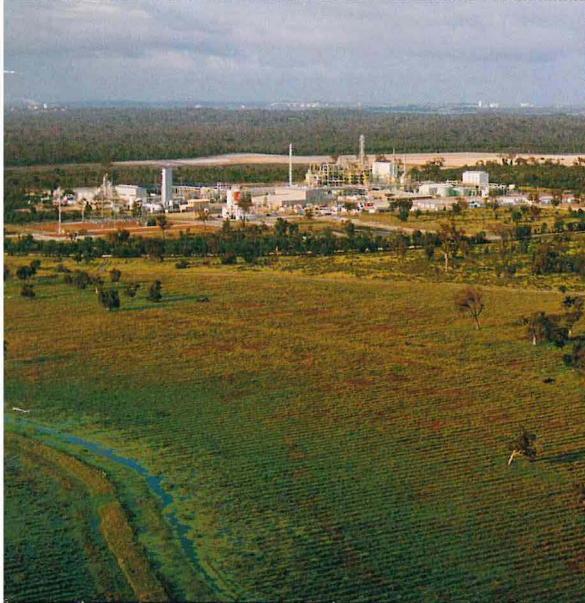


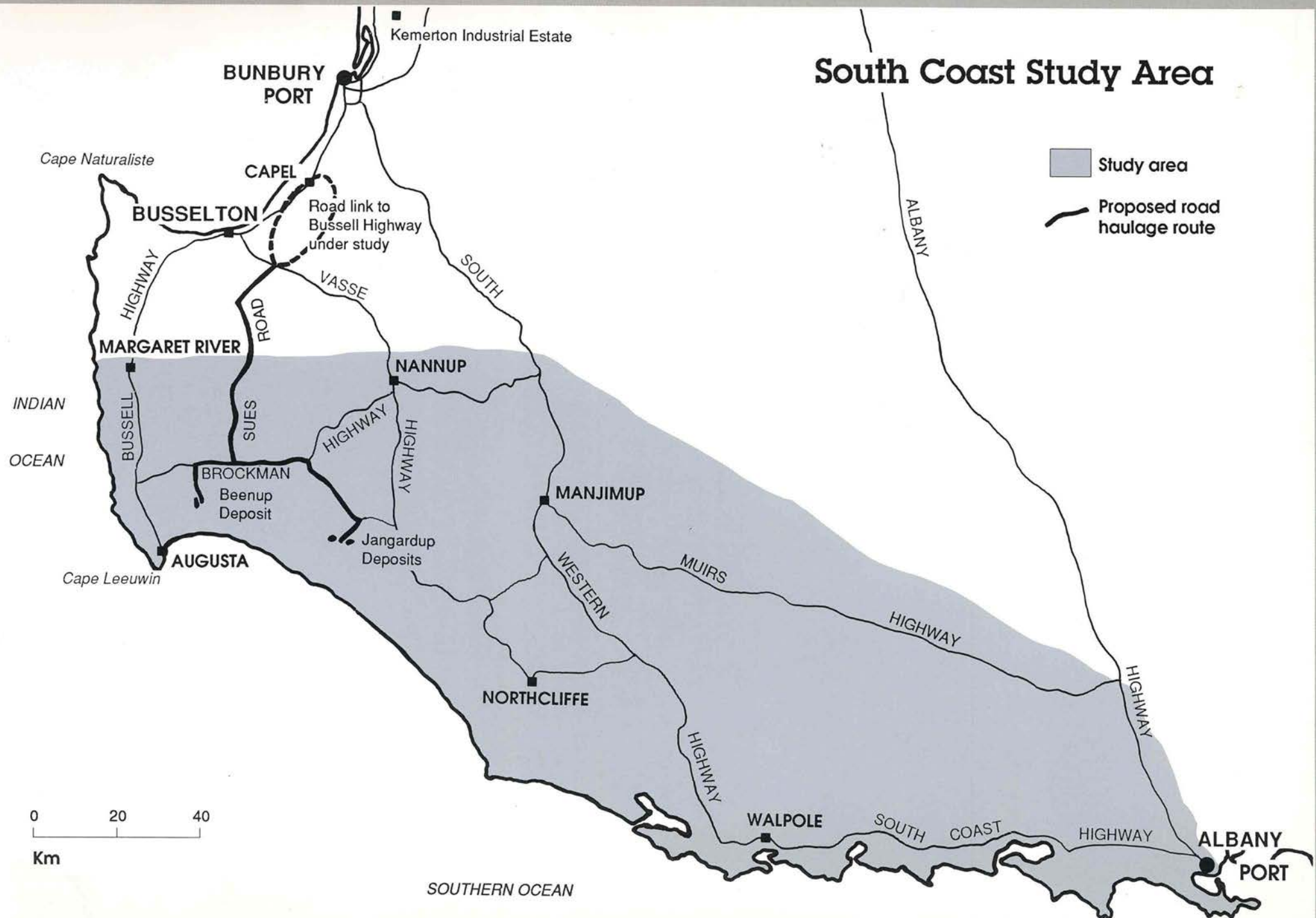
Box 27A.

SOUTH COAST MINERAL SANDS GOVERNMENT STRATEGY



GOVERNMENT OF WESTERN AUSTRALIA
APRIL 1990

South Coast Study Area



MINISTER'S FOREWORD

The South Coast region of Western Australia has a complex and diverse social infrastructure. The area is currently undergoing rapid population expansion which is causing significant social changes in the region.

Recent proposals for development of mineral sands operations at Beenup and Jangardup have caused concern with regard to how these projects will be integrated into the region which has had no previous exposure to the mining industry.

It is the Government's position that mineral sands mining, processing and associated transport should be developed through a co-ordinated approach between local communities, companies, local government and State agencies.

As part of the process it is necessary that the community has an understanding of the Government's strategic and policy framework as it applies to such developments.

This document has been prepared to outline the Government's strategy with regard to the development of the mineral sands industry.

It incorporates the findings of a wide range of studies and investigations carried out on the industry, many of which were based on the opinions of interested organisations and the public. In the companion policy document, policy is described in more detail and information is provided on a number of areas affecting the industry.

This strategy does not attempt to dictate which deposits will be allowed to develop and in what order. Apart from the considerable uncertainties associated with finding and proving deposits, it is not the Government's role to interfere with the normal process by which proponents develop operations in this State.

As both the mineral sands industry and regional planning are dynamic in nature it is proposed that the strategic plan will be updated every 3 to 4 years.



David Parker, MLA
MINISTER FOR RESOURCES
AND TRADE

STRATEGY OVERVIEW

The Government supports the development of the mineral sands industry in the South Coast region provided that projects meet environmental standards and can co-exist with existing land uses and industry in the area.

No development will be allowed to proceed without first obtaining clearance with regard to environmental and social impact from the Environmental Protection Authority.

Proponents of major projects will be required to:

- conduct public participation and information programmes;
- prepare social impact and benefit assessments for the projects.

National Parks and Reserves are closed to mining. Where areas included in National Parks are considered to be highly prospective the Government's policy as laid out in the 'Balancing the Scales' document will be applied.

