Please make available representative noise and dust data for all monitoring stations for the twelve months prior to August 1998. Show dates and durations of time for which data contiguity was lost and explain why.

6.9 Mt Charlotte Noise Monitoring Results

Why were the results of noise monitoring carried out at your 'site near Williamstown' [7] not part of the published Reports in the local newspaper.[8]

6.10 Plans for Further Mining

Are there currently any plans for KCGM and/or its successors to exploit other gold deposits in close proximity (ie. within 400 metres) to the Eastern edge of Kalgoorlie or Williamstown?

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[7] KCGM Environmental Review and Regulation 17 Application Mt Charlotte Reward and Northern Orebody Open Pits and Floor Pillars August 1998. Section 5.6 Noise para. 4

[8] KCGM Noise Monitoring Report The Kalgoorlie Miner 25 April 1998 Page 32

Rehabilitation

In various public information media there have been a variety of statements about access to Williamstown and about how Mt Charlotte will be rehabilitated after mining there. Submissions have requested clarification of these issues.

Regarding plans for the 'goat' track to Hannan Street, re-instating Austral Road and rehabilitation generally, submissions quoted the following:

"Mr Shipp explained that the particular pit to be worked was to be backfilled within some 8/12 months of the commencement of the mining at which point if necessary a walkway could be installed...the interim walkway would be on the North side.[9]

"The Mayor advised Mrs Mills that KCGM had conducted a presentation to Council on the proposal and as a result of that it had been strongly suggested that not only was there likely to be a footpath but also the possibility that the vehicular traffic route from Williamstown to Hannan Street might also be re-established, when the pit was filled in."[10]

"Mr Bawden explained that any land use of rehabilitated land could only occur with the approval of DME which would determine whether such use was safe and appropriate"[11]
"The Mayor explained that if the residents were to get together and make a submission arguing their case the rehabilitation would be to their requirements. If they failed on the other hand to make a submission they could only blame themselves"[12]

6.11 Rehabilitation

Please explain how the removal of more ore and the 'creation of more exposed ground and steeper angles are to be used as a basis for rehabilitation'[13].

6.12 Methodology, Plan and Resources

Please outline any undertakings you can make regarding finished landforms in the Mt Charlotte area at the end of planned mining activities in two years time. Where this is not possible, outline the proposed consultative mechanisms, auditable organisational structures involved and the extent of company resources to be committed to rehabilitation of the Mt Charlotte area after mining has ceased.

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[9] Public Meeting in Kalgoorlie Town Hall Banquet Room 8 September from 7pm

[10] Idid.

[11] Ibid.

[12] Public Meeting in Kalgoorlie Town Hall Banquet Room 8 September from 7pm

[13] Question from public submission.

KALGOORLIE
CONSOLIDATED
·GOLD MINES·

Response to Department of Environmental Protection Summary of Public Submissions

ENVIRONMENTAL REVIEW

NOB & ROB OPEN PITS

10 November, 1998

TABLE OF CONTENTS

1. General

The main objective of this document is to further clarify issues raised by the Department of Environmental Protection (DEP) in response to questions from public submissions to the KCGM Environmental Review for the ROB and NOB pits proposal.

1.1 Consultant assistance to KCGM

KCGM is the legal proponent and Kinhill Pty Ltd has been employed as a consultant to help KCGM prepare the Environmental Review document. Accordingly, the document reflects the intentions and commitments of KCGM for the project.

KCGM and Kinhill have agreed on the way the Environmental Review was assembled and Kinhill would not have produced the report if it were unhappy with the content.

Kinhill would not have used unreliable information in its report and KCGM would not have accepted such information either. Figures used and assumptions made in the document have appropriate qualifications and supporting explanations.

2. Noise

This Environmental Review supports an application for a variation to noise regulation 17 over the duration of this project. Consultancy Herring Storer Acoustics was retained by KCGM to prepare this application through a Noise Assessment Report. This report also includes a comprehensive noise modelling exercise. The complete noise report as required by the EPA and DEP is appended to the Environmental Review.

In overview the Noise Report shows that noise levels generated by the project work will be no greater than those levels already experienced in the area. It can be noted that the Kalgoorlie-Boulder Bypass Road runs along side the project site as also does Williamstown Road - both of which are major thoroughfares.

Noise levels are also coming down at Mt Charlotte as we have reduced the rate of hoisting and conveying of ore above ground in recent weeks. We are also now bringing equipment and ore out of the Sam Pearce Decline which is several kilometres away from the site; further reducing noise at Mt Charlotte.

