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GEOLOGICAL SURVEY OF NAMIBIA

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MINING IN PROTECTED AREAS

by

G SCHNEIDER

EARTH SCIENCES FOR NAMIBIA'S SUSTAINABLE DEVELOPMENT

THE IMPORTANCE OF MINING FOR THE NAMIBIAN ECONOMY

10% GDP
(largest contributor)
11 % Taxes
50 % Export-earnings

Royalties:
5% on unprocessed dimension stone
10% on rough diamonds
1% - 5% on all other commodities

Diamonds:
6 % of world production (value)
95-98% Gemstone quality

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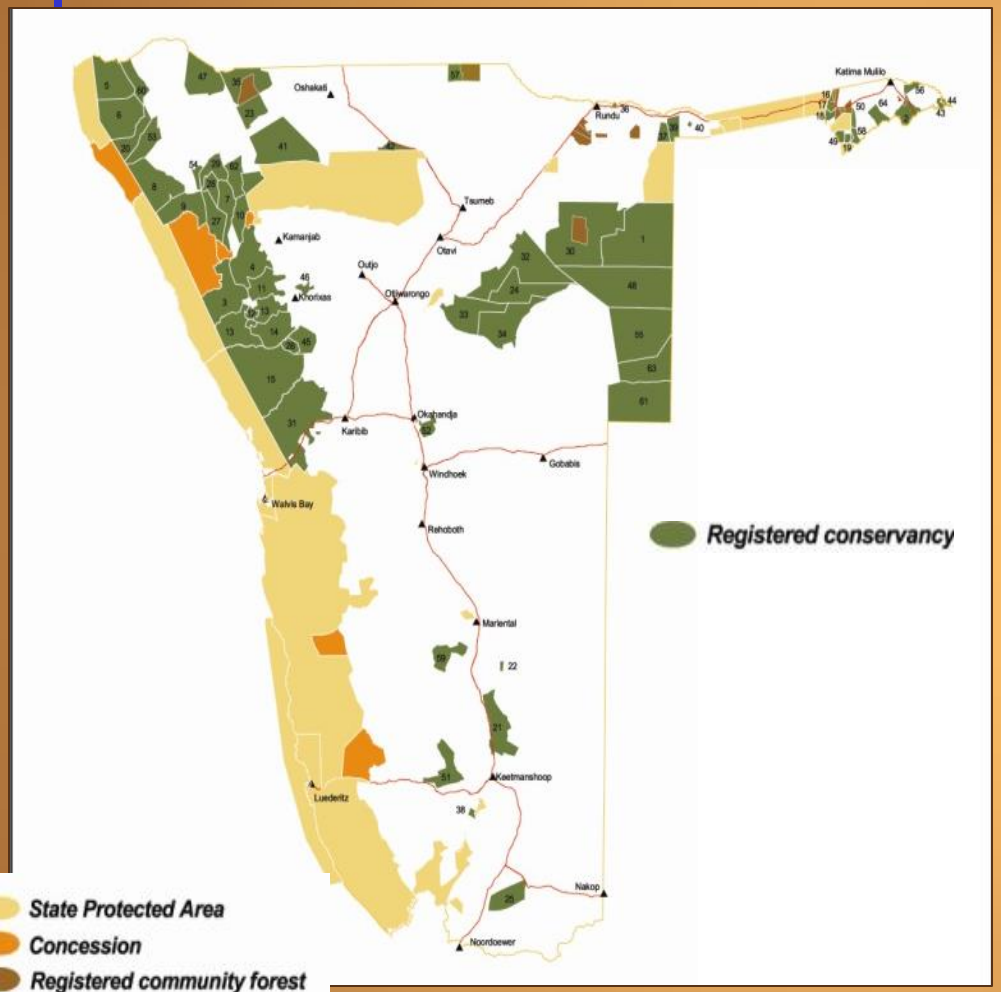
COMMUNAL CONSERVANCIES + NATIONAL PARKS IN NAMIBIA



42% of the country enjoys a state of conservation (IUCN requirement = 15%)

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COMMUNAL CONSERVANCIES + NATIONAL PARKS IN NAMIBIA

- Transfrontier Parks: Kavango-Zambesi, Iona, Ai-Ais
- Coastal Mega-Park: 10.8 m ha, 6th largest in the World, largest in Africa
- Tourism is 3rd largest contributor to GDP (has overtaken Fisheries)
- Tourism has high job potential (18.6%)
- Tourism is fastest growing sector

