Cataby Mineral Sands Project

Iluka Resources Limited

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1212
December 2005

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
25/03/2003	**Referral received**	
07/04/2003	**Intention to set EPS Level of Assessment advertised (no appeals)**	**2**
21/11/05	**Proponent's Final EPS document received by EPA** ***(Process was postponed through proponents preparation of Carnaby's Cockatoo Management Plan and Groundwater Dependant Ecosystem Investigations and Management Plan)***	**138**
09/12/2005	**EPA report to the Minister for the Environment; Science**	**3**

ISBN. 0 7307 6853 8
ISSN. 1030 - 0120
Assessment No. 1612

Contents

Tables

Figures

Appendices

1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the proposals relevant environmental factors. The proposal by Iluka Resources Limited (Iluka) is to establish a mineral sands mine in the Cataby area, Shire of Dandaragan, approximately 150km north of Perth (Figure 1).

Iluka referred the proposal to the EPA in March 2003. Based on the information provided, the EPA considered that while the proposal had the potential to have an effect on the environment, the proposal could be readily managed to meet the EPA's environmental objectives. Consequently it was notified in *The West Australian* newspaper on 7 April 2003 that, subject to preparation of a suitable Environmental Protection Statement (EPS) document, the EPA intended to set the level of assessment at EPS.

Iluka referred this proposal to the Department of Environment and Heritage (DEH) in February 2005 as the proposal impacts on *Calyptorhynchus latirostris* better known as Carnaby's Cockatoo, which is listed as endangered under *Environment Protection and Biodiversity Conservation Act 1999*. In March 2005 it was decided that it was not a controlled action by DEH.

The proponent has prepared the EPS (Iluka, 2005), which accompanies this report. The EPA considers that the proposal described can be managed in an acceptable manner subject to the recommended conditions and proponent commitments being made legally binding.

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

2. The proposal

The proposed Iluka Mineral Sands Mine project will consist of a series of 13 open pits over approximately 25km (Figure 2). The pits will range in size from 9 hectares to 110 hectares with a range in depth from 17m – 60m. The proposal is described in detail in Section 3 of the proponent's *Iluka Resources Limited Cataby Mineral Sands Project Environmental Protection Statement* EPS document (Iluka, 2005).

The pits will be progressively mined by dry mining techniques using a combination of scrapers, front-end loaders, excavators and haul trucks. The removal of overburden will be conducted using scrapers, excavators and trucks. Initially, the overburden will be stockpiled but once operations begin it will be placed directly into the mine voids. Topsoils and subsoils will be removed and separately stockpiled for use in rehabilitation. Mining will commence in the middle section of the deposit, heading north from the concentrator and then south from the concentrator. Mining of each pit will take between 1 to 12 months apart from pit 107 which will be mined for approximately 24 months (Figure 3).

The concentrator will be located centrally in the operations and will operate at 1100 tonnes per hour throughput (Iluka, 2005). The mine will produce approximately 760kt to 780kt of heavy mineral concentrate per annum. The concentrate will then be transported to the existing Iluka processing plants, Capel and Narngulu (near Geraldton). Transport to Capel will occur

by articulated road trains and to Narngulu via road to Eneabba and then continuing by rail (see figure 23 of the EPS)

Pre-production activities are proposed to commence in the first quarter of 2006, with production beginning in the third quarter of 2006. The life of the mine is approximately 5 years. Decommissioning and final rehabilitation will take approximately 3 years. The pits will be mined, backfilled and rehabilitated sequentially. The key characteristics of the proposal are shown in Table 1.

Table 1: Key Characteristics of the proposal.

Element	Description
Project Life	5 years (continual operation)
Construction (approximate)	9 months
Mining (approximate)	5 years
Closure (approximate)	3 years
Rehabilitation	Ongoing throughout mine life, completed by 2013
Land Tenure	The majority is owned by Iluka with agreements with the owners of private land
Mine Tenements	M70/194; M70/195; M70/196; M70/517; M70/518; M70/696; M70/760; M70/791; M70/867; M70/868; M70/869; M70/1017; M70/1018; M70/1086
Ore Volume	40 Million tonnes
Overburden Volume	150 Million tonnes
Rate of Extraction (overburden and ore)	40 – 60 Million tonnes per year
Processing Rate	800 – 1100 tonnes per hour
Extraction Method	Dry Mining
Number of Mine Pits	13
Size of Mine Pits	9 – 110 hectares
Depth of Mine Pit	Ranging from 17m to 60m
Area of Disturbance	650 hectares
Area of Vegetation Disturbance	115 hectares
Water Supply Source	Superficial formations – pit dewatering and production bores.
Groundwater Abstraction Rates	2 – 50 ML/day
Maximum Process Water Requirements	6600ML/year

The proposal is further described in detail in Section 3 of the proponent's EPS.