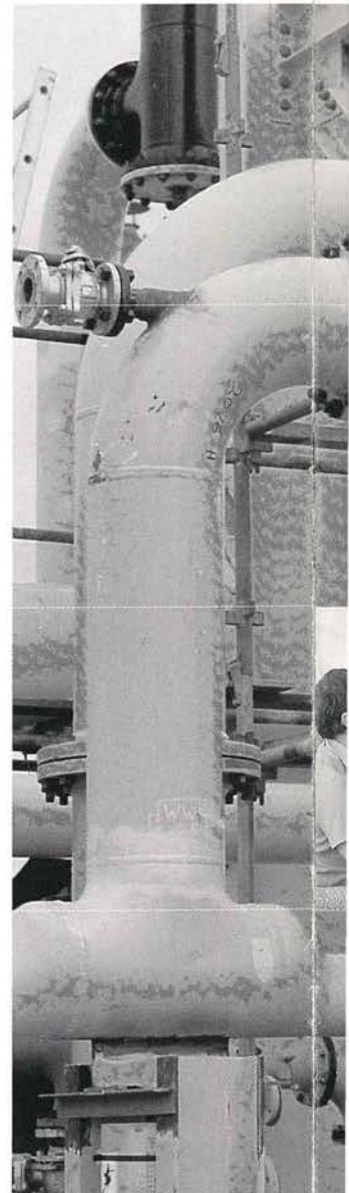
Rail is the preferred transport method for large volume traffic such as mineral sands. Although initial evaluations of rail options were not encouraging, Westrail is re-examining rail haulage from the region. This will give Government sufficient information to ensure that the best long term transport strategy is achieved. If rail proves not to be feasible, Sues Road will be upgraded as a heavy haulage road to service both Beenup and Jangardup. Planning work is progressing concurrently on both rail and road options to avoid mining delays.

The Government will continue to develop planned industrial areas such as Kemerton that are suitable for heavy industry. The region close to the Beenup/Jangardup deposits is not considered suitable for location of such industrial areas.

Rehabilitation of mined land will be to a sustainable standard. On agricultural land the minimum standard expected is that the rehabilitated land should have at least its former productivity. Where land is not suited to long

term agriculture, a stable self generating cover will be required, or where natural vegetation is removed, this will be rehabilitated to acceptance criteria set for the specific ecosystem.

Mineral sands mining is only one, albeit important, sector of the economy. This development strategy for the industry will be incorporated into long term planning and land use strategies for the region.



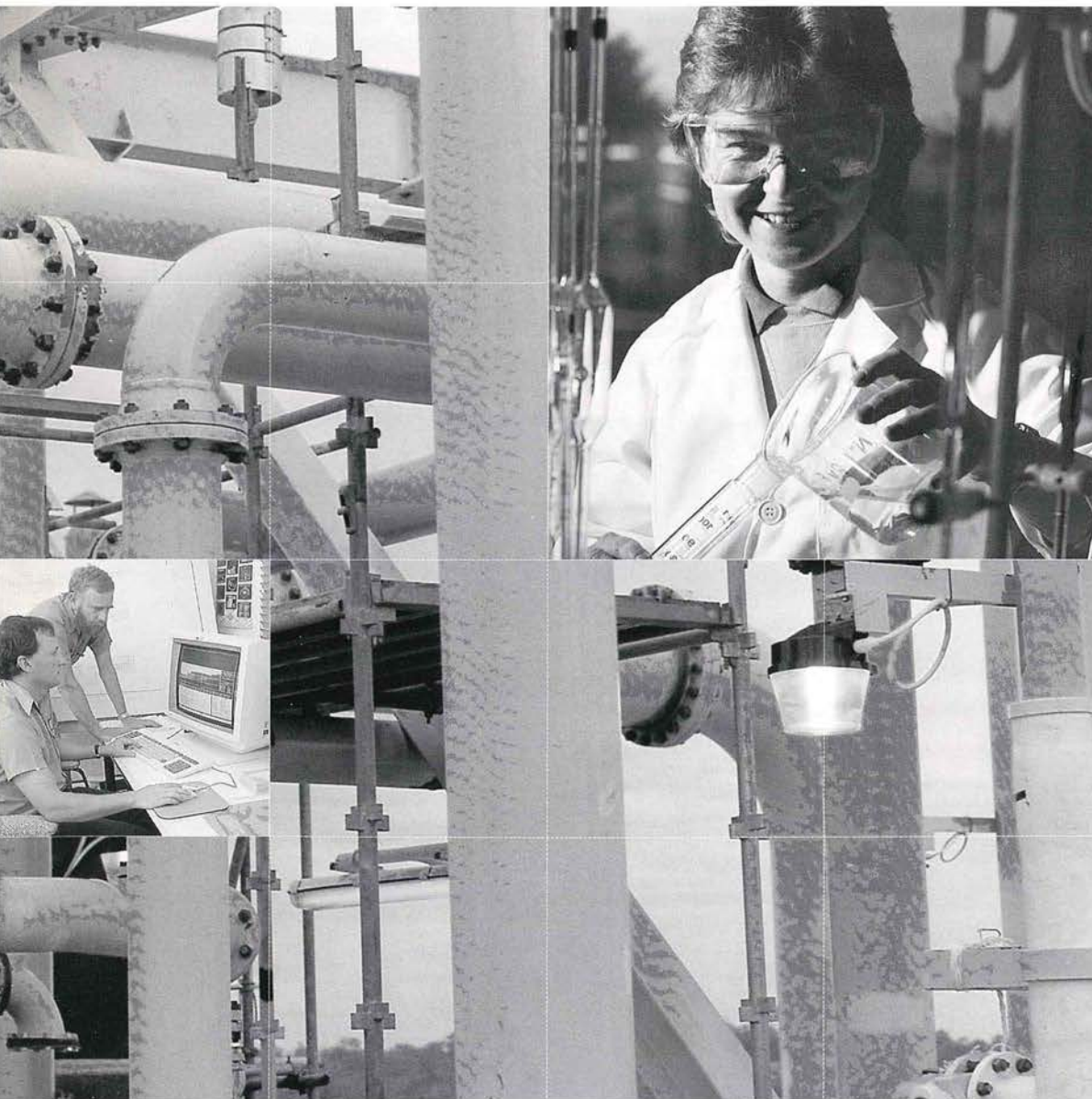
INTRODUCTION

The current expansion phase being experienced by the mineral sands industry has led to increased exploration activity in a wide sector of the State as producers seek to establish sufficient reserves to underwrite long term operations and others seek to discover deposits which would allow their entry into the industry.

As the South Coast region is both geologically prospective and in close proximity to current industry infrastructure, companies have been carrying out extensive exploration in this area. This has resulted in two organisations, Cable Sands and BHP-Utah, seeking approval to establish operations at Jangardup and Beenup respectively.

The Government recognises that this type of development leads to increased pressure on land uses and that mineral sands projects must be considered in the context of wider economic and social questions such as potential costs and benefits, lifestyle and environmental concerns. This is particularly relevant in the South Coast region where a diverse range of land uses and lifestyle values have developed.

The mineral sands industry and associated secondary processing industries make major contributions to both regional and State economies and Government supports ongoing environmentally and socially acceptable development of the industry.



The mineral sands and associated processing industries create varied and challenging employment, and make major contributions to regional and state economies.