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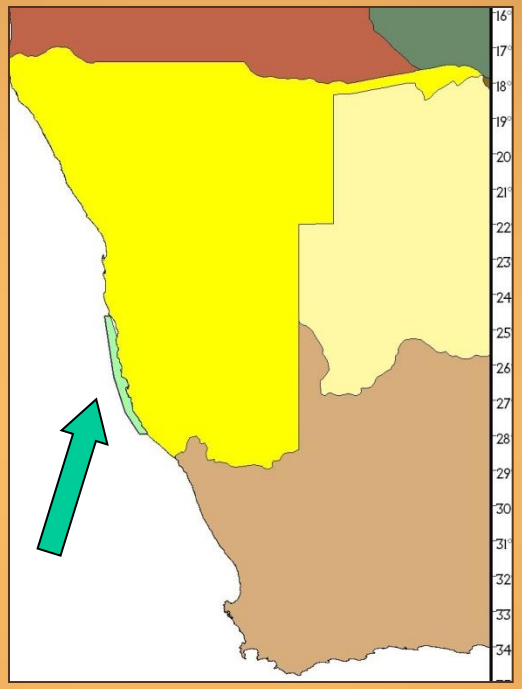
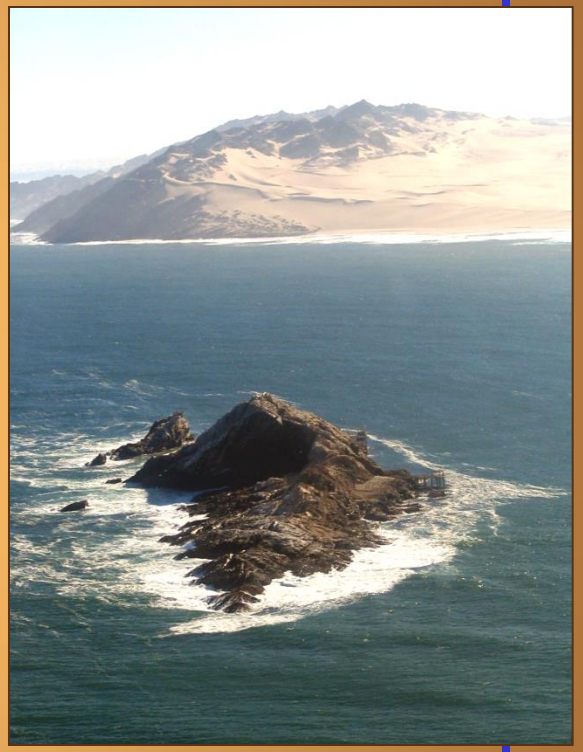
NAMIBIAN ISLANDS' MARINE PROTECTED AREA





Meob to Sinclair Island
200 m water depth

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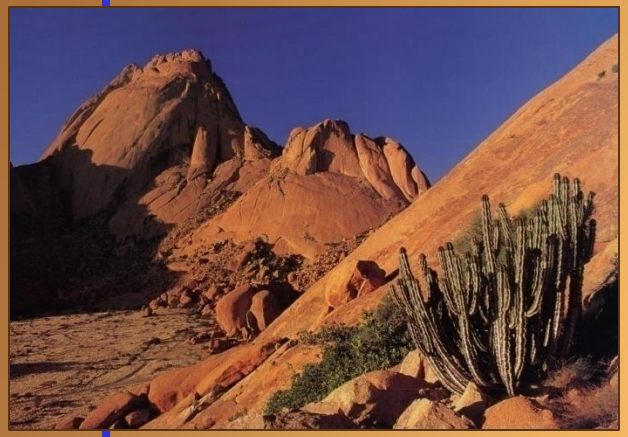
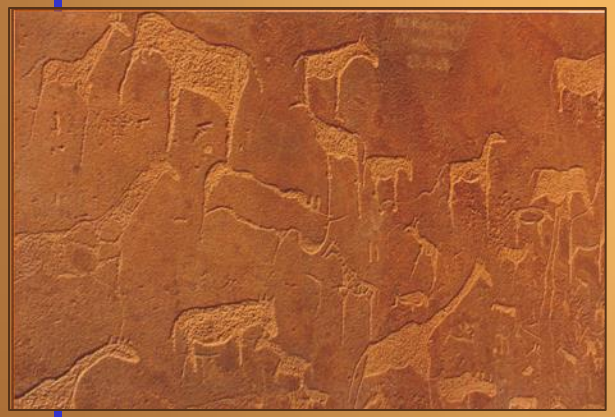
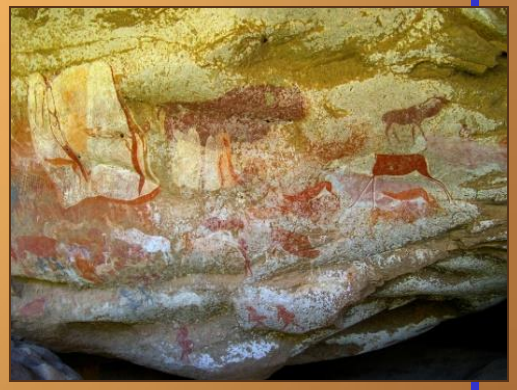
NATIONAL HERITAGE IN NAMIBIA







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MINING AND EXPLORATION IN PROTECTED AREAS

Hon Netumbo Nandi-Ndaitwah: "*We cannot have natural resources and not use them, but they must be used sustainably*"

With the high % of protected areas in Namibia, it is not possible to ban exploration and mining in National Parks.

