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HISTORY OF ASBESTOS MINING IN SOUTH AFRICA

Preface

After having been associated with the asbestos mining industry in South Africa for more than 50 years, from a junior through to senior management level, and having had access to a large part of the official information of the major producers, I felt compelled to compile a chronological report covering the history of the mining of this mineral. This may be of interest to persons wishing to follow this saga.

This book is divided into three main sections, dealing with each of the key types of asbestos found and mined in this country.

Section 1 deals with Cape Blue asbestos, found mainly in the present Northern Cape and North West provinces.

Section 2 deals with Amosite and Transvaal Blue asbestos, mainly found in the Limpopo province.

Section 3 deals with Chrysotile asbestos, mainly found in Mpumalanga province, with minor occurrences near Krugersdorp in Gauteng and Zeerust in the North West province.

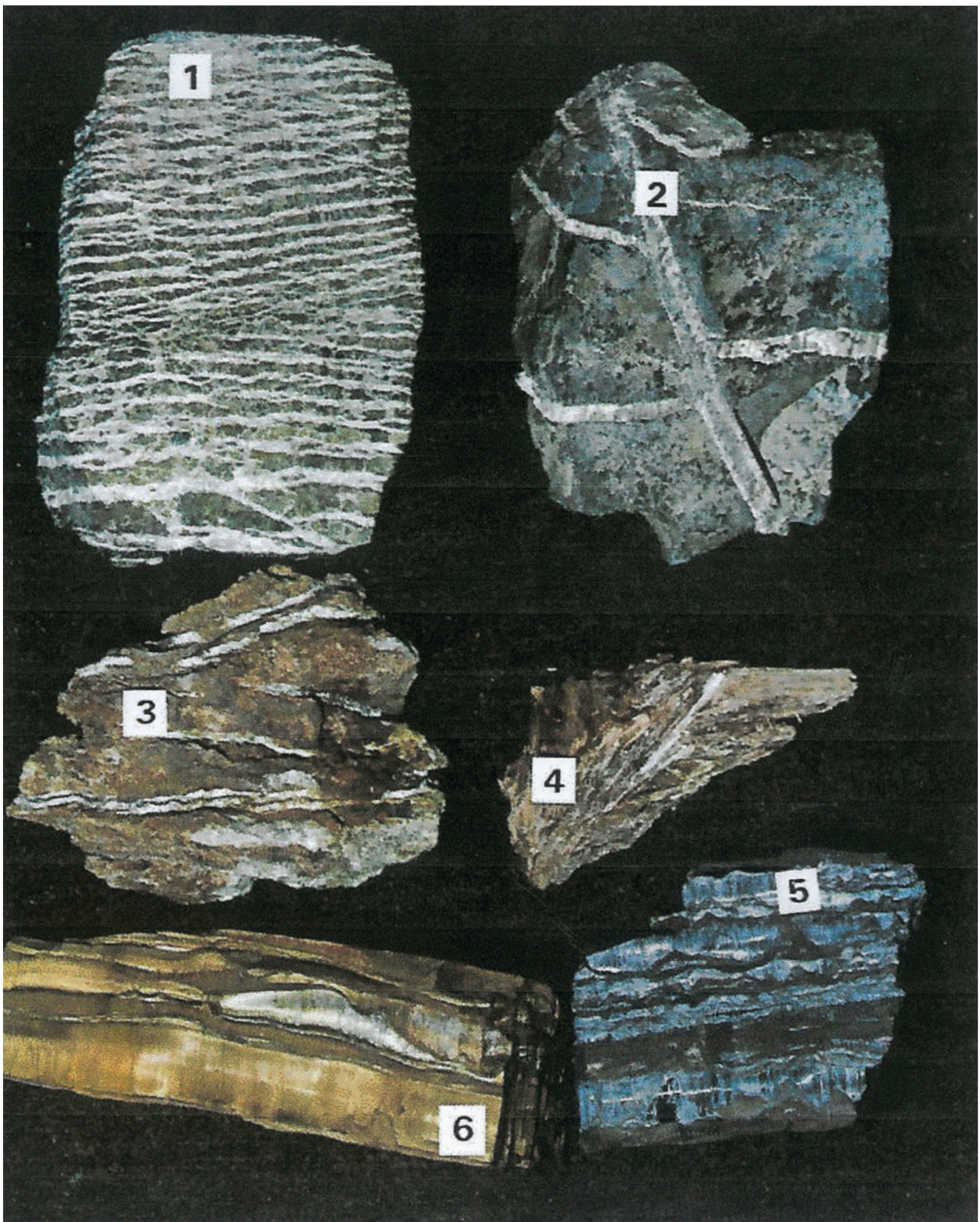
The content of this book reflects as much of the information which over time has come into my possession and which I consider to be appropriate. However, it is by no means exhaustive.

I would like to express my gratitude to the late Phiroshaw Camay, who ably assisted in getting the end product print ready. I would also like to acknowledge the support of Karen Whitehead who diligently attended to the typing of this manuscript over a period of some six years.