This document sets out Government strategies for the orderly planning of future developments. The strategy has incorporated recommendations from studies and investigations of the industry and region carried out over a number of years. The more recent studies include:

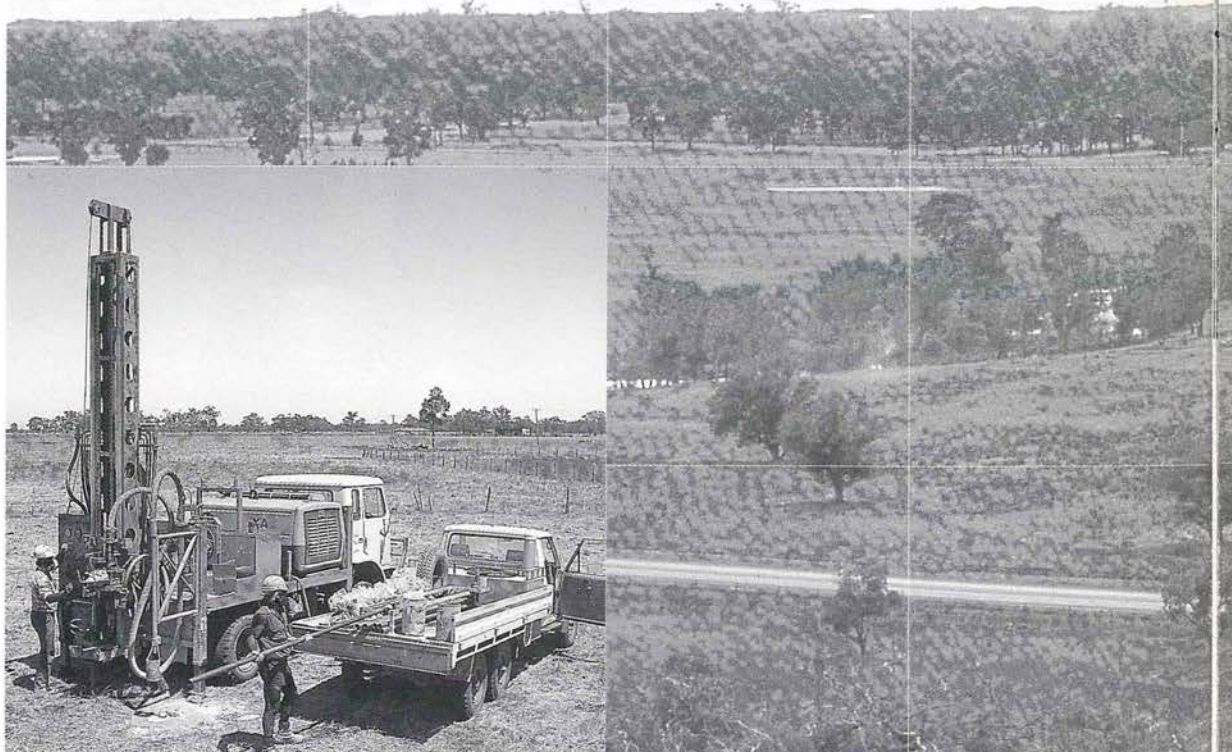
- South West Strategy - A People's Plan, November 1988 - co-ordinated by the South West Development Authority;
- The Leeuwin Naturaliste Region Plan, 1988 - prepared by the State Planning Commission;
- Transport Infrastructure for Proposed Mineral Sands and other Resource Developments in the South West of Western Australia, September 1989 - co-ordinated by the Department of Resources Development;
- Social Impacts of Proposed Mineral Sands Transport Routes - prepared by a committee consisting of Local Shire representatives and co-ordinated by the South West Development Authority;
- Report on Conservation and Rehabilitation in the Mineral Sands Mining Industry, April 1987 - widely known as the Playford Report and available from the Department of Mines;
- Report to the Minister for Health of Western Australia on Protection from Ionising Radiation Associated with the Mineral Sands Industry, June 1984. (Winn Committee of Enquiry).
- The Western Australian Mineral Sands Industry - Radiation Protection, 1989 - produced by the Department of Mines, Western Australia;
- The South West Mineral Sands Industry Report: An Information Handbook, 1990 - often referred to as the Mineral Sands Handbook and released by the South West Development Authority.
- Heavy Minerals Mine at Jangardup, Cable Sands (WA) Pty Ltd, Report and Recommendations of the Environmental Protection Authority, Bulletin 422.

These studies recognise that there is a need to provide ongoing interaction between local communities, companies, local shires and State agencies as proposals are developed. Proponents of major projects need to establish and maintain close liaison with these groups and clearly demonstrate how the resource is to be developed in an environmentally acceptable manner that will result in an optimal flow of economic and social benefits to both the local community and the State.

Policies set out in this document should be taken into account in the Regional and Local Planning processes that are carried out for Government under the State Planning Commission Act.

The dynamic nature of both regional planning and the mining industry is recognised by the Government, and therefore periodic review of this policy document is planned. The initial review would be completed by January 1994.

All exploration work is subject to strict environmental controls. Any areas disturbed are kept to a minimum and are rehabilitated.



MINING PROPOSALS

Mineral sands mining and processing currently takes place in the South West (Capel, Waroona) and Mid West (Eneabba, Cooljarloo) of Western Australia. The Capel, Eneabba and Cooljarloo deposits are expected to provide the major proportion of the State's mineral sands for the next 20 years. Strong world wide demand for ilmenite, rutile and zircon has resulted in expansion of production in these areas and also a State wide exploration effort in order to locate new reserves.

Expected Developments 1990-2000

A significant area of land in the South Coast region is covered by current or pending Exploration Licences or other types of mining tenements. Despite this, only five areas have been identified as major prospects. These are:

years plus), is extremely complex, with high levels of clay and non-economic minerals. For this reason the Company has no immediate plans to mine the Scott River deposit and would only re-assess its potential when other deposits have been processed.

In addition to these major prospects, Cable Sands has identified several magnetic anomalies in the area from Flinders Bay to Walpole. These anomalies could represent the presence of mineral sands. However, further exploration work is required to determine whether they represent viable deposits or are caused by other magnetic features.

Cable Sands has applied for Exploration Licences over this area. To date these have not been granted. Consequently the time frame for development of any

Deposit	Company	Area Mined Per Year (ha)	Area of Deposit (ha)
Economic			
Jangardup	Cable Sands	15	133
Jangardup South	Cable Sands	-	-
Beenup	BHP-Utah	30	700-800
Sub-Economic			
Scott River	Cable Sands	-	-
Witchcliffe	BHP-Utah	-	-

Current development proposals for the region are based on the prospects classified as economic.