- **Diamonds: Skeleton Coast Park, Sperrgebiet Park , Namibian Islands Marine Protected Area**
- **Uranium: Dorob National Park, Namib-Naukluft Park**
- **Zinc: Sperrgebiet Park**
- **Salt: Dorob Park**
- **Dimension Stone: Dorob Park, Namib Naukluft Park**
- **Gypsum: Namib Naukluft Park**
- **Copper: Namib Naukluft Park**
- **Phosphate: Namibian Islands Marine Protected Area**
- **Semi-precious stones: Brandberg Monument + Spitzkuppe Heritage Area**

ECONOMIC IMPORTANCE

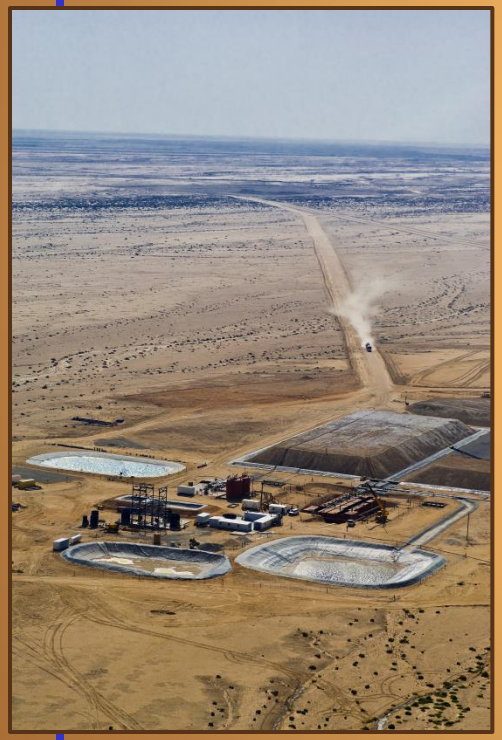
	Production	Turn-over	Tax	Royalty	Employ-ment
Diamonds	1 471 000 cts	5 026 m	594 m	503 m	1651
Uranium	1 678 t	1 400 m	----	32.2 m	268
Zinc	151 688 t	2524 m	14.8 m	11.6 m	682
Salt	872 000 t	352 m	7.7 m	6.6 m	131
Total		9302 m	616.5 m	553.5 m	2732

Contribution to GDP
Diamonds 3.6%
Other 5.4
Total 9% (10%)

Contribution to Taxes + Royalties
1 170 million
= 75.19%

ECONOMIC IMPORTANCE

Estimated increase of income from Uranium alone



	2009	2015	2020
% of Exports	13	54	63
Value of Export (million N$)	5 400	22 700	26 300
Royalties (million N$)	300	700	800
Corporate Tax (million N$)	500	1 600	2 500
PAYE (million N$)	100	500	600
Total (3-5)	900	2 800	3 900

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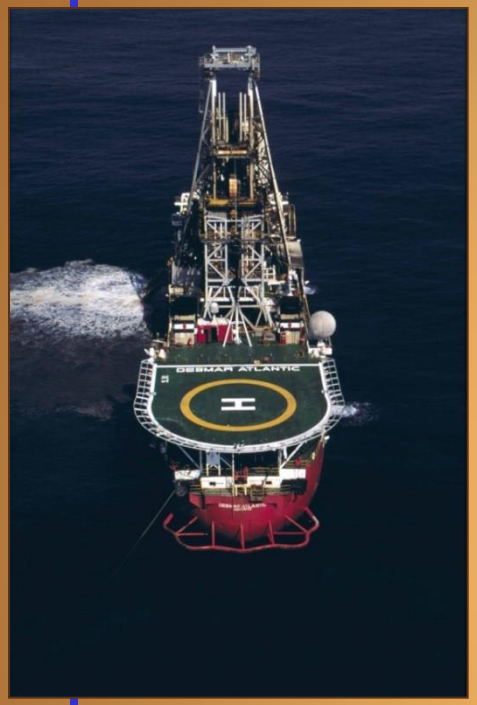
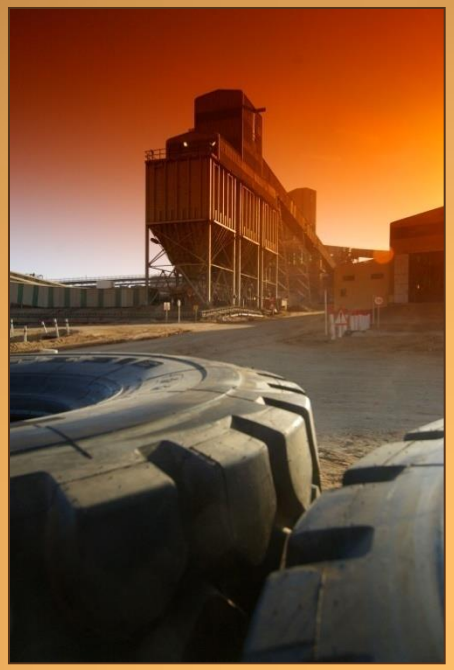
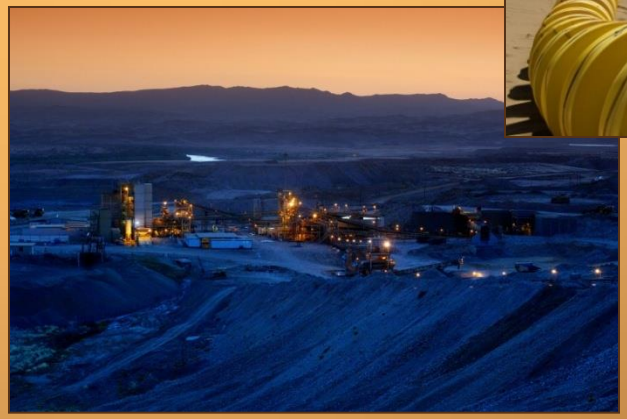




