Queensland Industrial Minerals Ltd

Queensland Industrial Minerals Ltd.
ACN 102 684 266

WATERANGA PROJECT

INITIAL ADVICE STATEMENT

July 2004

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1. OVERVIEW

Queensland Industrial Minerals Ltd ("QIM") wishes to apply for a Mining Lease in order to progress its potentially world class Wateranga Industrial Minerals Project, located approximately 80 km southwest of Bundaberg in Queensland.

The Wateranga Project (EPM 13278) has a combined eluvial and hard rock deposit comprising feldspar, ilmenite, apatite, mica, scandium, zircon, corundum and rutile. Currently, the Project's eluvial ore reserve and resource base accounts for 225 million tonnes at 4% ilmenite, 20% feldspar, 12% mica, 0.8% apatite and 30ppm scandium. The hard rock resource has been estimated to comprise in the order of 345 million tonnes at 34.3% of feldspar. These resource levels indicate a 30-plus year mine life. These identified resources are located both north and south of the Burnett River.

The feldspar resource in particular has valuable abrasive and glass manufacturing qualities and it may have application in the alumina industry owing to its superior Al_2O_3 content compared to competitor products. The project also has significant potential to develop other unique minerals including rare earths such as scandium for application in the aeronautical and defence industries.

The current Net Present Value of the Project upon grant of a Mining Lease is estimated by the Directors to be in the order of $85 million (discounted at 20% NPV). This figure is preliminary and is expected to significantly increase once a full financial and economic assessment is undertaken.

QIM need to rapidly acquire licences and approvals to begin extraction of these resources and to establish a mining operation on site which will ramp up the processing of ore from 1.5 million tonnes per annum to an expected maximum annual rate of 4.5 million tonnes per annum.

There is some urgency and time constraints for establishing this project owing to the impending Burnett River Dam Project completion by Burnett Water Pty Ltd in late 2005. With a substantial proportion of the eluvial resource base at risk of inundation once the reservoir is flooded, QIM would like the opportunity to gain access as soon as possible and to potentially extract and stockpile this ore which is at risk.

Due to the size and type of operation, it would appear that the potential environmental impacts from Wateranga are insignificant compared with the development of the Burnett River Dam.

Accordingly, QIM is seeking the assistance of the relevant Queensland Government authorities to progress this important project.

2. PURPOSE OF DOCUMENT

2.1. Aims

This document has been compiled to provide the key stakeholders with sufficient information to enable a decision to be made in regards to identifying the key government agencies responsible for this project, the approvals process, timeframes and additional information required of QIM in order to gain a licence to operate.

It is expected that this document and discussions held with key government agencies including the Department of State Development, Environmental Protection Agency, Department of Natural Resources, Mines and Energy (and Burnett Water Pty Ltd and the Biggenden and Perry Shire Councils) will provide QIM with certainty:

- regarding the appropriate government authorities, their roles and involvement in the Wateranga Project;
- that it is progressing appropriately, effectively and as efficiently as possible through Queensland mining, environmental and related approval processes;
- regarding referral processes to Environment Australia;
- regarding an Environmental Impact Statement for the Project;
- it will be able to gain access to mining tenure, enabling exploitation of a significant portion of industrial mineral resources, some of which are subject to inundation by water to the full supply level (FSL) associated with the establishment of the Burnett Dam.

2.2. Government Process

QIM expects to liaise directly with the Department of Natural Resources, Mines and Energy ("DNRME") and Environmental Protection Agency ("EPA") to gain the required Mining Leases and Environmental approvals necessary to commence mining.

It is also likely that the Department of State Development ("DSD") will be kept advised of project advances, development and approvals processes.

Other agencies including the Department of Primary Industries, Queensland Parks and Wildlife Services, Department of Main Roads and Queensland Transport will be consulted throughout the development of the Project.

3. INTRODUCTION AND BACKGROUND

3.1. Proponent details

3.1.1. Proponent history

The proponent of the Wateranga Project is Queensland Industrial Minerals Ltd, ("QIM") A.C.N. 102 684 266. QIM was registered in Queensland on 31 October 2002. The address and directors details are as follows:

Table 1 Queensland Industrial Minerals Ltd Business details

Registered Address	Suite 1, Level 1, 2563 Gold Coast Highway, MERMAID BEACH, QLD 4218
Business Address	52 Kawana Crescent, ASHMORE, QLD 4214
Directors	John Leslie Goody (Chief Executive Officer) Frank Reid Gardiner (Chairman) Neil Arthur Gracie Anthony Gerrard Casey
Secretary	Anthony Gerrard Casey
Business Phone	07 5539 4559
Business Fax	07 5537 7218

Further details are provided in Appendix 1.

QIM are a newly established company and therefore, their history is limited. The experience and capabilities of the professionals employed by QIM are outlined below.

3.1.2. Corporate and Technical Capabilities

The board of directors of QIM bring a range of corporate and technical capabilities to this project. Details of their experience is as follows:

Mr Frank Gardiner LLB. FAIM. FAICD. (Chairman) Mr Gardiner is a well-known international lawyer and company director with extensive experience in both the public and private sectors. He is a Fellow of the Australian Institute of Company Directors and a Fellow of the Australia Institute of Management. Mr Gardiner has international experience as CEO of listed companies and has had experience in the mining, technology and health sectors in both the formative and mature stages of company operations. He has held directorships of a number of publicly listed companies both in Australia and overseas. Mr Gardiner's experience in corporate governance and negotiations is an invaluable resource for the company. He has instituted a programme of corporate governance specifically designed to give ongoing disclosure to all stakeholders, shareholders and interested parties in the ongoing progress of QIM. Such a programme is to encourage continuing public consultation in respect to the Project.

Mr John Goody (CEO) has over 34 years experience in the mining industry. He has specialist experience in industrial minerals and has spent the last eleven years studying Wateranga-style deposits and is a recognised expert in this field. Mr Goody

has been responsible for exploration and subsequent development of many mines in many countries around the world. He has held senior mine management and directorships with various publicly listed mining companies, and was responsible for the exploration and development of many mineral deposits ranging from gold through to industrial minerals. Mr Goody's extensive experience in managing the formative and development stage of mining projects is invaluable to the company. Moreover, Mr Goody is a founder of the company and it is his desire to appoint a world class CEO to lead the company to the market, once all the development issues have been completed.

Mr Neil Gracie (Director) holds a Bachelor of Mechanical Engineering from Queensland Institute of Technology and has specialised in the development of engineering based solutions in the Oil & Gas and Mining Industries. Mr Gracie has a wealth of Australian and International experience in implementing solutions for plant design, project management and equipment procurement specifications for new built and major upgrade projects.

Mr Anthony Casey (Company Secretary) is a Certified Practising Accountant and is the Director/Company Secretary for QIM. Mr Casey has had 20 years experience as an accountant and has been on several local and State committees of CPA Australia. He is a Registered Tax Agent, runs his own private practise and is a Director of several companies.

QIM is supported by a team of professionals and researchers from a diversity of fields as follows:

Consultant	Services provided
Roche Mineral Laboratories (Gold Coast)	Mineral Sand experts – laboratory analysis
Julius Kruttschnitt Mineral Research Centre (JKMRC)	University of Queensland – research and laboratories
Queensland University of Technology	X-ray diffraction and Electron Microprobe work
CSIRO	Research into a suite of minerals
Environmental & Licensing Professionals Pty Ltd	Mining tenement and environmental application processes
Leddy Sergiacomi and Associates Pty Ltd	Transport and Socio-economic impact investigations
Natural Resource Assessments Pty Ltd	Environmental Studies (Flora and Soils)

Further consultants in specific and relevant fields will be appointed in due course.

Consultant geologist, Mr David Semple from Semple Geological Services Pty Ltd, is the Independent Geologist appointed to the Project. Mr Semple is also an authority in the field of Wateranga-style industrial mineral deposits. His services will be utilised throughout the Project's development. Mr Semple has over 37 years experience and is a Fellow of the Australian Institute of Geoscientists.

3.1.3. Financial Capabilities

As QIM is a newly established company, it does not have a long financial history. Funding to date has been provided by individuals in association with the company. For future funding, QIM is in discussions with several potential partners and is confident that funding will be arranged in the very near future. Several offers of funding have been made by Australian and foreign companies and these offers are currently being considered.

3.2. Project background

QIM intends to lodge one Mining Lease Application ("MLA"), known as "Central", within EPM 13278 located approximately 80 km southwest of Bundaberg in Queensland, see Figure 1.

Central is required for the purpose of extracting a variety of industrial minerals including feldspar and ilmenite. The deposit consists of a combination of unconsolidated and hard rock resources, of which the eluvial component is uniformly distributed and is situated at, or near surface. Additional resources external to the boundaries of the proposed MLA will be secured at the appropriate time in the future when the current resources are exhausted. Exploration to date has identified a large resource which, based on current proposed processing rates, will take over 30 years to mine.

The project is complicated by the pending development of the Burnett River Dam which will, upon inundation, sterilise a sizeable portion of the identified resources which are easily accessible and add significant value to the Project and royalty returns to the State. Dam construction has commenced and will progressively fill during the wall development. The dam is scheduled for completion and subsequent flooding in November 2005.

If possible, QIM intend to extract the identified resources from the Full Supply Level ("FSL") prior to inundation. This is dependent upon the rate of inundation once the Burnett River dam wall is completed. Accordingly, the size of the initial MLA and areas to be disturbed at any one time are significantly larger than would otherwise be required. Sizeable disturbance areas are expected for an approximate two to three year period due to the required storage capacity to stockpile ore removed from below the FSL of the dam while it awaits subsequent processing.

Stockpiling of topsoil is not expected to be large as the resource is generally only covered by a thin veneer of overburden. Initial unconsolidated resources will be extracted to a depth in the order of 4.5 m. Ore will initially be processed through a gravity water separation plant to extract the mineral concentrate, which will then pass through a magnetic separation process to separate the ilmenite and other magnetic minerals from the reject material.

Progressive rehabilitation will be undertaken to ensure minimal disturbance of the site. Stabilisation of the void areas subject to inundation through appropriate benching techniques will occur prior to flooding of the reservoir. Upon flooding, these areas will reach their final land use and will be considered rehabilitated. In other areas not subject to inundation, dewatered tailings material from the gravity separation process will be directed back into void areas. Upon completion of each excavation and backfilling with tailings, topsoil will be re-spread over the re-contoured pit and sown with a lucerne crop in order to complete the de-watering process. Upon completion of the lucerne crop, an appropriate final vegetation species mix will be the sown. Other beneficial and sustainable land uses which can be employed at this site include the development of forestry, vineyards, orchards and grazing.

