



THE UNIVERSITY OF QUEENSLAND

**University Experimental Mine at Indooroopilly
Site Planning Report 2000**

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1. SUMMARY

The University Experimental Mine site at Indooroopilly is an important asset of the University of Queensland and provides teaching and research facilities for the Faculty of Engineering and for industry. The site regularly hosts local public primary and secondary schools for educational experience.

Substantial infrastructure exists on site including an underground mine, surface infrastructure, buildings for teaching and research including the Julius Kruttschnitt Mineral Research Centre.

The changing circumstances of University teaching and research require continuous re-evaluation and refinement of physical needs. Variations to site development plans are a continuing process requiring review of the existing development plans to consider and incorporate where appropriate, physical requirements for predicted program requirements and directives.

This review incorporates the recent developments and projected requirements into an overall strategy for site development.

A review of the physical characteristics and development potential was carried out in 1990 and much of that information remains relevant to this planning report.

The review of the site has been undertaken by a Planning Group representing the site users and coordinated by Property and Facilities Planning Services Section.

The working group included:

Professor Tim Napier-Munn	Director, Julius Kruttschnitt Mineral Research Centre(JKMRC)
Professor Brian White	Department of Mining, Minerals & Materials Engineering (DMMME)
Dr Jeff Rowlands	Cooperative Research Centre for Mining Technology and Equipment (CMTE)
Ross Meakin	Site Planner, Property & Facilities (P&F)

This report is recommended for approval as the Site Development Plan for the Indooroopilly Experimental Mine site.

2. CONTEXT

2.1 Academic Context

The Indooroopilly site is used by the Department of Mining, Minerals and Materials Engineering (DMMME), the Centre for Mining Technology and Equipment (CMTE) and the Julius Kruttschnitt Mineral Research Centre (JKMRC). The activities and functional requirements of the site users are outlined as follows.

Julius Kruttschnitt Mineral Research Centre

The JKMRC is a postgraduate research centre and consulting organisation in the University of Queensland Faculty of Engineering, Physical Science and Architecture (EPSA). It works with the Australian and international minerals industry in contract research, consulting and product sales. Over 90% of its annual revenue of \$10M is sourced from industry and from competitive research grants.

Educational Activities

- Training of Masters and PhD students by research.
- Professional courses for industry.
- Some undergraduate teaching (to some extent).

Research Activities

- Applied research in mining and mineral processing, mostly in collaboration with the minerals industry.
- Computer modeling and simulation of mining and mineral processes.

Commercial Activities

- Consulting for industry.
- Software and hardware product development and marketing.

Department of Mining, Minerals and Materials Engineering

Teaching Activities

- Mine ventilation, mining geomechanics, excavation engineering, hydrology and mine drainage, mine surveying, mine production technology, mining, mineral processing and materials engineering.

Research and Undergraduate Activities

- Undergraduate thesis projects in the above mentioned areas.
- Limited (at present) post graduate research in mine ventilation, mining geomechanics and mine production technology

Demonstrations Activities

- Public open day each year and visitations by other academic departments, schools, Queensland Mining Council, and Community and Industry Groups

Cooperative Research Centre For Mining Technology & Equipment

Research Activities

- Applied research and development funded by the Commonwealth government CRC program and mining industry partners in the areas of:
 1. Rock cutting, drilling and excavation using water jet and mechanical tools in hard and soft rock.
 2. Technology transfer through postgraduate research programs.

The strategic plan for the Faculty require the facilities at Indooroopilly to be sustained and expanded to cater for education and research programs in the Department and specialised research conducted by the two Centres.

The existing and forecast population at Indooroopilly Experimental Mine is set out in the following table.

Unit	1999		2003		% Growth
	Staff	Students	Staff	Students	
JKMRC	76	36	85	45	15
Department of Mining, Minerals and Materials Engineering	2	100*	4	120*	20
Centre for Mining Technology and Equipment	7	3	8	6	15

* Students are on site for limited times.

2.2 Physical Context

The site occupies 5.9ha of land approximately 7km to the west of the Central Business District of Brisbane and only 3km from the University main campus St Lucia. **Figure 1**

The site is densely vegetated on a steep south easterly slope from Isles Road and from the rear of residential properties along Goldeslie Road down to Witton Creek. At the centre of the site is a cluster of buildings of an industrial and commercial style. Ground slope and site features are shown in the existing features plan No.1 **Figure 2** and the aerial photo plan **Figure 3**.

The general neighbourhood character is residential and proximity to services and central Brisbane is attracting an increased residential density around the site.

The visual impact from outside the site is perceived as a bushland setting which provides a natural buffer to the surrounding residential character. This bushland buffer can also present a fire risk **Figure 4**. The buildings are confined to the middle and lower area of the site and this provides a minimum of impact from the uphill properties. Properties in the Ormond Terrace/Vera St (unformed) area are at a similar level to the building facilities and are therefore exposed to any adverse impacts that may originate from the site activities and amenities.

The physical characteristics and past mining activities have dictated the form of development with buildings, roads and parking restricted by the open cut mining area, the underground facilities, deep gullies in the north and south west and the lower creek flood plain.