P A VAN ZYL
Johannesburg
January 2017

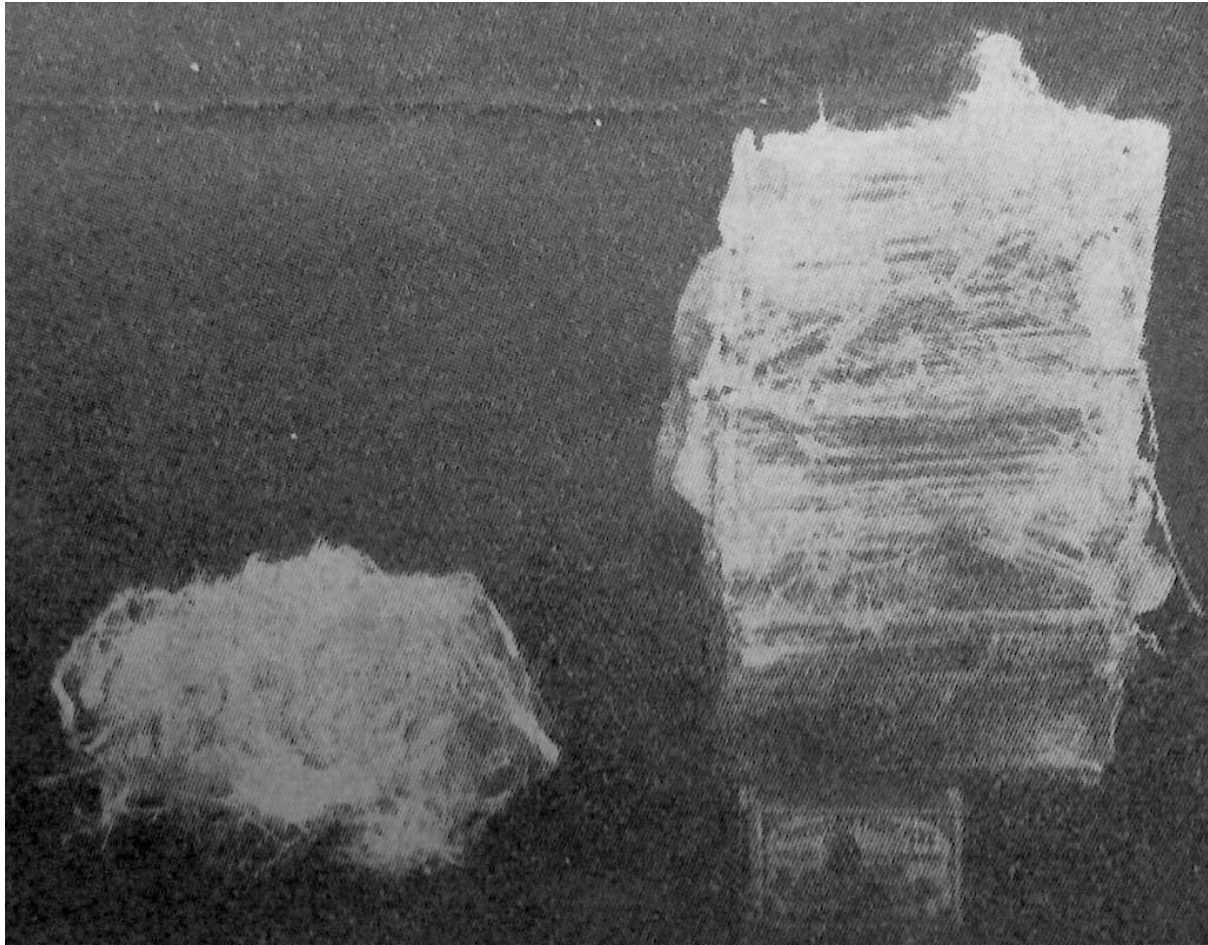


A HISTORY OF ASBESTOS MINING IN SOUTH AFRICA

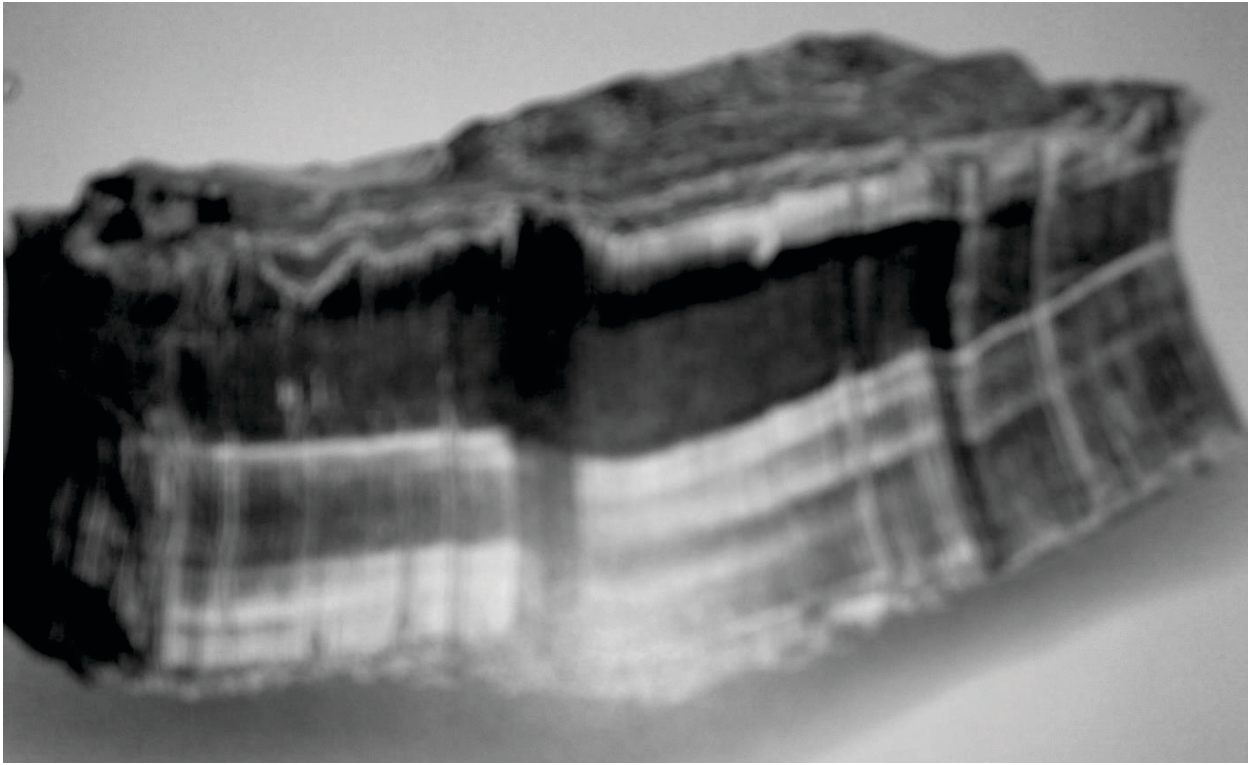


1. Chrysotile Ribbon Fibre
2. Chrysotile Stockwork
3. Chrysotile Outcrop

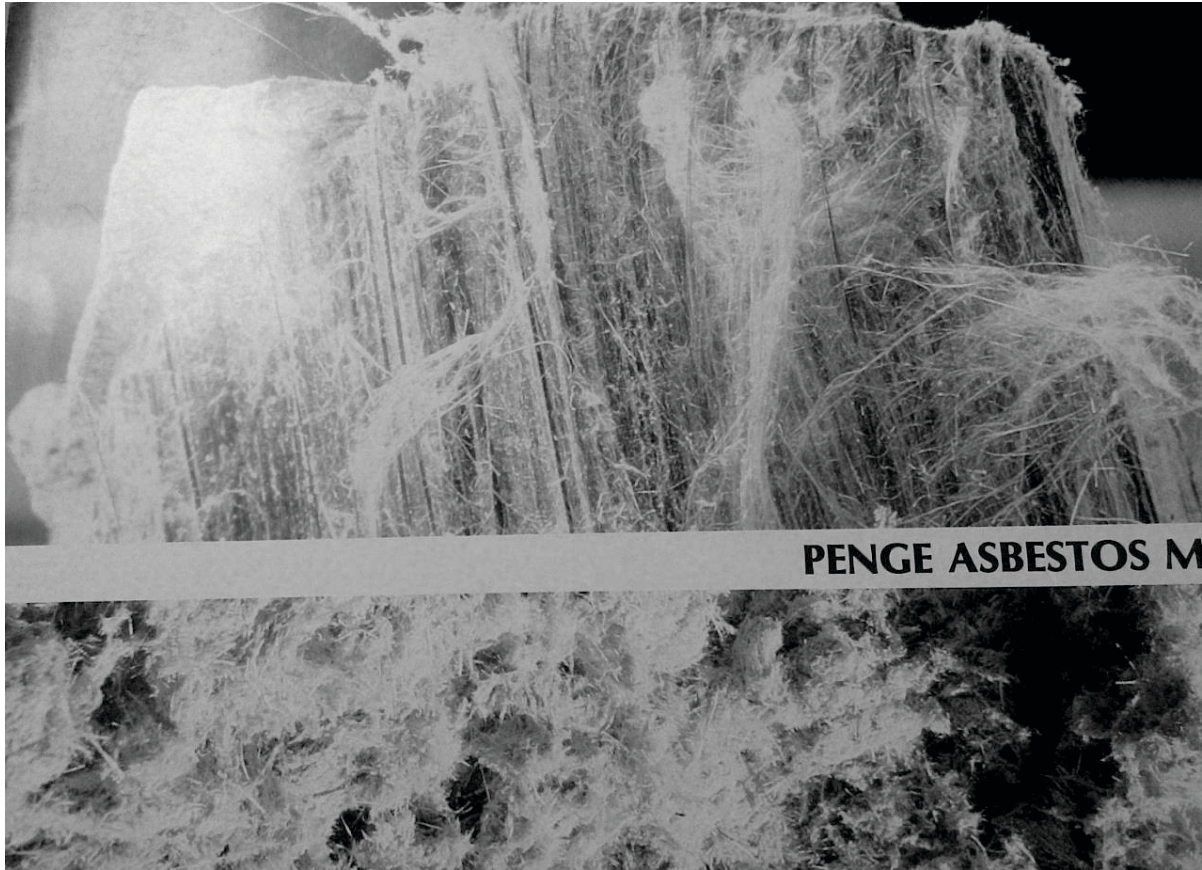
4. Anthophyllite
5. Crocidolite, oxydised
6. Crocidolite in banded ironstone