DIAMONDS



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DIAMONDS: Heritage

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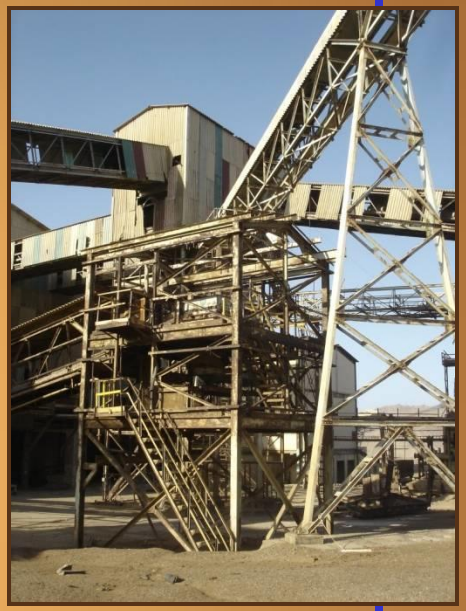
DIAMONDS: Rehabilitation MA1



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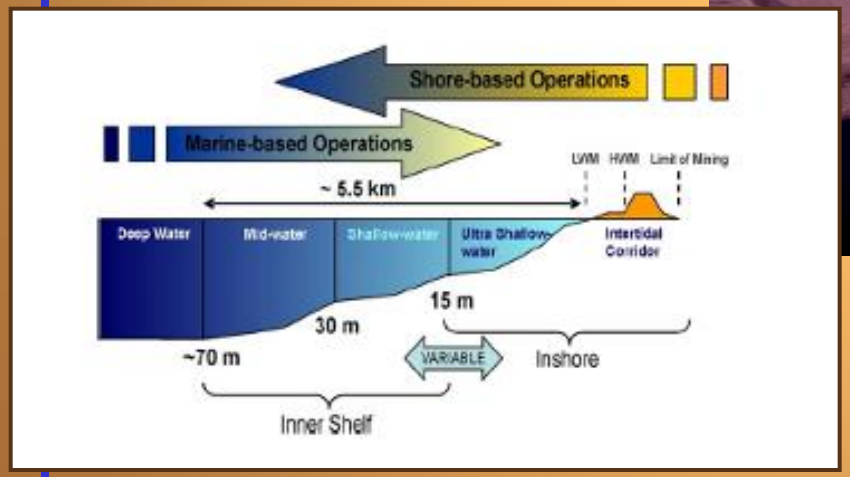
DIAMONDS



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DIAMONDS: ENVIRONMENTAL CONCERNS

Environmental aspects associated with the operation:

- Fine tailings discharge and shoreline accretion
- Shoreline modification (pocket beaches)
- Shoreline modification (littoral beaches)
- Activities of shore-based divers
- Activities of vessel-based divers
- Inshore mining influence on surf zone

DIAMONDS

- Damage to terrestrial environment
- Biodiversity loss of rocky and sandy intertidal communities
- Loss of habitat through smothering of subtidal reefs
- Biodiversity loss of subtidal reef+kelp bed communities
- Pollution

- Rocky and sandy beach monitoring
- Shallow subtidal zone monitoring
- Rock lobster and kelp monitoring
- Water quality survey
- Spill model

OFFSHORE DIAMONDS: Environmental Concerns

Environmental aspects associated with the operation:

- Changes to the ecosystem
- Climate Change
- Use of hazardous materials
- Spillages and releases
- Use of natural resources
- Waste generation + disposal

OFFSHORE DIAMONDS: Impacts + Mitigation

- Biodiversity loss
- Emissions into the air and greenhouse gases
- Pollution
- Impacts on the water column (tailings plume)
- Resource depletion and impacts on the sea bed (drill bit action)
- Natural variability???

- Biodiversity Action Plan
- Climate Change Action Plan
- Pollution Prevention and Waste Management
- Lifecycle Planning
- EIA
- Ongoing assessments
- Ongoing monitoring

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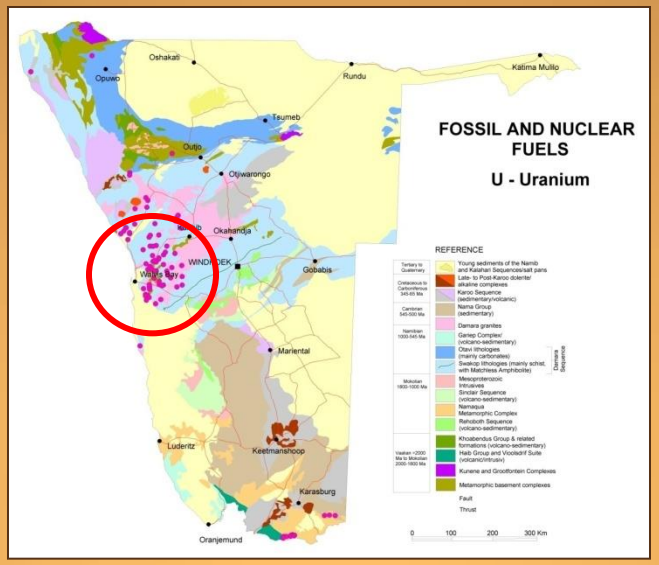
Langer Heinrich Mine