3.3. Project importance and benefits

The Wateranga Project is potentially a world class resource of feldspar and ilmenite. Upon production, the Project will provide significant revenue to the State of Queensland and employment opportunities for the local communities. The current

estimate by the Directors for the discounted Net Present Value of the Project is a conservative $85 million and this figure is expected to increase once a full financial and economic assessment is undertaken.

Expected royalties to the Queensland Government from the project once in production will be in the order of $8 million per annum and the estimated annual direct taxes paid to the Commonwealth Government are potentially $37 million. Significant indirect taxes are expected, resulting as a flow-on effect from the operation to downstream industries and wealth creation of local business and the community. Annual turnover is expected to be over $200 million with an approximate $100 million profit after tax. The project will ultimately offer full time employment for 100 people.

Exploitation of the resources from the Wateranga Project will have a beneficial impact on the environment. The financial and technical resources available to QIM for this project means that appropriate environmental management methods can be implemented to maximise the productivity of this landscape. Most notably, QIM will be able to implement significant dam bank management and stabilisation strategies post-resource exploitation, thereby providing erosion and sediment control mitigation measures for the dam. These measures will likely far exceed any others proposed for the catchment of the Burnett Dam. In addition, the landscape is very disturbed and is currently utilised only for cattle grazing. It is proposed that upon completion of mining, there will be an opportunity to introduce a number of complimentary industries to the area which are in-line with sustainability concepts. These industries potentially include, but are not limited to, vineyards, forests and orchards.

Wateranga is a unique deposit. Its layered nature, widespread conformity, volume and quality of industrial and rare earth minerals indicate that it has world class characteristics, offering competitive application in a broad range of industries.

The Wateranga plagioclase feldspar is a unique mineral because of its extremely high alumina content. Amongst its extremely high abrasive characteristics, the high alumina content makes it very attractive to the glass and ceramic industry, as well as another potential application as feedstock in the alumina/aluminium industry. The Wateranga feldspar (30% Al_2O_3) has double the alumina content of anorthosite (15% Al_2O_3 which is typically used in the glass industry), and therefore its superior qualities may have a competitive application in this industry.

Ilmenite is suitable for titanium dioxide pigment production, and the apatite is a direct source of phosphate for primary industry. Apatite is a natural, slow release phosphate fertilizer and with its advantageous “environmentally friendly” qualities, will substitute for super phosphate thus negating the potential (alleged) impact of super phosphate on the environment and more particularly, the Great Barrier Reef.

The micas present (muscovite and phlogopite) have wide usage in the electrical industry. In addition, the Wateranga Project is thought to contain the largest known deposit of scandium in the world.

Other minerals present in recoverable and economic proportions include zircon, corundum and apatite.

The Project’s proximity to readily available water, power, rail line and infrastructure place it in an excellent position to competitively produce a variety of industrial mineral products, with economic benefits afforded to the local community and State of Queensland.

3.4. Impact Assessment Level and Critical Issues

3.4.1. Assessment Level Decision

The following describes the environmental impact and assessment level of the Wateranga Project.

According to the Code of Environmental Compliance for Mining Lease Projects, January 2001, the Wateranga Project is a Non Standard project because:

- more than 10 ha of land will be disturbed at any one time;
- more than 5 ha of land will be disturbed at any one time due to mine workings;
- mining activities will be conducted within 2 kilometres of the Category A Environmentally Sensitive Area (ESA);
- The proposed mining activities include a Level 1 Environmentally Relevant Activity (ERA 42 Mineral Processing).

As well as meeting the Non Standard criteria for mining projects, the Wateranga Project also has the following attributes:

- It is located approximately 1 km west of the Goodnight Scrub National Park;
- It will mine 12.2 million tonnes of ore in the first year, and ramp up production progressively to process 4.5 million tonnes of ore per annum;
- An approximate maximum of 2,400 ML of water will be required for processing purposes. Water is likely to be sourced from the Burnett River Dam for the entire duration of the operation. However, this is dependent on availability of water during the first year of operation. If there is no water available from the Burnett River Dam in the first year, water will be sourced from natural surface water sources, and will, as much as possible, be supplemented through recycling of process water and precipitation;

The Wateranga Project potentially initiates the EIS trigger criteria identified in Appendix C of Guideline 4 (Deciding the Level of Impact Assessment for the Mining Industry). The EIS criteria which *may* apply to the Project include:

The project would or would be likely to:

- have significant impact on Category A and Category B environmentally sensitive areas ("ESAs");
- involve mining more than 2 million tonnes of mineral or run of mine ore will be mined per year;
- involve the abstraction of 2 million cubic metres of water per year from natural surface and/or groundwater sources.

The Project is located 1 km west of the Goodnight Scrub National Park and does not encroach on the National Park boundaries. It is spatially separated from the National Park by the Kalliwa Creek which will become flooded at FSL. It is expected that the only potential impacts of the mining project on the National Park will relate to dust. However, as the material mined has a high moisture content, dust is unlikely to present a significant environmental problem. Any potential impacts can be managed and contained by various mitigation and control measures. These impacts will not be "significant".

Endangered Regional Ecosystems (Category B ESAs) do occur immediately outside of the MLA boundaries, and several also occur along the Kalliwa Road in the southwestern part of the MLA. These EREs will, in part, become inundated to FSL by the Burnett River Dam. The remaining ERE may be impacted by the mining operation although there is no intention to specifically mine this area.

The abstraction of 2,400 ML of water from the Burnett River is the expected maximum amount of water required for the project. This quantity of water is not expected to be required until later years. A smaller quantity of water to support lower mining and processing rates will be required in the first year of mining which will be sourced from natural surface water. Following this, water will be sourced from the Burnett River Dam by arrangement with BWPL. This will not constitute obtaining water from a "natural surface water source". Wherever possible, QIM will limit its water usage through recycling and capture.

Under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), actions that have, or are likely to have, a significant impact on a matter of national environmental significance (i.e. are deemed to be "controlled actions") require approval from the Commonwealth Environment Minister.

An assessment of the Department of Environment ("DEH") database has identified that Threatened and Migratory species potentially exist within the area of the proposed Wateranga Project. Ideal habitat for migratory and threatened species is unlikely to occur within the proposed mine site area, and it is apparent that the river and creeks adjacent to the project would provide suitable habitat for transitory refuge when necessary.

The Project was referred to the DEH and, on 11 December 2003, it was determined by the Commonwealth Environment Minister to not be a controlled action.

Due to the size and type of operation, it would appear that the potential environmental impacts from Wateranga are insignificant compared with the development of the Burnett River Dam.

In addition, the areas to be mined and impacted upon have already been cleared and have been subjected to intensive grazing operations for some time, see Figure 2. A number of specific environmental and related studies will help clarify specific questions and concerns relating to the impacts of the mining operations. QIM have already initiated these studies and some have been completed. Studies undertaken include assessments on soil, flora, social and economic, power, and transport. A cultural heritage study which includes the development of a Cultural Heritage Management Plan, will be commenced in the near future, and further additional studies may also be undertaken as required.

3.4.2. Critical issues

The following items are viewed as critical issues for the Wateranga Project:

- Approvals are needed in order to progress the Wateranga Project and to potentially gain access to resources likely to be inundated at the completion of the construction of the Burnett River Dam.

- The total eluvial resource contains in the order of 225 million tonnes @ 4.8% ilmenite, 20% feldspar, 12% mica, 0.8% apatite and 30ppm scandium in the unconsolidated section, with a potential mine life in excess of 30 years, and a further 345 million tonnes @ 34.3% feldspar in the hard rock section. The percentage of the reserve in the Central MLA subject to inundation after the first 12 months is in the order of 23% of the unconsolidated resource calculation. If this portion of the resource is not extracted, a significant amount of potential revenue will be lost from this project and considerable revenues to the State of Queensland and the Commonwealth of Australia.

- The Wateranga Project is a benign mining operation. The geology, and the exploitation of the contained resources, will not expose any naturally occurring or contaminating elements which could potentially contribute to acid mine drainage or other forms of contamination to the environment. Added to this, the mining processes required are simple, widely used and proven methods including gravity and magnetic separation processes which do not use chemical or acid treatments to upgrade ore into product.

- In terms of public notification and community involvement, it should be noted that the interests and concerns of stakeholders affected by the application will be taken into account through the course of the MLA and Environmental Authority Application ("EAA") processes under the auspices of the *Mineral Resources Act 1989* and the *Environmental Protection Act 1994*.

4. PROJECT DETAILS

4.1. Location

The Wateranga Project is located approximately 30 kilometres southeast of the Township of Mt Perry. The Burnett River is the boundary between two local government authorities: the Perry Shire (north of the river) and Biggenden Shire (south of the river), see Figure 3. The project is under the jurisdiction of the Rockhampton Department of Natural Resources, Mines and Energy, and the Maryborough Environmental Protection Agency.

4.2. Mineral Tenures

QIM holds one Exploration Permit for Minerals (EPM 13278), see Figure 4. On 6 March 2001, this tenement was granted only over extinguished portions of land under the Alternative State Provisions. This EPM holds a standard environmental authority.

An amendment to the environmental authority was sought to facilitate more intensive site investigations. A bulk sampling programme has since been undertaken within this EPM and test work is assisting to establish additional markets for the product. To further facilitate test work required for the project, QIM made application for a Mineral Development Licence. MDL 355 has been granted on 2 July 2004. This MDL holds a non standard environmental authority.

A single MLA ("Central") is proposed to be lodged with the DNRME in July 2004, see Figure 5. The Central MLA is located on the north side of the Burnett River. **It is important to note that the proposed MLA is identical in size, shape and location to the currently granted MDL 355.** Additional MLAs may be applied for by QIM in the future as exploration activities identify additional resources within EPM 13278 and as demand for mineral production increases. Table 2 below describes the details of the proposed MLA.

The total size and shape of Central MLA has been determined based on the current outline of commercially extractable resources, proximity to infrastructure, landholdings and access routes. It is expected that the current area outlined for application will be sufficient for resource extraction over approximately the next 30 years.

It is proposed that the Central MLA will host the processing plant, tailings dams and other infrastructure necessary for processing ore from the entire operation.

Table 2 Proposal Mining Leases Application Details

Stage	Tenement Name	Description	Area	Purpose	Activity/Infrastructure	Minerals
1 & 2	Central	North of Burnett River	~1551 Ha	Mining Ore Establishment of Infrastructure Storage of ore stockpiles	Mining pits Ore stockpiles Processing plant Office Workshop Fuel storage Overburden/top soil stockpiles Internal roads Sediment control structures Tailings dams	Ilmenite Feldspar Phlogopite Muscovite Apatite Scandium Zircon

4.3. Background Land Tenures and Native Title

Most of the background land tenures to the proposed MLA are freehold tenures which extinguish native title. Sections of these freehold land tenures and areas surrounding the Burnett River have been acquired by BWPL to facilitate the progress of development for the Burnett River Dam. The beds and banks and tributaries of the Burnett River between approximately 131 km and 178 km AMTD were resumed on 4 September 2003 (refer QGG, No.4, September 2003), see Appendix 2.