2.1 Duration of Operation Phases

The operational phases of our proposal are detailed in the following chart. Each time line bar can also be referred back to the comprehensive noise modelling and contour plans, "Model Scenarios", that are provided in Appendix B of the Environmental Review document.

There are four main phases of the project and noise level contour plans or "Model Scenarios" are cross-referenced in brackets as follows:

1. Construction of noise bunds (Scenario 8 - bulldozer constructing earth barriers).
2. Haul road construction (Scenario 2 - ROB and NOB pits at commencement with earth bunds as noise barriers with all equipment on current ground levels).
3. Excavate top bench of pits (Scenario 2 - as above).
4. Excavate remaining benches (Scenario 3 - ROB and NOB pits advanced with earth bunds as noise barriers with equipment in the pits).

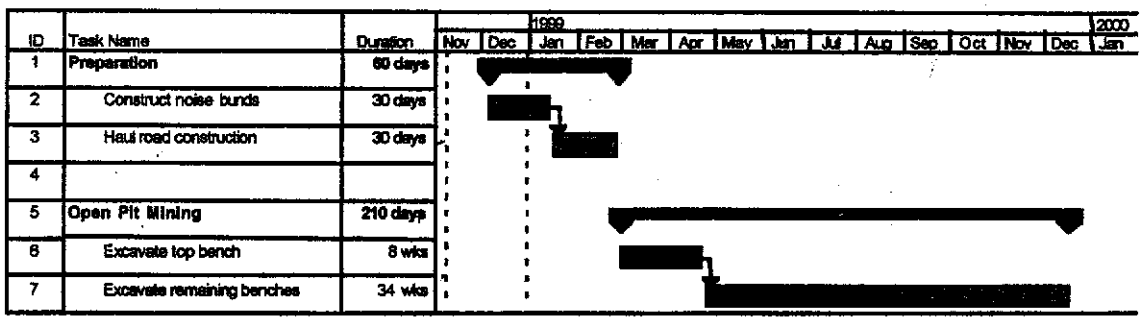


Figure SC8 in the Environmental Review document illustrates noise contours for the period of noise bund.

Figure SC2 in the Environmental Review document refers to noise contours relevant to the haul road construction and the excavation of the top bench.

Figure SC3 in the Environmental Review document represents the noise contours for the excavation of the remaining benches.

2.2 Equipment Modelled

Figure 2 in the Environmental Review document shows the conceptual layout of noise bunds. Noise bunds will be formed to achieve KCGM's goal of managing the impacts of this proposal on residential areas. KCGM's intended equipment and its noise characteristics remain unchanged since the noise modelling was done for this proposal. Recent measurements of trucks being trialed for this haul route have shown that their noise characteristics are consistent with model predictions, providing further confidence in the noise modelling completed for the Environmental Review. These assumptions are explained in detail in Appendix B of the Environmental Review document. We know that this type of construction is very successful from our experience with the noise bunded areas to the west of KCGM's Super Pit operation.

2.3 How Does the Bund Work?

KCGM has a successful working model of noise bunding in its Fimiston Open Pit. This bund demonstrates the effectiveness and considerable benefits achieved in shielding noise from a mining operation on the local community. As can be seen from the contour diagram in the Environmental Review document (Figure 1) the landform at our project site is slightly hilly. These hilly parts along the site perimeter will act as a natural noise bund and shield residences from the mining activity. In the lowest lying parts between the hill landforms we have committed to construct earthen noise barriers. As can be seen from the extensive noise modelling in the Environmental Review document these bunds will significantly minimise noise from the project site. Earthen noise bunds are used as they are effective barriers which deflect and absorb noise.

2.4 How Does the Noise Model Work?

KCGM has retained the services of the noise consultancy, Herring Storer Acoustics. This company has developed a thorough competency in noise management advice for both KCGM and industry throughout WA. The noise models prepared by the consultant in the Environmental Review document are based on actual readings and measurements taken over an extended period of time. The field data is then input into a computer simulation program, Environmental Noise Model, with the basic assumptions to produce the most likely noise generation for the particular scenario. The basic assumptions that have been used have been extensively detailed in Appendix B of the Environmental Review document. In the modelling phase, all likely scenarios are investigated to allow for accurate prediction of what will occur in the actual mining period.

2.5 Noise Impact on East Kalgoorlie Primary School

KCGM has made every effort to minimise the noise disturbance from this proposal. Recent measurements of trucks being trialed for this haul route have shown that their noise characteristics are consistent with model predictions, providing further confidence in noise modelling performed for the Environmental Review. Appendix 2 of the Environmental Review shows noise contour plans on which the primary school site can be located. It should be noted that the noise modelling is based on cases with all likely equipment operating for that case.