URANIUM

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URANIUM: Langer Heinrich Mine

Impacts + Mitigation

- Surface + ground water
- Biodiversity
- Radiation + air quality
- Archaeology
- Traffic
- Pollution + loss of soils
- Visual impact
- Noise + vibration

- Proper design of infrastructure to prevent pollution
- Re-instate palaoe-channel at mine closure
- Identification of sensitive areas + avoidance
- Minimize footprint and restore
- Biodiversity offsets in future
- Soil stockpile
- Nursery and seed collection
- Minimize dust
- Archaeological survey + rescue archaeology
- World War I tourist sites
- Financed C28 tarr surface
- Gobabeb soil studies
- Refill open pit + re-vegetate
- Well maintained equipment

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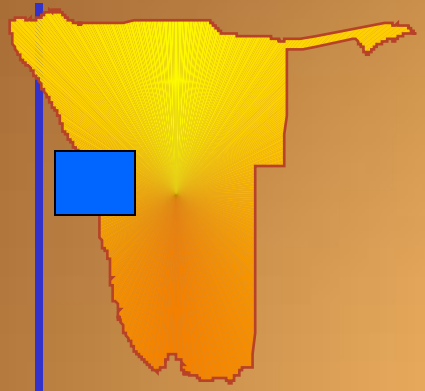
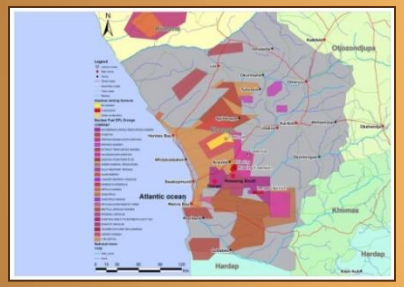
STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE NAMIB URANIUM RUSH





There was a clear need to establish comprehensive *Environmental Baseline data* to underpin environmental assessments (EIAs), contribute to EMPs and to the over-all process of progressing with exploration and potential mining license applications in a National Park. There was also an urgent need for a a process of systematic analysis of environmental impacts which extends the aims and principles of EIA upstream in the decision making process, beyond the project level and when major alternatives are still open (SEA definition according to UNDP, 2002) and a Land use Strategy of all areas affected by uranium mining, and in particular in the Namib Naukluft Park.

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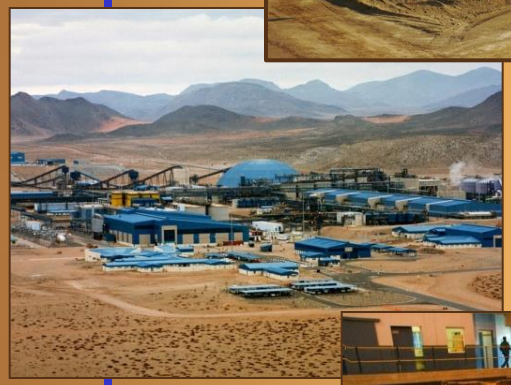
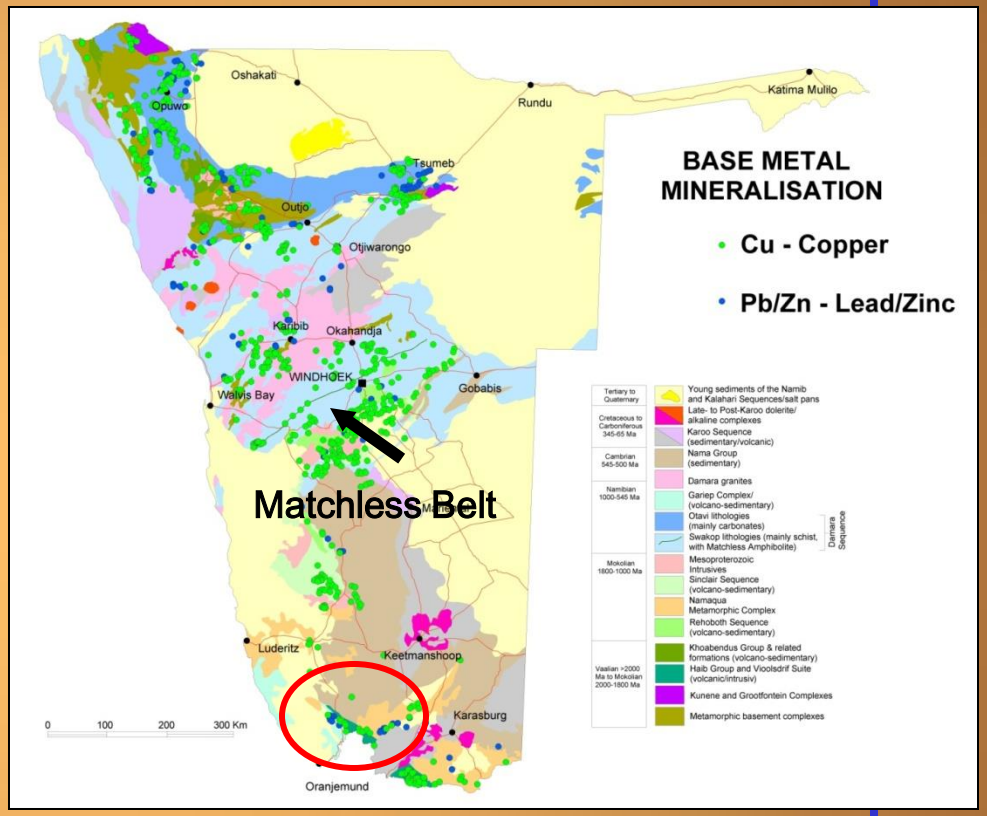
COPPER + ZINC