LOCALITY PLAN

UNIVERSITY OF QUEENSLAND

INDOOROOPILLY MINE SITE *Figure 1.*

Figure 1.

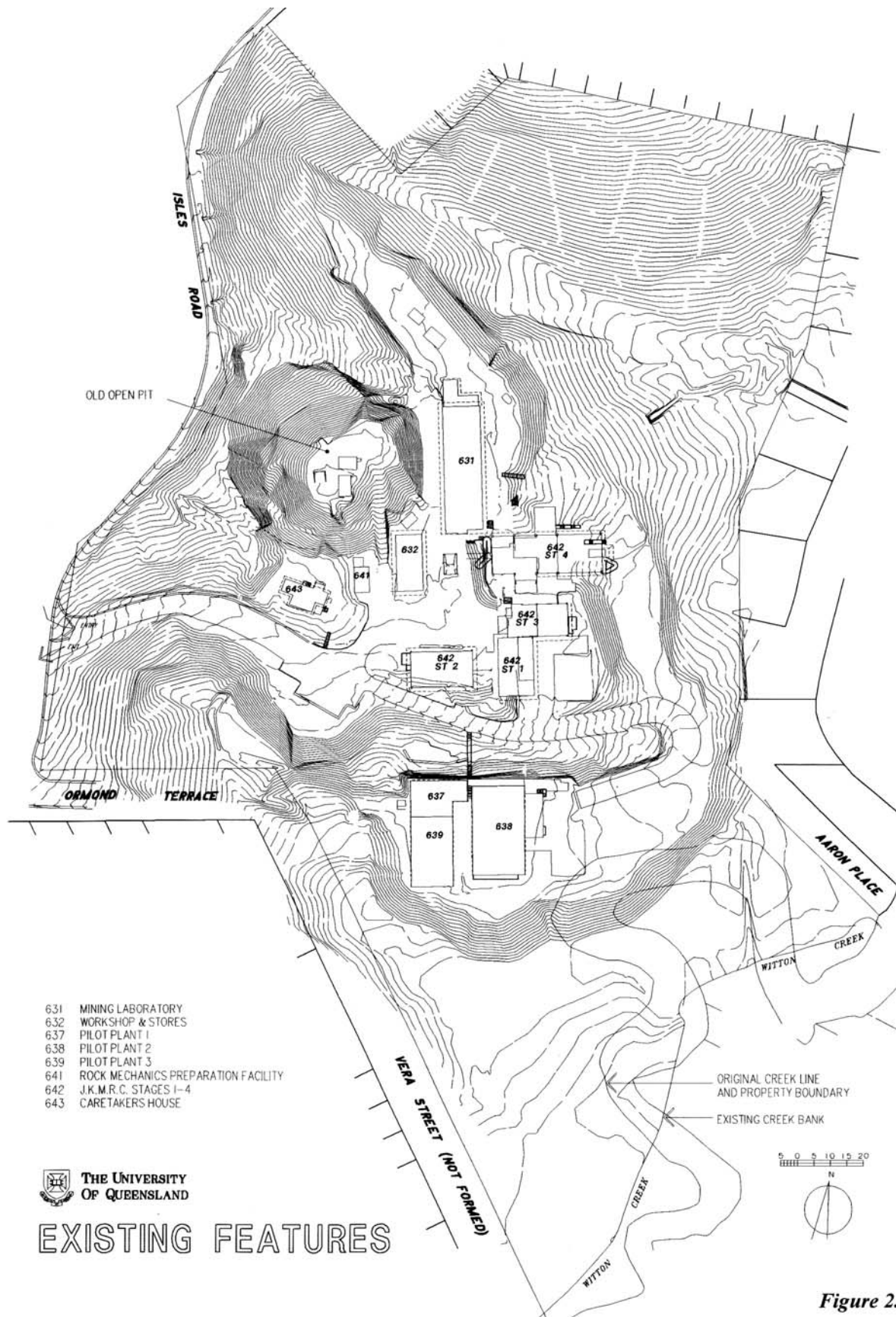


Figure 2.



Figure 3. Aerial photo

The physical form and character conveyed by the built environment is low density industrial and commercial typology mainly using corrugated metal sheet cladding. Coloured finishes to recent buildings helps to mitigate the visual impact of these buildings. **Figure 4 & 10**

Staff and students access the site mainly by car and therefore car parking is a significant use of land near to buildings. The access road east/west from Isles Road down to the Pilot Plant and Rock Mechanics laboratory form the major movement spine. Minor vehicle movement occurs north south beside the Mining laboratory and below the JKMRC buildings.

The site micro climate is influenced by the terrain and orientation to the south east providing good ventilating breeze from the south, south east, south west and east and north east. The steep hillside to the north and north west combined with the planting on the hillside provide protection from late afternoon summer heat.