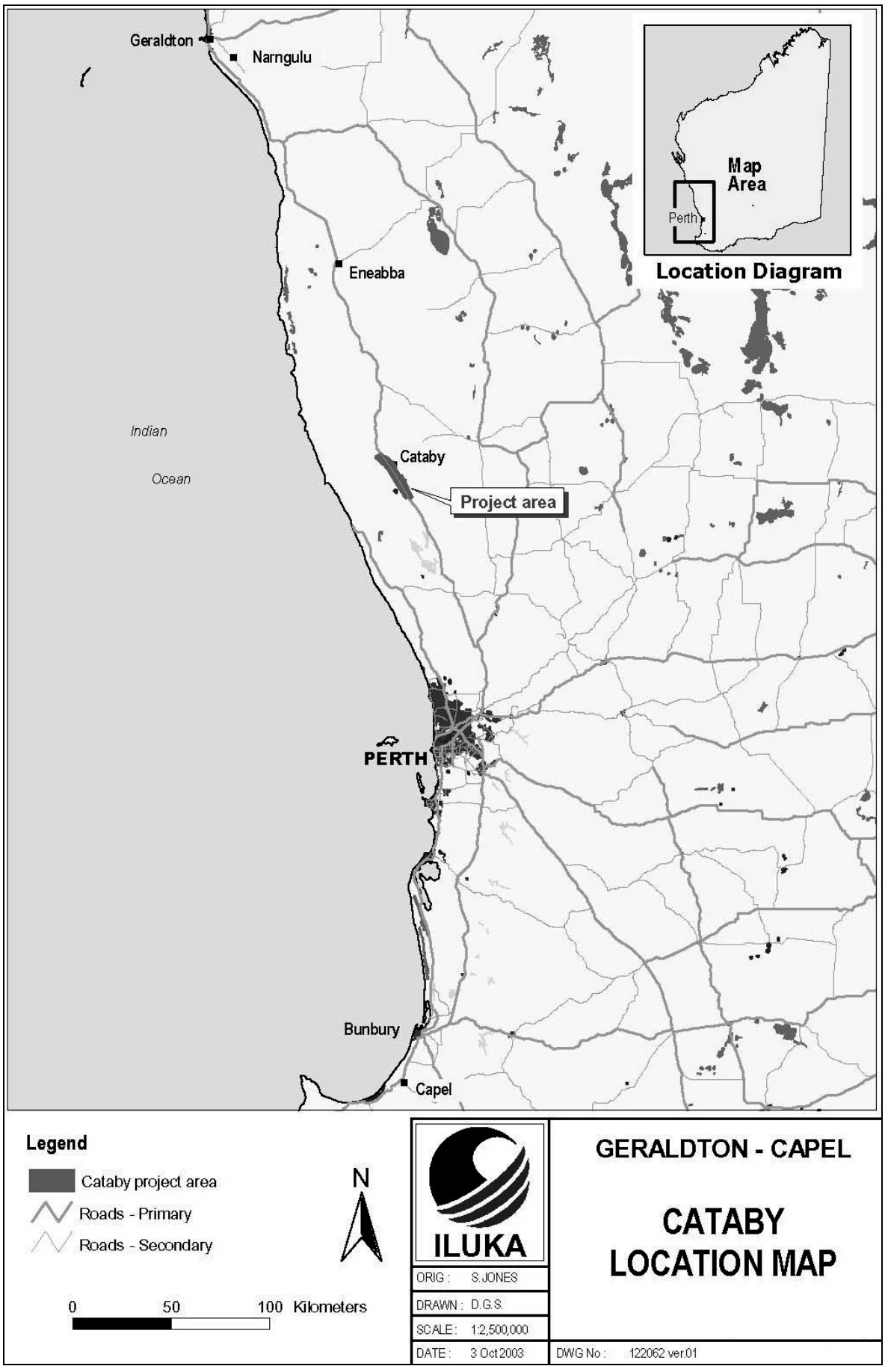

Figure 1: Location of the Proposed Iluka Cataby Mineral Sands Mine

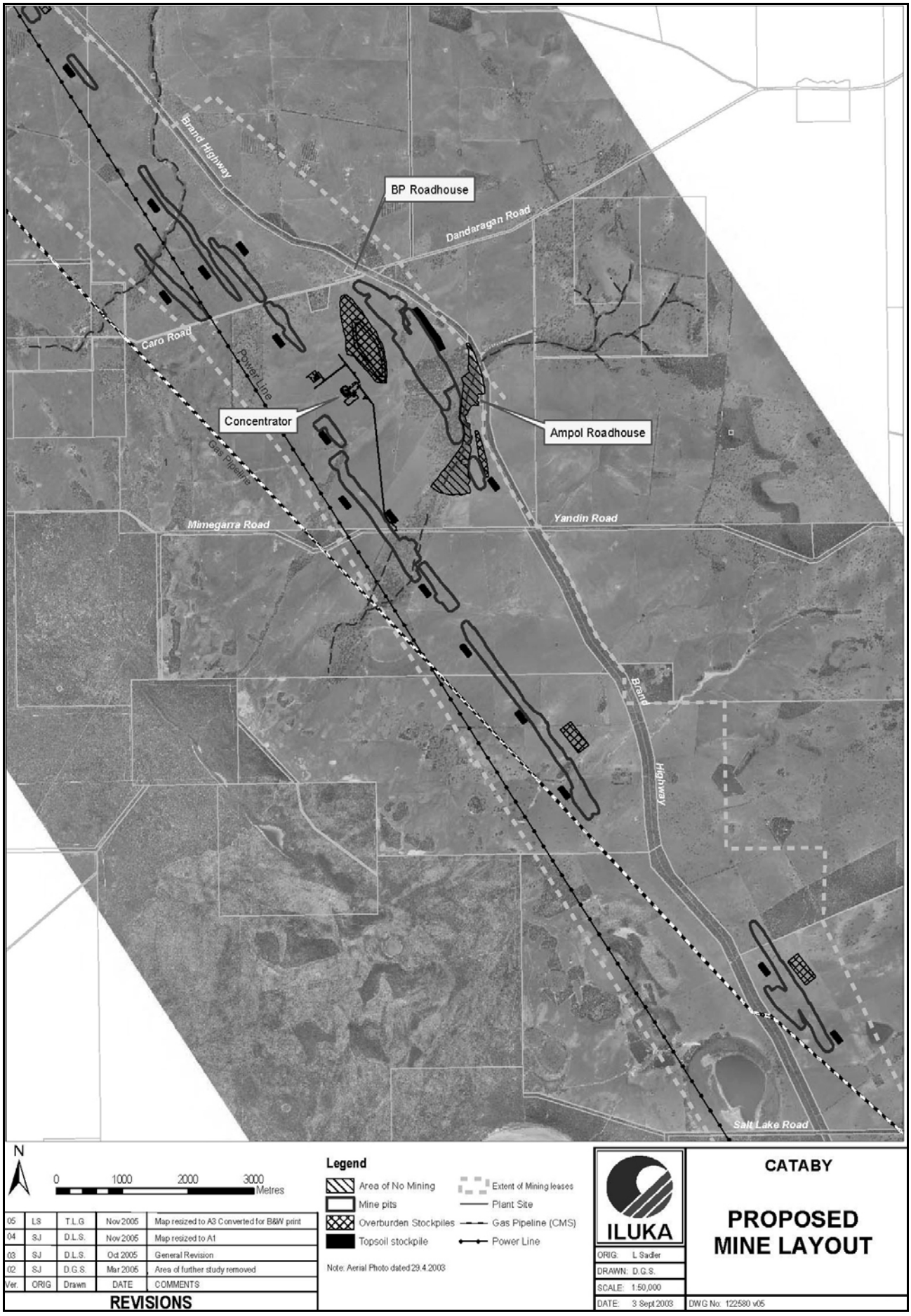

Figure 2: Proposed Mine Layout.

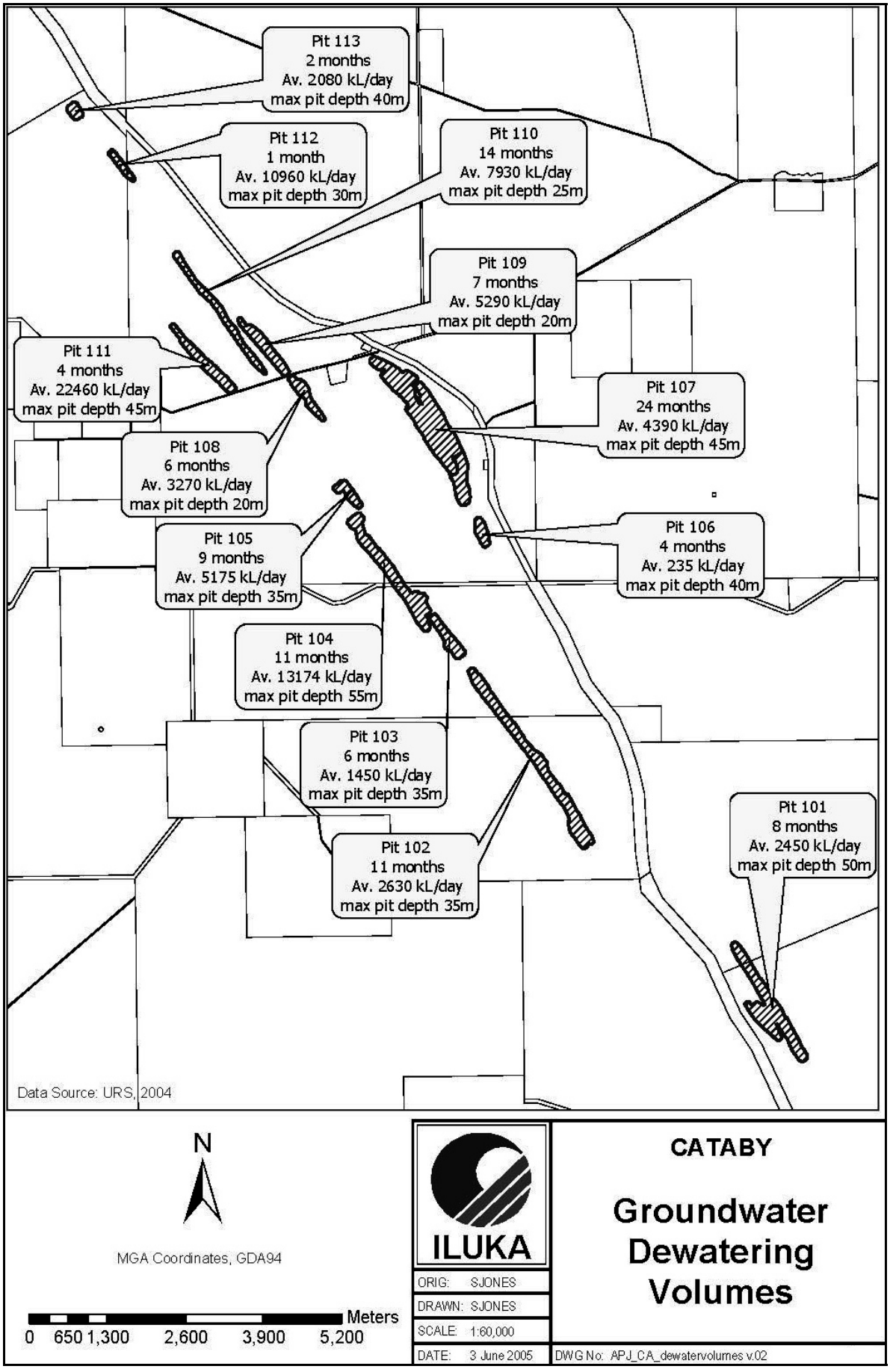

Figure 3: Mining Duration and Dewatering Values for Each Pit.

3. Consultation

During the preparation of the EPS, the proponent undertook consultation with various government agencies, companies with a direct interest in the proposal, other stakeholders and the community. The main stakeholders consulted included:

- Landowners within the project area;
- Landowners within 5km radius of the Cataby Project;
- Community Consultative Committee;
- Shire of Dandaragan residents;
- Tiwest Mineral Resources Pty Ltd;
- Wildflower Society;
- Conservation Council of WA;
- Birds Australia;
- WA Farmers Federation – Beekeepers section;
- Marine and Coastal Community Network;
- Shire of Dandaragan; and
- State and Federal Government agencies.

Iluka used the *Interim Industry Guide to Community Involvement* (Department of Environment, 2003) to guide its consultation program. The program comprised of the following phases:

- identification of stakeholders;
- dissemination of information and identification of issues;
- collection of feedback from stakeholders on the identified issues;
- response to the feedback on issues; and
- communication of proponent's response.

Iluka has committed to liaise closely with local authorities and the local community during each phase of the project.

One of the main areas of community involvement was the formation of the Community Consultative Committee. In July 2003 Iluka advertised a request for members for a community consultative committee in the 'Community Update'. A committee was then formed of 10 members, including:

- three landowners that are located within 5km of the proposed mine;
- a Shire of Dandaragan councillor;
- the Dandaragan Council CEO;
- two representatives from the West Midlands Natural Resource Group;
- two interested community members; and
- the President of Local Progress Association.

The Committee met on four occasions between October 2003 and December 2005. The committee reviewed the EPS, but no major issues were raised. Iluka maintains close contact with the chairman of the committee and organises meetings as necessary. A site visit to Gingin is planned in November 2005 to allow the committee to see an operating mineral sands mine.

The main concerns raised during the consultation process have been summarised and responded to by Iluka in Table 15 of the EPS. These included:

- Community impacts including employment, noise and involvement;
- Dust;
- Waste disposal;
- Vegetation impacts; and
- Groundwater drawdown.

The EPA considers that impacts on Carnaby's Cockatoos, vegetation impacts and noise impacts on adjoining residents to be the most important issues. These are addressed below in Section 4.

4. Relevant environmental factors

The summary of all of the environmental factors and their management are outlined in Table 2, (p iv – vii, Executive Summary) of the EPS (Iluka, 2005).

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

(a) Carnaby's Black Cockatoo;
(b) Vegetation; and
(c) Noise.

4.1 Carnaby's Black Cockatoo

Description

Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), also known as the short-billed black cockatoo, is endemic to South West Western Australia. It is found in locations extending from the Murchison River to Esperance and inland to Coorow, Kellerberrin and Lake Cronin (Department of the Environment and Heritage, 2004a). The species is listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* and in schedule 1 of the *Wildlife Conservation (specially protected) Fauna Notice 2004*.

Carnaby's Cockatoo forage in shrubland and kwongan heath that is dominated by proteaceous species (Department of Environment and Heritage, 2004b). Their feeding and breeding habitats are separate. The main food sources are derived from the seeds of hakeas, grevilleas, banksias and eucalypts, but they also take the seeds of weeds and exotic pines, as well as insect larvae. They nest in hollows of mature large eucalypts, primarily Salmon Gum and Wandoo (Department of Environment and Heritage, 2004b) and sometimes Marri woodland.

Breeding success is dependent on both the nesting and foraging areas being relatively close together and sufficient to support the population. Normally two eggs are laid in a breeding season from which one chick survives to fledging.

Carnaby's Cockatoo numbers have declined to approximately half of their 1960 population levels (Department of the Environment and Heritage, 2004a). It has also been recorded that they no longer breed in up to half of their former breeding sites in the wheat belt.