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ZINC: Skorpion Mine Impacts + Mitigation

- Surface + ground water
- Biodiversity
- Air quality
- Archaeology
- Pollution + loss of soils
- Visual impact
- Noise + vibration

- Integrated risk management system
- Prevent and mitigate water pollution
- Minimization of waste
- Prevent and mitigate ground pollution
- Soil stockpile
- Prevent and mitigate air pollution
- Minimize dust
- Archaeological survey
- Integrated environmental monitoring and rehbilitation plan
- Draft closure plan
- Well maintained equipment

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SALT

- Walvis Bay salt works part of Ramsar Site
- Single most important wetland for migratory birds in southern Africa
- Amongst top 3 in Africa
- Lesser Flamingo
- Cape Teal
- Black-winged Stilt
- Black-necked Grebe
- African Oystercatcher
- Plovers

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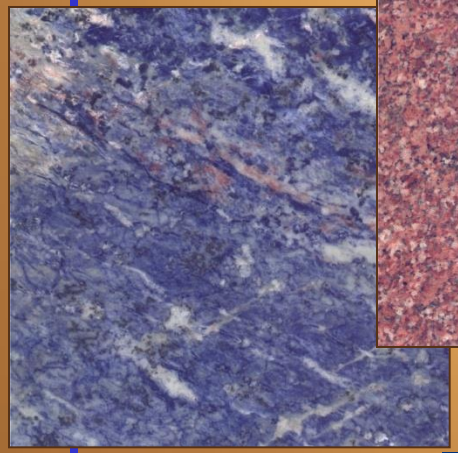
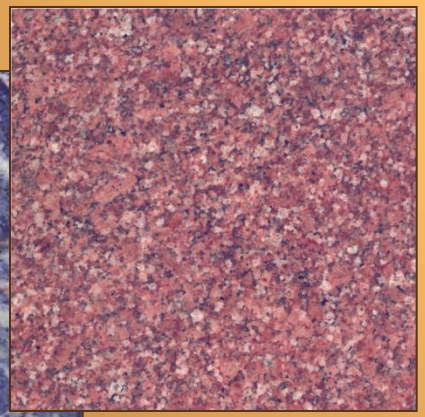
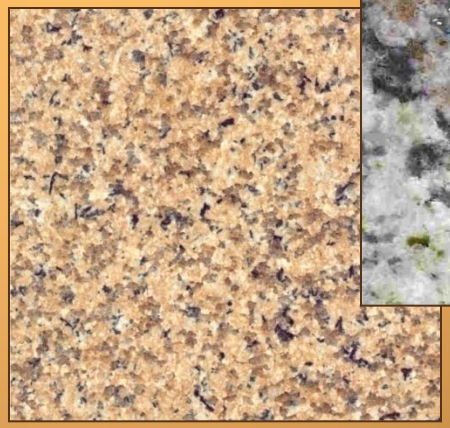
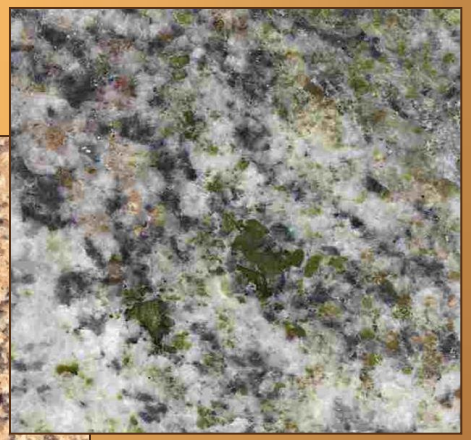
DIMENSION STONE

- Policy not to grant dimension stone licenses in parks
- Pre-existing rights honoured



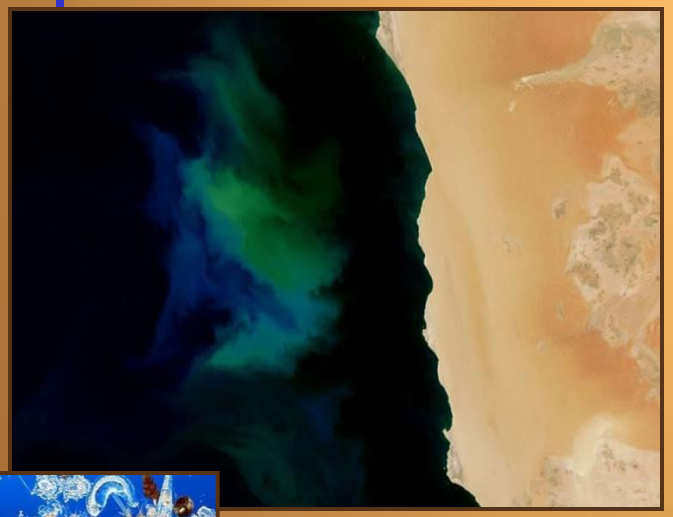






PHOSPHATE

- The exceptional biological productivity of the Benguela Current leads to the formation of biogenic sediments high in phosphorous of organic origin
- Phosphorous concentrations can reach 23%
- Highest concentrations occur south of the Kunene mouth and between Swakopmund and Lüderitz