The following native title claims in Table 3 overlap the area of the Wateranga Project.

Table 3 Native Title Claims

MLA	Native Title Claim Number	Native Title People
Central	QC99/33	Wakka Wakka
	QC 01/29	Port Curtis Coral Coast

There are three landholders affected by the proposed project as outlined in Table 4.

The nearest residence to the Central MLA is approximately 200m south of the southern boundary. However, this residence is in the inundation zone of the Burnett Dam and is scheduled for removal. The next nearest residence is approximately 1 km from the southwest boundary and is also to be removed. The surrounding country is sparsely populated, and the only nearby neighbour is Peter A Fletcher of 'Wateranga' Station who is 3 km to the southwest. Mr Fletcher has already relocated. There is no residential dwelling held by Edith Ryan in the near vicinity of the Project.

Table 4 Background Land Tenement Information – Wateranga Project

MLA Name	Background Parcel Description	Tenure Type	Landowner	Pre Mine Land Use
Central	Lot 6 on BN37319	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 7 on BN37319	FH	Jim, Fay & Chris Younger	low intensity grazing
	Lot 10 on BN37319	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 55 on BON974	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 62 on BON40	FH	Edith Elizabeth Ryan	low intensity grazing
	Lot 15 on BN37319	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 54 on BON603	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 18 on SP160099	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 9 on SP160099	FH	Jim, Fay & Chris Younger	low intensity grazing
	Lot 16 on SP160099	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 7 on SP160099	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 8 on SP160099	FH	Jim, Fay & Chris Younger	low intensity grazing
	Lot 4 on SP160099	FH	Jim, Fay & Chris Younger	low intensity grazing
	Lot 6 on SP160099	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 1 on SP160099	FH	Burnett Water Pty Ltd	low intensity grazing
	Lot 65 on SP160099	FH	Jim, Fay & Chris Younger	low intensity grazing
	Lot 66 on SP160099	FH	Jim, Fay & Chris Younger	low intensity grazing
	Lot 67 on SP160099	FH	Jim, Fay & Chris Younger	low intensity grazing

4.4. Environmental searches

4.4.1. EPA Database (Ecomaps)

Assessment of the EPA's Ecomaps database has confirmed that one significant and several smaller environmentally sensitive areas ("ESA") exist in the vicinity of the proposed MLA of the Wateranga Project. The significant ESA is the Goodnight Scrub National Park which carries a Category A classification. This National Park also hosts a number of Endangered Regional Ecosystems ("ERE") (v4 Biodiversity Status) which carry a Category B classification.

The eastern boundary of the Central MLA lies approximately 1 km west of the National Park boundary. In accordance with the Code of Environmental Compliance for Mining Lease Projects, January 2001, mining activities cannot be undertaken in, or within, 2 km of a Category A ESA, or in, or within, 1 km from a Category B ESA.

This National Park is located on the opposite side of a tributary (Kalliwa Creek) leading to the Burnett River. Upon completion of the Burnett Dam, the tributary and a section of the park will be flooded by the dam. As the Category A ESA is located on the opposite side of a natural drainage system to the proposed project area, there is minimal chance of any significant impact on the National Park by the proposed operation.

The only potential for adverse impact on the National Park by the Wateranga Project is dust from the operation. However, the material to be removed through excavation has a high natural moisture content, and therefore, dust produced through mining is expected to be minimal. In addition, due to the general prevailing wind direction from the southeast, any dust generated will be transported away from the National Park. These factors, coupled with the dust abatement measures proposed by the operation, suggest that the impact by the Wateranga Project on the National Park will be minimal to insignificant.

Although the Wateranga Project lies adjacent to the National Park, the benign nature of the geology and mining operations combined with the application of appropriate environmental management strategies and controls indicates that its close proximity is highly unlikely to have any significant impacts on this environmentally sensitive area.

Smaller EREs also exist in the southwestern portion of the MLA along the Kalliwa Road and are also scattered immediately outside and adjacent to the MLA boundary. Some of the EREs within the MLA will be disturbed by the mining process. However, it is also likely that these EREs will become inundated once the Burnett River Dam is inundated.

4.4.2. Environment Australia Database

QIM has undertaken a referral application to the Department of Environment ("DEH") and Heritage for the Wateranga Project. **On 11 December 2003, the DEH advised that the project was not considered a controlled action and an EIS was not required under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.** The decision made by the DEH is attached in Appendix 3.

4.5. BWPL Burnett River Dam Project

Significant discussions were held between Burnett Water Pty Ltd ("BWPL") and QIM prior to the dam project's commencement and the development of BWPL's EIS. Mutual consent and consideration between the parties regarding the proposed dam and mining operation development was established during these preliminary discussion stages.

The Burnett River Dam Project will involve the construction of a dam on the lower Burnett River at 131.2km AMTD. The Project is located approximately 20km northwest of Biggenden, and about 80km southwest of Bundaberg. It will affect an area (storage capacity) in the vicinity of 2,950 ha. Its catchment size is in the order of 14,017,000 ha.

The Project to be undertaken by Burnett Water Pty Ltd (ACN 097 206 614) was declared a significant project pursuant to the *State Development and Public Works Organisation Act 1971*. It was also referred to Environment Australia and was determined to be a controlled action. The project was assessed under an accredited assessment process and via an EIS which fulfilled the requirements of the State and Commonwealth Governments.

The EIS, which was released in September 2002, concluded that a dam was necessary to provide the Burnett region with the opportunity to increase its economic growth, reduce high unemployment rates and provide a sufficient, reliable water supply upon which the agriculturally driven community could depend.

At FSL, the dam will hold 300,000 ML of water. The dam will yield in the order of 130,000ML per annum, with water proposed to be used for agricultural, industrial and urban applications. The Project is expected to create 7,500 jobs and provide AUD$1.7 - 2.9 billion in economic benefits.

Dam wall construction commenced in 2003 and is expected to take two years to complete at a cost of $200 million. The main materials required for dam building will include concrete, rock, gravel, earth fill, clay and steel. Rock is expected to be sourced from nearby sites. Sand, clay and concrete aggregates will be sourced from borrow pits within the reservoir area. The expected completion date of the dam wall is November 2005. The reservoir will begin to fill as the dam wall construction progresses.

BWPL and QIM will continue to engage in discussions regarding the Project's development.

5. DESCRIPTION OF MINING ACTIVITIES

5.1. Geological Resource

The project area is situated on the Gabbro contained in the Wateranga layered ultramafic intrusive complex and another un-named separate but almost contiguous nearby Gabbro. The Wateranga Gabbro is dissected by the Burnett River thus creating a northern section, upon which the Central MLA is situated.

Unlike gold and base metals, these deposits exhibit a layered sequence and are relatively uniform in their distribution and nature. This is caused by lateral weathering of the underlying gabbroic host rock. The resulting alluvial, colluvial and eluvial material derived from weathering generally reflects the mineralogy of the host. For economic viability, these deposit styles depend on mineral quality and surface visibility.

The widespread nature of the visible mineralisation, the results of the assays and petrology tests from the various drilling and sampling programs together with the known geoscientific evidence from previous exploration data and the known extent of the underlying gabbro are sufficient to allow a reliable and systematic estimation of the ore potential particularly in the Central area and in the area south of the Burnett River.

All resource estimates have been undertaken by Semple Geological Services Pty Ltd and carried out by its principle, Mr David Semple, a duly qualified independent geologist. The resources have been calculated by Mr Semple in accordance with the *Australasian Code for Reporting of Mineral Resources and Ore Reserves 1999.*

The following extract has been taken from the Information Memorandum on Proposed Industrial Minerals Mine (QIM, July 2004):

“Calculations of the Wateranga Project, based on extensive drilling, and bulk sampling to date has confirmed a deposit of 142 million tonnes, in the unconsolidated section, of a Proved Reserve and Measured and Indicated Resource with a recovered grade of 5% Ilmenite and 20% High Alumina Feldspar (65 million tonnes are in the Proved Ore category). This equates to 7.1 million tonnes of Ilmenite and 30 million tonnes of Feldspar.

Other minerals shown to be present in the deposit include Scandium (at 30 grams to the tonne, equal to 4 million kilograms of contained Sc), Muscovite and Phlogopite occurs at approximately 16.6% for the combined products, which equates to 23.5 million tonnes, and Apatite at approximately 0.8% which equates to about 1.1 million tonnes. Zircon occurs as a minor by-product at 0.2% and equates to approximately 284,000 tonnes. Corundum is also known to occur in significant amounts at up to 18 kg per tonne. Rutile has been assayed at up to 0.46% and averages 0.1%.

The above identified resource is sufficient for a mine life in excess of 30 years at an annual production rate of 4.5 million tonnes, with the potential to radically expand production to whatever circumstances warranted. However only approximately 30% of the known mineralised section has been drilled and the final Ore Reserve figure, for the unconsolidated section, is expected to exceed 200 million tonnes down to an average depth of 4.5 metres.

It is anticipated that Wateranga will have an annual production from the unconsolidated section of approximately 225,000t of Ilmenite, 765,000t of Feldspar,

400,000t of Mica, 27,000t of Apatite along with other minerals with a combined gross value of approximately $150 million. Wateranga will also produce approximately 4 million ounces of contained Scandium annually.

In addition to the above Resource/Reserve Wateranga has an Inferred Resource of approximately 84 m/t grading 20% Feldspar, 4.3% Ilmenite, 10% Mica, 0.8% Apatite and 30 ppm Scandium. This brings the total Reserve and Resource, in the un-consolidated section, at Wateranga to 225 million tonnes with a grade of 4.8% Ilmenite, 20% Feldspar, 12% Mica, 0.8% Apatite and 30ppm Scandium."

"The hard rock section immediately below the unconsolidated section in what is now the northern part of the Wateranga **Proven Ore Body** has been tested with Diamond Drill Hole NS5. This hole was open hole without sample between 0 and 21 m, and between 21 m to 38 m assayed 4% apatite and between 38 m and 56 m assayed 11.2 % apatite. Grades averaging 15% ilmenite were received in the same interval 21 to 56 m.

It is anticipated that, upon the commencement of mining of this section of the hard rock, Wateranga will produce, an additional 200,000t of Apatite, 150,000t of Ilmenite and 600,000t of High Alumina Feldspar per year.

In addition to the above Hard Rock resource, the central core of the Wateranga Gabbro outcrops as a ridge 120 m above the eluvial surface. This ridge is 1600 m in length and averages 600 m in width. Surface sampling of this outcrop as well as diamond drilling of the gabbro has outlined an **Indicated Mineral Resource** for the hard rock deposit of 345 million tonnes with feldspar ranging in grade from 17% to 70%. The average recovered grade is 34.3% feldspar.