Trucks will be selected with the least intrusive noise characteristics to traverse the route past the school – also, the school is setback from the road. The noise signal will be intermittent throughout the day as the trucks pass down this route and it will not be a continuous disturbance.

As mentioned in section 4.1 of this document and in section 2.4 of the Environmental Review document, the ROB and NOB open pits will generate approximately 800,000 tonnes of waste material. This is 800,000 tonnes that does not have to be transported from the Fimiston Open Pit to Mt Charlotte. Haul trucks will take approximately 650,000 tonnes of ore from the pits to the Fimiston Mill and will be loaded with waste rock backfill for the return journey to Mt Charlotte. Backfill haulage has been occurring along this route for the greater part of the Mt Charlotte operation to date. Our proposal is also expected to reduce, by some 40%, the overall number of truck movements along this route. This is clearly a substantial benefit to the East Kalgoorlie Primary School.

3. Dust

Dust management for the project has been comprehensively covered in the Environmental Review document. It covers a review of:

- ambient dust levels throughout the City of Kalgoorlie-Boulder;
- dust modelling for the area in close proximity to the project site; and
- an assessment of short term dust impacts.

Of equal importance is that the Environmental Review explains in detail the proposed methods of dust control for routine work and contingency for abnormal weather conditions.

3.1 Dust Modelling - Phases of Operation

Some of the methods used to manage dust levels are reiterated here. During the construction of the noise bunds, the material will be continually watered down with a water truck as it is placed to form a bund.

During the short haul road construction and trucking phases, the roads will be well watered to control dust. Personnel utilising the road will monitor road conditions throughout that phase. These personnel will be able to make radio contact should conditions require action. Most of the haul road construction will take place after the construction of the bund. This means the bund will also act as a further dust shield while the haul road is under construction. Once mining is below the first stage, about 6 metres below the ground surface dust will be controlled by the use of water trucks or other water sprays as required.

3.2 Model Assumptions

At the request of the Department of Environmental Protection and through its guidelines, KCGM ensured that the Environmental Review included a comprehensive dust modelling report. Full details of this work undertaken by Kinhill are given as Appendix C in the Environmental Review.

Three atmospheric models were used including Ausplume which is one of the best standard model for this type of work in Australia. Two other models described in the report were used to complement the Ausplume work and to enable comparison of the predictions as a means of gaining further confidence in the report findings.

KCGM operates a best practice set up for weather monitoring to manage air quality. This comprehensive data set was used to help calibrate or set up the models. Full details of the model construction and calculations are given in Appendix C of the Environmental Review document. Predictions are given for the various aspects of our proposal such as bulldozing, grading, traffic and haul truck movements, wind and moisture factors.

The modelling reports notes that if we avoid mining work in hotter drier periods and use watering methods appropriately dust generation from the project will be below current background levels. These background levels are normally encountered at other monitoring stations in the Kalgoorlie-Boulder urban area.

3.3 Control of Dusty Conditions

Dust suppression, particularly road watering as an example will be done effectively on an as needs basis. The amount of traffic and activity on any particular day will influence watering requirements as would weather conditions. As stated in section 3.1 above, all operators for the project will have two way radios or mobile phones to enable a timely response to changing conditions such as roads drying out.

Community feedback and our dust monitoring program will also help in this regard. KCGM encourages the community to approach it directly with complaints or inquiries to enable a prompt or timely response. Again reference is made to our flow chart [section 6.5] for our response to inquiries.

3.4 Other Activities/Other Days

Mining activity for this project will be undertaken during the hours of 0700 to 1700 Monday to Friday only, and not on weekends or West Australian gazetted public holidays.

3.5 Health Concerns

As has been mentioned in the Environmental Review and in section 3.2 dust levels predicted for this project will not be greater than those experienced elsewhere in Kalgoorlie-Boulder. Furthermore, ore and waste rock being mined have the same basic physical and chemical properties as materials mined elsewhere in this proximity and do not contain any constituents that will pose a health hazard to either the workforce or to residents in the area.

4. Waste Rock Backfill

As is common practise for underground mining, Mt Charlotte also has a programme of backfilling key underground workings to ensure operational and longer term stability of the ground surface and underground zones.

This project according to current plans will be of major benefit to this backfill programme and have a significant benefit to the community. As mentioned further in this section waste rock from this project will reduce by 40% the overall amounts of waste rock to be trucked back to Mt Charlotte from the Fimiston Open Pit Operations.