Block of Kalkkrans Asbestos Company's chrysotile fibre, with some teased-out material which is of a silky-soft texture



Cob of blue asbestos



Amosite fibre

Although other varieties of this mineral are also found in South Africa, the occurrences are too small to be of any commercial significance. These include antophyllite and tremolite.

HISTORY OF ASBESTOS MINING IN SOUTH AFRICA

Introduction

Asbestos was mined in South Africa for more than a century, starting in approximately 1891 and ending in 2001. A major dictionary, online and therefore current, describes asbestos as 'a highly heat-resistant fibrous silicate mineral that can be woven into fabrics, and is used in brake linings and in fire-resistant and insulating materials.' Asbestos still has industrial applications where it may be difficult to replace, and the dictionary adds, 'the danger to health by breathing asbestos particles has led to more stringent control of its use'.

Mainly three varieties were mined in South Africa. Two are classed as amphibole types, namely crocidolite (pronounced 'crew-sida-lite', and commonly called Cape Blue asbestos and Transvaal Blue asbestos) and amosite (commonly called brown

asbestos). The third variety, with some chemical and mineralogical differences, is chrysotile (pronounced 'cry-so-tile', and commonly called white asbestos).

Cape Blue Asbestos (Blue)

The earliest reference to the occurrence of asbestos in South Africa can be found in the reports of Lichtenstein in 1805 and Burchell in 1812, following their expeditions into the interior. Both these observations were made in the Prieska/Koegas/Griquatown areas of the Northern Cape. This part of the country was incorporated into the Cape Colony in 1879 and is now known as Griqualand West.

During 1884 the land north of the Orange River up to the Molopo River became a Crown Colony. By then it had already been established that blue asbestos occurred over a distance of some 200 miles (approximately 300 kilometres) from south of Prieska to north of Kuruman, in what is generally referred to as the Asbestos Mountains in the south and the Kuruman Hills in the north.

Amosite (brown)

The first reference to amosite is around 1907 when Mr C J Ward, merchant at Mooihoek farm near Penge, 're-discovered' the mineral on the banks of the Olifants River in the then Eastern Transvaal. Apparently these occurrences were first identified by a certain Charlie the Reefer, but little is known about his exploits. Further prospecting revealed large deposits in the Strydpoort mountains to the north, and as deposits were opened up, it was established that Transvaal Blue asbestos occurred in conjunction with the amosite in some locations.

Transvaal Blue

As this fibre type occurs frequently in the same areas as amosite, and depending on whether the blue or amosite is the major type, a blue or an amosite mine could be established.

Chrysotile (white)

As early as 1905 reference to chrysotile appears in correspondence between Cape Asbestos, London, their local office in Kimberley, Mr Rundle Olds, mine manager at Koegas and The Consolidated Goldfields. The Goldfields company was exploiting some deposits near Carolina.

CAPE BLUEASBESTOS

Prieska/Koegas area

In the early 18th century local inhabitants from the areas near Prieska were well aware of the existence of fibrous rock formations in their neighbourhood, and there is speculation that they may have used it on a limited scale as a building material or in pottery. They referred to it as *doeksteen*, meaning cloth rock. However, there was no commercial demand for it and therefore no need to exploit it.

When diamonds were discovered near Kimberley in the 1860s, work seekers flocked in from the surrounding areas. Those from Prieska brought with them rock samples containing blue asbestos, in an effort to evoke commercial interest.

A speculator, Cohen, became interested and later showed these samples to Mr Francis Oats, a Cornish mining engineer from St Just in England, at the time employed as Government Mining Engineer for the Cape Government in Griqualand West. Oats became keenly interested.

Another individual who took an early interest in asbestos was Mr Solomon Weingarten. Born in Cassel, Germany, he came to South Africa in 1879 to work in Lilienfeldt's store in Griquatown, in the district named Hay. His wandering spirit soon had him travelling all over Hay and neighbouring districts in search of mining opportunities. It is said that there is hardly a farm in that area that he did not visit or prospect on. He often referred to himself as 'the father of asbestos mining in South Africa'. At one stage he was also involved in copper mining south of the Orange River.

When Oats resigned from government service he joined Baring Gould Brothers and Atkins, diamond miners in Kimberley. At some point he became manager of the Victoria Diamond Mining Company. Following the amalgamation of various properties into the De Beers Consolidated group, he became a director of De Beers in 1890.

An early attempt

Copper deposits were known to exist in the Northern Cape, although most were too small to be of commercial value. However, as land was cheap, many prospectors simply acquired any land showing mineral potential.

As early as 1888 a company, Orange River Asbestos and Land Company (Orange River), was registered, with a share capital of GBP 250 000 (pounds sterling).

The object of this company was to merge two existing copper ventures, Griqualand West Copper and Mining Syndicate (Griqualand) and The Volharding Copper Syndicate (Volharding) into a single venture. Volharding owned the farm Zeekoebaart, north-west of Koegas on the Orange River, on which asbestos occurred. Amongst those involved in the venture were Oats and Weingarten.

At a shareholders' meeting of Orange River held during October 1891, some criticism was levelled at Weingarten and to a lesser extent against Oats. This prompted Weingarten to write to the Diamond Fields Advertiser stating that, as he had just returned from overseas and did not attend the meeting, he was going to call another meeting to clear his name as well as that of Oats.

A further meeting was held at which some 90 shareholders were present or represented, including some prominent names like Leopold and George Albu, later on founders of General Mining and Finance Corporation Limited (later, Gencor).