These grades are higher than the feldspar grades found in the eluvial deposits and equates to 111 million tonnes of Feldspar. Ilmenite grades, in this section of the Hard Rock, are lower than in the eluvial deposit, this hard rock returning 1% ilmenite and 33ppm Scandium. This area has not been assayed for Apatite or Mica at this stage although visual estimates of the Mica content are similar to the 10% assayed elsewhere in the deposit.

An arithmetic calculation of the gabbro down to a depth of 200 metres equals 21 billion tonnes at a minimum grade of approximately 35% high alumina feldspar. This equates to approximately 7.35 billion tonnes of feldspar containing approximately 2.57 billion tonnes of alumina (Al_2O_3). Diamond drilling has shown that the gabbro extends to a minimum of 350 metres in depth. Calculations using the dip of the layering suggest a depth of the gabbro in the centre of the deposit of at least 2000 metres."

5.2. Exploration and testwork history

The Wateranga deposit was identified by Mr John Goody (Goody Investments Pty Ltd) in December 2000. Extensive investigations into all previous exploration were carried out in the immediate area of Wateranga. This review was initially based on DNRM information which included drill assays, rock chip sampling, petrology and a very detailed airborne Helicopter Magnetic Survey of the area.

Three major mineralised zones were followed up which included two grab sampling programs, three drilling programs and bulk sampling programs. These programs targeted alluvial, colluvial and eluvial material from surface to 15 m depths of the Wateranga Gabbro. Exploration of the much larger potential hard rock resource of

the Wateranga Gabbro consisted of six diamond drill holes and a number of bulk surface rock assays, the results of which have been very encouraging.

Exploration was initially undertaken using hand augers to define the geology and mineral types. These programs were undertaken both north and south of the Burnett River in EPM 13278. The first drilling program comprised nine widely spaced drill holes to depths of 1 - 4m in the Central MLA, producing 23 samples for analysis. A further 10 holes from both the Central MLA and an area south of the Burnett River were drilled to 1.6 - 4.7m producing 34 samples for analysis.

In December 2002, a Reverse Circulation Drilling program produced a total of 1463.9 metres in 276 holes. 1500 samples were collected at one metre intervals from the surface through the eluvium, until the decomposed gabbro became too hard to penetrate. The uniform nature of the orebody and the uniform distribution of the mineralisation are such that a 200 m x 200 m drilling grid was employed.

Five grab samples have been taken and a bulk sampling program comprising 140 kg of randomly collected material from the northern part of the EPM was completed.

Significant assessment has been performed on all of the above samples, including assaying, X-ray Diffraction, Electron Microprobe, petrological and multi-stage circuit test programs.

5.3. Mining

The following information in Table 5 is an overview of the mining operation for the entire project in terms of staging, areas of disturbance, ore production levels, water, power and transportation. The ore throughput is the maximum throughput proposed at this time.

It is important to note that the mining operation staging process outlined below will be determined by water levels reached in the Burnett River Dam prior to mining. If the mining operation does not commence prior to inundation to the FSL, the proposed Stage One operation will not be able to commence and QIM will likely proceed with the Stage Two operation instead. If the opportunity arises during lengthy dry season events to exploit resources below the FSL, QIM will consider undertaking Stage One exploitation under these circumstances.

Table 5 General mining parameters – overview

Stage	Maximum disturbances in any one year	Extraction levels	Maximum Ore throughput	Maximum Water usage	Transport
1	186 ha	12.2 Mt p.a.	4.5 Mt p.a.	2,400 ML p.a.	100-150 trucks/day (100 tonne trucks)
2	109 ha	4.5 Mt p.a.	4.5 Mt p.a.	2,400 ML p.a.	75-100 trucks/day (100 tonne trucks)

The following staged approach outlines the strategy required to exploit the mineral resources within the Wateranga Project. This approach is required to accommodate timing constraints and allows the mining, stockpiling and processing of resources subject to inundation in Stage One. Stage Two mining and processing will only be employed as Stage One approaches completion, and as demand requires.

A complete assessment on areas of disturbance attributed to Stage One and Stage Two operations is shown in Table 6.

Table 6 Schedule Of Disturbance And Rehabilitation (Stage 1 and 2: over a 5 year period)

DESCRIPTION	Prior to commencement of this plan (Actual)	Year 1 * 2004/2005	Year 2*/** 2005/2006	Year 3** 2006/2007	Year 4** 2007/2008	Year ** 2008/2009
Mine excavation (pit)		To be disturbed: 72 ha	To be disturbed: 10 ha	To be disturbed: 20 ha	To be disturbed: 30 ha	To be disturbed: 30 ha
Ore stockpile		To be disturbed: Approx. 60 ha	To be disturbed: 50 ha	To be disturbed: 25 ha	To be disturbed: 15 ha	To be disturbed: 15 ha
Topsoil/Overburden stockpiles		2.0 ha	2.0 ha	2.0 ha	2.0 ha	2.0 ha
Waste stockpiles		Refer Assumptions below	Refer Assumptions below	To be disturbed: 5 ha	To be disturbed: 5 ha	To be disturbed: 10 ha
Rehabilitation Area (previous year disturbed)			To be rehabilitated 50 ha	To be rehabilitated 30 ha	To be rehabilitated 30 ha	To be rehabilitated 30 ha
Water supply dams		2.5 ha	2.5 ha	2.5 ha	2.5 ha	2.5 ha
Roads/tracks		5.0 ha	5.0 ha	5.0 ha	5.0 ha	5.0 ha
Plant area		2.0 ha	2.0 ha	2.0 ha	2.0 ha	2.0 ha
Workshop area (refer to plant)						
Fuel, oil & chemical storage/Camp (refer to plant)						
Settlement Pond/ stormwater dam		2.0 ha	2.0 ha	2.0 ha	2.0 ha	2.0 ha
Contaminated land						
Reject stockpile/ tailing dam		40 ha	40 ha	40 ha	40 ha	40 ha
Ore (product stockpile area)/concentrate		0.5 ha	0.5 ha	0.5 ha	0.5 ha	0.5 ha
Rehabilitation processes complete						
First year care & maintenance completed			25 ha (ore stockpile)	10 ha (ore stockpile) + 20 ha (pit))	30 ha (Pit)	30 ha (Pit)
2nd year care & maintenance completed			Reach final land use: 72 ha	25 ha (ore stockpile)	30 ha (Pit)	30 ha (Pit)
TOTAL DISTURBANCE		**186 ha**	**114 ha**	**104 ha**	**104 ha**	**109 ha**
Successfully Rehabilitated				25 ha	50 ha	50 ha

Notes:

- Year 1 disturbance ~ 186 ha. i.e initial mine excavation, ore stockpile, tailings dam, etc.
- Year 2 disturbance ~ 114 ha. i.e 166 ha + 10 ha (pre year 3 mine excavation) -72 ha (this land will reach its natural land use after flooding.
- Year 3 disturbance ~ 104 ha. i.e 114 ha + 20 ha (year 3 mine excavation) – 25 ha (rehabilitation of half ore stockpile)

- Year 4 disturbance ~ 104 ha. i.e 104 ha + 30 ha (year 4 mine excavation) – 30 ha (rehabilitated mining cells (pits) from year 3)
- From year 5, the area of disturbance will remain the same (119 ha) unless there is an increase or decrease in production.

Assumptions

1. 1 tonne of ore = 0.555m^3
2. 40% of ore is waste
3. 27.6% of waste is dry waste and available for rehabilitation
4. The total ore stockpile area is approximately 60 ha. 50 ha of the stockpile area will be temporary. This accounts for a stockpile height of 10m. These dimensions are only necessary in Year 1.
5. 25 - 50ha of ore stockpile will be rehabilitated starting from Year 2. The remaining 10 ha of ore stockpile will be become a permanent stockpile area for the plant.
6. 5 ha of the 50ha temporary stockpile will be reserved as a dry waste dump. Material from the temporary waste dump will eventually be used as backfill during rehabilitation.
7. The material stockpiled in the temporary waste dump will be a combination of processing waste and dry waste from the tailings dam.
8. Most of the voids areas created in Stage 1 (72 ha) will reach their final land use after mining due to flooding by BWPL.
9. Water requirement
   Annual or throughput = 4.5Mt/2.5 million m^3
   Total process water requirement/annum = 2,400 ML
   Makeup water dam @ 5m = 2.5 ha
10. Tailings dam
    Total Tailings Dump Capacity = 4.06 Mt/ 2.25 million m^3 for 3yrs (Stage 1)
    Since tailings will be used for backfilling from year 3, tailing dump space is required to hold 1.6 million m^3
    Approximate area required for a 5m tailing dump wall = 400000 m^2/40 ha
    This is divided into three part dumps:
    - Two 20 ha wet tailings dumps
    - Dry coarse waste will also be used for the initial backfilling of slopes in the Stage 1 operation

Therefore, the total tailings dam area is approximately 40ha. This comprises 2 tailings dams – each approximately 20 ha and separated by a 5m high dam wall). The average depth of each dam will be approx 5m. The capacity for each dam is 200 000 m3.

11. The plant area is estimated 4.0 ha.
12. The concentrate stockpile area is estimate 0.5 ha
13. 2.5 ha for make up water dam
14. Other stormwater dams and process water storage areas will cover an area of approximately 2.0 ha. An average depth of approximately 1m is proposed.
15. The amount of water used during operation is 2 400 m^3 (2,400ML). This will be sourced from surface water in Year 1. Successive years will source water from the Burnett River Dam. Where available, water will be collected and recycled for use in the operation. This will reduce the amount of water required from surface water sources.

5.3.1. Stage One

Due to the impact of the proposed Burnett River Dam, QIM are required to conduct mining operations on the Wateranga Project in two stages. Construction of the Burnett River Dam is expected to be completed by November 2005, however flooding will commence earlier as the wall is under construction. As such, to operate in a safe manner and to maximise the amount of ore salvaged prior to inundation, QIM propose to remove as much of the resources below the FSL (i.e. RL 67.6m) as possible by this date.

Approximately 12.2 million tonnes of ore in the Central MLA lie below the FSL. Accordingly, these ore resources will need to be rapidly exploited in Stage One of the operation.

The depth of the resource below the FSL averages 4.5m. To completely extract the resource below the FSL, QIM will mine 4m beyond the RL 67.6 m contour, see Figure 7a. This will enable an extra lift (mining bench) to be extracted beyond the FSL, thereby ensuring that all of the ore that has the potential to be inundated is removed. As the resource occurs at or near surface, overburden stockpiling is expected to be minimal which will minimise the total area of disturbance at any one time.

Ore will be removed in a series of cells where the previously worked cell will be rehabilitated while resources are extracted from the current cell. Each cell will be approximately one hectare in size. Mining activities undertaken during Stage One will be conducted as follows:

- Topsoil (approximately 0.15 m) will be stripped from the current cell and immediately re-spread over the cell being rehabilitated.