Cable Sands

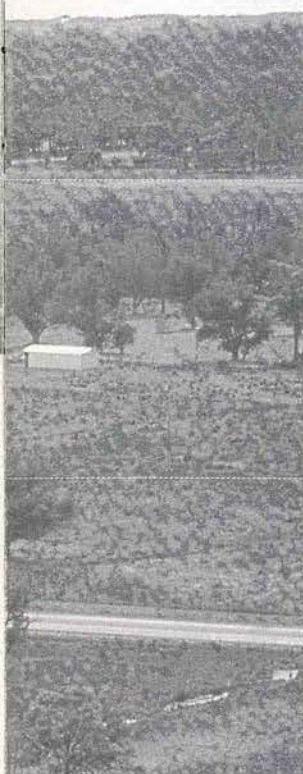
Cable Sands has announced plans to develop the Jangardup deposit and current schedules are for the Company to commence operations by mid 1991. The life of the deposit is estimated at seven to eight years. Towards the end of Jangardup's economic life the Company plans to develop Jangardup South, which represents a further two years of production and which will be completed by approximately the year 2000. Plans beyond this date are not firm. The only other confirmed deposit in the region over which Cable Sands has mining rights is at Scott River. This deposit, although large (20

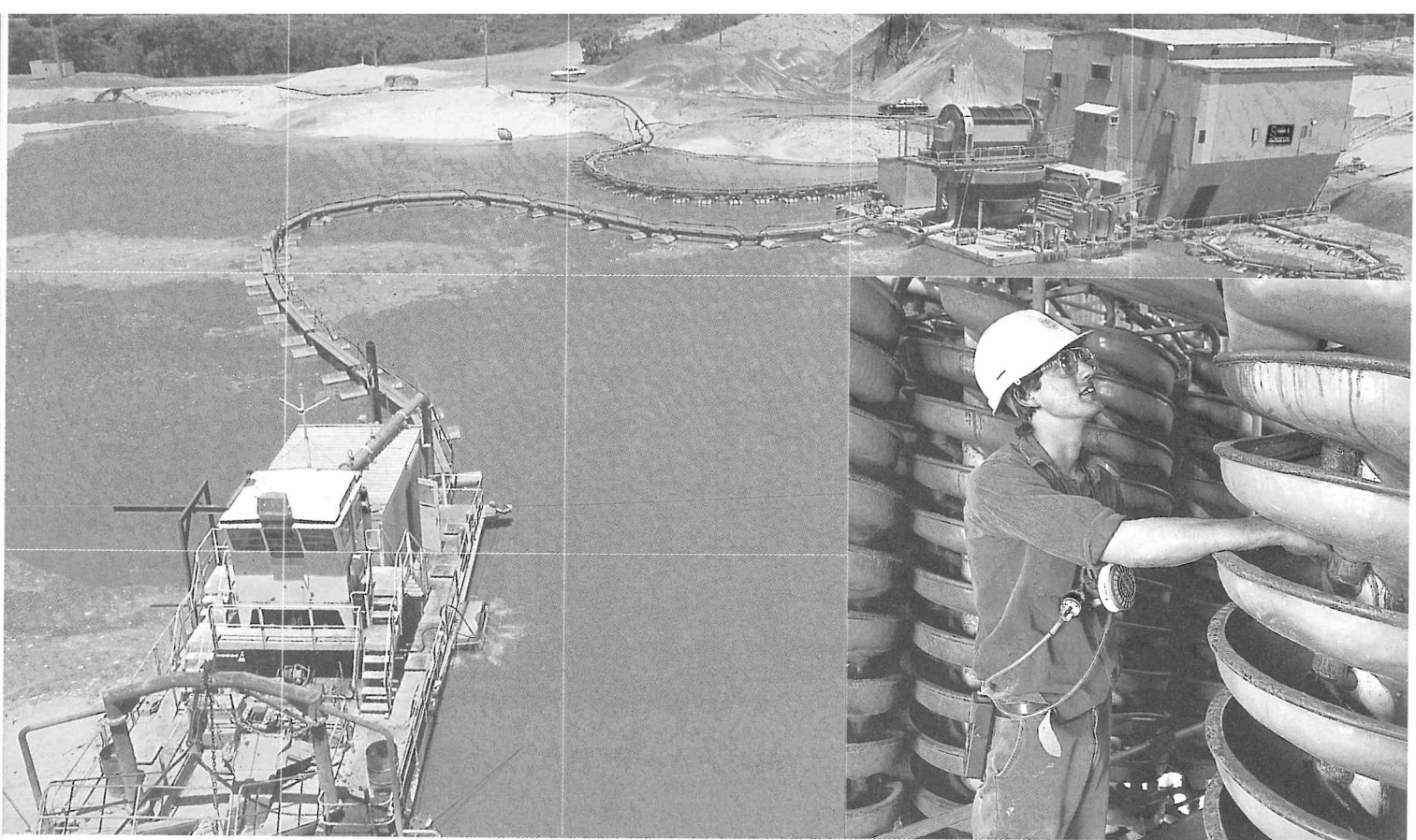
deposits that may be established through more detailed exploration work is well into the second half of the 1990s. This will allow significant time for detailed assessment and public involvement.

BHP-Utah

BHP-Utah has recently announced its proposal to develop the Beenup deposit. The Company has produced an Environmental Review and Management Programme (ERMP) for the project. This document was recently released for public review and comment prior to assessment by the EPA.

The Company has formed a Beenup Consultative Group in order to inform the local community about the project and to allow public





input into the project planning, decision making and development processes.

Beenup has a designated economic life of 20 years and is scheduled to operate over the period 1992-2012.

BHP-Utah has leases over a further prospect at Witchcliffe. This resource is currently considered sub-economic. Even if further drilling extended the resource, development would not be expected to take place this decade.

Prospective Resources

Over time the prospects for commercial mineral sands deposits in an area may change considerably as a result of increasing knowledge, advances in technology, new theories of mineral deposit formation and changes in the economic outlook for particular commodities. The prospects for mineral sands in the South Coast region have significantly increased due to developments in each of these factors over the past three to four years.

Within the South West/South Coast region the two well defined geological provinces of high prospectivity for new mineral sands discoveries are:

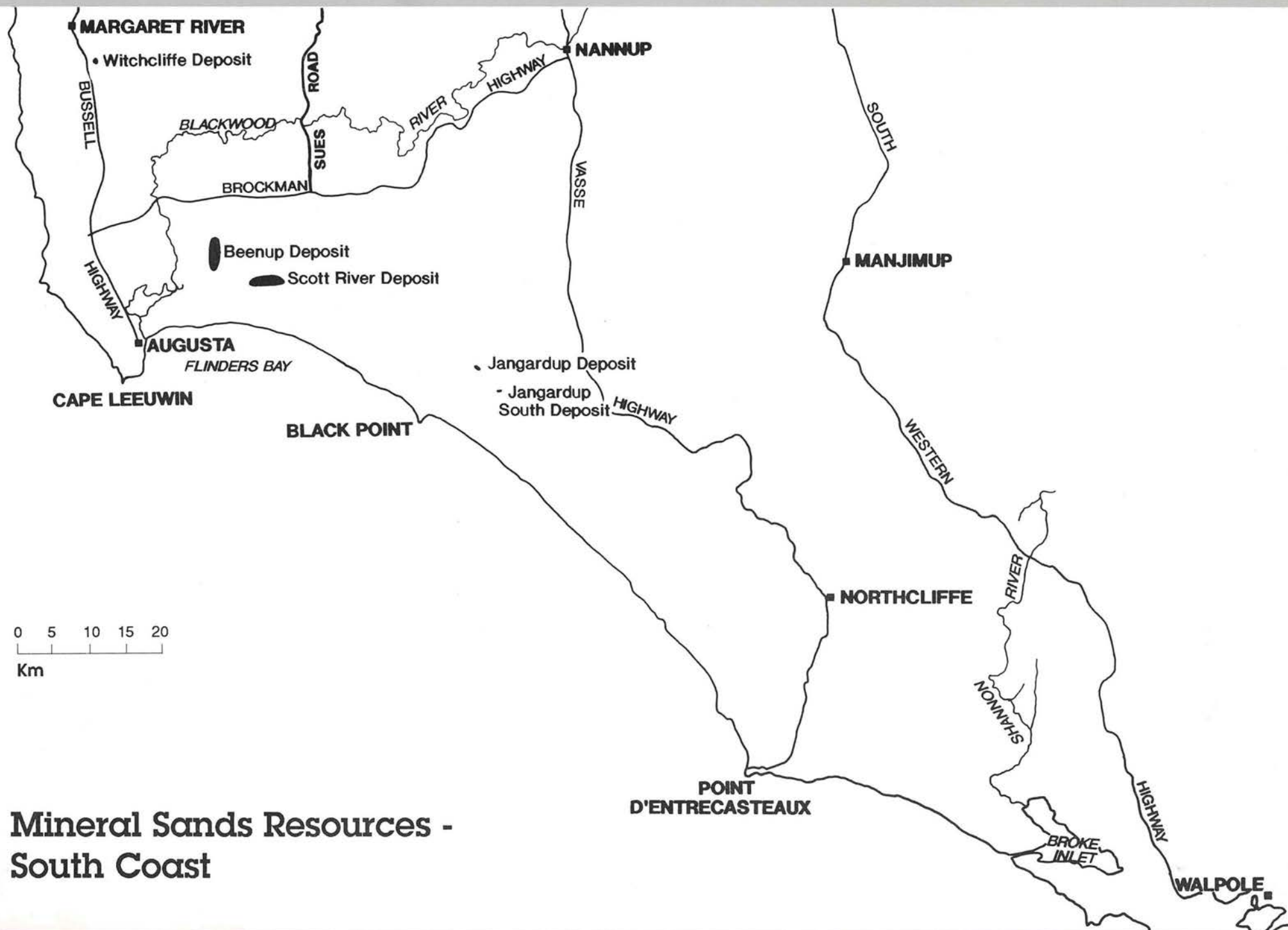
- **the southern Swan Coastal Plain**- from the coast to the Darling Scarp and its extension to the south and west between the Whicher Scarp and the coast from Perth to Dunsborough;
- **the Scott Coastal Plain** - a southern coastal belt between Augusta and Walpole.