Figure 4: Outside Site - View from east to JKMRC Building

Assets and Population

JKMRC

The physical assets of the Centre on the Indooroopilly site comprise:

- Four building, housing offices for staff and students, laboratories, library and computing areas, and teaching facilities; a fifth such building is listed on the University's Capital Management Plan for construction in 2002.
- Two buildings and surface plant, comprising the Centre's main laboratory, pilot plant and workshop.

Summary of Useable Area in October 1999:

Building	Area
Rock Mechanics Research Lab	169.0
Pilot Plant	357.6
Sample Preparation Shed	263.5
Administration Staff	<u>1,594.3</u>
Total	2,384.4

The on-site population in December 1998 was as follows:

Postgraduate Students	36
Research Staff	36
Consulting Staff	15
Technical Staff	12
Administration Staff	<u>13</u>
Total	112

The current laboratory and office space per staff member at the JKMRC is already low relative to other Faculties, Departments/Centres (18.8m²/person for office space and 11.7m²/person for laboratories, compared with Faculty means of 32.6 and 44 respectively).

CMTE

The physical assets for the Centre for Mining Technology and Equipment (CMTE) at the Indooroopilly Experimental Mine are as follows:

Offices in Mining Laboratory	10
Workshop	1
Large Scale Research/Testing Equipment (drilling rig)	1

The on site population in February 2000 is as follows:

Research/Technical Staff	7
Research Students	3
Administration Staff	<u>1</u>
Total	11

DMMME

Summary of Useable Area:

Building	Area	
Mining Laboratory	395.6	
Workshop and Stores	182.2	
Environmental Laboratory		79.9
Jet Shed	20.1	
Rock Mechanics Preparation Facility	51.3	
Caretaker's Cottage	11.2	
Ballistic Mortar	21.0	
Drilling Pad	<u>25.9</u>	
Total	787.2	

2.3 Mining Context

The site has a mining history dating back to 1918 when silver/lead mineralisation was discovered at Finney's Hill by G Olsen and PJ Madden.

The discovery was followed by open pit operations and then underground. By 1929 the ore reserves were depleted and the mine closed leaving access shafts, underground excavations and drivages, an open pit and surface plant and equipment.

The Queensland Department of Mines and Energy has proclaimed the area closed to further prospecting and mining although the area is still covered by Mining Leases. What remains of the original workings includes a network of underground tunnels, shafts, adits and completed stopes, a large crater from open pit activities *Figure 5* and various surface facilities built during the mine's operational days.

The underground mine is partially maintained to provide the University with a unique facility for experimental and educational purposes.

The 'real' mine characteristics contribute to the uniqueness of the site and produce a strong connection between the academic and research activities of the University and practical mining experience.

In 1951 the University secured a lease over the site and in 1967 gained ownership. The land holdings include former crown land to east of the site.

The diagrammatic layout of the underground mine is illustrated in *Figure 6a and Figure 6b*.