Sir George Albu, founder of the General Mining and Finance Corporation

The meeting expressed concern that no shareholders meetings had been held since incorporation three years earlier, that no proper books were kept, that the company's cash was kept in the private account of the company secretary, and that the farm Zeekoebaart had not been transferred from Volharding to Orange River as required in terms of the merger agreement. A proposal that the company apply for a Stock Exchange listing was approved, as well as payment of GBP 1 000 and the allocation of an additional 10 000 shares to Oats. This indicates that Oats's name was cleared. There is no evidence that the merger was ever completed, and it appears that Griqualand carried on in its own name for some while, and Francis Oats played a major role in the development of asbestos mining in South Africa.

Articles in a London daily newspaper attributed to the company's management quotes in financial circles like 'Sprigs of asbestos in their buttonholes', that 'asbestos will do for Griqualand West what diamonds did so far', and that 'orders for asbestos are streaming in'.

Orange River continued to exist but played no major role in the development of the asbestos mining industry, although there is record that Cape bought fibre from them in 1925.

Further attempt

By the end of 1891 Francis Oats, Solomon Weingarten, Cohen the speculator and another De Beers director, Ludwig Breitmeier, started The Cape Mineral Syndicate, acquired the farms Koegas, Westerberg, Nauga and Hounslow west of Prieska, and started mining and exporting asbestos. This syndicate was the forerunner of Cape Asbestos Company Limited (Cape) which was floated in London in December 1893.

Breitmeyer, co-founder and first Chairman of Cape Asbestos, died in 1930 and was succeeded by Sir Evelyn Wallers, KBE.



*Francis Oats, developed blue asbestos mining in South Africa
(Photo: 50 Years on The Diamond Fields)*

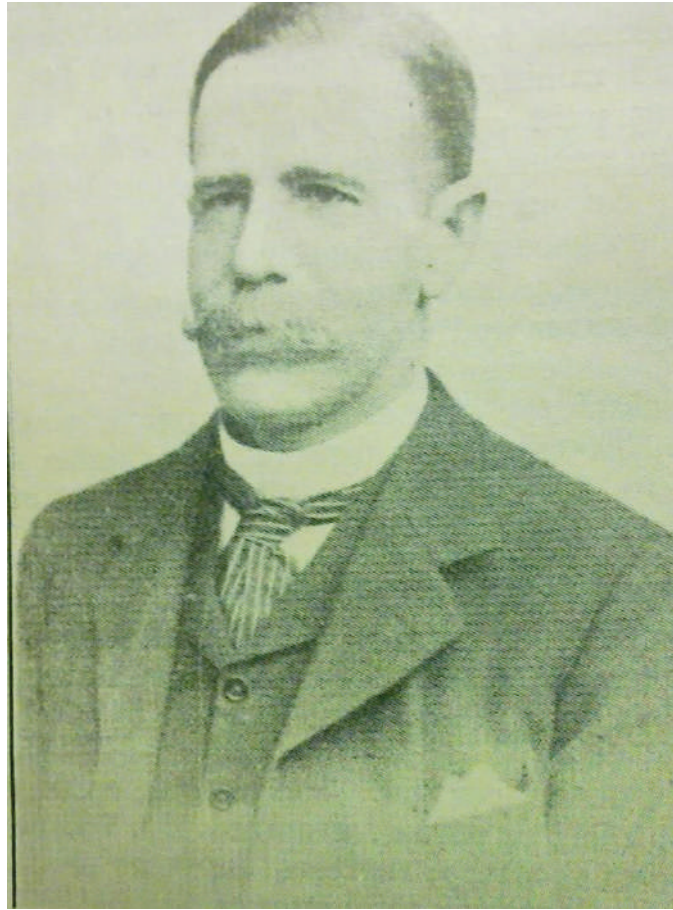


*Ludwig Breitmeyer, co-founder and first Chairman of Cape Asbestos
(Photo: 50 Years on The Diamond Fields)*

The object of the floatation was to raise capital of some GBP 50 000 for the erection of factories in England to manufacture asbestos products, at the same time

promoting the use of the mineral.

Capital for development in these remote areas could only be raised from overseas, although limited investments were forthcoming from Cape Town, Kimberley, Port Elizabeth and, after 1910. Johannesburg.



THE LATE MR. F. P. T. STRUBEN

(Photo: S.A. Mining And Engineering Journal)

Fred Struben, renowned in gold mining, was first Chairman of The African Saltpetre Company Limited (ASC), which became Gefco

Another United Kingdom company, The African Saltpetre Company Limited (ASC), was incorporated in England in 1895 to exploit saltpetre deposits in the Prieska/Griquatown area, and purchased a number of farms, on which blue asbestos deposits were present. Altogether 51 000 acres was acquired.

The first chairman of this company was a Johannesburg resident, Fred Struben of gold mining fame; he had been keenly interested in gold mining and prospected extensively in the lowveld of the Eastern Transvaal, particularly in the Barberton area. He was also involved in gold prospecting on the West Rand, where Strubens Valley is named after him and his brother, Harry. He died in 1930.

The rights to mine the asbestos deposits on some Northern Cape farms were leased to independent producers, inter alia Weingarten and a Griquatown firm known as Christie & Carroll.

There is speculation that the saltpetre samples on which ASC's investment decision was based were 'salted', but the official version is that it could not be exploited profitably and nothing came of the venture. The income from royalties paid by the asbestos tributors was however sufficient to keep the company in existence for a number of years. Cape also ventured into the saltpetre business.

The company's name was later changed to The Griqualand Exploration & Finance Company Limited (Gefco).

Cape's early exploits

The history of blue asbestos mining in the Northern Cape basically reflects Cape's early history, and much of what follows is viewed from the Cape perspective.

Among the diamond buyers who came to South Africa were Julius Wernher and Alfred Beit. They founded the firm Wernher Beit & Co. and assisted Cape with finance during the first 20 years of its existence. Mr Friedrich Hirschhorn of this firm became a director of Cape in 1900 and acted as intermediary between the mines and Cape's London office. During 1903 Mr Alfred Westcott of the same firm also became a director of Cape. Both were also directors of De Beers.

The idea of erecting their own factories was apparently mooted by De Beers director Breitmeyer, the reason at the time being that it was difficult if not impossible for blue asbestos to compete with the well established, softer Canadian and Russian chrysotile fibre types in the then fairly limited market.

Large deposits of chrysotile asbestos were discovered in Canada around 1870, and the commercial use of this material was well established long before the first blue asbestos was mined. Factories using a specific fibre type successfully were loath to switch to unknown and untested types. It was commonly acknowledged that 'the man working at the bench' makes the final decision on changes in raw materials.

The first manager at the Koegas mine was Mr John J Borthwick (Hocking). He was succeeded by Mr Rundle Olds, a nephew by marriage of Francis Oats. Olds remained at the helm for many years, until he retired in 1931 due to ill health.¹

Olds played an important role in the evaluation of most prospects along the Northern Cape asbestos belt. Cape on occasion also sent him to Carolina to evaluate local chrysotile deposits and also to the then Rhodesia to inspect chrysotile prospects in that country.