- The resources will be removed via an excavator and/or front end loader and placed into dump trucks for transport to the ore stockpile adjacent to the processing plant. Upon removal of the resources from the current cell, the sides and base of the cell will be re-contoured and appropriate erosion control structures installed, see Figure 7b.

- Topsoil and overburden stripping on the next cell will commence, at which point the removed topsoil from that cell will be immediately re-spread on the stabilised and re-contoured cell walls being rehabilitated.

- Areas not subjected to inundation above the FSL will then be re-seeded with appropriate vegetation to assist in re-generation and stabilisation of the site.

Due to the requirements to remove resources below the FSL by November 2005, short term disturbances created by the proposed activities during Stage One will be higher than would otherwise be required if this timeframe were not imposed upon QIM. QIM will endeavor to maintain the total (non-rehabilitated) disturbed areas subjected to extraction at any one time during the Stage One mining activities at an absolute minimum, and is expected to be no more than 20 ha.

The final land use for areas exploited during the Stage One operation is to be incorporated into the reservoir. Accordingly, complete backfilling of these voids with waste and tailings material will not be required. To stabilise the excavated areas, bunding, erosion and sediment control strategies will be incorporated along the perimeter of the workings.

As the void development will essentially meet its final land use (ie reservoir) upon ore extraction, only a small portion of the banks will remain unrehabilitated at any one time. Appropriate slope development and the distribution of the heavy waste fraction sourced from the Dry Process facility will be utilised to stabilise the dam banks. No water ponding will be permitted to occur in the void areas. The voids will be reshaped to ensure they remain free flowing in accordance with future fluctuating dam water levels. No organic material will be used in this process owing to the importance of maintaining dam water quality.

During Stage One, the resources of approximately 5.53 million cubic metres will be stockpiled to a height of 10 m on Central MLA. If processing occurs concurrently as it is expected to starting at approximately 1.5 - 2.5 Mt p.a., the maximum amount of stockpiled resource for the first 12 months of operation will only be in the order of 1.25 million cubic metres. Stormwater diversions and erosion control measures will be implemented around the stockpiles in accordance with standard mining and environmental practices. Any stormwater run-off from the stockpile will be directed into the process water dam where the water quality can be continually monitored. Any potentially contaminated water from the operation will be managed in a closed system and will flow into the environmental pond.

Table 7 outlines the mining volumes and tonnages expected from Stage One of the project development.

Analysis of the drill samples collected by QIM indicates that the ore has minimal potential to produce hazardous leachates. These sample results show the natural background levels of a number of elements within the host rock types of the Wateranga Project ore resources. Laboratory results are located in Appendix 4.

A series of tailings dams will be constructed adjacent to the processing plant. These tailings dams will be used to store tailings material and reject from the magnetic separation plant from the processing of the Stage One ore stockpile. Based on the expected size of the ore stockpiles and the expected percentage of reject material produced by the processing plant, the tailings dams will be constructed to contain a maximum capacity of 2.25 million cubic metres of tailings/reject material. Each tailings dam will have a wall height less than 5 m high and a capacity of less than 500 ML. None of the dams proposed will exceed referable dam criteria.

Any material generated from Dry Plant processing will not report to the tailings dams. It is expected that the dry waste material will be used immediately for rehabilitation purposes (ie stabilising re-contoured cells), and any excess material will temporarily be stored in the area pre-disturbed by ore stockpiles. An area up to 5 ha has been allowed for this purpose.

On completion of the ore stockpile from the Stage One mining operation, the Stage One tailings will be used for the Stage 2 operation.

Figure 8 outlines the proposed mining operation and mine plan layout for Stage 1.

Table 7 Stage 1 Mining Volumes and Disturbances

Maximum Void Disturbance (ha)	Volume removed from void cell (m^3)	Total Tonnage removed / annum (for Stage1) (Mt)	Ore throughput / annum (Mt)	Concentrate produced in wet processing/ Annum (Mt)	Waste delivered to tailings dam / annum (Mt)	Waste generated in total / annum (Mt)
Depth • Central MLA: 4.5m Area of void (Disturbance) • Central MLA: ~ 0.72 million m^2 (72ha)	Total Void • 4.5 million m^3 • 100 cells Single cell size • 10,000 m^2 • 1ha	Total tonnage Central MLA: • 12.2Mt • 6.78 million m^3	• 4.5Mt • 2.5 million m^3	Per Annum • 2.7Mt / annum • 1.5 million m^3	Total Waste Wet • 1.5Mt • 0.83 million m^3 Total Tailings Dam Capacity • 4.06Mt • 2.25million m^3	Total Waste Wet + Dry • 1.8Mt • 0.999 million m^3 Dry Waste • 0.3Mt, or • 0.1665million m^3

Assumptions

16. 1 tonne of ore = 0.555m^3
17. 40% of ore is waste
18. 27.6% of waste is dry waste and available for rehabilitation
19. The total ore stockpile area is approximately 60 ha. 50 ha of the stockpile area will be temporary. This accounts for a stockpile height of 10m. These dimensions are only necessary in Year 1.
20. The remaining 10 ha of ore stockpile will be become a permanent stockpile area for the plant. 5 ha of the 50ha temporary stockpile will be reserved as a dry waste dump. Material from the temporary waste dump will eventually be used as backfill during rehabilitation.
21. The material stockpiled in the temporary waste dump will be a combination of processing waste and dry waste from the tailings dam.
22. Most of the voids areas created in Stage 1 (72 ha) will reach their final land use after mining due to flooding by BWPL.
23. Tailings dam
    Total Tailings Dump Capacity = 3.81 Mt/ 2.1 million m^3 for 3yrs (Stage 1)

Therefore, the total tailings dam area is approximately 40 ha. This comprises 2 tailings dams – each approximately 20 ha and separated by a 5m high dam wall). The average depth of each dam will be approx 5m. The capacity for each dam is 250 000 m3.

24. The plant area is estimated 2.0 ha.
25. The concentrate stockpile area is estimate 0.5 ha
26. 2.5 ha for make up water dam
27. Other stormwater dams and process water storage areas will cover an area of approximately 2.0 ha. An average depth of approximately 1m is proposed.
28. The amount of water used during operation is 2 400 m^3 (2,400ML). This will be sourced from surface water in Year 1. Successive years will source water from the Burnett River Dam. Where available, water will be collected and recycled for use in the operation. This will reduce the amount of water required from surface water sources.

5.3.2. Stage Two

The Stage Two mining process is similar to that detailed in Stage One with the following principle differences:

- Stage Two mining activities will only be conducted on the areas above the FSL of the Burnett River Dam.

- Upon removal of the resource from the current extraction cell, the ore will be immediately processed, and tailings produced from that ore will be placed directly back into the rehabilitation cell upon de-watering.

- Due to the percentage of the original material removed from the gravity separation stage of the processing plant, and taking into account the swelling factor of the de-watered tailings (approximately 30%) and the ability to supplement the Stage Two tails from Stage One tails stockpile, the final land form of the rehabilitated cell will be approximately equal to the existing surface level.

- To remove a large percentage of the remaining moisture in the tailings, a lucerne crop will be planted in each rehabilitated cell as an initial ground cover. The lucerne crop will effectively stabilise the landform by removing a large percentage of the remaining water, increase the nitrogen levels in the soils and provide valuable stockfeed for livestock.

- Upon completion of the lucerne crop, a final vegetation cover species mix will be sown. The re-growth on each cell will be monitored and maintained as necessary to ensure the area re-generates to meet the appropriate sign-off criteria.

- For the tailings dams and other areas which have been mined, final land uses will be determined and may include any of the following activities:

    - Commercial timber production
    - Vineyards
    - Orchards
    - Grazing

- The total area of disturbance as a direct result of extraction activities during the Stage Two mining activities will be less than those of Stage One and is expected to not exceed 15 ha at any one time.

Commencement of the Stage Two mining operations will not occur until such time as the ore stockpiles from the Stage One mining operation are almost exhausted and as demand requires. Based on the expected commissioning date of the processing plant and the annual production figure, the Stage Two mining operations are not expected to commence until at least 2006.

All clean stormwater will be diverted around the stockpiles and any stormwater draining from the ROM pad will be directed to the process water dam which will be part of the regular water monitoring program.

For the Stage Two mining activities, tailings produced by the processing of ore will be pumped back into the cell being rehabilitated at that time. Before being placed into the rehabilitation cell, the tailings will be de-watered. Upon completion of extraction and processing operations on the current extraction cell, the cell being rehabilitated, (i.e. containing the tailings from the current cell) will be re-contoured and the top soil

stripped from the new extraction cell will be immediately re-spread over the rehabilitated cell.

Re-vegetation strategies to be used in the rehabilitation of Stage Two mining activities cells was detailed in previous sections.

Figure's 9a and 9b outlines the proposed mining operation and mine plan layout for Stage Two.

5.3.3. Ore Treatment

The Central MLA will host the processing plant, ore stockpiles and tailings dams, see Figure 10.

Reference should be made to Figure 9a for the location of the processing plant and other required infrastructure within the Central ML following inundation of the reservoir.

A flowchart of the processing plant is shown in Figure 11. The processing plant requires gravity and mineral separation plants. These are described as follows.

a) Gravity Separation

The first stage of the processing plant will include a water gravity separation stage to extract heavy mineral concentrate from the un-mineralised fraction. Based on a total annual expected production rate of 4.5 million tonnes (2.5 million cubic metres) per annum for the entire project, and an expected water usage of 1,000 litres per cubic metre of ore, the daily water requirement for the gravity separation plant is in the order of 6,848 cubic metres.

The tailings are expected to be free draining. Approximately 50% of the decanted water from the tailings dam will be recovered and recycled in the plant via the process water dam. In addition, water recovered from stormwater dams during wet periods will be recycled through the plant. Accordingly, 66% of the makeup water required for processing is expected to be sourced through recycling of recovered water. This will therefore reduce the demand on other water resources during Stage One.

Following the flooding of the reservoir by BWPL, should the stockpiled resources on Central MLA be depleted and there is sufficient demand for product, Stage Two mining will commence.

Prior to completion of the Burnett River Dam, process water will be extracted directly from the Burnett River via an appropriate authority under the *Water Act 2000*. Investigations with the DNRM indicate that this may entail approaching existing water holders to obtain an allocation, or gaining a temporary usage allocation through Sunwater. Other water sources are currently being investigated. Subsequent to the completion of the Burnett River Dam, water will be extracted directly from the dam via an agreement with BWPL.

b) Mineral Separation Process

The concentrate produced by the gravity separation process will be dried prior to passing through a magnetic separation circuit. Reject material from this process will be placed into the tailings dam in the case of the Stage One mining operation or back

into the rehabilitation cell in the case of the Stage Two mining operation. Mineral concentrate produced from the gravity separation process will then be placed into covered and bunded stockpiles awaiting Dry Plant processing.