Figure 5. View to old open cut mine

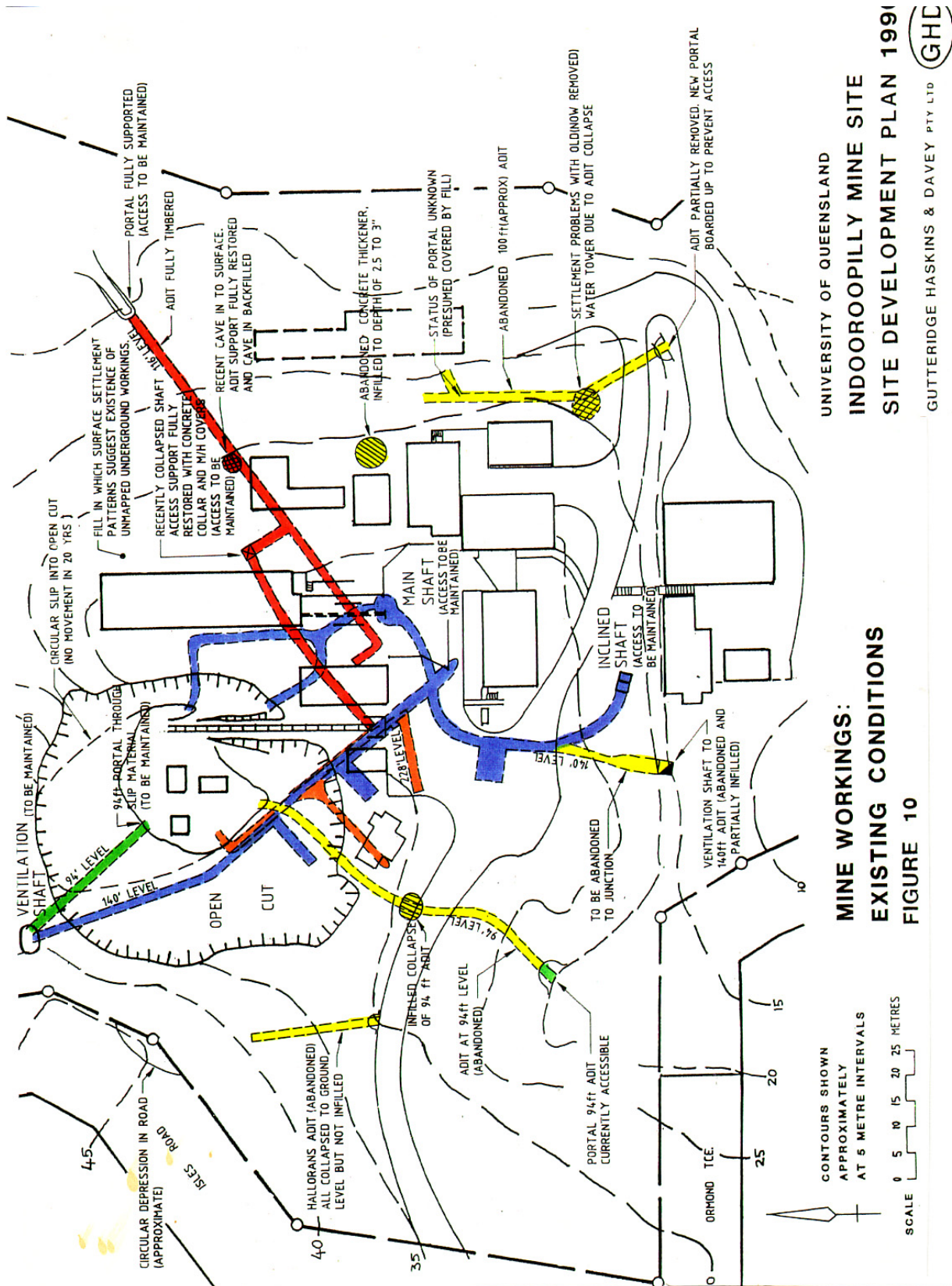


Figure 6a. Layout of Underground Mine

As at February 1998

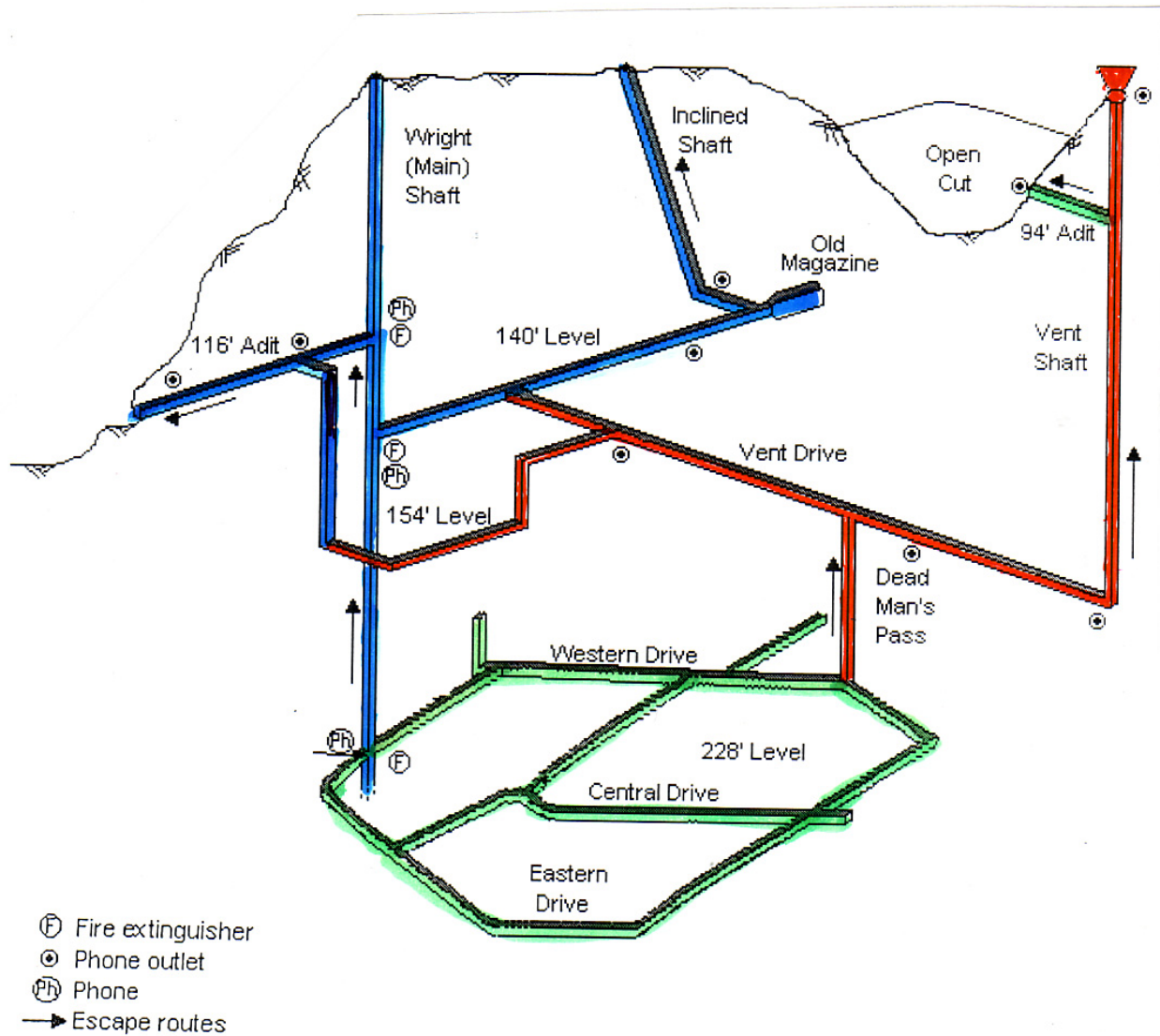


Figure 6b. Three dimensional diagrammatic view of underground mine layout

3 PLANNING AND DESIGN

3.1 Academic Goals

The strategic goals of the Faculty and Departments utilising the facilities are to further enhance teaching and research activities relating to mining and metallurgical engineering.

The specific objectives for the site use include:

- Provide facilities for the Julius Kruttschnitt Mineral Research Centre.
- Provide an experimental mine and mining laboratories for the Department of Mining, Minerals and Materials Engineering.
- Accommodate other teaching, research, and related activities of the University that are compatible with the above uses including the Mining Research program conducted by the Centre for Mining Technology and Equipment.