4.1 Quantity of Waste Rock During Project

The ROB and NOB open pits will generate approximately 800,000 tonnes of waste material, this is 800,000 tonnes that does not have to be transported from the Fimiston Open Pit to Mt Charlotte. Haul trucks will take approximately 650,000 tonnes of ore from the pits to the Fimiston Mill and will be loaded with waste rock backfill for the return journey to Mt Charlotte. A full explanation of traffic movements and haulage quantities is given in section 2.4 and table 1 of the Environmental Review document.

4.2 Overland Conveyor

Further to the above section 4.1.

The overland conveyors primary role is the transportation of crushed ore from the shaft at Mt Charlotte to the Fimiston Mill. The overland conveyor will not be involved in the extraction or cartage of any material associated with either the NOB or ROB pit mining operation.

5. Blasting/Vibration

KCGM makes every effort to run a best practice system of controlling blast vibration. We believe that we have greatly reduced the vibrations from blasting in recent years and our approach to this is reiterated in this response and in the Environmental Review. There have been some seismic vibrations (like earth tremors) occurring near Mt Charlotte in recent times. These have occurred we think in response to readjustment of rock stress in relation to our mining at very deep levels underground. Whilst recent seismic events did occur at the same time as deep underground blasts, these events can occur independently. We have since revised our mining strategy to ensure that we have the best possible understanding of potential seismicity and to reduce the likelihood of it occurring. We have given details in this section about our management strategy for this project and we are confident that seismicity will not occur and that blast vibrations will be minimal.

5.1 Expected Ground Vibration

As stated above in section 5 we are confident that seismicity will not occur and that blast vibrations will be minimal. It is our aim to design and conduct the two blasts with expected ground vibrations that comply with Australian Standard AS2187.2-1993, as referred to in section 5.3. It is highly unlikely that a seismic event will be caused by the two underground pillar blasts. The amount of vibration from a seismic event depends on two factors, the energy stored in the rock mass, and the distance from the seismic source. For example the less energy stored or the more distant the activity, the less vibrations.

Due to the shallow depth of the pillars a low amount of energy is stored in the rock mass. There are three reasons for this:

- Shallow depth therefore low stress levels;
- The rock mass is partly weathered, and weak zones of gravelly, sandy and clayey material run through the area and around the upper part of the mine (close to the ground surface; and.
- These rock materials will move easily and gradually in response to vibrations from the planned mining activity in the upper part of the mine. This is because at these shallow depths the rock materials are under low mining stress (stress may be considered as either the pressures forcing blocks of rock together or in trying to pull those same rocks apart). The rock stress (pressure) at the depth of the pillars under the pits is about 14 megaPascals (MPa), which is about 20% of the 76 MPa stress at the mine's deepest workings.

These conditions will effectively eliminate the possibility of seismicity from occurring at the relatively shallow depth of our project.

5.2 System for Fixing Blast Damage

As explained in section 5.1 of this document, vibrations will be minimised to eliminate the possibility of damage. In the unlikely event that damage does occur, residents are asked to contact the KCGM Inquiry Line. The Inquiry Line procedure will be followed as outlined in section 6.5 of this document.

KCGM has a long standing commitment and has recompensed parties for any property damage verified as due to blasting. Our building inspector or an independent building surveyor response to all inquiries or complaints about blast damage with the aim of reaching an agreed outcome.

As previously mentioned in this document thousands of blast designs in our computer modelling will be examined in the selection of the final design. The underground blasts will

be designed to ensure residences and structures in the area remain in the same structural condition after the two underground blasts.

5.3 Potential Building Damage from Blasting or Seismicity

KCGM will conduct the underground pillar blasts for this project by performing literally thousands of computer predictions (called iterations) to ensure that the designs for the project produce the lowest blast vibration (ppv). The underground blasting methodology is detailed more in section 5.5.

The commonly accepted criterion used in the determination of potential damage to structures as a result of blasting induced ground vibration is the peak particle velocity (ppv) as given in Australian Standard AS2187.2-1993. The recommended maximum ppv values that are applicable to this project are given in the following table.

Type of building or structure	ppv (mm/s)
Houses and low-rise residential buildings and commercial buildings.	10
Commercial and industrial buildings or structures of reinforced concrete or steel construction.	25

KCGM will design and undertake the blast for this project with the aim of complying with AS 2187.2-1993 and further reassurance of KCGM competency in this work is given is section 5.5 below.

5.4 Ground Subsidence into COB

The NOB pit and underlying crown pillar adjoin to the northern side of the current workings of the Charlotte Ore Body (COB) and Glory Hole. We propose to progressively backfill all workings related to this project in a manner to ensure stability at the ground surface at all times during and after the completion of this project.