Power for the mining operation and processing plant will be supplied by local sources. The initial operation will only require one source of power to the Central MLA. Power supply options are currently being investigated.

Current estimates indicate that the plant will process up to 4.5 million tonnes of ore per annum. This is expected to produce approximately 2.7 million tonnes of mineral concentrate per annum. This concentrate will be then be passed through a secondary processing plant (Dry Plant) comprising two separate circuits. One is the Ilmenite Circuit, the other is the Feldspar Circuit.

c) Ilmenite and Feldspar Circuits (Dry Plant)

Ilmenite Circuit
The concentrate from the wet plant is passed through a classifier to remove the Muscovite. The remainder of the concentrate is then dried and passed through IR Magnets to extract the magnetic fraction which is then processed further through various electrostatic devices to produce an Ilmenite Product and Tails. The non-magnetic fraction is then passed across tables which produces an Apatite Product and Tails. All the tails are then returned to the mine pit.

Note: At a later date the tails from the electrostatic stream may undergo further treatment to extract Scandium. This will involve a third stage processing plant and will be addressed by a separate Environmental Authority application.

Feldspar Circuit
The concentrate from the wet plant is passed through a classifier to remove the Phlogopite. The remainder of the concentrate is then dried and passed through IR Magnets to extract the magnetic fraction. The non-magnetic fraction is the Feldspar product. The magnetic fraction is the Tails. All the tails are then returned to the mine pit.

Note: The same circuits as those indicated above will be utilised in the processing of apatite and mica. In addition, at a later date the tails may undergo further treatment to extract Scandium. This will involve a third stage processing plant and will be addressed by a separate Environmental Authority application.

d) Recent Bulk Sample

Recent work carried out by Mr Goody and the Independent Geologist on the periphery fraction of the one and a half tonne bulk sample processed at Roche MT has confirmed that the recovered grade of ilmenite may exceed the head grade estimated in the drill sample.

The feldspar recovery from this bulk sample, although not optimised (this was the first pass) has already exceeded the planned sales volumes for the first 20 years. Further, a mica concentrate has been produced and is being sent to a mica specialist for further optimisation.

All the results of the bulk sample processed to date confirm that the mineral processing techniques contained in QIMs model are not only appropriate but, as a

result of the actual recoveries of the minerals to date, appear to be well in excess of QIMs expectations.

QIM is currently in negotiations with a major international engineering and construction company in respect of all aspects of the mine's technical and logistic requirements.

5.3.4. Water Management and Supply

The primary water requirement for the Wateranga Project will be for the gravity separation component of the mineral processing plant. Based on laboratory tests of the drill samples extracted by QIM, estimates indicate that approximately 700 – 1,000 litres of water will be required to process one tonne of ore. This will equate to a total water consumption requirement of approximately 1,575 - 2,250 mega litres per annum, assuming 50% return from tails water. For the operation, QIM will, as much as possible, use recycled water including the utilisation from water collection points within the MLA.

Water will also be required for dust suppression, domestic use and re-vegetation operations. These activities only have minor water requirements in comparison to the processing plant requirements. Total water usage for the secondary activities is not expected to exceed 150 mega litres per annum. Therefore the estimated annual water requirement for Central MLA (at 2.4 mega tonnes per annum) is approximately 2400 mega litres.

The water requirements for the Wateranga Project are expected to be met and supplied from the following sources:

- Use of existing water licences within the area (to be used before the Burnett Dam is completed).
- Extraction from the Burnett River/Burnett Dam pursuant to appropriate approvals.
- Recycled water from treatment and processing plants.
- Stormwater captured from various stormwater diversions and stormwater dams within the project area.

Consultation with the Department of Natural Resources, Mines and Energy in Bundaberg has indicated that gaining access to water for at least the first 12 months of operation may potentially be sought, via either an existing water allocation licence, or upon application with Sunwater to gain a temporary water usage permit. Other water resources will also be investigated to supply the operation with sufficient water to meet processing needs.

Preliminary discussions held earlier between QIM and BWPL indicated that future allocations of water for the mining project could potentially be sourced from the Burnett River Dam upon its completion. QIM will potentially be a major client of BWPL for the supply of water to the mining project.

5.4. Transportation and Off-Site Activities

5.4.1. Transportation

Transportation of ore within the MLA will be by dump truck and front end loaders.

The size and type of trucks used to transport concentrates away from the site will be subject to discussion with appropriate authorities governing road usage and haulage limitations. However it is proposed that transportation of concentrates from the site may be undertaken by Semi Trailer and/or B Double trucks. Concentrates would be transported by this method for delivery to Bundaberg via either:

- Option 1: the Gayndah-Mt Perry Road, traveling north to Mt Perry, through Gin Gin and then to Bundaberg; or,

- Option 2: Building a new road from the mine site to Bruce Highway - and then along the Bruce Highway to Gin Gin – West Bundaberg and then to the Port.

Preliminary discussions have been held with the relevant shire councils on this issue. The Department of Main Roads, Department of Transport and Queensland Rail are being consulted, and transport study has been completed. Figure 12 outlines the main transport routes. However, it should be noted that the exact location of the Option 2 route is yet to be decided and therefore, it is marked only for the purposes of providing an approximate guide.

At a later date consideration would be given to other potential transportation options.

5.4.2. Power

The Central MLA is about 5 km from the main existing trunk power line. This powerline is subject to relocation by BWPL as a result of inundation. Further discussions with Ergon Energy and an assessment will be required to determine the most appropriate source and location of power for the operation.

5.4.3. Accommodation

The estimated full time work force for the stage one mining activities is not expected to exceed 100 full time on-site personnel. Upon completion of the Stage One mining activities, the workforce may decrease to approximately 80 full time on-site personnel where processing activities-only will be conducted until such time as the ore stockpile is reduced.

Upon commencement of the Stage Two mining activities the workforce will rise again to approximately 100 full time on-site staff.

Most on-site staff will be accommodated in local townships with only security staff accommodated on site.

6. ENVIRONMENTAL CONSIDERATIONS

6.1. Potential Impacts

Table 8 identifies the values, potential impacts and proposed management strategies for each of the key environmental parameters of the Wateranga Project.

An assessment has also been performed on the BWPL EIS and compared with the expected environmental impacts of the Wateranga Project. The results of this assessment are included in Table 9.

The EIS comparison assessment identified the similarities and differences between the two projects, and where additional information may be required to verify environmental impacts of the Wateranga Project. The conclusions drawn indicate that the following assessments to account for the Wateranga Project development are likely to be required:

Assessment Type	Current Status
• Local road transport infrastructure impacts	Completed
• Socio-economic impacts	Completed
• Identification of suitable power supplies	Completed
• Land impact assessment (soils and flora)	Completed
• Erosion, sediment control and waste water management assessment	To commence shortly
• Water source impacts	To commence shortly
• Cultural heritage assessment	To commence shortly

Overall, there is significant useful information which can be utilised and drawn from the EIS and incorporated into environmental documentation for the Wateranga Project. Information is currently being sought and field studies have commenced where existing data is deficient or not directly applicable to this project. The extent and type of additional information required is being determined in consultation with specialist environmental sub consultants where relevant. In addition, contact with the traditional owners has been initiated to facilitate cultural heritage studies and the development of a Cultural Heritage Management Plan.

It is important to note that QIM has established good relations with the parties affected by the Project identified to date. It is the company's intent to ensure good relations continue to be fostered with all stakeholders and parties associated with, and affected by, the development. QIM also recognises that compensation, as part of the Mining Lease Application process, will need to be addressed prior to grant of tenure.

This information will be incorporated into an EIS by QIM, and will also be reflected in the Environmental Monitoring Overview Strategy ("EMOS") and Plan of Operations ("PoO"), as per the requirements of a Non Standard mining project and Environmental Authority.

6.2. Post-mining land uses

Through sound mine planning and management, long term sustainable uses and applications for the Wateranga site post-mining can be implemented. These uses will have considerable financial benefits to the local community and landholders and will markedly improve the current land use of the site.

Environmental planning aspects for consideration which can be implemented following exhaustion of resources at Wateranga will include forestry applications, intensive agricultural uses such as vineyards, orchards and intensive grazing and permanent dam development, and terraced landforms.

In particular, landholders such BWPL will reap downstream financial benefits from these sustainable development concepts through the sale of water from the Burnett Dam.

6.3. Other

The Wateranga Project will be the subject of an Environmental Management System (EMS) to ISO 14001 standards. Part of this system and company approach will be the training of all onsite personal,

The plant site will be a closed system. The immediate plant site will be contoured to promote the reporting of water to an environmental dam adjacent to the operations. Clean water will be diverted around the plant site. Accordingly, throughout the site there will be a number of spill kits, for potential hydro-carbon spills.

An example training programme is included in Appendix 5.

Table 8 Environmental Considerations for the Wateranga Project

Parameter	Description of values	Potential Impacts	Proposed Control Strategies
Air	▪ Agricultural environment ▪ Cane burn-off during harvesting ▪ Low vehicular emissions ▪ Low human population. Closest residence 1 km southwest of operation ▪ High intensity rainfall events ▪ Southeast wind direction	STAGE 1 ▪ Increased dust impact due to volume of material moved and vehicle movements STAGE 2 ▪ Minimal dust emissions from excavation, screening, stockpiling, loading and transport activities	▪ Obtain baseline data from BWPL EIS ▪ Dust monitoring ▪ Wetting of exposed areas and watering of haul roads ▪ Rapid/progressive reinstatement of disturbed areas to stabilise soils and prevent dust emissions ▪ Immediate re-seeding to establish a rapid vegetation cover ▪ Speed limiting of haul trucks. ▪ Route haul routes away from ESA's ▪ Place stockpile within natural topographic depressions to minimise wind erosion
Water	▪ Surface water ▪ Groundwater ▪ Refer to EIS	SURFACE WATER ▪ Increase in turbidity and sedimentation ▪ Very low concentrations of S, Cd, As, Sb, Pb impacts ▪ Excess stormwater GROUND WATER ▪ Shallow depths of excavation are expected, and therefore no groundwater resources will be intersected	▪ Capture dirty stormwater before overflow after major rainfall events ▪ Initiate monitoring protocols ▪ Investigate any exceedence of contaminant trigger levels identified through monitoring ▪ Divert clean stormwater to drainage lines ▪ Install environmental ponds to capture run-off from plant area
Noise and Vibration	▪ Remote rural location ▪ Background noise levels in the range of 30 dBA to 40 dBA. ▪ Noise attributed to vehicles, cattle, dogs and agriculture	▪ Impacts dependent on nature of operations, proximity to noise sensitive receptors, climatic conditions and geographic factors ▪ Emissions from excavation using earthmoving equipment ▪ Emissions from haul trucks and light vehicle traffic on public roads	▪ Use appropriate technology and equipment ▪ Use mufflers and noise silencing equipment on all machinery ▪ Route internal and external haul trucks away from noise sensitive locations ▪ If required, haulage will only be undertaken during daylight hours