The main threats to their habitat include:

- competition with invasive species such as the Galah, feral bees and the Western Long-billed Corella;
- competition for hollows from other species;
- habitat fragmentation, especially in the northern and eastern Wheat belt areas;
- poaching;
- loss of native food sources caused by urban development on the Swan Coastal Plain; and
- removal of nesting trees for use as firewood or to make properties look tidy.

To manage the potential impacts on Carnaby's and their habitat, Iluka developed a *Carnaby's Cockatoo Management Plan* (CCMP). To assist in the protection of the species, on advice from the Department of Conservation and Land Management (CALM), the plan has not been included in the EPS.

One of the objectives of the CCMP was to develop surveys and studies to address the potential impacts on Carnaby's Cockatoos. The potential direct impacts on Carnaby's Cockatoos were identified as clearing of their breeding and feeding habitats, increased competition from other species and light emissions from mining operations and indirectly by impacts on groundwater.

Surveys
Iluka engaged R E & C Johnstone to conduct baseline studies of Carnaby's Cockatoos within the project area. The initial survey work commenced in September 2003 and was completed in February 2004. The surveys will continue each breeding season for the life of mine.

In the 2003/2004 survey a total of 12 breeding pairs and 24 nesting hollows in 22 trees within the project area were identified. The survey showed the success of the 2003/2004 breeding season. In 2003/2004 of the 18 eggs laid in the 24 nests, 12 fledged a single chick.

The second survey was completed over the 2004/2005 breeding season. In this survey four new hollows were located and four artificial hollows were erected. Five of the hollows used in 2003/2004 were not used in the 2004/2005 breeding season (Iluka, 2005). The 2004/2005 season was less successful than 2003/2004 with a reduction of 12 to 6 successfully fledged chicks.

Vegetation Clearing
Oliver Remnants (an area of remnant eucalypt woodland which falls partly within the proposed mining area) has a high conservation value and consists of both degraded and parkland-cleared vegetation. This area is under threat from isolation, grazing and, potentially, rising groundwater levels. CALM has indicated that this location is a significant habitat for Carnaby's Cockatoos as it supports both nesting hollows and nearby feeding areas, particularly adjacent roadsides, (D. Coffey pers. comm.). CALM's priority concern is that the clearing of vegetation may also contribute to higher impacts on the cockatoos from competitor species, particularly galahs and honey bees displaced when trees elsewhere on the project site are cleared.

The clearing of this area for the mine will include 34ha of parkland cleared Marri woodland, 12 ha of parkland cleared Wandoo woodland and 1 ha of York Gums. Two of the identified nesting sites in the 2003/2004 survey are located in the proposed clearing area and will be removed. Iluka proposes to try and relocate these two nesting trees from the mining impact area. There are reservations about the likely success of this although studies show that a

deceased tree can still provide a nesting site for several years after death. A more detailed discussion on the impacts of clearing and nest relocation is discussed in the CCMP.

Galahs, corellas, honeybees and Australian Wood Ducks are some of the species that compete with Carnaby's Cockatoo for nesting areas (Iluka, 2005). In particular feral bees, galahs and corellas compete for hollows in this area. These species take over nests previously occupied by Carnaby's Cockatoo nesting pairs, reducing the number of potential sites available in the preferred habitat.

Iluka has investigated options for removal of competitor species. Galahs, corellas and feral bees will potentially be controlled with organised eradication programs. In doing so, Iluka will seek the advice of the monitoring team currently completing the surveys, Department of Agriculture (DoA) and CALM to fully investigate and implement competitor control methods.

Light
Where lighting is required for operational facilities, light penetrating outside of the operational area has the potential to impact on the behaviour of cockatoos. Iluka has committed to restrict night-time operations in the vicinity of the Carnaby's habitat during the breeding season.

Groundwater
CALM and the Department of Environment (DoE) identified the possibility that groundwater drawdown, water logging, increased salinity or diverted surface water flow could impact on the existing native vegetation. Therefore impacting on Carnaby's Cockatoo's habitat and feed areas.

Iluka engaged URS to undertake modelling of current groundwater levels in the Cataby area and predicted groundwater drawdown caused by mining activities. In relation to the potential impacts on Carnaby's Cockatoos, the depth to groundwater in their nesting areas is between 20 and 50m (URS, 2004). Groundwater monitoring from September 2003 to July 2004 at the four bores within this area has shown groundwater levels to be greater than 37m. It is therefore likely that this area is surface-water dependent not groundwater dependant, with vegetation having little or no direct dependence on groundwater (Froend, Bowen and Associates, 2004).

Assessment
The area considered for this assessment is the location of the proposed Iluka Mineral Sands Mine in Cataby, specifically the areas identified as the Carnaby's Cockatoos breeding and feeding habitats.

The EPA's environmental objectives for this factor are to:

- maintain and enhance the habitat of Carnaby's Cockatoos to promote the recovery of the population of this species consistent with the *Carnaby's Black-Cockatoo Recovery Plan* (Cale, 2003);
- protect endangered species consistent with the provisions of the *Western Australian Wildlife Conservation Act 1950*; and
- protect the fauna listed in the schedules of the *Environment Protection and Biodiversity Conservation Act 1999.*

Iluka has conducted baseline surveys of the Carnaby's Cockatoo population. Surveys were conducted in the 2003/2004 and 2004/2005 breeding seasons. The EPA notes that the results

of the surveys have assisted in the development of the CCMP and will also aid in further research on the species.

The EPA notes that there will be impacts from mining activities (clearing and operational) on Carnaby's Cockatoo and it's breeding and feeding habitats and that the proponent has sought advice from the CALM on these identified impacts. CALM indicated that its primary concerns are the loss of Carnaby's Cockatoos breeding habitats and the secondary impacts resulting from displacement of other hollow-nesting species through clearing in adjacent areas. Galahs and feral bees from nest sites cleared elsewhere on the mine site could potentially compete for nest holes with the Carnaby's Cockatoos in the core nesting area.

The EPA notes that Iluka has committed to positioning lights to minimise the light penetrating outside the project area and has determined that this is not likely to cause an impact to the Carnaby's Cockatoo population.

The EPA notes that groundwater studies indicate that there is unlikely to be any negative impacts to the habitat vegetation of Carnaby's Cockatoos through groundwater drawdown. This is because there is a large depth to water table at the breeding and feeding habitats and it is therefore most unlikely that the vegetation is groundwater dependant.

To mitigate potential impacts the proponent proposes to support external programs that will assist in meeting the *Carnaby's Black-Cockatoo Recovery Plan* (Cale, 2003). The EPA notes that support options have been discussed in depth through negotiations between CALM and Iluka. The EPA is therefore satisfied that the best research and management strategies for Carnaby's Cockatoos have been developed. Specific options will be based around management, monitoring and revegetation schemes.

The EPA notes that Iluka has adopted the *EPA Position Statement 9: Environmental Offsets* (Preliminary Version 2. EPA, 2005) to assist in determining the mitigation sequence and appropriate environmental offsets for the predicted impacts.

The mitigation sequence for impacts on fauna is detailed in Section 8.2 of the EPS and includes the actions proposed to 'avoid, minimise, rectify and reduce' impacts. Iluka has committed to:

- avoid some of the Carnaby's Cockatoo habitat by designating an area of no mining;
- minimise impacts (including light) by reducing operation times near the Carnaby's Cockatoos habitat during breeding and eradicating camping sites;
- rectify the impacts by rehabilitation the clearing habitat; and
- reduce the impacts by rehabilitation as soon as possible after disturbance.

Further to this mitigation sequence the EPA notes, that through negotiations with CALM, Iluka has produced an offsets package (Table 2), which includes a list of management plan commitments that should provide a net environmental benefit to the Carnaby's Cockatoos. The full description of each management plan commitment is listed in Table 2 of the CCMP. A summarised list is below:

- designated area of 'no mining' in Oliver Remnants through the optimisation of pit 107;
- rehabilitate cleared Minyulo and Cataby Brook vegetation;
- restoration works aimed at creating self sustaining communities;
- fencing off the 'no mining' area of Oliver Remnants;
- establish 20kms of tree belts providing a link to Eneminga Reserve;

- relocate trees with suitable nesting hollows;
- conduct trials on artificial nesting boxes;
- develop and implement competitor control;
- implement a revegetation scheme to support the rehabilitation of surrounding catchments;
- support cockatoo monitoring and management activities in the region;
- apply a conservation covenant along Cataby Brook; and
- conduct cockatoo and nest competitor monitoring.

Table 2: Offsets proposed by Iluka.

Offsets	Cataby Project	Cockatoo Specific
Direct	• Improve on pre-impact condition of native vegetation in rehabilitation by incorporating understorey species.	• Restoration of over 180 hectares of parkland cleared vegetation that will not be disturbed for mining to include understorey species. • Provision of additional hollows through repairing hollows, providing artificial hollows and competitor removal (including bees).
Indirect	• Awareness of local landowners through involvement in rehabilitation programs by incorporating understorey species. • Clean-up of rubbish and weeds within Oliver Remnant. • Reducing human impact on area by removing unrestricted public access. • Planting of over 20 km of tree belts using local native species.	• Ongoing monitoring and research on cockatoos over life of project. • Supporting monitoring and management of cockatoo's over a wider range. • Creating vegetation corridor with Eneminga Nature Reserve. • Conservation Covenant over Cataby Brook. • Revegetation scheme sponsoring catchment revegetation.

Summary
Having particular regard to the:

(a) mitigation sequence proposed by Iluka for the protection of Carnaby's Cockatoos, located in the Cataby area, discussed above; and
(b) the management plan commitments that form the offset package;

it is in the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor.

4.2 Vegetation Protection

Description
The vegetation over the area of the Cataby Mineral Sands Mine proposal is variable. It is characterised by cleared pasturelands and minimal vegetated areas. The areas of native vegetation include the Brand Highway Road Reserve, Minegarra Road Reserve, Caro Road Reserve, Oliver Remnants, Nature Reserve 27933, Cataby Brook, Minyulo Brook and isolated trees on agricultural land (Iluka, 2005). There is also a large area of Tagasaste on the northern side of Caro Road.