- Sedimentary phosphate is one of the main sources of phosphorous for fertilizer prodction
- Rock phosphate prices increased from US$ 50/t in 2007 to US$ 350-400/t in 2008 (currently US$ 200/t)

PHOSPHATE: Impacts + Mitigation

- Acoustic pulses of geophysical equipment
- Marine sediment removal
- Losses of stock of commercial species
- Pollution

- Monitoring of marine macro-fauna
- Minitoring of benthic fauna
- Monitoring of commercial species
- Best practises of pollution controll

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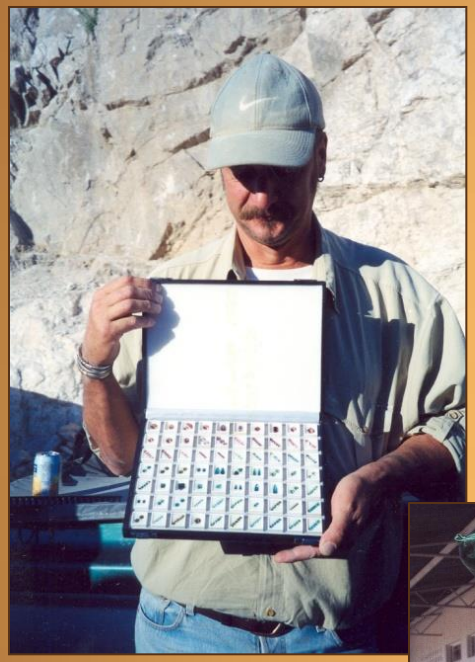
SEMI-PRECIOUS STONES + MINERAL SPECIMEN



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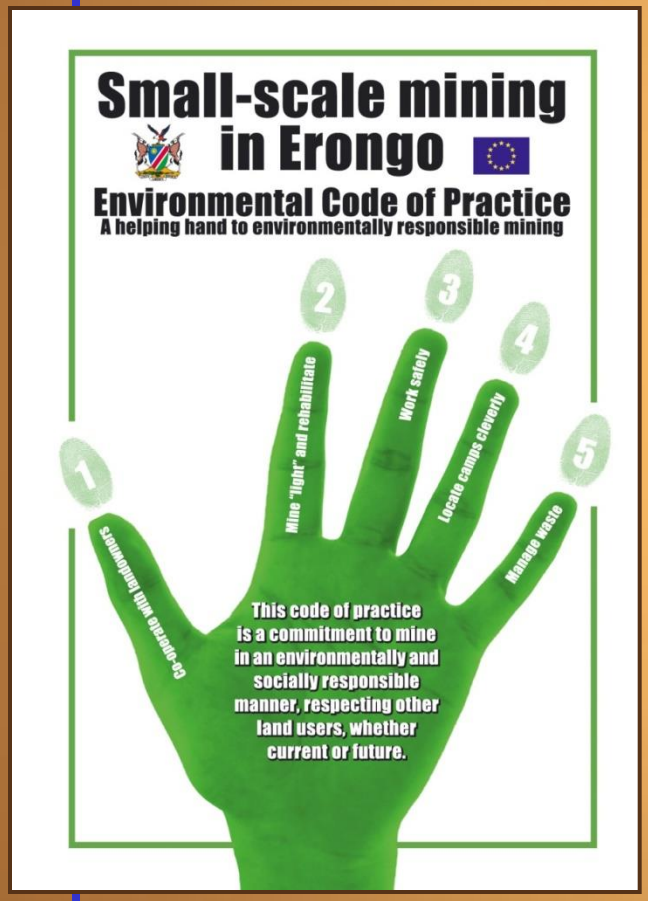
SMALL SCALE MINING



ECOP point	Impacts reduced
1. Co-operation with landowners	• Poaching • Litter & waste • Risk of fire • Security risk • Disruption of farming activities • Interference with tourism
2. Mine "light" and rehabilitate	• Visual • Erosion • Interference with tourism • Risk to health & safety of miners
3. Work safely	• Risk of fire • Risk to health & safety of miners
4. Locate camps cleverly	• Wildlife displacement • Visual • Risk of fire • Risk to health & safety of miners • Damage to archaeological heritage
5. Waste management	• Litter & waste • Visual • Risk of fire