Early operations in the blue asbestos fields were rather primitive, with ore being extracted manually and thereafter cleaned on surface by chiselling off the attaching host rock with hammers to produce a clean 'cob' of fibre. Cobs were bagged and sent to factories in England and Europe where the fibre was spun into fire-resistant and insulating cloth and yarn, which is still used for packing pumps and bearings, and in sealing caulk.

Virtually no infrastructure existed in these areas. The highest priority was to secure water at or near any site. Those properties on or near the Orange River, like Koegas and Westerberg, had an advantage over properties further away where water was extremely scarce. Many wells dug on farms in this semi-desert region turned out dry. All transport was animal drawn over dirt tracks, and the only communication with the outside world was the post cart service from Kimberley to Prieska, from where the

¹ There were some military graves at Koegas. It is not clear from the available documentation what the origin of these is. It is however known that a police force was stationed at Koegas as early as 1868, followed by troops in 1869, to deal with Koranna and Griqua raids in the area. Several attempts were made by Cape to transfer this piece of land to the State, though without success.

transport wagons took the mail to Koegas. On occasion there was a break in communications when the Koegas mailbag from Kimberley fell off the cart before reaching Prieska!

Final product had to be carted by wagon to De Aar, the nearest railway station some 250 kilometers away. From here it was railed to Port Elizabeth and shipped by steamer to Europe. One can only imagine the condition in which a hessian bag full of cobs would arrive at the factory after a challenging 6000-mile journey. Complaints about spillage were plentiful as witnessed in early correspondence between London and the mine.

Due to these difficult operating conditions coupled with low sales, Koegas was temporarily closed for two years from 1895 (Hocking). The outbreak of the South African War in 1899 further delayed mining activities and operations only returned to normal after the war.

By 1904 Cape was mining at Koegas, Westerberg and a place near Prieska known as Kliphuis, where the mineral rights belonged to the Government. Royalties based on production were paid to the State. Kliphuis was closed by 1908.

A feature of asbestos mining in these areas is that a site exploited by one party until considered worked out, was frequently restarted by another party following further prospecting work. In some instances the original operator would re-evaluate the occurrences and, if positive, re-open the mine. Kliphuis is a good example of this, having produced on and off for several years.

Two other deposits were then opened up by Cape, one in 1907 on the farm Klein Naute bought from Mr Vigne of Kimberley, and the other at the beginning of 1908 on the farm Naauwpoort nearer Griquatown. This farm, including mineral rights, belonged to Mr Theo Paton of Barkly West, later living at Dannhauzer and Lion's River in Natal. The asbestos deposits on this farm were fairly extensive and operations continued for a number of years. The farm was later bought by Cape.

The transport situation improved steadily as a railway line was extended from the main line between Cape Town and Kimberley, first to Britstown, then to Omdraaisvlei, about 50 kilometers south-east of Prieska, and by October 1905 to Prieska. This still left Cape the challenge of getting fibre from Koegas and other sites to the railhead at Prieska some 50 kilometers away.

Cape also bought fibre from other small-scale producers, provided quality and price were acceptable. This was sometimes considered preferable as own reserves were then preserved. Some of these producers delivered their fibre to Cape at Prieska, some to other stations along the Prieska line, and others directly to Kimberley where Hirschhorn concluded transactions. Fibre purchased in Kimberley was stored at the warehouse of G Lawrence & Co.

One such producer was the colourful Mr Solomon Weingarten, of Griquatown, referred to earlier. After the formation of Cape, of which he was also a shareholder, he continued looking for prospects. If he found one, he would either start out on his own or syndicate with others to mine the asbestos. Cape bought fibre from him from as early as 1904.

The marketing of asbestos fibre took him to many destinations, including Germany, England and the USA. He was instrumental in setting up the Hay Asbestos Syndicate together with Mr Blumenthal of Germany, Mr Lomnitz of Rondebosch, Cape Town, and a local farmer Klaas Heyns. The syndicate obtained mining rights over Leelykstad, Stilverlaats and Groot Naute. From Leelykstaat they supplied crude fibre to a German firm, Calmon. Cape admitted that the German market was basically controlled by Weingarten, excluding only Cape's own factory in that country.

This syndicate also obtained rights over Gefco's farm Elandsfontein. This is the same place where Burchell was shown the occurrence of asbestos in 1812. Production from this farm was not tied to the Calmon contract and could be disposed of to Cape.

Weingarten was also a partner in the Carn Brea Syndicate which worked deposits on the farm T'Keikamspoort south-east of Prieska. He died in Germany in April 1931.

Other suppliers to Cape included V K Green of Prieska, the owner (unnamed) of the farm Kloof near Elandsfontein, Burgers and Kerr working properties east of Prieska, Christie and Carroll working Blackridge and Kranskloof (another Gefco farm), Schreuder working on the farm Kwakwas, Visagies Asbestos of Prieska, and a Cape Town firm, E R Syfrets, operating on Nauga.

Nauga belonged to Cape but they did not own the mineral rights. Syfrets discontinued operations and offered Cape the right to mine. Although Olds was not optimistic about the potential of this farm, Cape did operate it on a small scale for some time.

By 1905 Olds was asked to buy long crude fibre from Glen Allen mine, west of Prieska, where a new (unnamed) syndicate started working.

Some small producers tried to sell their own fibre directly to overseas factories but this was not an easy task. There is record of at least two consignments dumped at sea when the would-be overseas buyers refused the cargo on arrival at port, quoting quality concerns. The cost of storing it at port until a new buyer could be found and then reconsigning it rendered it uneconomical.

Independent buyers of fibre were a cause for concern to Cape. One such individual, Radeke from London, was often reported to be in the Prieska area, buying everything in sight. At one stage he was also involved in mining at Blackridge, in partnership with others.

During 1904 Cape received an enquiry from Australia about the availability of prospects in the area. It seems, however, that the Australians were, understandably, not encouraged by Cape.

Cape operated trading stores on their mines where workers could buy merchandise. Contract workers could also buy explosives from these stores. The profits derived from these activities contributed to Cape's survival during bad times.

It was common practice on the asbestos fields to pay workers with chits of paper, known as 'goodfors', which could be exchanged at the company's store for merchandise. In correspondence between Cape's Koegas mine and their office in Kimberley, it is stated that Mr Christie of Christie & Carroll claimed to be making 200% on merchandise sold from their store to workers.