Recent exploration activity has identified a third area of significant potential in a geological environment which until recently has been considered to have limited prospectivity. This is:

- **the Donnybrook Sunkland** - between the Whicher Scarp in the north, the Scott Coastal Plain to the south, the Darling Fault to the east and the Leeuwin Complex to the west.

Although large land areas comprising these geological provinces are currently being explored, there has been no report of major prospectivity outside the five locations discussed. This trend fits with mining records which show that on average only 1 in 1000 tenements develops into a producing mine.

Mining is often carried out by dredge, with initial concentration of heavy minerals in a floating 'wet' plant.



Mineral Sands Resources - South Coast

NATIONAL PARKS

Government policy intentions are spelt out in the document 'Mining and the Environment: Balancing the Scales.'

Legislation to enable the implementation of this policy is currently before Parliament. In the meantime the policy is being implemented administratively where this is possible.

The basis of the 'Balancing the Scales' document is that all National Parks and Class A Reserves are closed to both exploration and mining. A specific park or reserve can only be opened for exploration following assessment by the EPA and approval by both Houses of State Parliament. Areas of highest biological or landscape value are to remain closed.

Even in circumstances where Parliament has approved exploration, the process of EPA assessment and Parliamentary

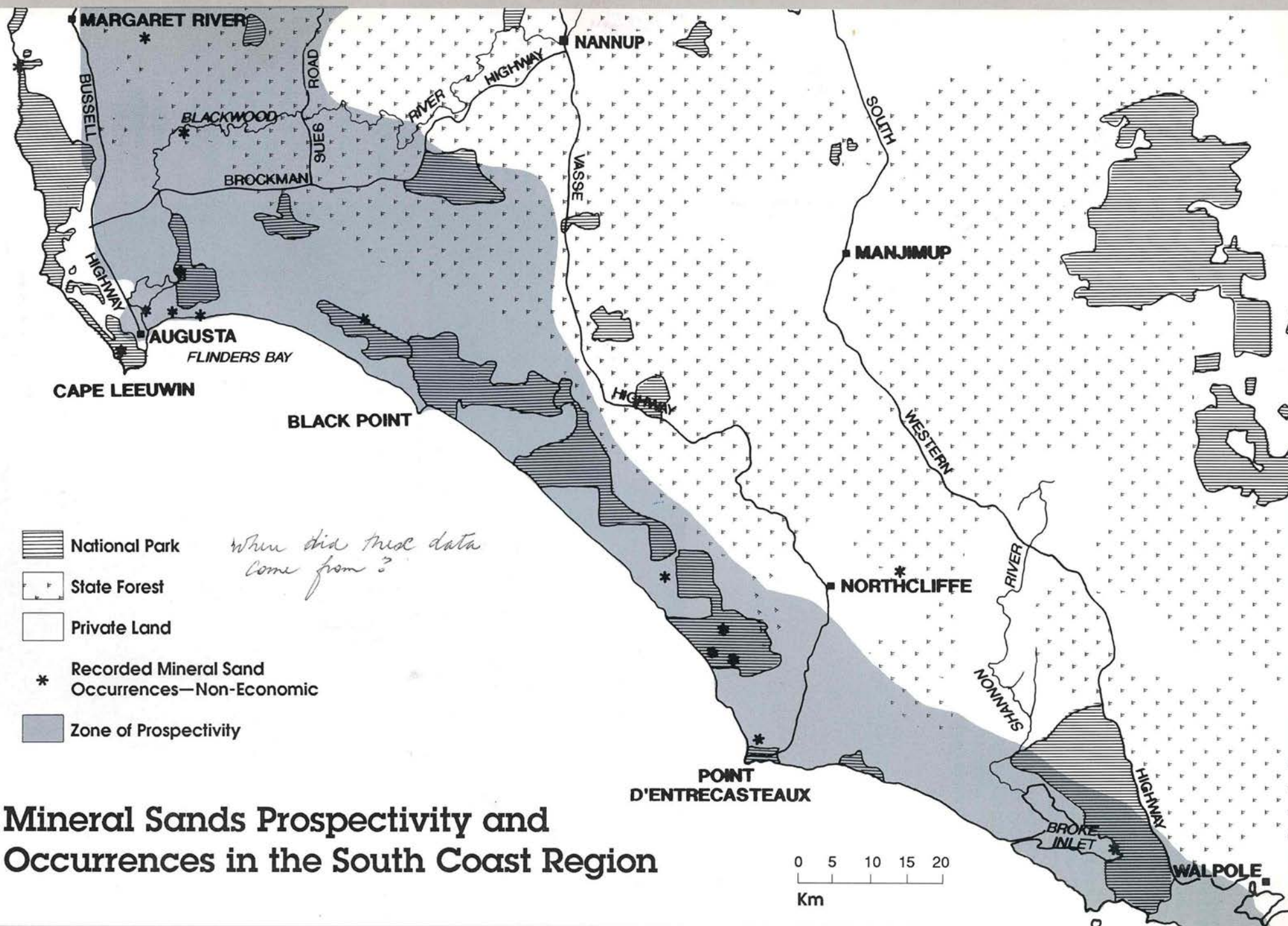
approval will have to be repeated before a mining lease can be granted.

Non-destructive geoscientific survey work can be permitted in National Parks and Reserves under a permit issued by the Minister for Mines, but only with agreement from the Minister for Conservation and Land Management.