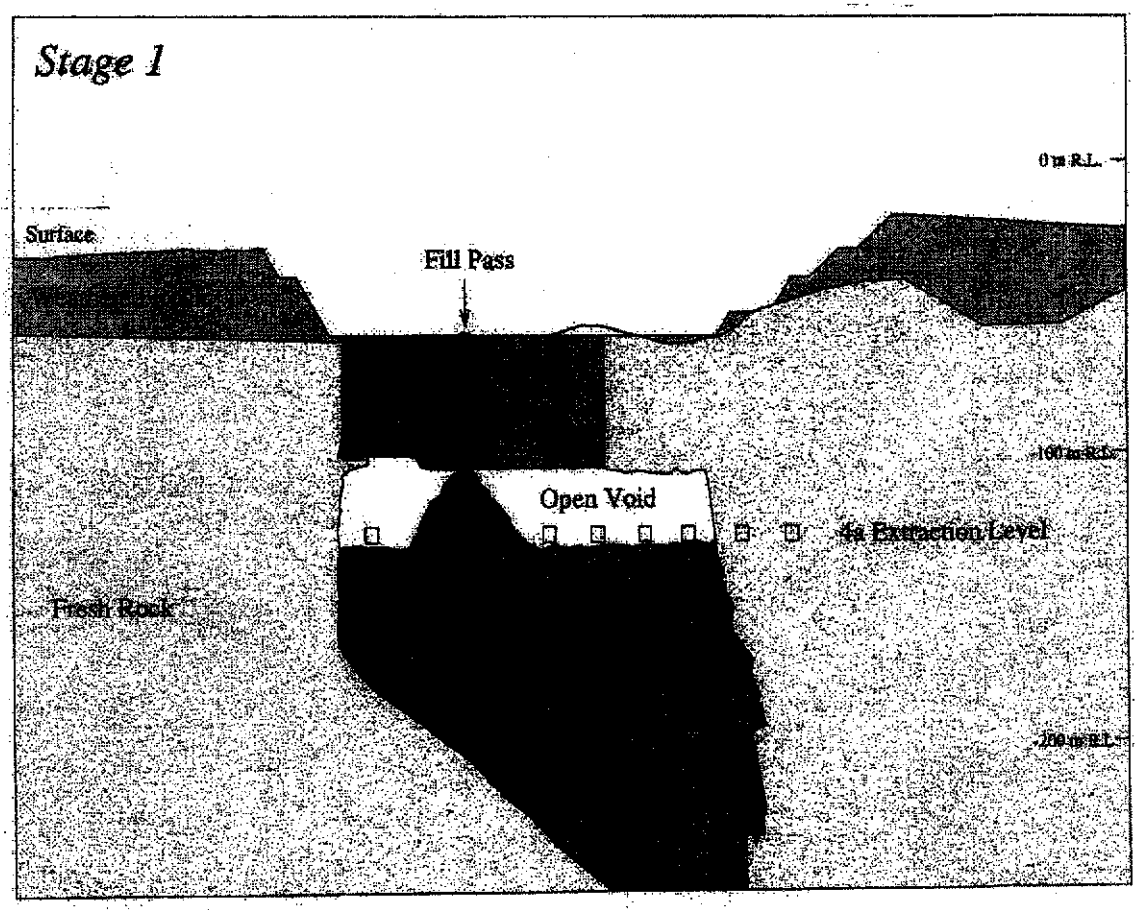
5.5 Blast Design and Estimated Impacts

Mt Charlotte has a long history of advanced pillar drill and blast design and is considered as a leader in the mining industry in this field. Techniques, procedures and methods used by Mt Charlotte for blast design are used by other mining companies and explosives suppliers for training of personnel.

All drilling is designed on computer, drill hole locations are then accurately surveyed underground to ensure maximum accuracy. After drilling, selected holes are downhole surveyed to measure any drill hole deviation, this information is then used in the blast design phase. All blast designs are numerically modeled by external consultants to predict

maximum ppv. Literally thousands of scenarios are modeled and the ppv calculated for each design.

KCGM then uses this information to re-design the blast and undertakes an iterative design approach to ensure that the design which produces the lowest ppv value is selected. Special explosives and detonators are manufactured exclusively for Mt Charlotte to help minimise blast vibration. The method proposed by KCGM is to drill into the pillars from underground as shown schematically in the following diagram. In accordance with the requirements of the Mine Safety and Inspection Act the mining technical aspects of the entire project, including our design and implementation of the underground blasts, will be open to scrutiny by the Department of Minerals and Energy.