Iluka engaged Hart Simpson and Associates in 2002 and Mattiske Consulting in 2003 to conduct vegetation surveys. Hart Simpson and Associates defined the existing vegetation and flora of the proposal area and completed a detailed survey of Oliver Remnants (Iluka, 2005). The Mattiske Consulting survey established a vegetation-monitoring program to assess the potential impacts of mining on vegetation on or near the project area (Iluka, 2005). Both of these surveys followed the *Environmental Protection Guidance Statement 51 – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004).

The EPA identified two main impacts on the vegetation of the project area – clearing and groundwater impacts.

Clearing
Hart Simpson and Associates identified 19 vegetation formations in the area. Although several of these were considered to be locally significant none were recorded as threatened ecological communities. A full description of the vegetation formations identified is described in Table 10 of the EPS (Iluka, 2005).

Iluka proposes to disturb approximately 650ha over the duration of the project. Only 115ha of this is native vegetation, specifically 34ha of parkland cleared Marri woodland, 12ha of parkland cleared Wandoo woodland and 1ha of York Gums will be cleared. The remaining 68ha is mainly tagasaste or parkland cleared.

The area of vegetation around Cataby Brook is important, as it has been identified as an area that supports Carnaby's Cockatoo breeding and feeding habitats, described previously in section 4.1. The area has also been identified as being important as it supports a population of York Gums.

Groundwater Impacts
Dewatering will occur throughout the life of project and has the potential to impact on vegetation health. Figure 3 shows the proposed groundwater dewatering volumes for the project.

Iluka has produced a Groundwater Dependant Ecosystem Management Plan (GDEMP) (Appendix B of EPS) to protect vegetation that could be potentially impacted on from groundwater drawdown. This plan includes a study by Edith Cowan University (ECU) groundwater dependant ecosystems (GDEs) in the proposal area and adjacent locations.

The level at which vegetation impacts are experienced from groundwater drawdown is termed the drawdown threshold. In the proposal groundwater threshold has been identified as the point beyond which active management may be necessary for the protection of native vegetation (Iluka, 2005).

The research findings indicated the greater the groundwater depth, the lower the vegetation's requirement for groundwater. Therefore, the more tolerant the vegetation would be to groundwater drawdown. Figure 2 from the GDEMP shows the modelled depth to water table of 32 vegetation units that were identified. These are described in Section 2.3 of the GDEMP.

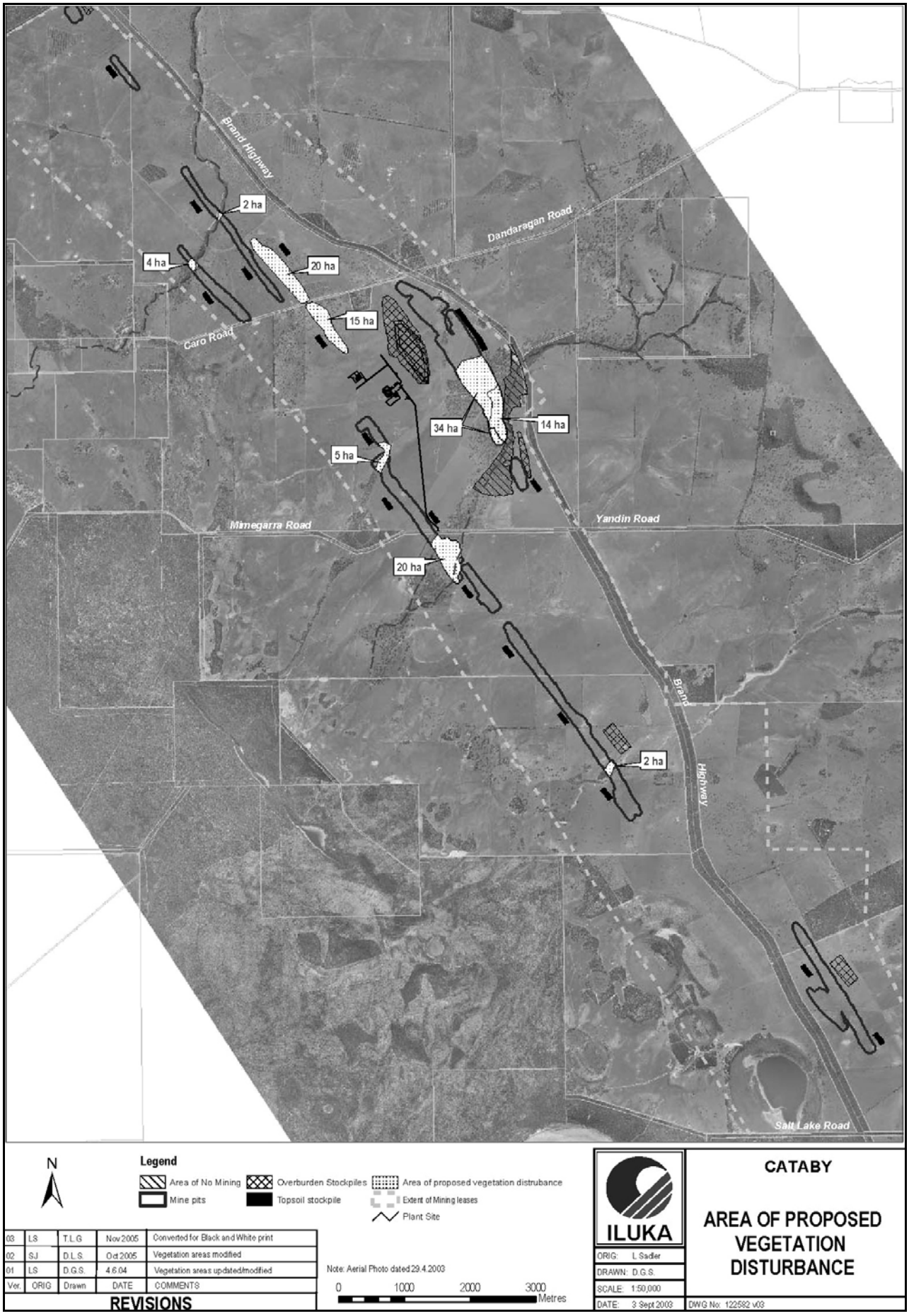

Figure 4: Areas of Proposed Vegetation Disturbance.

Groundwater levels predicted during mining were used to identify potential GDEs where the level of drawdown predicted exceeds the drawdown threshold (Iluka, 2005). 18 sites were classified as having a depth to watertable of less than 9m and 11 of these sites were identified as potential GDEs (figure 6 of GDEMP). However, 6 of these were defined as highly degraded and are not proposed to have active management in the form of artificial recharge system (ARS). Loss of vegetation is anticipated in these cases and rehabilitation will occur post mining. This left 5 sites that will need management.

Assessment

The area considered for this assessment is the total area of the Iluka Cataby Mineral Sands Project, specifically the areas identified as 'proposed vegetation disturbance' (Figure 4) and the 32 identified vegetation units and recorded in the GDEMP.

The EPA's environmental objectives for this factor are to:

- maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities; and
- maintain terrestrial ecological integrity and biodiversity and ensure that impacts on vegetation communities are avoided.

The EPA notes mining activities are likely to directly impact on 47ha of native vegetation and indirect impacts are likely due to groundwater drawdown.

Clearing

On advice from CALM and the DoE the main concern of the EPA, on the clearing of native vegetation, relates to the loss of an important vegetation unit, Oliver Remnants and some of Lower Cataby Brook. The other concern is the location of a small population of York Gums in the area to be cleared. This species is not usually found on the Dandaragan Plateau.

Surveys indicate that the majority of the vegetation required to be cleared is degraded with minimal or no understorey. Iluka (2005) states that no vegetation unit will be completely removed and less than 15% of a vegetation type will be cleared. The EPA notes that clearing Oliver Remnants will remove a portion of area that is an important habitat for the Carnaby's Cockatoo. However, Iluka has optimised the pit design of 107 (see figure 4 for location) to reduce the amount of clearing of Oliver Remnants and has made a commitment to produce an extensive rehabilitation plan of the cleared areas. The plan includes the rehabilitation of native vegetation with species appropriate to the proposal area and Carnaby's Cockatoo.

The identified population of York Gums is the most western population that has been recorded, as York Gums are normally found further into the wheat belt**.** The population was investigated by a vegetation consultant and given a grading on the *Keighery Scale* of 6, which is classed as degraded to completely degraded (L. Sadler, pers. Comm., written). Iluka has advised that the historical use of the area has markedly reduced the values of this area and although the species is considered to be significant due to its reduced state across its range, the values present in Oliver Remnants do not warrant protection. However, the EPA notes that Iluka reduced the area to be cleared from 3ha to 1ha and has proposed that seed will be collected from the York Gums to be used in the future rehabilitation of the cleared area.

The EPA recommends a draft condition requiring the preparation of a Vegetation and Flora Management Plan to manage the impacts of clearing and mining on the flora and vegetation of the site. This plan will include:

- retaining topsoil for use in rehabilitation;

- returning topsoil in the shortest possible time;
- minimising the clearing of native vegetation;
- retaining as many cockatoo nesting trees as possible; and
- dieback and weed management.

Groundwater Drawdown
The development of Cataby Mineral Sands Mine is predicted to contribute to the drawdown of the water table in the area resulting from other mining operations. In response to the DoE comments on groundwater levels the EPA notes that Iluka has committed to installing another 11 monitoring bores. The EPA notes that Iluka will conduct groundwater and vegetation monitoring before and during mining. This will include monitoring of groundwater drawdown and vegetation responses. Table 6 of the GDEMP outlines the water resources monitoring program.

The EPA notes that Iluka has researched mitigation measures for potential groundwater drawdown impacts and has proposed that artificial recharge systems (ARS) will be used to manage potential GDEs. The actual predicted risk and proposed environmental management has been tabulated for each of the sites in Table 20 of the EPS (Iluka, 2005).