There are no mining leases granted over any National Park or Class A Nature Reserve in the South Coast region under consideration. There are, however, a number of Exploration Licence applications pending over National Parks, and in the case of the D'Entrecasteaux National Park, a formal request to open parts of the Park for exploration has been made. This application will need to be assessed by the EPA and considered by Parliament to determine whether or not exploration can take place.

All National Parks and Class A Reserves are closed to both exploration and mining. A Specific park or reserve can only be opened for exploration following assessment by the EPA and approval by both Houses of Parliament.





Mineral Sands Prospectivity and Occurrences in the South Coast Region

PROJECT ASSESSMENT PROCEDURES

The mineral sands industry is owned and operated by private industry and is regulated through the Mining Act, the process of environmental assessment and where appropriate a State Agreement Act.

It is not the Government's role to regulate private industry to the extent of dictating which deposits will be allowed to develop within a certain time frame. However, before being allowed to proceed, a project will have to demonstrate that it is environmentally and socially acceptable and offers economic benefits to the region and the State.

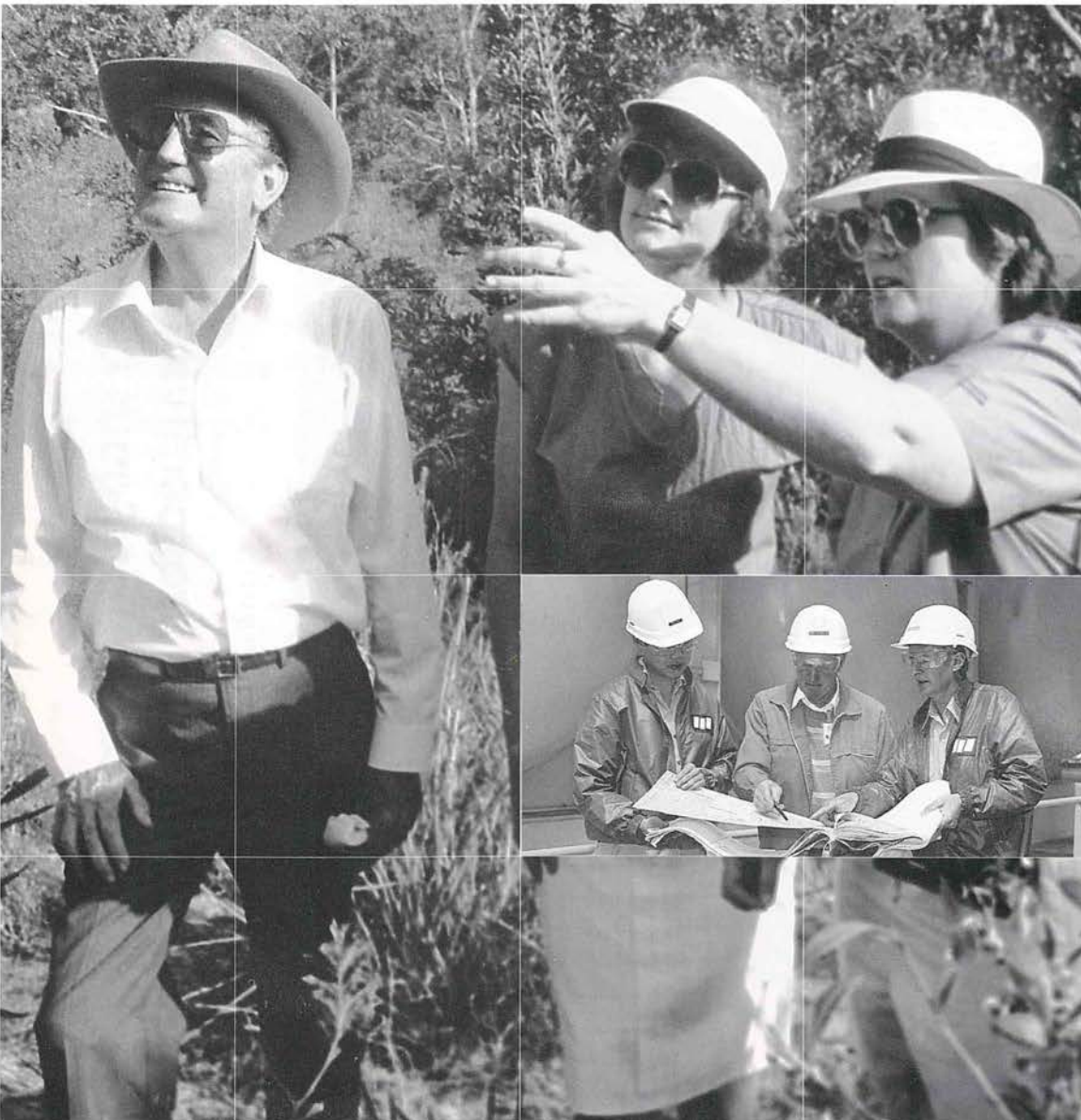
Environmental Assessment

No mineral sands development in the South Coast region will be allowed to proceed without clearance from the Environmental Protection Authority (EPA).

Referral of mineral sands proposals to the EPA is mandatory for Ministers, Government Departments or Local Councils and can also be made by the proponent, members of the public or interest groups. The EPA can also call in proposals for assessment.

It is the EPA's role to determine whether proposals are likely to have significant impact on the environment.

Consultation with local community groups plays an important part in the early planning and development of projects. Here, members of the Beenup Consultative Group inspect areas rehabilitated after mining.



When the EPA has decided to formally assess a proposal, the proposal cannot proceed until the EPA has completed its assessment and the Minister for the Environment so authorises.

A proposal subject to a Consultative Environmental Review (CER), Public Environmental Review (PER) or Environmental Review and Management Programme (ERMP) is made available to the public and written submissions sought for four, eight or ten weeks respectively. Public interaction is encouraged at several stages throughout the assessment process.

The EPA process involves advertising in each Saturday's "West Australian" newspaper a listing of projects referred and assessment levels determined by the EPA, closing dates for public submissions, and assessment reports recently released by the EPA.

Interested parties have the opportunity to:

- Appeal to the Minister for Environment against the level of assessment set by the EPA for a project;
- Make submissions on the CER, PER or ERMP reports released by the proponent;
- Appeal to the Minister for Environment against the EPA's assessment of a project

Social Impact Assessment

The development of any major project will result in social impacts, positive, negative or both. Most predicted impacts can be managed with positive impacts being enhanced to increase the benefits to the communities and State, while some negative impacts can be reduced.

Communities will be informed about projects and have input into the planning, assessment and decision making processes relating to the project.

Proponents of major projects will be required to design and conduct public participation and information programmes. These programmes and results together with management plans to address the social impacts of the project will be detailed in the social impact assessment undertaken as part of the EPA's assessment process.

Assessments will address potential impacts which relate to the inherent characteristics of the region. These include population trends, land use conflicts, competing needs on infrastructure, natural attributes, lifestyle values and social organisation/cohesion.

Benefit Assessment

Proponents of major projects should clearly demonstrate the benefits that will accrue on a local, regional and State basis from any new project.

If further processing of the minerals does not form part of the project, proponents will be expected to commit to study the potential for further processing and to develop such investments when these studies show the project to be viable.