- Provide a unique educational experience for students of the University, the mining industry and the public at large.

3.2 Planning Goals

- Accommodate the University's requirements in a manner that does not harm the surrounding residential amenity.
- Develop buildings, facilities and amenities that are suitable and comfortable for the activities.
- Establish a land management plan that repairs the indigenous and natural state of the site.
- Improve access for vehicles, pedestrians and cyclists.

The overall planning goals are shown in the Concept Plan *Figure 7*.

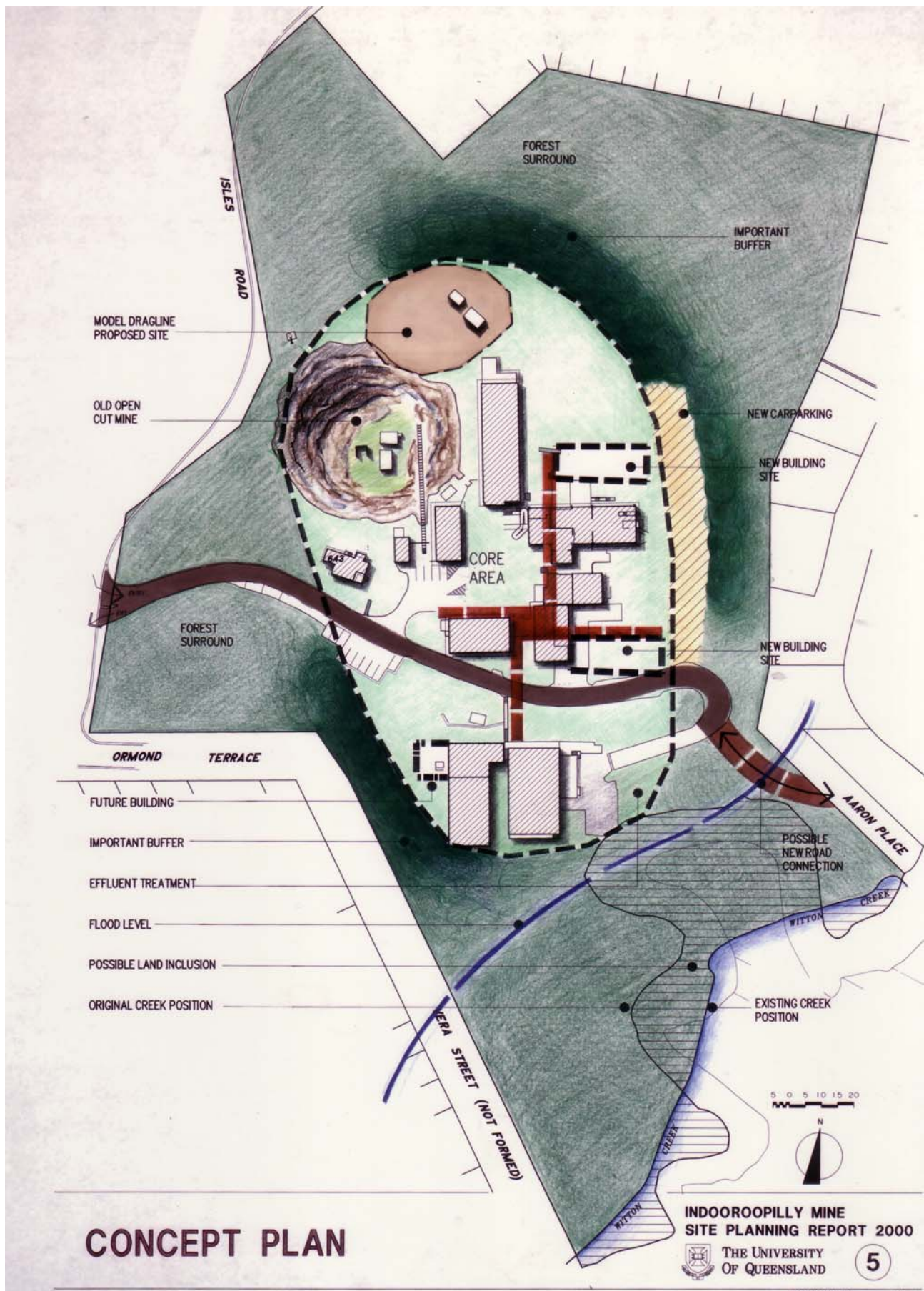


Figure7. Concept Plan



Figure 8. Broad frame natural forest



Figure 9. Court space around buildings

3.3 Design Goals

Establish the site with three distinct principles:

1. A broad frame natural forest **Figure 8**.
2. Detailed landscape court spaces in and around buildings. **Figure 9**.
3. A compact buildings core area, suitably designed to mitigate noise and visual impact to neighbouring properties.

Build to the scale and form of existing buildings with the following principles:

1. Use of subdued colours that minimise visual impact **Figure 10**.
2. Construction that contains noise below the 'nuisance' threshold.
3. Set backs and openings that make maximum use of natural light and ventilation.
4. Buildings that provide equity of access.
5. Efficient and effective planning of spaces.

Develop a circulation and access system that allows comfortable and safe movement around the site by adopting the following principles:

1. Alternative vehicle/pedestrian/cycle access from Aaron Place **Figure 11**.
2. Sealed surfaces to all paths, parking areas.
3. Security and night lighting.
4. Organised and legible signage.

Upgrade Infrastructure

1. Upgrades of electricity, water supply, waste water treatment and sewerage is illustrated in the Proposed Services Plan **Figure 12**

Landscape Enhancement

1. Reinstate natural species and clear invasive weed and vine growth.
2. Maintain fire break zones to the perimeter of the site and along the gullies.

4. DEVELOPMENT

The existing intensity of development for the current and future activities should be maintained. Marginal expansion of floor space is appropriate provided the expansion is confined within the core area close to the existing buildings area. There is substantial deterioration of infrastructure and infrastructure lacking even for current use. Roads, parking, effluent, power and water all need upgrading. Expansion of the range of experimental/demonstration facilities to provide contemporary academic and research capability is necessary. Expansion of buildings and changes to the site layout are proposed including the relocation of the caretakers house, **Figure 13** construction of two new buildings, road access and car parking. **Figure 14** The various issues that impact on the ability of the site to function well now and in the future have been recorded. The development intent is shown in the Site Development Plan. **Figure 15**

The following development guidelines are proposed to bring the site up to expectations:

1. Seek approval to form a south east road connection via the newly formed Aaron Place.
2. Expand floor area by developing to the north and south of the JKMRC.
3. Provide effluent treatment facility.
4. Add to the existing car parking capacity.
5. Improve a number of existing buildings.
6. Provide a site for the scale model dragline.
7. provide a site for a Mine Safety and Health building.
8. Provide additional improved access to the underground workings.

A schedule of proposed works is provided in **Appendix 1**.