Iluka has begun a simulation of an ARS based on Eneminga Reserve and the Swamp, which are two of the sites identified as needing artificial recharge. The proposed system is conceptual and involves direct injection of artificial recharge at the water table via trenches to locally sustain water table elevations upstream of Eneminga Swamp. The system showed a reduction in the predicted drawdown to less than the drawdown threshold for the site.

The EPA notes that, on advice from CALM, Iluka proposes to achieve ARS by different means including:

- understanding of the environmental constraints, linked to access, dieback, existing surface water environments and water storage characteristics of the unsaturated profile;
- understanding of the existing groundwater environment and how best and where to introduce and transmit the artificial recharge;
- groundwater availability, ideally recharge water should be of very low suspended solids concentration and of quality and hydrochemistry compatible with the local shallow groundwater; and
- conservation and sustainability aspects given that each system would need to operate on a continuous basis and efficiently replenish the water table environment for extend periods.

The EPA notes that Iluka will determine the preferred method of ARS based on the criteria listed in section 4.1 of the GDEMP.

The EPA notes that the GDEMP will be amended over the following twelve months through further assessments on the types of ARS to be used, feasibility studies and discussions with decision-making authorities (DMAs). The EPA recommends a draft condition that the GDEMP shall be submitted for approval, prior to mine establishment.
The EPA notes that Iluka has provided a contingency measure that, if there is any loss of vegetation, within sites selected for protection from drawdown, impacts will be recorded and reported to the relevant DMAs. The EPA also notes that Iluka will complete a review, and if necessary, will change the GDEMP to prevent further impacts. Further to this the EPA recommends that contingency measures should be further defined to include the actual

measures proposed to counteract vegetation impacts to ensure that there are no unnecessary delays to the implementation of methods of ARS.

CALM has also indicated that its other primary concerns are how will Iluka rate the success of the proposed rehabilitation and whether, in terms of excess water discharge down drainage lines, there are there potential impacts to downstream native vegetation. The EPA notes that in response to this, Iluka has detailed that rehabilitation success will be based on management actions such as fencing, weed control and species planting (S. Jones, pers. comm., written). The outcome of theses actions will be vegetation that can naturally mature to a stable and functioning landform (S. Jones, pers. comm., written). CALM was satisfied with the response. Potential impacts to downstream vegetation will be addressed and commitments made through the preparation and implementation of a Surface Water Management Plan (draft condition 12). This plan will address the potential impacts to down stream vegetation that is surface water dependant but will still be impacted on from dewatering.

Summary
Having particular regard to the:

(a) the protection of 62ha of Oliver Remnants by classing it as an area of no- mining through the optimisation of pit 107;
(b) proponent's responses to the issues raised by CALM and the DoE;
(c) mitigation measures proposed and already completed by Iluka including:
    - groundwater modelling;
    - the continual monitoring of groundwater levels during operations;
    - the commitment to artificially recharge impacted sites;
(d) preparation and future implementation of a Vegetation and Flora Management Plan
(f) preparation, review and future implementation of a Groundwater Dependant Ecosystems Plan;
(g) commitment to prepare and implement a Surface Water Management Plan; and
(h) recommended Ministerial Conditions and proponent commitments,

it is in the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor.

4.3 Noise

Description
Noise was identified as a potential impact resulting from the proposal, as residents are located close to the operations (Figure 5). The two roadhouses are included as residences as they have sleeping quarters for staff and one has an adjoining motel. Accounting for the land uses surrounding the mine and traffic noise from Brand Highway, the set noise limits have been defined in Table 3. L_{A10} is the assigned noise level, which is not to be exceeded for more than 10% of the time.

Iluka conducted acoustic modelling to predict the sound pressure levels at the identified residences. This model incorporated the characteristics of the equipment to be used and their location, as well as natural features of the area including topography and meteorological conditions.

Table 3: Residential Noise Limits *(Environmental Protection (Noise) Regulations 1997)*.

Time	Noise Limits - L_{A10}dB(A)
0700 – 1900 hours Monday to Saturday	45-46
0900 – 1900 hours Sundays and Public Holidays	40-41
1900 – 2200 hours Monday to Saturday	40-41
2200 – 0700 hours Monday to Saturday and to 0900 hours Sundays and Public Holidays	35-36

Modelling was completed for each residence for a worst-case scenario. Worst case is when wind is the strongest, directly downstream of mining operations and the mobile machinery is working at full capacity in the pit located closest to the study residence. During worst-case conditions, with no mitigation measures in place modelling indicated that the assigned noise levels will be exceeded. However, it is unlikely that all equipment will be operational at once and at one location during the project.

Iluka identified following noise mitigation measures to minimise noise emissions.

Bunding
Bunding is a measure used to control noise. The higher the bund the better the level of noise reduction, however, as the bund gets higher, the area of ground disturbance increases. Iluka has committed to construct a 5m high bund in strategic locations.

Machinery Attenuation
Iluka proposed that a 5dB reduction could be achieved with appropriate equipment modifications. This control almost achieved approved daytime levels in all of the residences. However, night-time levels were not met in any of the cases.

Control Level A and Control Level B
Control level 'A' limits the overburden removal fleet in worst case conditions and control level 'B' will have no overburden fleet in use during worst case condition. With this control level, during adverse conditions, no night-time mining will be conducted in the pits closest to the residences unless the correct levels can be achieved.

Iluka also completed a review of weather data at the four most affected premises with the described control options and mitigation measures (Table 25 of EPS).

Noise modelling to date predicts that the assigned noise levels can be met following implementation of the proposed noise mitigation measures.

Assessment
The area considered for this assessment is the whole area of the Iluka Mineral Sands Mine and the surrounding location. There are 8 residences that could be affected by noise from the proposed mine operations, the location of these are shown in Figure 5.
The EPA's environmental objective for this factor is to:

- ensure that noise resulting from the construction and operation of Iluka's Cataby Mineral Sands Mine will comply with the *Environmental Protection (Noise) Regulations 1997* and acceptable standards.

The EPA sought advice from the DoE on the potential impacts of noise on the nearby residents and on the effectiveness of the proposed noise mitigation machinery. The EPA was advised that noise mitigation of machinery is possible, however it is recommended that Iluka

test the new machinery to ensure that 5dB reduction is achieved. The DoE was satisfied with work already completed on noise modelling works and the proposed content of the noise management plan.

The EPA notes that noise emissions will be minimised by the use of the proposed mitigation measures. Iluka has committed to monitoring conditions to ensure that if worst-case scenarios arise management actions will occur including stopping of mining operations during worst-case conditions.

The EPA notes that attenuating machinery noise and limiting the number of machines operating is predicted to result in compliance with night-time levels during favourable weather conditions. Modelling has shown that the control measures proposed to be used show that noise levels can be met through maximising close proximity operations in favourable weather conditions. Iluka has proposed that when night-time operations are close to each residence, machinery use will be limited to favourable weather conditions. As well as utilising various control measures, Iluka will continuously monitor meteorological conditions and noise levels will be monitored weekly.

The EPA recognises that Iluka has held discussions with the identified residents during the proposal and will continue through the operations. Iluka will advise each resident on the sequence of mining so they are informed of when mining will be close to them. The EPA notes that Iluka has an existing noise complaints procedure that will be followed in the event of a resident raising a concern regarding noise levels. The EPA also recognises Iluka's commitment to provide alternative arrangements, such as noise attenuation of residential properties, if noise mitigation and management measures cannot limit noise to below the noise regulation residential noise limits.

In conjunction with the above mitigation measures the EPA recommends a draft condition for the preparation of a Noise Management Plan that will enable monitoring and management of noise levels during construction and mining operations.

Summary

Having particular regard to:

(a) the modelling completed by Iluka; and
(b) the noise mitigations controls proposed as part of the proponents commitments;
(c) the preparation and implementation of the Noise Management Plan; and
(d) recommended Ministerial Conditions and proponent commitments,