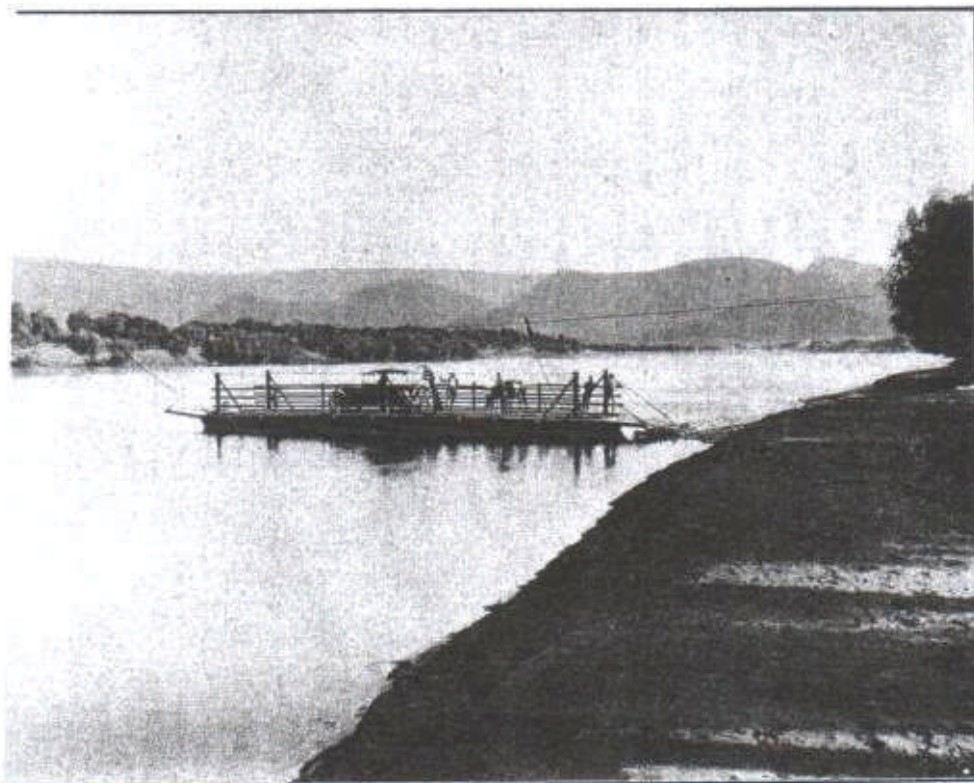
Organising transport to De Aar, at the time the nearest railhead, was a tremendous problem, particularly during 1904 when a severe drought, which followed the rinderpest and the South African war, wiped out virtually all draft animals.

To partly overcome the transport problem, Olds bought a wagon and 16 donkeys during 1906 for GBP 200, without prior authority from London. At the time the company was really walking the financial tightrope and Olds was severely reprimanded for this extravagance.

Cape used forwarding agents at the different railheads. Wilson & Spurgin was used at De Aar, and later at Britstown and Omdraaisvlei. At Prieska, Mclvor & Todd was used.

Independent producers used forwarding agents of their own choice. Cape preferred delivery of purchased fibre to their forwarding agents, Mclvor & Todd in Prieska, where Olds normally called in to check quality and quantities before approving despatch to the coast. Should a producer however be nearer another station, he was allowed to deliver there.

During 1907 Cape erected a pont over the Orange River between Westerberg and Koegas for their own use, Westerberg mine was situated on the south side of the Orange River whilst Koegas was directly opposite on the north side. Cape's pont was used for ferrying men and material over the Orange river from 1907 to 1952, when it was replaced by the Riley bridge, named after Sir Rupert Riley, chairman of Cape at the time. The company pont also generated some extra income from private business.



Cape's pont, ferrying a motor car, some people and perhaps a horse, across the Orange River between Westerberg and Koegas, among the crocidolite-carrying hills in Griqualand West

(Photo: Dr. Hall)

From correspondence between Cape's Kimberley office and the mine, it seems that Messrs Oats and Hirschhorn and their travelling companions from Kimberley were the first to use this facility, after arriving by motor car on the south bank of the Orange River during November 1907.

Cape's issued capital at this stage was GBP 71 500, as declared to the Local Authorities by Acting Local Secretary Hirschhorn. From time to time Oats and Hirschhorn advanced money to Cape to fund operating expenses until payment for a shipment was received from overseas. From correspondence during 1905 between Cape's local office in Kimberley and their London office, a total of 450 short tons of fibre was exported during 1903 from the Cape Colony, of which Cape's share was about 400 tons or 85%. During 1904 the numbers were 500 tons, of which Cape's share again was 85%. This illustrates Cape's dominance in the early years. At the time no other types of asbestos were mined in South Africa and therefore all exports were blue fibre.

The first vertical shaft at Westerberg was started during 1905, and was expected to reach a depth of 300 feet within two years. Cape reported to the Inspector of Mines that the average number of people employed during 1905 was four white people and 140 coloured people (of mixed race).

During 1906 demand for the company's products was quite high and it was impressed on Olds that, after the lean times to date, he should ensure that all orders are satisfied, thus enabling the company to capitalise on the good times ahead. He was instructed to buy all available fibre from other producers, provided prices and quality were acceptable. To this end Olds managed to obtain substantial quantities from Weingarten's Hay Asbestos Syndicate. However, due to quality complaints caused mainly by bad sorting, Cape's German factory refused to take any more fibre from this syndicate after the initial shipments.

An effort to improve communication was made when during 1907 an application was submitted for a telephone service to Koegas. The estimated cost appeared prohibitive and the idea was shelved for the time being. The post cart service remained the only feasible method, with the odd telegram from the nearest point at Springputs being hand delivered by runner.

Cape's unique position as the major force in the blue asbestos business necessitated a close watch on potential competitors, both locally and at home. Small operators would approach Cape's local offices at Koegas or Kimberley with offers of fibre or prospects. This provided useful information as to size, quality, location, ownership, potential markets and prices. Cape would evaluate the information and, depending on whether it was to be taken seriously, could decide to either buy their output or just monitor their activities. Any threat of a substantial competitor would cause Cape to move closer.

Early exploits to the north Danielskuil area

By 1903 Cape was offered farms near Danielskuil, including Warrendale, where a few tons of fibre had been recovered earlier. Water supply was however insufficient and the deposit considered too small to be of interest. A farm belonging to Mr van Staden was offered through Mr Bates, a promotor of Cape Town, but this was not followed through.

During 1907 Olds was instructed by the Kimberley office to proceed to properties in the north which were on offer to Cape. He set off on the 180 mile journey in a Cape cart, on the way calling in at Griquatown for normal business and then on to Postmasburg, where Mr Theo Scribante provided him with a guide.

The first site visited was Billinghamurst, about 50k's north of Danielskuil, where some fibre was opened up. Although Olds was satisfied with the quality, he did not think the deposit was large enough to be of interest to Cape.

Next stop was at Khosis (Ga-Tlthose) where the reef could not be located. The storekeeper was however requested to send samples and, provided quality and prices are acceptable, he could act as agent for Cape. On the return journey he called in at Farm 104 of Mr De Lange. According to Olds this was the best reef seen on the trip. Olds did not think any of these prospects could be worked by Cape, but crude might be bought from tributors provided prices and quality were acceptable.

Olds returned via Griquatown and called in at Kranskloof, a Gefco farm some 12 miles south-east of Griquatown, next to Elandsfontein. This property was worked by Christie & Carroll at the time. They claimed to have a contract with the Admiralty at prices far in excess of those being obtained by Cape. Although they did not want to disclose any details to Olds, he did memorise the bag markings. It is not known whether this information was of any value at a later stage but not long afterwards this operation floundered. Olds covered some 500 miles in 3 weeks visiting the various sites.