MINE PIT AND BACKFILL STOPE

5.6 Other Blast Hazards

All blast holes will be drilled from underground and will stop about 10-15 metres from the bases of the two pits. This layer between the underground drilled zone and surface workings consists of a weathered zone (oxide material) to be left intact at the base of the pits. The ROB2 fill pass will be backfilled prior to blasting. These precautionary measures will prevent venting of explosive gases and limit the possibility of flyrock generation.

6. Social/Other Impacts

KCGM has made a concerted effort to communicate this project proposal to the community throughout the assessment process.

We have made every effort to respond to letters from the Williamstown Residents Committee (WRC). We have not been able to meet with the WRC, however, we have door knocked all residents in Williamstown and taken on board their feedback and answered their inquiries.

We have provided copies of the Environmental Review to all Williamstown residents and to other stakeholders and community representatives.

We have held open days for the community to view our proposal first hand.

We have attended public meetings facilitated by the Kalgoorlie-Boulder City Council and addressed queries by the community.

We believe that the environmental concerns about the proposed have been addressed comprehensively in the Environmental Review and in this response to submissions.

We have committed to respond to:

- complaints and inquires during the course of the project; and
- seek public input into the rehabilitation of the site.

6.1 Aboriginal consultation in rehabilitation process

Members of the local aboriginal communities have been involved with the project from the outset. This commenced with the public meeting held in Williamstown in December 1997. It should also be noted that KCGM held two days of open forum and mine open days inviting all local community members to attend. Members of the Aboriginal community were also present at a council meeting for discussion on this project.

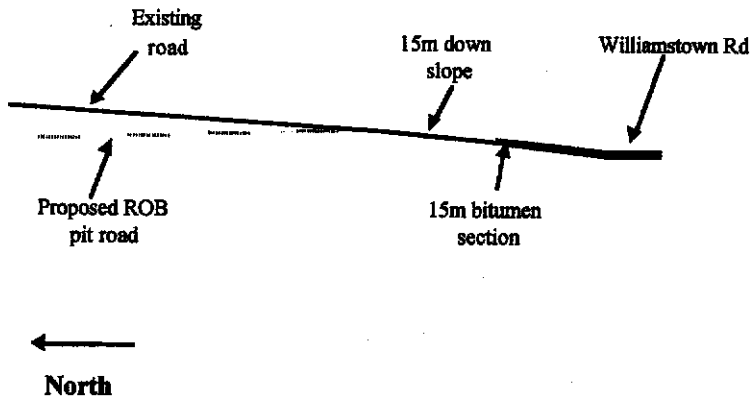
Further, in accordance with the Environmental Protection Authority (EPA) guidelines for the Environmental Review KCGM ensured that a copy was forwarded to all specified government departments including the Department of Aboriginal Affairs. It should also be noted that there are no areas of Aboriginal significance in the proposed project area as has been stated in the Environmental Review (refer to sections 4.11.1 and 5.9.2). This was substantiated by a survey undertaken in 1989 and a follow up survey in 1994 to confirm this.

6.2 Safety and Haul Trucks - Road Crossing

The section of haul road to the north of Williamstown Road is a combination of bitumen and earthen materials. The bitumen portion of the road extends for 15 metres north of the Williamstown/haul road intersection.

The bitumen provides a good surface for trucks to stop and is self draining, thereby reducing the danger of trucks slipping.

With the mining of the ROB open pit, the haul road north of Williamstown Road will be re-graded and re-cambered further reducing any hazards.



A spotter will be employed at all times when trucks will be hauling ore and waste between the Mt Charlotte and Fimiston Open Pit operations. The spotter will be trained in traffic control and hazard identification techniques. All traffic movements along the haul road at the intersection with Williamstown Road will come under the control of the spotter who will ensure that haul trucks or heavy equipment will always give way to pedestrians or public road traffic. All authorised personnel travelling at any time on the haul road will be licensed operators trained in hazard identification and have a duty of care towards all members of the public when using this road. The spotter will also be in continual communication with all mobile equipment operators and supervisors.

Trucks will be transporting ore from the open pits back to the Fimiston Mill to be loaded with waste material for the return journey. Therefore, there "will be no increased haulage trucking resulting from this project". There will be a net reduction of haul truck traffic as outlined in section 4.1 of this document.

6.3 Road Jurisdiction

The haul road is a private road that comes under the jurisdiction of the Department of Minerals and Energy (DME).