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

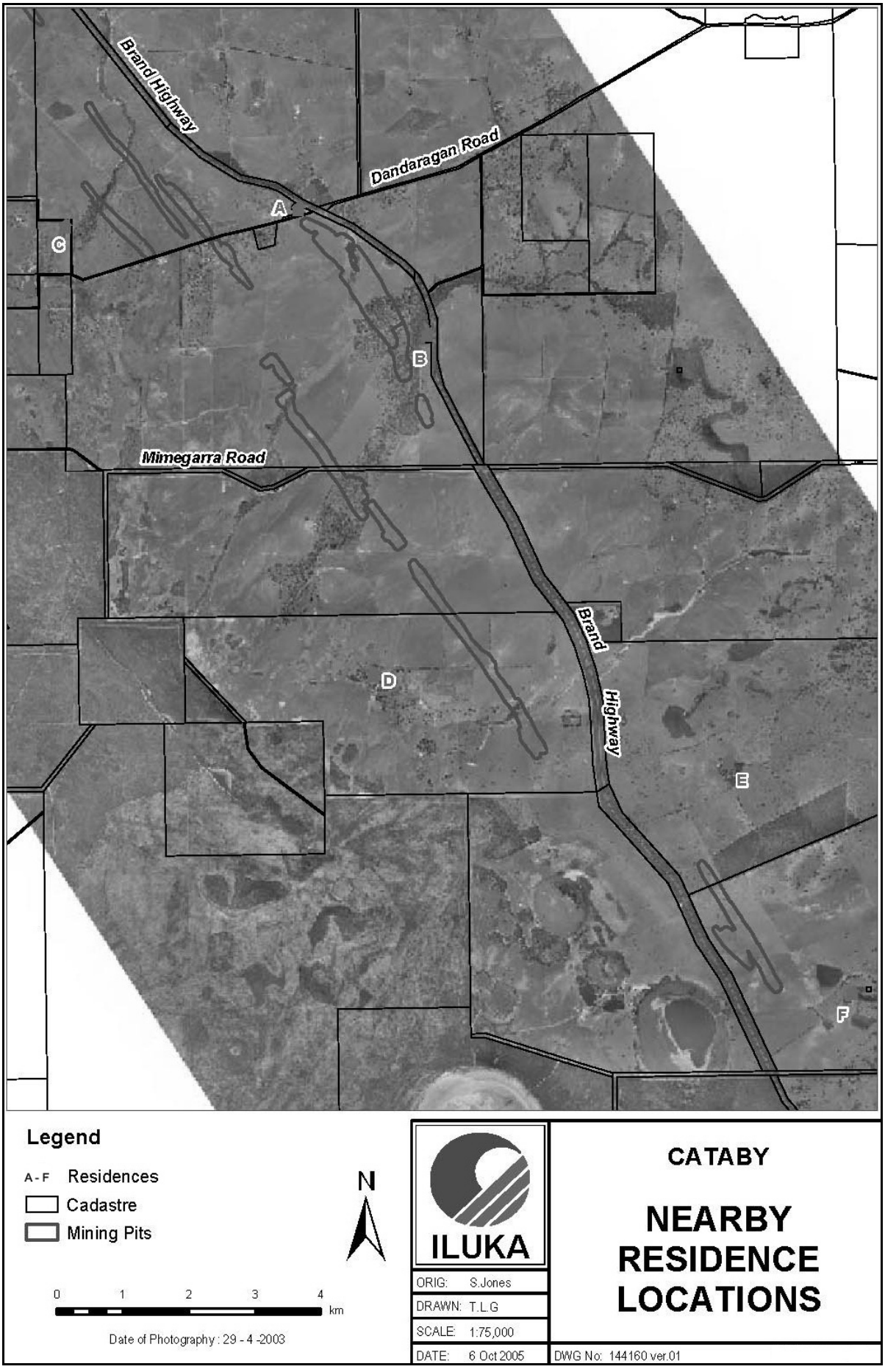

Figure 5: Location of Nearby Residences.

5. Conclusions

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.

Carnaby's Black Cockatoo

The EPA concludes that the factor of Carnaby's Black Cockatoos can be managed to meet the EPA's objectives to maintain and enhance the habitat of Carnaby's Cockatoos to promote the recovery of the population of this species consistent with the *Carnaby's Black-Cockatoo Recovery Plan* (Cale, 2003); to protect endangered species consistent with the provisions of the *Western Australian Wildlife Conservation Act 1950*; and to protect the fauna listed in the schedules of the *Environment Protection and Biodiversity Conservation Act 1999.*

The EPA objectives will be met by Iluka's commitment to the proposed offsets package including the management plan commitments detailed in Section 4.1. The EPA considers that these are suitable offsets for the potential impacts on Carnaby's Cockatoos resulting from the proposal.

The EPA is satisfied that Iluka met the requirements requested by CALM for the protection of Carnaby's Cockatoos by following the *Carnaby's Black Cockatoo Recovery Plan* (Cale, 2003). The EPA is satisfied that the protection of Carnaby's Cockatoos is ensured through the implementation of the proposed offsets and through the advice of CALM.

Vegetation Protection

The EPA concludes that the factor of native vegetation clearing can be managed to meet the EPA's objectives to maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities as well as to maintain terrestrial ecological integrity and biodiversity and ensure that impacts on vegetation communities are avoided.

The Proponent has made the commitment to protect native vegetation on the site. This was done through the identification of the area of no mining as well as the future implementation of a Vegetation and Flora Management Plan (which will include retaining topsoil for use in rehabilitation; minimising the clearing of native vegetation; and dieback and weed management). It will also be achieved by Iluka's commitment to continue and expand on its current groundwater modelling and the commitment to artificially recharge sites identified as groundwater dependent, if needed. The above matters will be addressed through an updated Groundwater Dependent Ecosystems Management Plan, which will be required through an environmental condition.

The EPA is satisfied that, through the above measures, there will be no significant impacts on flora and vegetation of the area and that any potential impacts will be appropriately managed and mitigated.

Noise

The EPA concludes that the factor of noise can be managed to meet the EPA's objective to ensure that noise resulting from the construction and operation of Cataby Mineral Sands Mine will comply with statutory requirements and acceptable standards.

The proponent has completed modelling of the potential noise impacts to the nearby residents and has proposed noise mitigation measures as part of its commitments to ensure that noise emissions will meet the standards in the residential areas. The EPA has recommended an environmental condition to ensure that the Noise Management Plan is prepared and implemented to mitigate any potential impacts.

6. Recommendations

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

1. That the Minister notes that the proposal being assessed is Iluka Resources Limited, Cataby Mineral Sands Project.

2. That the Minister considers the report on the relevant environmental factors as set out in Section 4.

3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the recommended conditions and proponent commitments as set out in Appendix 2, including the provision for implementation of an environmental management system.

4. That the Minister imposes the conditions and procedures recommended in Appendix 2 of this report.

Appendix 1

References

Cale, B., 2003. *Carnaby's Black Cockatoo Recovery Plan,* Department of Conservation and Land Management, WA.

Department of Environment, 2003. *Interim Guide To Community Involvement*, Department of Environment, July 2003.

Department of Environment and Heritage, 2004a. *Australian Threatened Species: Carnaby's Black-Cockatoo, Threatened Species Day Fact Sheet*, Department of Environment and Heritage, Australia.

Department of Environment and Heritage, 2004b. *Recovery Outline – Carnaby's Black-Cockatoo*, Department of Environment and Heritage, Australia.

Environmental Protection Authority, 2004a. – *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*, Guidance Statement Number 51, Environmental Protection Authority, Western Australia, June 2004.

Environmental Protection Authority, 2004b. – *Environmental Offsets*, Preliminary Paper, Position Statement Number 9, Environmental Protection Authority, Western Australia, July 2004.

Iluka Resources Limited, 2005. *Draft Significant Species Management Plan, Carnaby's Cockatoo.* Cataby Mineral Sands Project (Appendix A), Iluka Resources Limited, Australia, October 2004.

Iluka Resources Limited, 2005. *Draft Groundwater Dependent Ecosystems Management Plan.* Cataby Mineral Sands Project (Appendix B), Iluka Resources Limited, Western Australia, October 2004.

Iluka Resources Limited, 2005. *Cataby Mineral Sands Project Environmental Protection Statement*, Iluka Resources Limited, Western Australia, February 2005.

Appendix 2

Recommended Environmental Conditions

and Proponent's Commitments

Statement No. xxx

RECOMMENDED CONDITIONS AND PROCEDURES

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

CATABY MINERAL SANDS PROJECT
CATABY

Proposal: To construct a mineral sands mine at Cataby, approximately 150km north of Perth. The project will consist of a series of 13 open pits over approximately 25km, which will be progressively mined by dry mining techniques. It is approximated that the proposal will produce approximately 760 to 780kt of Heavy Mineral Concentrate per annum. The proposal is further documented in schedule 1 of this statement.

Proponent: Iluka Resources Limited

Proponent Address: Level 23, 140 St George's Terrace, PERTH WA 6000

Assessment Number: 1612

Report of the Environmental Protection Authority: Bulletin 1212

The proponent, subject to the following conditions and procedures, may implement the proposal referred to above:

1 Implementation

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

2 Proponent Commitments

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

3 Proponent Nomination and Contact Details

3-1 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 as the proponent for the proposal.

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

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

4 Commencement and Time Limit of Approval

4-1 The proponent shall substantially commence the proposal within five years of the date of this statement or the approval granted in this statement shall lapse and be void.

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

4-2 The proponent shall make an application for any extension of approval for the substantial commencement of the proposal to the Minister for the Environment prior to the expiration date of this statement, which shall demonstrate that:

1. the environmental factors of the proposal reported in Bulletin 120x have not changed significantly;
2. new, significant, environmental factors have not arisen; and
3. all relevant government authorities and stakeholders have been consulted.

5 Compliance Reporting

5-1 The proponent shall submit compliance reports in accordance with a schedule approved by the Department of Environment and with the compliance monitoring guidelines, and shall:

1. describe, or update, the state of implementation of the proposal;
2. provide verifiable evidence of compliance with the conditions, procedures and commitments;
3. review the effectiveness of corrective and preventative actions contained in the environmental management plans and programs;
4. provide verifiable evidence of the fulfilment of requirements specified in the environmental management plans and programs;
5. identify all confirmed non-conformities and non-compliances and describe the related corrective and preventative actions taken; and
6. identify potential non-conformities and non-compliances and provide evidence of how these are being assessed for corrective action.

6 Performance Review

6-1 The proponent shall submit a Performance Review every five years after the start of production to the Environmental Protection Authority, which addresses:

1. the major environmental issues associated with implementing the project; the environmental objectives for those issues; the methodologies used to

achieve these; and the key indicators of environmental performance measured against those objectives;
2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;
3. significant improvements gained in environmental management, including the use of external peer reviews;
4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and
5. the proposed environmental objectives over the next five years, including improvements in technology and management processes.

7 Oliver Remnants

7-1 The proponent shall not mine in the 62ha area of Oliver Remnants defined as an area of 'no mining' in figure 2, schedule 1.

7-2 The proponent shall place a conservation covenant over the rehabilitated Oliver Remnants area once rehabilitation has been completed.

8 Carnaby's Cockatoo Management Plan

8-1 Prior to ground-disturbing activities, the proponent shall implement and comply with the Carnaby's Cockatoo Management Plan presented in the *Cataby Mineral Sands Project, Environmental Protection Statement* (November 2005).

9 Groundwater Dependant Ecosystem Management Plan

9-1 Prior to ground-disturbing activities, the proponent shall review and revise the Groundwater Dependant Ecosystem Management Plan presented in the *Cataby Mineral Sands Project, Environmental Protection Statement* (November 2005) to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The revised plan shall include:

1. a map showing the locations of any priority or declare rare fauna species in potential groundwater dependant ecosystem areas;
2. a map showing the locations of weekly vegetation health monitoring;
3. an assessment of the types of artificial recharge options to be used which will include identifying the best option of each site.
4. contingency measures for the prevention of vegetation impacts in potential groundwater dependant ecosystem areas; and
5. actions to be taken in the event that detrimental effects to vegetation health are observed, that includes consultation with a qualified botanist, within 5 days, to assess the cause of the impact; and
6. measures to mitigate impacts on vegetation in the event the artificial recharge system does not perform. This will include the review and modification to the artificial recharge system to prevent further impacts on vegetation sites.