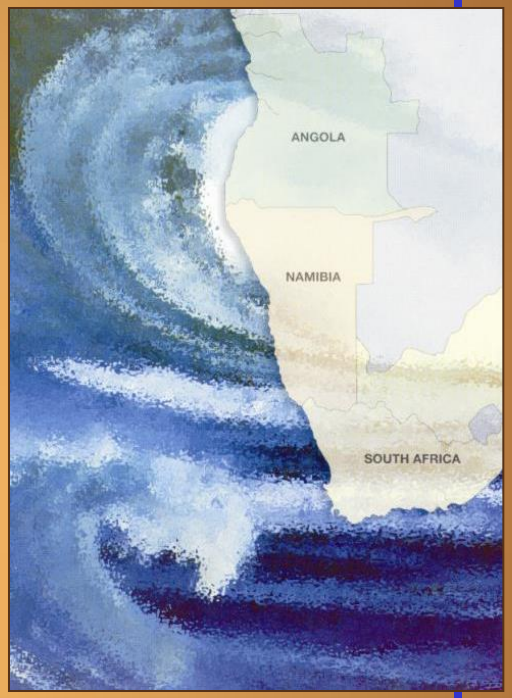
COOPERATION BETWEEN THE MINISTRY OF MINES & ENERGY + THE MINISTRY OF ENVIRONMENT & TOURISM

- MET representation on Mineral Rights Committee
- MME Vice-Chair of the Environmental Investment Fund
- Conference on Mining in Protected Areas
- NACOMA
- Environmental Rehabilitation Sign-off
- Sperrgebiet Park Advisory Committee

BENGUELA CURRENT COMMISSION

RESOURCES:

- Fish
- Crustaceans
- Mari-culture products
- Minerals
- Hydrocarbons
- Tourism



BENGUELA CURRENT COMMISSION

- MANAGEMENT OF MINING AND DRILLING ACTIVITIES
  - Regional Consultation Framework
  - Policy Harmonization
  - Cumulative Impact Assessment

- MANAGEMENT OF POLLUTION
  - Harmonizing environmental quality objectives
  - Oil pollution contingency plans and regional policy

- MAINTAINANCE OF ECOSYSTEM HEALTH + PROTECTION OF BIOLOGICAL DIVERSITY
  - Vulnerable species and habitats
  - Ballast water policy
  - Marine biological diversity conservation

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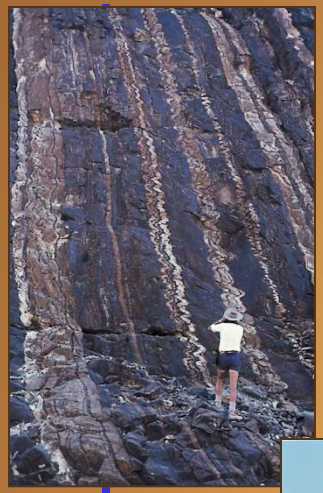
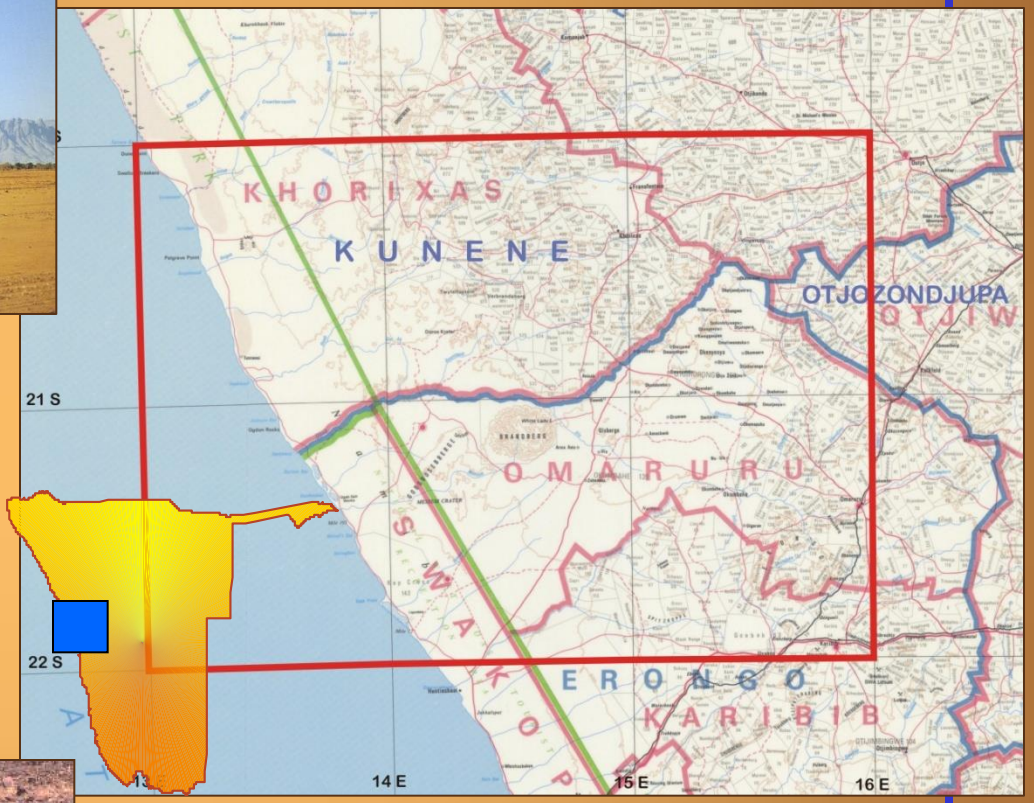
GONDWANALAND GEOPARK





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