The typical areas that may be addressed in a benefit assessment are stated in the South West Strategy as:

- use of raw materials sourced in the region;
- contribution to regional employment on a continuing basis;
- contribution to community headworks;
- contribution to the structure of the regional economy;
- impacts on environment, lifestyle, land use;
- nett benefits to the community.

A benefit assessment should consider both the construction and operating phases of the project. Where possible the assessment should be expressed in dollar equivalent terms and separated

into those that accrue to the local community, region, State and those that flow elsewhere.

Regional and Local Planning

The Government has a planning programme which involves the production of regional plans such as the Leeuwin Naturaliste Region Plan. Sand mining, processing and associated transport are activities that must be taken into account within such a regional plan.

INFRASTRUCTURE

Transport

It is Government policy that where practicable rail should be used as the transport for large volume traffic such as mineral sands. Where rail is considered non viable, the potential for use of the existing road system will be assessed. If the existing road system is considered unsuitable, then provision of new infrastructure will be considered.

In the case of the Beenup and Jangardup proposals, a detailed study has been carried out to determine the optimum mode and route for transporting mineral sands to Bunbury.

This study consulted with a wide range of interested parties, and input was obtained from the local Shires and the public.

The construction of a new rail line was ruled out due to the high cost requirements (\$53 million), doubts about viability at the level of tonnage expected, and the inherent investment risk associated with a single product rail freight service. However, Westrail will continue to re-examine rail haulage from the region in order that the necessary data is available for Government to ensure that the best long term transport strategy is achieved.

The Transport Study also indicated that a dedicated heavy haulage route along Sues Road has considerable merit. This includes the subsequent construction of a road to connect the Vasse and Bussell Highways to the point where the Sues Road route joins the Vasse Highway.

There is considerable support for this road option from all quarters and the companies have agreed in principle to meet the cost of upgrading the road. Planning work is progressing concurrently on both road and rail options to avoid mining delays.

Power

Where power is not readily available, and should there be a requirement for upgrading or extending the power grid, the proponent would be expected to

either contribute substantially towards these costs or establish its own on-site generating facilities.

Proponents are encouraged to connect to the SECWA power grid wherever economically viable as this extends the opportunities for other potential users in the region to be connected.

Additions to the power distribution grid or private generation require EPA approval and may invoke the formal assessment process under the EP Act.

Water

The regulatory powers of the State will be carefully exercised to ensure that:

- pollution of water systems does not occur
- environmental damage is minimal
- competing users for the water are not disadvantaged.

Industry would be expected to use the lowest quality water available where its use is environmentally acceptable. Water conservation and recycling processes will be encouraged in all aspects of process design.

The proponent would also be expected to undertake exploration and assessment for suitable groundwater sources, where required.

Social Infrastructure

All projects should optimise the use of existing social infrastructure, and contribute to any new infrastructure required to service the project.

The Government will provide assistance at an early planning stage to local councils involved in development projects. This assistance includes the identification of any need for expanded social infrastructure in townships affected by projects and the assessment of costs and responsibilities for the infrastructure requirements.

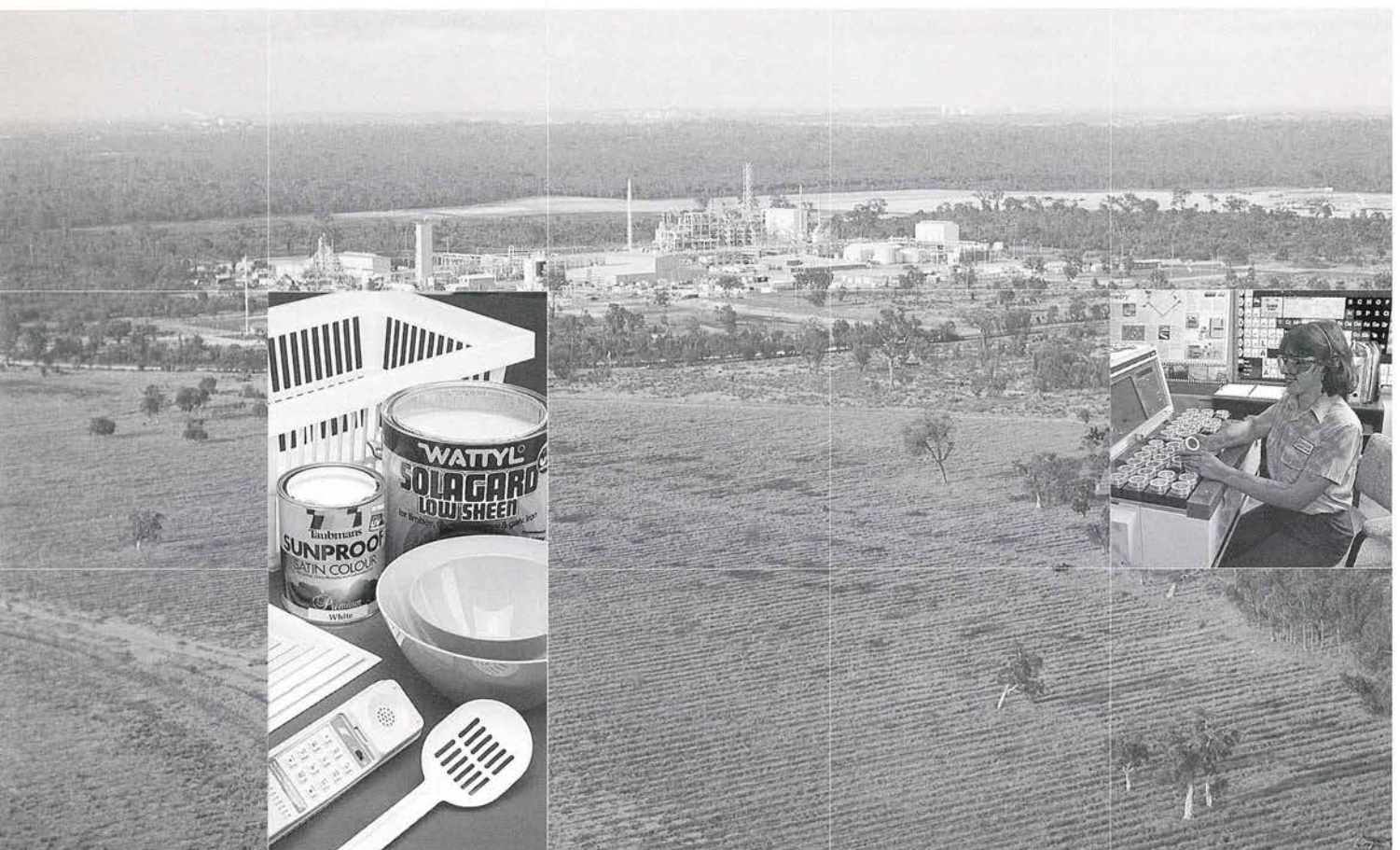
SITING OF SECONDARY PROCESSING

The Government has and will continue to develop planned industrial areas that are suitable for the location of heavy industry and have clear guidelines for development.

Planned industrial areas will meet the EPA's objectives for such land uses which include ensuring that impacts of industrial development do not exceed the assimilative capacity of the receiving environment.

The types of mineral sands processing that would be appropriately located in such industrial areas are titanium pigment and titanium sponge or metal plants. Kemerton Park Industrial Estate near Bunbury is an example of such a development in the South West region. However, areas close to the Beenup/Jangardup deposits are not considered suitable for location of such industrial areas.