9-2 Following the utilisation of artificial recharge systems in the project, the proponent will submit a report to the Department of Environment detailing:

1. the recharge options utilised for each area of mining;
2. outcomes of vegetation health monitoring conducted near mining operations; and
3. an evaluation of the performance of the artificial recharge system. The proponent shall provide explanatory notes to substantiate the artificial recharge system's performance achieved.

9-3 The proponent shall implement the revised Groundwater Dependant Ecosystem Management Plan required by condition 9-1.

9-4 The proponent shall make the revised Groundwater Dependant Ecosystem Management Plan required by condition 9-1 publicly available.

10 Noise Management

10-1 Prior to ground-disturbing activities, the proponent shall prepare a Noise Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The objectives of the Plan are:

- to ensure that the amenity, health, welfare and comfort of residents in surrounding areas are protected; and

- to ensure compliance with the *Environmental Protection (Noise) Regulations, 1997*.

10-2 The Plan shall include detailed descriptions of:

1. the acoustical model of the mining operations;
2. measures to minimise noise emissions;
3. operating procedures to be adopted for particular routine activities to minimise noise impacts on amenity at recreational areas;
4. the noise monitoring programme; and
5. the complaint management procedure.

10-3 The proponent shall implement the Noise Management Plan required by condition 10-1.

10-4 The proponent shall make the Noise Management Plan required by condition 10-1 publicly available.

11 Vegetation and Flora Management Plan

11-1 Prior to ground-disturbing activities, the proponent shall prepare a Vegetation and Flora Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The objectives of this plan are:

1. minimise disturbance to vegetation communities and significant flora; and
2. identify rare and priority flora species and ensure they are protected during the mining operations.

11-2 The Plan shall:

1. identify any priority or declared rare flora in or surrounding the proposal area;
2. include the management, monitoring and reporting of impacts on the defined vegetation communities and any identified declared rare flora and priority flora species within the proposal area;
3. plan clearing to ensure no vegetation unit is completely removed;
4. include management and mitigation measures for dieback and weed management;
5. minimise all unnecessary impacts to vegetation and flora from mine operations; and
6. any management or mitigation actions required, including modification to the mine layout to provide for retention of significant flora

11-3 The proponent shall implement the Vegetation and Flora Management Plan required by condition 11-1.

11-4 The proponent shall make the Vegetation and Flora Management Plan required by condition 11-1 publicly available.

12 Surface Water

12-1 Prior to ground-disturbing activities, the proponent shall prepare a Surface Water Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

12-2 The Plan shall include detailed descriptions of:

1. existing surface flow regimes;
2. significant surface water dependant ecological systems which may be impacted by changes to existing surface water regimes;
3. a stream diversion plan;
4. stormwater management;
5. aquatic fauna and riparian monitoring program;

and shall set out measures for:

1. maintaining the integrity of flow paths and water quantities to protect surface water dependent ecological systems; and
2. monitoring and reporting of any changes in surface water flow regimes caused by implementation of the proposal, and impacts on surface water dependant ecological systems.

12-3 The proponent shall implement the Surface Water Management Plan required by condition 12-1.

12-4 The proponent shall make the Surface Water Management Plan required by condition 12-1 publicly available.

12-5 In the event that adverse impacts on surface water dependent ecosystems are identified, the proponent shall develop and implement appropriate contingencies.

13 Dieback Management Plan

13-1 Prior to ground-disturbing activities, the proponent shall prepare a site Dieback Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

13-2 The Plan address:

1. product transport vehicles to and from the mine site;
2. passenger vehicles to and from the mine site;
3. earth moving and other machinery vehicles to and from the mine site;
4. regular monitoring for the site to detect the introduction of dieback;
5. contingency arrangements in the event of an occurrence of dieback; and
6. reporting to the Department of Environment in the event of an occurrence of dieback.

13-3 The proponent shall implement the Dieback Management Plan required by condition 13-1.

13-4 The proponent shall make the Dieback Management Plan required by condition 13-1 publicly available.

14 Rehabilitation Plan

14-1 Prior to the commencement of ground-disturbing activities, the proponent shall prepare, in consultation with the Department of Conservation and Land Management, a Rehabilitation Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority. The Plan shall provide the framework to ensure that the site is left in an environmentally acceptable condition.

The objective of the Plan is to:

- revegetate the areas of vegetation that have been cleared during construction;
- ensure that rehabilitation is carried out in a coordinated, progressive manner and is integrated with development planning, consistent with the ANZMEC/MCA Strategic Framework for Mine Closure, current best practice, and the agreed end land use(s).

The Plan shall include:

1. rehabilitation of all disturbed areas with local native species;
2. completion criteria;
3. a rehabilitation schedule including timing;
4. rehabilitation and revegetation requirements;
5. management measures (such as weed management);
6. monitoring and maintenance of rehabilitated areas for at least five years following completion; and
7. remedial actions.

14-2 The proponent shall implement the Rehabilitation Plan required by condition 13-1 until such time as the Minister for the Environment determines, on advice of the Environmental Protection Authority, that the proponent's rehabilitation responsibilities have been fulfilled.

14-3 The proponent shall make the Rehabilitation Plan required by condition 14-1 publicly available.

15 Decommissioning/Closure Plans

15-1 Prior to construction, the proponent shall prepare a Preliminary Decommissioning and Closure Plan, which provides the framework to ensure that the site is left in an environmentally acceptable condition, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The objective of the Plan is:

- To ensure that closure planning is carried out in a coordinated, progressive manner and is integrated with development planning, consistent with the ANZMEC/MCA Strategic Framework for Mine Closure, current best practice, and the agreed end land use(s).

The Preliminary Decommissioning and Closure Plan shall include:

1. rationale for the siting and design of plant and infrastructure as relevant to environmental protection, and conceptual plans for the removal or, if appropriate, retention of plant and infrastructure;
2. long-term management of ground and surface water systems affected by the mining operations including groundwater drawdown and diversion;
3. a conceptual rehabilitation plan for all disturbed areas and a description of a process to agree on the end land use(s) with all stakeholders;
4. a conceptual plan for a care and maintenance phase; and

15-2 At least 18 months prior to the anticipated date of decommissioning and closure, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Decommissioning and Closure Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The Final Decommissioning/Closure Plan shall include:

1. removal or, if appropriate, retention of plant and infrastructure in consultation with relevant stakeholders;
2. long-term management of ground and surface water systems affected by the mining operations including groundwater drawdown and diversion;
3. rehabilitation to a standard suitable for the agreed new land use(s); and
4. identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities.

15-3 The proponent shall implement the Final Decommissioning and Closure Plan required by condition 14-2 until such time as the Minister for the Environment determines, on advice of the Environmental Protection Authority, that the proponent's decommissioning and closure responsibilities have been fulfilled.

15-4 The proponent shall make the Final Decommissioning and Closure Plan required by condition 15-2 publicly available.

Procedures

1. Where a condition states "to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority", the Environmental Protection Authority will provide that advice to the Department of Environment for the preparation of written notice to the proponent.

2. The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice to the Department of Environment.

3. Where a condition lists advisory bodies, it is expected that the proponent will obtain the advice of those listed as part of its compliance reporting to the Department of Environment.

Notes

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

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

3. The proponent is required to apply for a the appropriate Licences / Permits for this project under the provisions of the *Rights in Water and Irrigation Act 1914* as well as *Rights in Water and Irrigation Regulations 2000.*

4. Within this statement, to "have in place" means to "prepare, implement and maintain for the duration of the proposal".

Schedule 1

The Proposal (Assessment No. 1612)

The proposed Iluka Mineral Sands Mine project will consist of a series of 13 open pits over approximately 25km. The pits will range in size from 9 hectares to 110 hectares with a range in depth from 17m – 60m.

The pits will be progressively mined by dry mining techniques using combinations of mining equipment. The overburden will initially be stockpiled but once operations begin it will be placed directly into the mine voids.

The concentrator will be located centrally in the operations and will operate at 1100 tonnes per hour throughput, producing 760 to 780kt of Heavy Mineral Concentrate per annum.

Mining will commence in the middle section of the deposit, heading north from the concentrator and then south from the concentrator. Mining of each pit will take between 1 to 12 months.

The life of the mine is approximately 5 years with decommissioning beginning in 2010. Decommissioning and final rehabilitation will take approximately 3 years. The pits will be mined, backfilled and rehabilitated sequentially.

The key components of the proposal are:

- Carnaby's Black Cockatoo;
- Vegetation impacts; and
- Noise.

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

Table 1 – Key Proposal Characteristics

Element	Description
Project Life	5 years (continual operation)
Construction (approximate)	9 months
Mining (approximate)	5 years
Closure (approximate)	3 years
Rehabilitation	Ongoing throughout mine life, completed by 2013
Land Tenure	Iluka Resources Limited (majority holder) and private land owners
Mine Tenements	M70/194; M70/195; M70/196; M70/517; M70/518; M70/696; M70/760; M70/791; M70/867; M70/868; M70/869; M70/1017; M70/1018; M70/1086
Ore Volume	40 Million tonnes
Overburden Volume	150 Million tonnes
Rate of Extraction (overburden and ore)	40 – 60 Million tonnes per year
Processing Rate	800 – 1100 tonnes per hour
Extraction Method	Dry Mining
Number of Mine Pits	13
Size of Mine Pits	9 – 110 hectares

Element	Description
Depth of Mine Pit	Ranging from 17m to 60m
Area of Disturbance	650 hectares
Area of Vegetation Disturbance	115 hectares
Water Supply Source	Superficial formations – pit dewatering and production bores.
Groundwater Abstraction Rates	2 – 50 ML/day
Maximum Process Water Requirements	6600ML/year

Figures (attached)

Figure 1 – Cataby Mineral Sands Project Location
Figure 2 – Cataby Mineral Sands Mine Layout including area of no mining.