During 1908 Cape's Kimberley office drew the London office's attention to the fact that Reuters cabled Cape's financial results of the previous year, released at the annual general meeting, to various countries, including South Africa. This led to a scramble by all and sundry for asbestos rights in the Northern Cape. It was feared by the local office that, should some successful new operators enter the market, prices may be forced down, to the detriment of Cape. London was urgently requested to ensure that such information remains confidential in future.

Locally Cape started looking at other farms in the Prieska neighbourhood like Pypwater and Naauwgekneld. Olds was also instructed to establish who was opening up Glen Allen mine. By 1909 Cape realised that they were fast losing their monopoly in the blue asbestos business as new operators entered the fray and Cape found it impossible to buy up all the production. Cape reported that shopkeepers, schoolmasters (an obvious reference to Mr Cunningham of the Kuruman Public School) and ex-policemen were all digging!

Cape was also offered other opportunities in the minerals field. During 1908 copper samples were delivered to Olds at Koegas. Oats followed up on the prospects which were apparently towards Upington. Olds also received some samples of saltpetre in 1905 which were evaluated by the DeBeers Explosives Works at Somerset West and found to be of good quality.

After despatching a consignment of 800lbs to them, he was advised to discontinue all efforts towards this business as railage costs to the factory rendered it totally uneconomical. This was also the time when large deposits of chrysotile asbestos were discovered in Rhodesia and Old's brother was sent to the Hartley area to report on these for Cape.

All in all, by 1910 some 40 farms were already known to either have substantial reserves of blue fibre on it or had the potential to be turned into small payable operations. These stretched from south-east of Prieska to well north of Danielskuil.

Kuruman area

Since the asbestos fields stretched over such a long distance from south to north, there was always a risk that another firm of substance could obtain rights over large areas and either mine it or just sit on it to keep others, including Cape, out. This seems to have been the information that reached Cape about the Kuruman area early 1907. A letter and some samples were received by Olds at Koegas from Mr Danie Abt, hotelkeeper in Kuruman, offering fibre to Cape. Olds thought that the fibre from Maripin (more likely Maipin) was of good quality. During 1909 Cape embarked on a more active prospecting program towards Danielskuil and Kuruman.

By 1908 the owner of Bretby farm, Mr J S Terblanche, extracted samples of long fibre from outcrops on his property and granted prospecting rights to Walter Harris of Kimberley. Harris founded a company called Blue Asbestos Limited and started mining operations on this and other farms, including at Ga-Mopedi, north of Kuruman. He is credited with having pioneered asbestos mining in the Kuruman district. (Snyman) He died in 1923 and his Ga-Mopedi mine was then taken over by the Willmores, merchants of Kuruman. According to the late Mr Douglas Willmore, asbestos was already mined during 1909 at a place called Droësloot near Kuruman.

Vryburg Area

At the end of 1907 Cape was offered samples by a prospector named Albert Thomas Mayers, of Beaconsfield, Kimberley, operating around Vryburg. Cape indicated to him that the samples were of good quality and suggested he enter into an agreement with the farm owner and, should the quality of fibre produced be on par with the samples and prices acceptable, they would do business with him.

No farm name or the name of the owner is mentioned and there is some doubt as to whether this property was in fact in the Vryburg district. Cape's Kimberley office sometimes referred to a farm as being in a certain district, but on closer scrutiny the property was actually located in an adjoining district.

During 1924 a locust control officer by the name of Chalon St Quentin, who worked for the South African Department of Agriculture, was on patrol some 80 kilometers from Morokweng in the Vryburg district. After dismounting from his camel, he spotted some blue ribbons in nearby rock formations. He took some samples and later showed these to his father in Vryburg. His father told him that he had found asbestos. Cape soon learned about this and sent out a prospector by the name of Charles Stewart, a policeman from Morokweng. Although he was not a regular prospector, he knew the farmers and soon found asbestos on the farms Cheddar and Botallack. The farmers agreed that Cape could mine there, Stewart staying on as manager.

In 1927 Cape opened up a mine on a nearby farm, Pomfret.

Cape's southern operations

According to a 1909 report from the manager at Koegas to their Kimberley office, the operations around Prieska/Griquatown produced about 100 English tonnes of fibre per month and employed some 460 men and 600 women either directly or indirectly. However, by the middle of 1909 Cape London reported severe overstocking at the factories and the prospect of hard times ahead.

Olds was requested to reduce production (including purchases) first to 50 tons per month and later to 40 tons, to match factory consumption. Olds could not introduce layoffs with immediate effect, as most workers were in debt at the company store. After drawing Cape's attention to the real risk of incurring bad debt, he implemented dismissals based on settlement of outstanding accounts.

Due to the difficult times the Christie & Carroll partnership dissolved and Burgers & Kerr also stopped producing. It is interesting to note that Eternit, in Italy, ordered blue asbestos from Koegas during April 1910. In a letter from Hirschhorn to London dated 1st October 1910, it is stated confidentially that altogether 4458 bags (roughly 44½ tons) of asbestos was railed from Prieska during 1909 by other producers, most of it to Hirsch, Laubscher & Co. of Port Elizabeth, for export. As a result of the cutbacks in production the labour strength and production figures for 1910 were only five white people, 210 coloured people and 633 tons were produced.

The period 1910 to 1920

After 1910 there was a mad scramble for prospecting and mining rights all along the 'asbestos belt'.

Mining activities stretched from south of Prieska to north of Kuruman and could no longer be considered as if in separate localities.

Small operations were started by farm owners, or by individuals or companies who obtained rights from farm owners. The base mineral rights on most privately owned farms belonged to the owners, while the rights to precious metals and stones were reserved to the State.

By 1911 there seems to have been an improvement in the market and Cape tried to obtain additional rights near their Koegas base.

The British and German navies recognised the advantages of blue fibre for insulation and fireproofing in ships and this contributed to the higher demand.

When Olds left for England on holiday during August 1911, the acting manager Neil Mcleod was sent to Kuruman to inspect some prospects on offer in that area, carrying a letter of introduction to attorney De Jager.



Attorney H J C de Jager
(Photo: P.H.R. Snyman)

Mcleod's report was sent to London during January 1912. Olds, on his return, did not think that the Kuruman propositions could be of interest to Cape, noting that in most cases the fibre was discoloured and not of the same quality as in the southern areas. In any event, most of these propositions had already been inspected earlier. Hurley was however an exception. Mr Frank Orpen offered Cape some fibre from this farm during 1909. Hurley blue became a benchmark for good quality fibre.

Cape again tried to get rights over Blackridge farm, about 12 miles from Koegas, said to belong to the well-known Abe Bailey. Weingarten and Radeke mined there earlier and sold fibre to Cape. At the same time Weingarten was also very keen to obtain the rights again.

On a previous occasion Olds and a certain Ferrier visited this farm but could not properly inspect the workings, as they took the wrong direction and ran out of food and water for themselves and their animals.