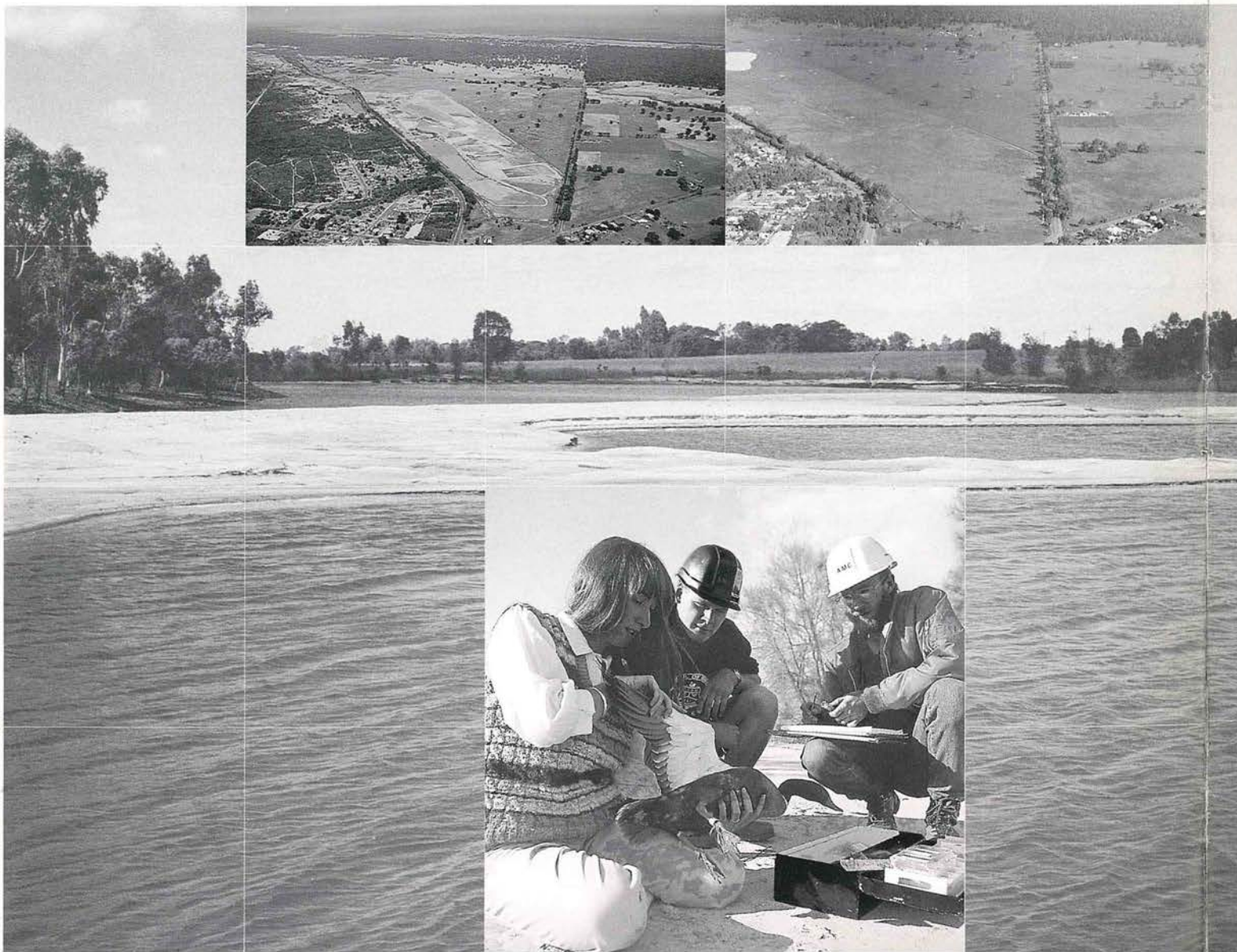
Synthetic rutile plants are normally operated by the primary processor and, provided that the site is acceptable to the EPA, are usually located in close proximity to the dry separation plant.



Planned industrial areas, such as Kemerton Park, have clear guidelines for development and are suitable locations for secondary processing of mineral sands.

Development of wetland reserves form an integral part of mineral sands rehabilitation programmes in the South West. Researchers monitor waterbirds to encourage the development of permanent populations.

Farm land at Capel during the mining operation and the rehabilitated land eight months after completion of mining. Groups of trees have subsequently been planted for stock shelter and regional landscaping.



REHABILITATION

Mineral sands mining is undertaken on a range of different land types, and rehabilitation objectives and standards have been developed for each category of land. In each case the final land use must be sustainable and not require further or ongoing rehabilitation. The industry has clearly demonstrated the ability to meet these requirements and the EPA has recently stated that... "New rehabilitation areas are at the forefront of technology - they are as good as or better than comparable areas elsewhere in Australia and the world".

Private Land

The most common land type in the South West upon which mining takes place is privately owned agricultural land. The rehabilitation objective on such land is to return it to sustainable productive agricultural use. The minimum standard expected is that the mined land should have at least its former productivity. The incorporation of clay material into the upper horizon of the tailings is encouraged as this increases the moisture retention of the soil and as a consequence increases productivity.

In areas not suited to long term agricultural production the preferred rehabilitation option is to establish a stable vegetation assemblage. In practice, either native vegetation ecosystems or various types of tree crops have been used.

Reserve Land

There are no current operations in the South West involving National Parks or Nature Reserves. Mineral sand mining has, and is being undertaken on areas of State Forest.

In the case of State Forest, mining is subject to conditions set by the Department of Conservation and Land Management (CALM). Rehabilitation objectives usually require the area to be returned to its former use. Standards are set by CALM in relation to species selection and vegetation density.

Compensation is required to be paid to CALM for the loss of forest values resulting from the mining, and the Company is also responsible for the rehabilitated areas until they are considered by CALM to have reached sustainability. Completion criteria to determine when such sustainability has been achieved are determined on a case basis for each ecosystem type. The Department of Agriculture, CALM, Mines and the Environmental Protection Authority contribute their expertise to determine completion criteria.

Vacant Crown Land (VCL)

The rehabilitation objectives for VCL are to re-establish a stable vegetation cover that will be self-regenerating, unless there is some other approved future land use for the area. Completion criteria may also be set for this type of rehabilitation.

Remedial Restoration

The Government endorsed findings of the Playford Report that listed four areas in the South West region as requiring remedial restoration:

- Wonnerup
- Old Yoganup
- Yoganup Extended
- South Capel

In each case a currently operating company has taken responsibility for remedial work and programmes that will return these areas to a sustainable land use are either underway or completed.



CONCLUSION

This strategy lays a firm foundation for environmentally and socially acceptable mineral sands development to proceed in the South Coast region of Western Australia. The dynamic nature of both the South Coast region and the mineral sands industry will necessitate regular reviews of the strategy every three to four years.

Comments on the strategy are welcomed by the Government, through the Department of Resources Development.

For those requiring more detailed information on Government policy relating to the mineral sands industry, a "Policy Document" has been prepared in conjunction with the strategy. Both documents are available from:

Co-ordinator
Department of Resources
Development
170 St Georges Terrace
PERTH WA 6000

Telephone: (09) 327 5454
Facsimile: (09) 327 5481