Parameter	Description of values	Potential Impacts	Proposed Control Strategies
		▪ Stage 1 haul road traffic – 100-150 trucks per day ▪ Stage 2 haul road traffic – 75-100 trucks per day ▪ Emissions from processing plant ▪ Operating hours to vary between 7am-6pm, 6 days per week, to 24 hrs per day, 6 days per week	▪ Perform excavation activities only during daylight hours ▪ Maintain a complaints register
Land	▪ No significant flora or fauna species and/or plant associates identified within the project area ▪ Altered landscape surfaces attributed to farming ▪ Minimal shrub development ▪ Grassland and scattered eucalyptus with small woodland areas Located on the opposite side of the Kalliwa Creek: ▪ A Category C ESA - Goodnight Scrub Resources Reserve 300m east of the eastern boundary of Central MLA. A significant portion of this ESA will be flooded by the dam ▪ Category B ESA – Endangered Regional Ecosystem 1 km east of the eastern boundary of Central MLA ▪ Category A ESA – Goodnight Scrub National Park 700 m east of the eastern boundary of Central MLA	▪ Clearing of vegetation ▪ Alteration of landforms ▪ Material and waste storage ▪ Alteration of drainage ▪ Temporary displacement of existing landuse ADVERSE IMPACTS Potential adverse impacts to existing land values may occur as a result of: ▪ Land suitability changes. ▪ Land use changes. ▪ Land contamination. ▪ Land instability. BENEFICIAL IMPACTS ▪ Improved land capability through improved vegetation rooting medium and post mine vegetation species cover. ▪ Increased water storage capacity of Burnett river dam by up to 5,000,000m^3	▪ Determine appropriate landform design. Landform design will emulate natural slope and drainage systems characteristics in the project area. Design will include natural and engineered structures to minimise erosion and stabilise final landforms ▪ Re-use stripped topsoil immediately on previous excavation cell or temporarily stockpile in windrows ▪ Rehabilitate and revegetate disturbed areas to self-sustaining/stable landforms as identified in the post mine landuse ▪ Re-vegetate disturbed areas with appropriate species selected through consultation with EPA and landholder
Waste	▪ Small volume of waste generation by Biggenden township ▪ Burnett Shire Council landfill capable of accepting general and construction wastes,	▪ No hazardous chemicals or wastes indicates low impact on general and regulated wastes ▪ Potential contamination arising from accidental spillage or leakage of petroleum products,	▪ Develop and maintain a Waste Management Plan ▪ Develop a complaints register – record and act upon all complaints

Parameter	Description of values	Potential Impacts	Proposed Control Strategies
	and some regulated wastes	salinity, or leaching of trace materials	▪ Minimise wastes ▪ Waste recycling and treatment
Community	▪ Visual aesthetics ▪ Low economic growth ▪ High unemployment ▪ Refer EIS	BENEFICIAL IMPACTS ▪ Significant social and economic benefits to the local district. ▪ The local economy will benefit from employment, payment of rates and the injection of workforce, income, and project expenditure for supplies, food, entertainment and other needs. ▪ Estimated potential mineral royalty of $11 million per year ▪ Estimated tax payable of $47 million per year ADVERSE IMPACTS ▪ Visual aesthetics ▪ Nuisance via increased noise levels ▪ Nuisance via increased dust levels	▪ Manage the project to avoid negative impacts on the community during and after mining ▪ Minimise exposure of the public to hazards from the operation and post mine landforms through restriction of access ▪ Establish and maintain a complaints register ▪ Development/implement procedures to address complaints

Table 9: Assessment of Burnett Water EIS and its application to the Wateranga Project

EIS: Activity and Impact	EIS: Area of Impact outlined (Burnett Water Pty Ltd - BWPL EIS) *	QIM EMOS-ML: Expected Operational Impacts	Differences/Similarities of the Projects
Impacts on Infrastructure: Existing Infrastructure • Roads and Bridges • Rail • Power and Telecommunication Required infrastructure • Transportation • Accommodation	Gayndah – Mt Perry Road bridge crossing (Mingo crossing) of the Burnett River upstream of the QIM MLAs will be inundated at full supply level. A number of local roads and farm tracks near the river, and several causeway crossings of the Burnett River and tributaries will be affected. The construction of the dam will affect some power and telephone lines as a result of inundation. They will require replacement and realignment. The nearest rail line (Monto line) will not be affected by the dam project.	Will not impact on any major road. May affect a few tracks mostly in the southern MLA. Roads will be used for access to site and transportation of products (concentrate) off site to consumer/customers. No impact on rail line (Monto line) is expected. However, this could be used for concentrate transportation to port. Power or electricity supply issues have not been addressed. Drying of products (concentrate) in the processes plant may require a significant amount of energy. The absence of a gas pipe line near the mine may increase the operational cost of processing. Accommodation will be in local townships. No requirement for major site waste disposal facility is required.	Both projects will utilise similar facilities and local infrastructure (roads, water supply, etc.). Road upgrades by BWPL will be beneficial to both QIM and the local community. A high capacity - low volume traffic network was identified in the BWPL EIS. This implies comparatively less impact from the mining activity on the road network. However, it is estimated that the use of the Isis Highway may increase by 5%. Distance from the mine to the nearest power supply may change due to realignment of the power line. The energy requirements for the project should be quantified. These impacts should be identified and addressed in the EMOS. *An assessment of power supply and road impacts on local roads attributed to the QIM mining operation should be undertaken.*
Physical Environment: • Climate • Topography • Geology • Soils	Climate, topography, geology and soils information has been adequately dealt with in the EIS and is directly relevant and applicable to the QIM project. Potential impacts identified include erosion, sedimentation, contamination from previous mining sites, grazing and cattle dips. Some of these impacts will apply to the QIM project.	The operation will affect the topography and soil distribution within the mine site. Potential impacts may include erosion and sediment control. Acid mine drainage not expected due to nature of soils. Leachate from trace minerals may occur.	Climate has been adequately addressed in the BWPL EIS and information can be extracted directly because it is representative of the existing climate in the Wateranga Project area. The same data and source can be used to analyse climate of both sites. Topography and soil issues should be addressed in depth in the QIM EMOS. However, topography and soil changes are not that significant compared to the changes that will occur post dam construction.

EIS: Activity and Impact	EIS: Area of Impact outlined (Burnett Water Pty Ltd - BWPL EIS) *	QIM EMOS-ML: Expected Operational Impacts	Differences/Similarities of the Projects
			QIM geological information should be adequate for the purpose of an EMOS. *The studies completed in the EIS can be used for the QIM project.*
Land: • Land use and tenure • Conservation • Planning controls • Land use and Planning Impacts	There will be a significant loss of agricultural land as a result of dam development. A significant portion of the Goodnight Scrub National Park will be affected by inundation at full supply level. Flooding will also significantly reduce the QIM project site area and will impact on 10% of the project resource. Total catchment area is 14,017,000 ha Total reservoir area of the BWPL dam project is 2,950 ha Impacts from noise, dust and ground vibration are also expected to affect land value.	The QIM project will impact on land. The impact of Stage One of the project is within an area that will be inundated by the Burnett dam at full supply level. Without prior extraction, the resource will be sterilised by flooding of the reservoir. Total area covered by the QIM project is in the order of 1,800 ha. Most of the disturbance area due to Stage One mining activities will increase dam capacity marginally and increase the value of the available mineral resource. Hence, the mining activities will be complimentary to the dam activities. Activities as a result of Stage 2 mining operations will impact on grazing land which has been previously cleared for this purpose. Post-mining land uses include grazing, vineyards, orchards and forest plantations.	Similar land issues are envisaged for both projects although the size of affected land will be different. The size of the QIM project is significantly smaller than that of the BWPL dam and therefore the broad scale of the BWPL EIS is not directly applicable to that of QIM project. However, it is potentially justifiable that the BWPL dam project significantly nullifies the land impact issues of the QIM project. *Land capability studies will need to be conducted for the QIM Project.*
Water: • Existing Surface Water Quality • Existing Groundwater Quality Water Resource • Existing surface water • Impacts on surface water	The issues and impacts on water quality assessed in the EIS are different to those of the QIM project. The purpose of the dam is to provide a significant increase in water supply for agricultural, industrial and urban use. The water licences required for the BWPL dam project are not applicable to the QIM project. Surface water usage for the QIM project will require	Impacts on the surface water are probably limited to an increase in turbidity and sedimentation issues. Hazardous leachate is not expected and is verified by laboratory testwork on the host rock and ore. No impacts on groundwater are expected from the QIM project. This is because of the shallow excavation required and the rarity of perched water tables in the area. Some	Impacts from the two projects will be different. However, the QIM project will depend on the Burnett River dam for most of its process water. Inundation by flooding of the dam will effectively sterilize a significant portion of the identified mineral resources of the Wateranga project. There is adequate water supply for the operation from both the Burnett River and the Burnett River Dam, subject to obtaining the

EIS: Activity and Impact	EIS: Area of Impact outlined (Burnett Water Pty Ltd - BWPL EIS) *	QIM EMOS-ML: Expected Operational Impacts	Differences/Similarities of the Projects
	application to existing holders of water licences or Sunwater to obtain sufficient water for the Wateranga project prior to the flooding of the reservoir. The *Water Resources Act 2000* is applicable to both the BWPL dam and QIM projects.	additional information on groundwater may be necessary. There are adequate water supplies for the QIM operation without interfering with the local water supply. An agreement with BWPL will be necessary to source water from the Burnett River Dam. *Water Resources Act 2000* is applicable.	appropriate agreements or licenses to extract water. Erosion and sediment control will be required to ensure no turbidity or sedimentation impacts on the dam from the QIM project. *Suitable control strategies will be proposed in the EMOS and PoO.* *Assessment on water supply is required to identify holders of water allocations including, consultation with Sunwater and BWPL.*
Air Quality	Background air quality for the entire EIS area is representative of the QIM site. The air quality of the area has been adequately assessed in the EIS. The goal is to meet the requirements of the Queensland EEP (air) quality standards.	Impact on air quality will occur during normal mining operations. This section of the EMOS has been extracted from BWPL EIS. The distance of the operation from the closest occupied residence and low population density will minimise the impacts. Also, the predominant wind direction will limit the impacts on the adjacent National Park. The predominant wind direction is from the southeast.	Both operations occur in similar environments and will be initially undertaking activities that have the potential to cause minimal dust emission (eg. excavation, screening, stockpiling, loading and transportation). However, it is expected that the size of the dam construction and operations will initially have a greater environmental impact than the QIM operation, although it will only occur on a short term basis. Air quality issues identified have been adequately addressed in the BWPL EIS. *No further data collection is warranted. The EIS information can be utilised in the QIM EMOS.*
Noise & Vibration Impacts	Background noise levels are similar to that of QIM site. Anticipated noise from dam operation will be over and above that on the QIM site. Noise issues have been adequately addressed in the EIS. Therefore, it is appropriate for QIM to adopt similar control measures.	This section of the EMOS has been extracted from BWPL EIS. It is envisage that noise levels will be within 5dB (A) of background for most residents.	Both operations have similar activities and environment that have the potential to generate noise. However, it is expected that the size of the dam construction and operations will have more short-term noise impacts than the QIM operation. The air quality issues identified have been adequately addressed in the BWPL EIS. *The data from the BWPL EIS can be incorporated into the QIM EMOS. Information on noise impacts caused by transport, earthmoving equipment and the processing plant will be required in the EMOS.*