Figure 10. Preferred scale, form and colour



Figure 11. Potential access from Aaron Place

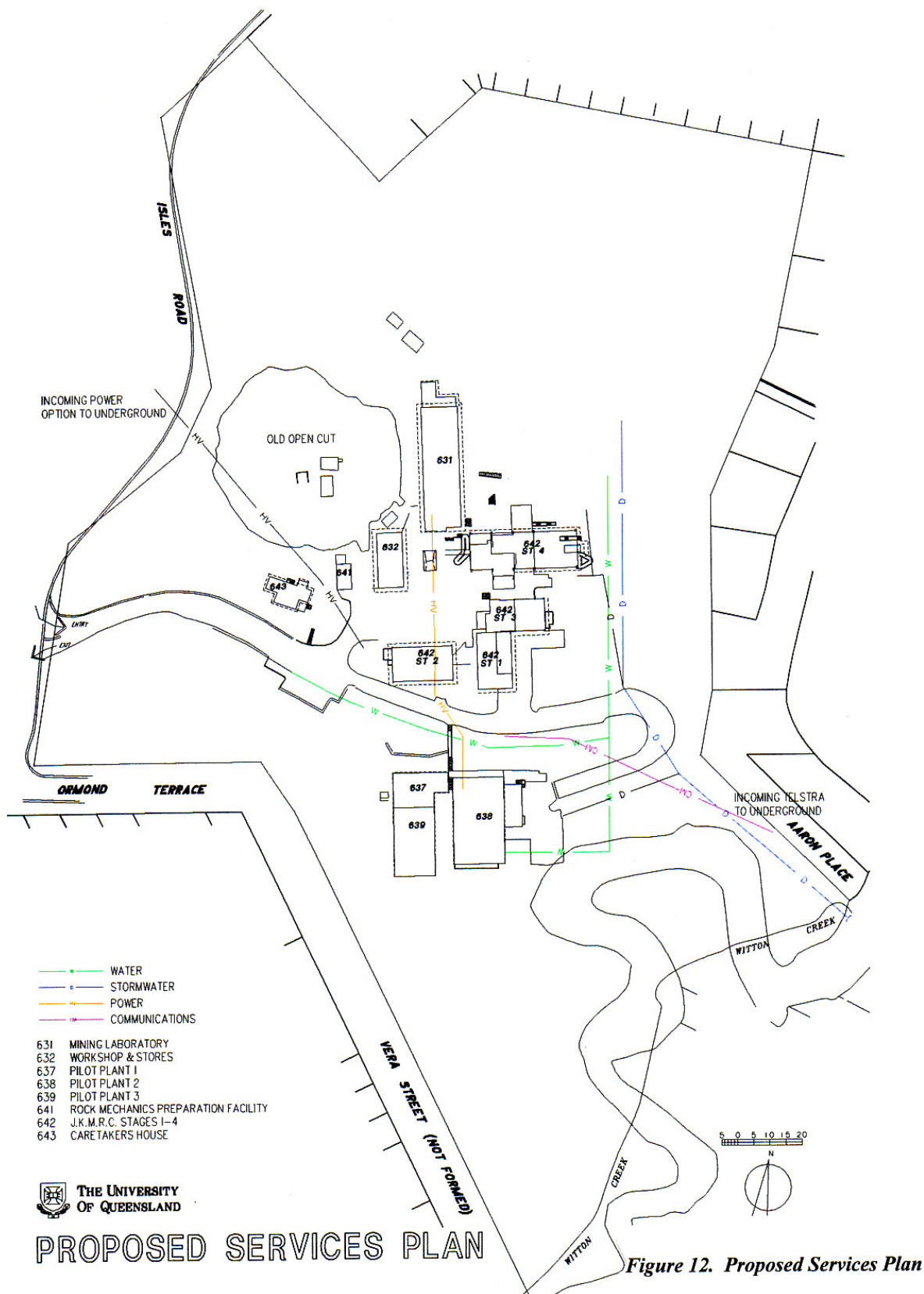


Figure 12. Proposed Services Plan

Figure 12. Proposed Services Plan



Figure 13. Caretakers House



Figure 14. Access to rear of JKMRC and future car parking

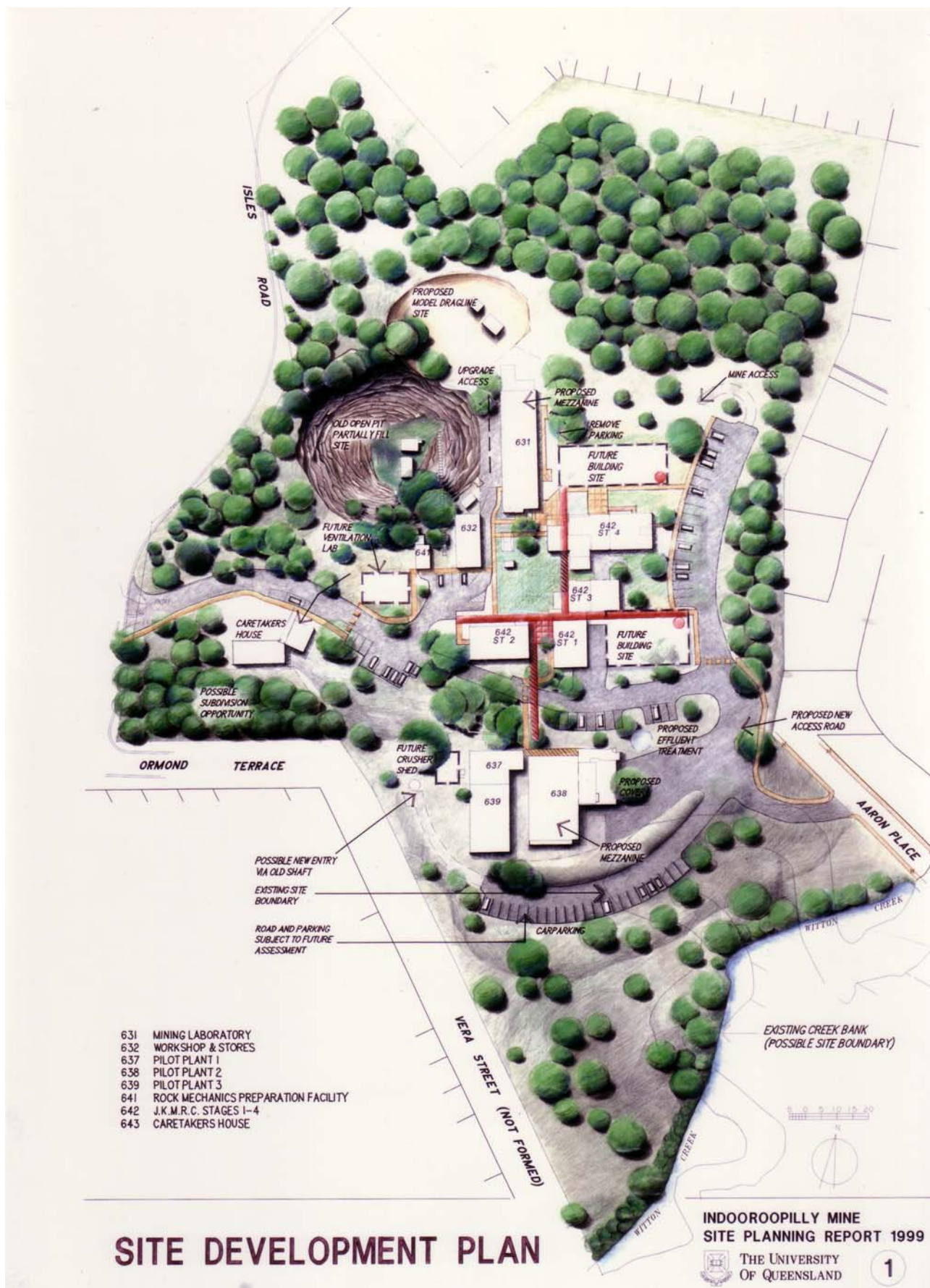


Figure 15. Site Development Plan

5. IMPLEMENTATION

This planning report outlines the general intent for development of the Indooroopilly Experimental Mine Site and is to be used as a general framework.

Actual development is dependent on program requirements and resource allocation.

Funding availability and justification of physical development is an action controlled by the University and not considered in this planning report. The list of projects outlined in the appendix have been identified during the planning as desirable for a safe, functional and comfortable working and teaching environment.

Timing of projects depends on priority and funding availability which can be unpredictable causing difficulty with a prolonged approval process. This planning document is intended to provide guidance to future development as they arise, thereby assisting with an efficient development process.

The appropriate procedure for development would be to have the Planning Report approved by Senate as the guiding document.

Individual projects would then be subjected to an administrative approval process which may involve further Senate approvals depending on the size of the proposal.

6. REFERENCES

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Undergraduate Thesis *by M A Nuttal*
October, 1993

APPENDIX SCHEDULE OF PROPOSED WORKS
INDOOROOPILLY MINE SITE - SITE PLANNING REPORT 2000

Clas No	Schedule of Proposed Works Project	Year	Cost Estimate	Funding Source	Comments	Priority
B-1	Upgrade toilets in Mining Laboratory	1999	\$ 30,000	UQ	Female toilets required	H