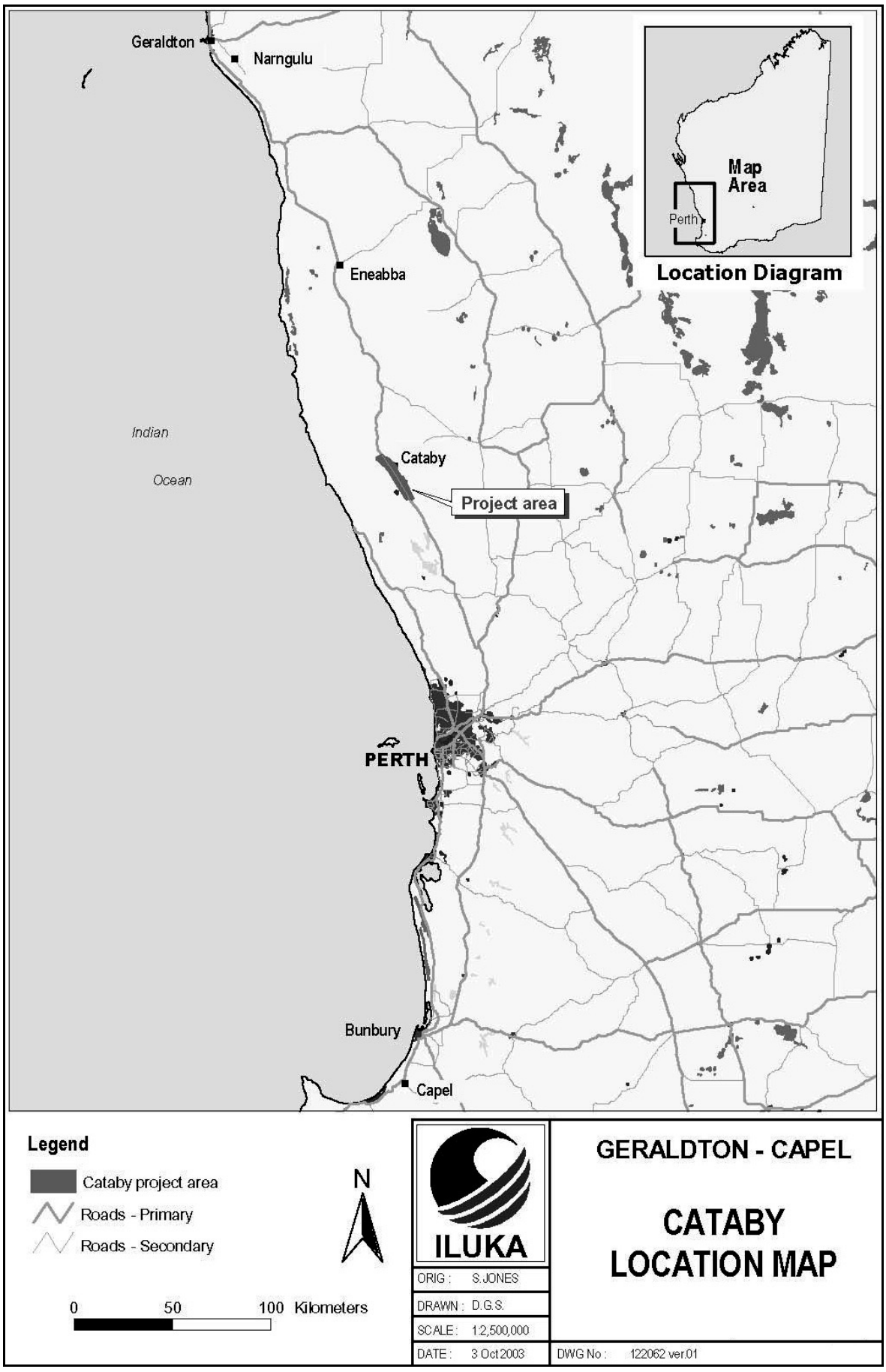

Figure 1: Cataby Mineral Sands Project Location

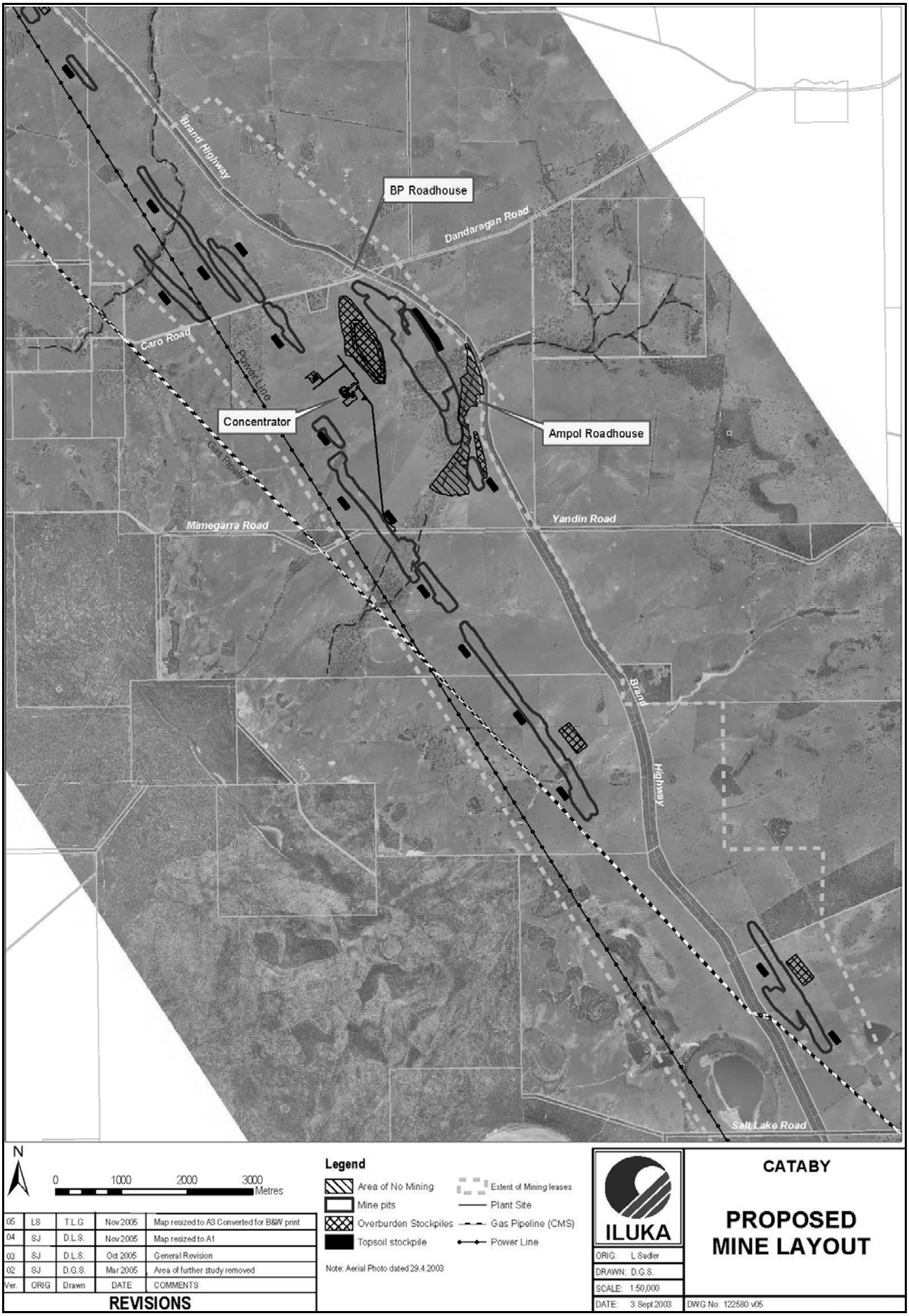

Figure 2: Cataby Mineral Sands Mine Layout including area of no mining.

Schedule 2

Proponent's Environmental Management Commitments

9 December 2005

CATABY MINERAL SANDS PROJECT, CATABY

(Assessment No. 1612)

Iluka Resources Limited

Proponent's Environmental Management Commitments – December 2005

CATABY MINERAL SANDS PROJECT (Assessment No. 1612)

Note: The term "commitment" as used in this schedule includes the entire row of the table and its six separate parts as follows:

- a commitment number;
- a commitment topic;
- the objective of the commitment;
- the 'action' to be undertaken by the proponent;
- the timing requirements of the commitment; and
- the body/agency to provide technical advice to the Department of Environmental Protection.

Iluka Resources Limited - Cataby Mineral Sands Mine (Assessment Number 1612)

	Topic	Objective	Action	Timing	Advice
1.	Landform and Soil	To maintain the integrity, ecological functions and environmental values of the soil and landform.	1. Prepare a Soil Management Plan addressing: • handling of topsoil and subsoil; • return of potential acid forming (PAF) material directly to mining void below the water table; • acid sulphate soil (ASS) screening; • contingency for direct treatment of PAF with agricultural lime. 2. Implement Soil Management Plan	Prior to construction Ongoing	DoE
2.	Dust	Ensure that dust emissions, both individually and cumulatively, meet appropriate criteria and do not cause an environmental or human health problem.	1. Prepare a Dust Management Plan including: • Dust control measures; • Dust monitoring. 2. Implement the Dust Management Plan.	Prior to construction Ongoing	

	Topic	Objective	Action	Timing	Advice
3.	Carbaby's Cockatoo	To maintain and enhance the habitat of Carnaby's Cockatoos to promote the recovery of the population of this species consistent with the *Carnaby's Black-Cockatoo Recovery Plan* (Cale, 2003). To protect endangered species consistent with the provisions of the *Western Australian Wildlife Conservation Act 1950* and *Environment Protection and Biodiversity Conservation Act 1999.*	1. Implement offsets specified in the Carnaby's Cockatoo Management Plan presented in Appendix A of the *Cataby Mineral Sands Project, Environmental Protection Statement* (November 2005)	Ongoing	CALM
4.	Oliver Remnants	To maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities. To maintain terrestrial ecological integrity and biodiversity and ensure that impacts on vegetation communities are avoided.	1. Collect seed from the York Gums before clearing 2. Fence and clear non native debris in the area of no mining shown in figure 2	Prior to construction During/ongoing	CALM