EIS: Activity and Impact	EIS: Area of Impact outlined (Burnett Water Pty Ltd - BWPL EIS) *	QIM EMOS-ML: Expected Operational Impacts	Differences/Similarities of the Projects
Flora and Fauna: • Flora • Fauna	Impacts on vegetation except within the Goodnight Scrub park is not expected to significant because the landscaped and vegetation has been significantly altered by land clearing and grazing and orchards. The national park will be partially inundated at supply level. At Q100 flood level, an estimated area of 459.6ha will be inundated. Comprising of 61.5ha of national park and 398ha of resource reserve. Estimated area of vegetation that will be impacted is 668ha including a significant part of the QIM project area. The river habitats will significantly altered after the construction of the dam. The BWPL EIS covers the QIM site. Therefore flora and fauna information in the BWPL EIS is applicable to the QIM site.	Flora and fauna issues have not been addressed in the QIM EMOS. Some of the issues raised in BWPL EIS (eg impacts on vegetation, fish, turtle, etc) are applicable at a small scale and can be adopted for the EMOS	Similar flora and fauna exist on both sites. Although the impact in the case of the Burnett dam project is on a comparatively larger scale, the Environmental Management Plan (EMP) in the EIS will be applicable. Strategies and actions to mitigate the impacts on flora and fauna in the EIS are can be transferred to that of the QIM project at a much smaller scale. *The flora/fauna studies in the EIS are applicable to the QIM project.*
Visual Impacts	The dam wall is approx. 40m in height and 220m wide, embankment approx 100m in high 800m long, watercourse 35 to 60m wide and sloping banks 10 to 40m high. The change will be significant, affecting QIM as well.	Very small impact is expected compared to that of the dam project. The mining project is not located near frequently used public roadways, and therefore, visual impacts are reduced. May have visual impacts if the project is visible from relocated residents. Potentially one landholder will be directly affected.	No objections were raised in the BWPL EIS with regards to visual amenity. Although mining will impact on the environment, it should not be a major issue. *Additional studies are unlikely to be required.*
Waste Water Management	Waste management issues associated with the dam development have been assessed in the EIS on a much larger scale than is necessary for the QIM Project.	There is limited potential for land contamination from spills, leaching of trace metals, salinity etc. Large quantities of benign waste product will be produced from	Waste water issues of the BWPL EIS do not apply directly to the QIM project except in land clearing along the flood areas. *Waste water issues in the QIM EMOS will require additional*

EIS: Activity and Impact	EIS: Area of Impact outlined (Burnett Water Pty Ltd - BWPL EIS) *	QIM EMOS-ML: Expected Operational Impacts	Differences/Similarities of the Projects
		processing.	*information.*
Hazard and Risk	The risk aspects of the dam are considerably different to those risks associated with the QIM mining project.	This aspect has not been addressed in the EMOS. Hazard/risks should be assessed in the EMOS and concerns addressed.	This section of the BWPL EIS does not apply to the QIM project. This aspect needs to be fully addressed in the QIM reports (EMOS, etc.). Hazards and risks for the dam construction period and post-construction are envisaged to be much higher than those for the QIM project. *Assess risks and hazards for the QIM project.*
Cultural Heritage	Has been assessed by BWPL but is only applicable to a portion of the QIM site. However, BWPL activities (inundation) may impact on the QIM project (eg. the inundation of Mingo Crossing)	A major cultural heritage feature near the project is the Mingo crossing bridge which is of historical cultural heritage importance. However, the dam will inundate and submerge this crossing d at full supply level.	Both projects have similar cultural heritage issues due to their location and proximity to a major water feature. However, the dam project has a bigger impact on cultural heritage issues than the QIM project. *It is unlikely that additional cultural heritage studies will be warranted on areas subject to inundation – the EIS can provide this information. Further cultural heritage assessment can be undertaken in compliance with cultural heritage legislation.*
Community consultation	Has been undertaken by BWP but is not directly applicable to the QIM site. However, there are some effected residents within the QIM site.	Not a major issue due to the remoteness of the site and few local residents. However, information in the EMOS will require more detail to ensure that all issues, and affected and interested persons, are covered.	*Whilst the BWPL EIS applies generally to the QIM project, this aspect can be addressed and detailed in the QIM EMOS.*
Socio-Economic Impacts	Significant economic impact. Will create 1200 full time equivalent jobs and support the retention of an existing 1800 jobs. Create a net wealth increase of $800 million per annum and a turnover of over $ 2 billion.	Estimated mineral royalties of $11 million. Payroll taxes. Estimated annual taxes of $47 million. Flow on tax. Tax from down stream industries. Estimated full time employment of 100 people. Will require less capital investment with a base case annual turnover of over $ 200 million and over $100 million profit after tax.	This section of the BWPL EIS does not apply to the QIM project. Socio-economic aspects need to be addressed separately in the QIM EMOS

EIS: Activity and Impact	EIS: Area of Impact outlined (Burnett Water Pty Ltd - BWPL EIS) *	QIM EMOS-ML: Expected Operational Impacts	Differences/Similarities of the Projects
EPBC Issues	Similar environment. Therefore similar EPBC issues. The controlling provision of the EPBC Act were: Section 18 and 18A (Listed threatened species and communities); and Section 20 and 20A (listed migratory species). It was concluded that "no significant impacts are expected on the controlling provisions as identified under the EPBC Act".	Potentially triggers EPBC issues but may not be a significant issue compared to the BWPL project. However, a referral may be necessary to ensure that clearance is given by Environment Australia. This will also curtail future delays.	This section of the BWPL EIS partly applies to the QIM project. Information regarding the threatened and migratory species could be applied to the QIM project. *The Wateranga Project is not a Controlled Action under the EPBC Act.*
Dam Construction Activities	Major dam project. Will directly affect the QIM site. Will inundate a significant portion of QIM site at full supply level.	Not applicable. Only a comparatively small tailings dam will be required.	This section of the BWPL EIS partly applies to the QIM project. There is a similarity between dam construction and mineral sand mining (e.g. erosion issues, sedimentation, crushing of rock, sizing of products, topsoil removal, rehabilitation of disturbed areas, etc.). Differences may include size of operation, inundation, numbers of Environmentally Relevant Activities (ERAs), drilling and blasting, etc. In most cases, the impacts from the dam construct will be more than that from the mineral sand operation. Especially in the case of BWPL and QIM.
Environmentally Relevant Activities (Potential)	ERA11 Crude oil or petroleum product storage (exempt if less than 10,000 L) ERA 15 Sewage Treatment (depending on nature and capacity of treatment system selected) ERA 19 Dredging material from the bed of any waters ERA 20 Extracting rock or other material ERA 22 Screening Washing, crushing, grinding materials ERA 28 Motor Vehicle Workshop (if mechanical repairs are to be carried out on site) ERA 38 Land clearing ERA 39 Constructing premises or civil engineering structures ERA 62 Concrete batching	*ERA11 Crude oil or petroleum product storage (exempt if less than 10,000 L)* *ERA 28 Motor Vehicle Workshop (if mechanical repairs are to be carried out on site)* *ERA 38 Land clearing*	The Projects will generally hold different ERA licences.

7. COMMERCIAL ASPECTS AND MARKETS

The Wateranga Project has a suite of minerals with unique properties which have a number of potentially competitive applications in a variety of industries.

Results of analyses have shown that feldspar from Wateranga will find usage as a feedstock for the glass and ceramic industry, where the very high Al_2O_3 content will make it a premium product. It is high in calcium and has unusually high levels of alumina, thereby offering cost reductions to glass makers in their consumption of lime and alumina.

Another extremely unusual characteristic of the Wateranga feldspar is its very high abrasive quality attributed to a combination of very high Al_2O_3 and the angular nature of the grains. This attribute opens up new opportunities in other markets in the abrasives industry and it is probable that the Wateranga feldspar can be used as a substitute for garnet in this industry.

Other possible applications for this mineral are in the alumina/aluminium industry for which it's very high Al_2O_3 content could make it a useful feedstock. Most of the feedstock for the world alumina industry comes from bauxite, although a relatively small percentage is also being produced from aluminous clays and anorthosite using acid leach methods. The feldspar at Wateranga is high quality, high alumina anorthosite (30% Al_2O_3) which is potentially more attractive to consumers because current anorthosite supplies only have up to 15% Al_2O_3. It should be noted that the new process technologies available, combined with the characteristics of the Wateranga feldspar, avoid using acid processing methods. The clays at Wateranga are also aluminous clays which combined with the feldspar, probably make up about 80% of the ore body and a significant percentage of the tonnage.

The ilmenite at Wateranga is suitable for titanium dioxide pigment production. The apatite is free of contaminants such as cadmium, mercury, arsenic, lead, uranium and thorium that can occur in phosphorite and will have application for primary industries, offering a 'green' alternative to super phosphate fertilisers. Wateranga apatite is high in phosphorous (P_2O_5 at 45%) and compares favourably with sedimentary phosphorite which usually only contains between 20% and 35% P_2O_5.

The micas present, including muscovite and phlogopite, have wide usage in the electrical industry. In addition, the mineral scandium is strongly represented in the ilmenite fraction of the Wateranga resource. Scandium can be extracted using new extraction technology which makes the Wateranga project an attractive source of scandium with lower contamination levels in the final product. Scandium is proposed to be the new metal to replace nickel in the automotive industry and there have been expressions of interest to the CSIRO for this metal and its application to the space industry. Currently there are no western suppliers of scandium, which is partially attributed to a reliability problem in terms of quality and price. It is expected that a reliable supply from the Wateranga Project could achieve world wide sales.

Other minerals present in recoverable and economic proportions include zircon and corundum. It should also be noted that the silica in the Wateranga feldspar occurs as silicate (SiO_3) and as such, does not pose a health hazard (it will not cause silicosis).