B-2	Mezzanine Level in Pilot Plant and new toilet	1999	\$ 185,000	JKMRC/UQ	Underway	H
B-3	Mezzanine in Mining Laboratory	1999	\$ 150,000	CMTE	Completed	-
B-4	Cover over Pilot Plant equipment	2000	\$ 50,000	JKMRC		H
B-5	Space of equipment and sample storage	2000	\$ 25,000	Dept/JKMRC		M
B-6	Extension to the Crusher Shed	2000	\$ 100,000	Dept/JKMRC	Acoustic treatment to prevent noise nuisance to neighbours	L
B-7	New Mine Health and Safety Lab and move Security house	2001	\$ 650,000	Dept/Industry/ UQ	200m ² - \$50,000 relocation	H
B-8	New building	2002	\$ 2,500,000	CMP	Space requirements to be determined	H
I-1	Road upgrade beside Mine Lab and down to Pilot Plant	1999	\$ 100,000	UQ(DM)	Possibly part of resurfacing	M
I-2	Upgrade electrical supply	1999	\$ 120,000	UQ	In progress	-
I-3	C/w cooling system for equipment	1999	\$ 10,000	Dept	Review	-
I-4	Improve mine drainage	1999	\$ 50,000	Dept/Industry/ UQ		-
I-5	Landscaping	2000-5	\$ 100,000	UQ		-
I-6	Fencing of entire site	2000-5	\$ 150,000	UQ		M
I-7	Car park	2000-5	\$ 200,000	UQ		M
I-8	Effluent Treatment/Drainage around Pilot Plant	2000	\$ 110,000	SWSS/FAC		M
I-9	Drainage around old open cut	2000	\$ 30,000	UQ		M
I-10	Upgrade external lighting in car parks	2000	\$ 30,000	UQ		M
I-11	New access road from Aaron Place	2001-5	\$ 300,000	UQ	Needs Brisbane City Council Approval	H
I-12	Sewerage extension	2002	\$ 50,000	UQ		H
I-13	Stormwater extension	2002	\$ 60,000	UQ		H
I-14	Communications upgrade	2002	\$ 30,000	UQ	To be underground for security	H
M-1	Refurbishment main shaft	1999	\$ 50,000	UQ	Required urgently. Limited remedial work in progress	H
M-2	Scale model dragline	2000	\$ 10,000	CMTE	Impact assessment required	H
M-3	New mine entrances	2001	\$ 100,000	Dept/Industry	Planning study 2000	M
M-4	Underground inter-level access decline	2002	\$ 500,000	Dept/Industry	Planning study 2000	L

Classification: B = Building; I - Infrastructure; M - Mine

Priority: H = High; M = Medium; L – Low