6.4 Management of Truck Emergency

KCGM supports a fully equipped mine rescue facility based at the Mt Charlotte operation. The KCGM mine rescue team comprises 20 people all trained to Level 3 Emergency Response – Surface and Underground issued by the Institute of Emergency and Response. Level 3 is the highest level available in Western Australia. The KCGM mine rescue team has a long

history of success in inter and intra-state mines rescue competitions. Their record for the last 12 months is:

1st in West Australian underground mines rescue 1998

1st in West Australian surface mines rescue 1998

2nd in Victorian underground mines rescue 1998

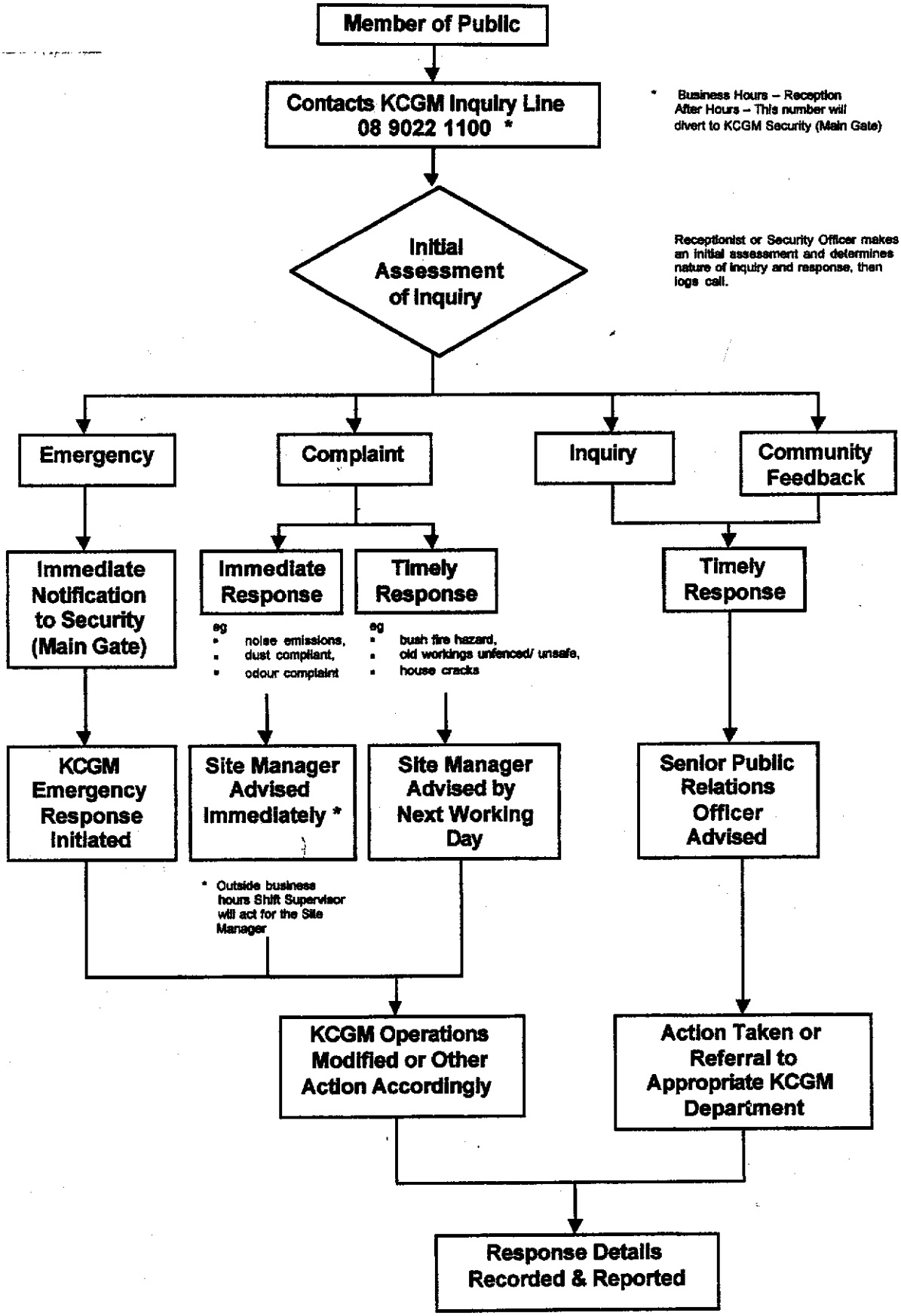
The average response time for the deployment of a mines rescue team is 15 minutes from the receipt of the initial distress call. The team has at their disposal a fully equipped fire fighting vehicle which includes 100kg of foam and 100kg of dry powder, there are also a number of water trucks and the W.A. Fire Brigade is available for assistance if required.

6.5 KCGM Response to Inquiries and Complaints

The Environmental Review provides details of KCGM's response to community inquiries for the duration of our project proposal. To provide further details of our response reference is made to the following inquiry line flow chart. We reiterate the benefit, and want to further encourage the public to contact us directly for any matter that may need follow up, to enable us to implement a timely response to their concern. Further, we will report to the DEP on complaints received regarding this project.

Our response flow chart shows that we will able to respond to any caller 24 hours a day, after hours our inquiry line is manned by our security personnel who can immediately refer urgent matters to relevant site personnel. It should be noted however, that we intend to conduct this project operation during the hours of 0700 to 1700 Monday to Friday only. No mining activity related to waste and ore truck haulage will be undertaken during West Australian gazetted public holidays. Therefore, operations personnel will be able to quickly respond to control any problems or concerns. KCGM will also alter its operations or stop work if necessary should abnormal weather conditions lead to concerns about our operation at that time.

KCGM INQUIRY LINE PROCEDURE



6.6 Public Access to KCGM Controller

KCGM has a 24-hour Inquiry Line (through its main switchboard telephone number) that can be contacted for a broad range of issues. Mining activity for the open pits will be restricted between the hours of 0700 and 1700, Monday to Friday.

During the daytime operating period calls to the inquiry line will be forwarded immediately to the relevant Mt Charlotte Senior Engineer who is responsible for coordinating the mining of the open pits. This person will have the authority to modify operational activities related to this project. Any problems that occur outside the daytime operations will be dealt with through the 24-hour inquiry line and forwarded to the relevant site personnel for immediate action or follow up as needed.

6.7 Instrument Care and Availability

KCGM calibrates and maintains its noise monitors according to the requirements of the Environmental Protection Act 1986.

Dust monitors are regulated according to ministerial conditions whilst weather monitors are maintained according to the requirements of the air quality control system. Both systems are also maintained according to manufacturer's requirements.

Blast monitors undergo comprehensive calibration and service on an annual basis, whilst their performance is in accordance with Australian Standard AS2187.

KCGM aims to achieve continuous monitor availability. A small percentage of the time monitors are down for maintenance or repair.

Summary noise and dust data for required monitoring sites are contained within KCGM's Annual Environmental Report. This information is available upon request, site inspection or through the DEP offices. Dates and duration of monitoring data are also provided in the Annual Environmental Report.

Noise monitors for the Fimiston Open Pit operation are published in the local paper as required by the DEP. KCGM's Mt Charlotte monitor was installed more recently and the results will be included into the local paper advertisement in response to requests from the public.

6.8 Noise and Dust Data reliability

KCGM operates three noise monitors in Williamstown, at Boulder Primary School and at Kalgoorlie Technical School. Over the previous 12 months this network has achieved an on-line reliability of 96%.

KCGM operates eight dust monitors sited throughout the city of Kalgoorlie-Boulder including one in close proximity to the project site at Mt Charlotte. Over the previous 12 months this network has achieved an on-line reliability of 97%.

6.9 Mt Charlotte Noise Monitoring Results

KCGM will publish the Mt Charlotte results as stated in section 6.7.

6.10 Plans for Further Mining

As has been stated many times at public meetings and other forums, KCGM is not able to relinquish any of its mineral leases from the exploration phase. Also, we cannot guarantee the presence of potential future mining until the resource has been fully evaluated. The evaluation encompasses all exploratory, technical, economical and environmental aspects and as such mining in any or our leases cannot be discounted for the future around Kalgoorlie-Boulder.

6.11 Rehabilitation

The KCGM world wide web site http://www.kalgold.com.au provides a comprehensive account of our commitment to, and achievements in, the areas of environmental management and rehabilitation.

KCGM has spent more than $10 million to date on the rehabilitation of degraded land, tailings-storage facilities and waste rock dumps. KCGM has been awarded for excellent work on this programme both by the Australian Minerals and Energy Environment Foundation and by Greening Western Australia. Since 1991, more than 160,000 trees have planted around our operations.

KCGM will rehabilitate and make safe areas that have been disturbed by this mining project during and after the works. This will maintain safety and improve the environmental values and amenity of the area. Along with satisfying statutory rehabilitation requirements KCGM will also seek public input from the Kalgoorlie-Boulder community into the rehabilitation plans.

6.12 Methodology, Plan and Resources

We reiterate from section 6.11 above, that KCGM will consult with the community, interested groups and Government bodies over the final rehabilitation of landforms of the Mt Charlotte site on final closure.