Following his next visit Olds reported that the fibre quality on the farm was good and that, notwithstanding there being no water on the property, Cape should take up the rights to keep others out. As a result Weingarten was furious with Olds. It was then suggested by Olds that Cape London deal directly with Weingarten in all matters in the future.

Cape could not meet Eternit's requirements, which led them to abandon the use of blue fibre for the time being.

By this time a number of individuals and groups were operating around Kuruman. Amongst these were Gillanders & Campbell of Branksea near Ga-tlhose, Khosis Asbestos Limited of the Brown brothers and a Michael Griffen, and shopkeepers and merchants within the Ga-tlhose Reserve, as well as Dr Beare, attorney Herman Hammerschlag and Danie Abt of Kuruman, who formed The Abtonia Asbestos Company. Most of them bought crude from independent operators from various (unnamed) nearby sites.

Confidence Trickster

During 1912 a man giving the name John Wilke called in at Cape's London offices, claiming to be desperately in need of money to get back to work at Koegas. There was no way of verifying the information – it would have taken the best part of eight weeks by surface mail. He was advanced the sum of two pounds ten shillings in good faith. London wrote to South Africa asking the mine to recover the amount from his wages. Olds duly replied that there was no such person on their books!

Also during 1912, Cape successfully revisited the provision of a telephone service to Koegas.

During 1913 Cape brought Klein Naute back into production. Fibre was also bought in from N A Heyns, Witberg.

Some small local orders were forthcoming from Durban but the railage costs rendered this uneconomical.

The year 1914 saw the start of World War I. Cape hastily managed to ship off the last consignment to their factory in Germany via Delagoa Bay (Lourenço Marques) before exports to that country were prohibited.

Olds informed the Kimberley office that three employees, including himself, being members of the Rifle Club, might be called up for active service. It is not clear whether any of them were in fact called up. Certainly Olds was around during 1916 when the first company car was made available to Koegas, and during 1917 he acted as Justice of the Peace in that area.

Demand for fibre remained strong, however, due to its strategic mineral classification. So many operators were by now involved that competition soon caused a number of them to close down. Only those with strong financial backing like Cape, Gillanders & Campbell and The Harris Syndicate were able to survive.

Cape had the backing of De Beers, whilst Gillanders & Campbell and Crown Lands Asbestos, operating in the Kuruman area, were financed by Dunell Ebdon & Co., in Port Elizabeth, and Hobdell, Way & Co. (a subsidiary of the British company Turner and Newall (T&N)) in London, respectively. By 1917 Cape was again buying in fibre, mostly from Weingarten.

A Government survey of the Cape Blue asbestos industry conducted in 1917 divided the area into two sections, northern and southern. Dealing first with the southern section, it was reported that Cape worked eight farms in that section, the Carn Brea Syndicate worked T'Keikamspoor, and The Good Hope Syndicate worked Kliphuis and adjoining ground. A certain amount of fibre was also produced at Blackridge and Elandsfontein. The survey stated that Cape was by far the largest operator.

In the northern section a number of smaller companies and syndicates had been prospecting and developing mines for about 10 years. Among these were Northern Asbestos Co., Gillanders & Campbell, The Crown Lands Syndicate and The Harris Syndicate. Northern was producing on Warrendale and Owendale near Danielskuil whilst Gillanders & Campbell, owned by the two Scotsmen, acquired neighbouring farms. Through to the end of 1920 demand remained firm. This again led to increased activity from newcomers.

The period 1921 to 1930

By 1921 the market went into a slide and many newcomers closed down. Cape also cut back but soon started to benefit from a modest turnaround, and during 1924 it produced 25 218 cwt bags (1 261 short tons) and bought in another 7 899 cwt bags (395 short tons).

During 1925 Cape's production was raised, from Koegas, Westerberg, Blackridge, Kliphuis, Kameelpoort, Klein Naute, Buisvlei, Glen Allen, Klipfontein (Prieska) and Carn Brea. Altogether 24 215 cwt bags were produced. They also bought in a total of 7 107 bags from Weingarten, C Edelstein, Orange River Asbestos Mines Ltd, De Harts A Gotze, Gers & Co., Wolf & Simpson, and G Lawrence & Co. Ltd. Sales went well and there was no stock on hand at the end of 1925.

In addition to those who sold fibre to Cape in 1925, there were two new suppliers, namely P N Nell and E G Bryant of Prieska working Stofbakkies. Bryant occasionally corresponded with *The South African Mining & Engineering Journal* regarding asbestos in the Prieska area.

During 1925 Cape acquired the Egnep and Amosa amosite mines in the Northern Transvaal, and soon thereafter some Transvaal Blue interests in the same area. This will be dealt with separately below.

During 1926 Cape entered into an agreement with Weingarten to acquire his shares in Malipsdrift Asbestos Mines Ltd. Cape obtained prospecting rights from Mrs E H Dickson over the farms Shelek, Alice, Collins, Constable and Klgare in the Vryburg District. In the same district, Cape produced fibre at Cheddar, Bottalak and Penwith, and entered into an agreement with Mr T G Gericke to purchase from him asbestos raised at Shenuie. In 1926 Cape acquired the farm Stilverlaats near Koegas, also entering into an agreement with H P Rudd to mine the farms 210, 211, 216 and 217 in the Hay district.

New suppliers included Hogdison, De Kock, Walker, T R Montclare, Kuruman Asbestos Co. Ltd, Gillanders & Campbell, H H Hancock of Betsjoeanaland Asbestos Co., W S Corbett, P J Loots of Kaffirskrantz and D C S Naude.

In the Kuruman area various operations were carried on, but many battled to survive. Gillanders & Campbell ran up substantial debt with Dunell Ebdon, the Port Elizabeth shipping company, which forced them to appoint their own man, Robert Marcus, as manager. They were later forced to take over the operations and ran it as G & C Blue Asbestos, with W H Addison as manager. Addison extended operations to new sites at Eldoret, Exit, Langley, Whitebank, Woodstock and Klipvlei.

Demand was strong and Dunell Ebdon allowed Addison to start his own Orcadia Asbestos Company Ltd, which exploited two of Walter Harris's old sites. Marcus founded the Excelsior Asbestos Syndicate and took over the interests of the liquidated Khosis Asbestos during 1924.

Walter Harris had died in 1923 and his Gamopedi (Sardinia) mine was, as previously stated, taken over by the Willmores of Kuruman. His other interests were taken over by Dunell Ebdon and operated as Bechuanaland Asbestos Company Limited.

Crown Lands Asbestos could also not survive and was taken over by Hobdell, Way & Co., a T&N subsidiary. Quite a number of other companies were formed to exploit

properties around Kuruman. Attorney J P Frylinck, A T Sitwell and T A Johnson, together with partners from Durban, started the Kuruman Asbestos Mines Ltd in 1920. This company, together with Century Asbestos Leases and Orcadia Asbestos, all closed during 1930 as a result of the Great Depression. Another company, Planiol Asbestos, owned by the Cuban Ramon Planiol, worked Mansfield for some time, but also floundered.

How did the mines operate?

Although from time to time some articles appeared in the press regarding the processes unique to asbestos mining, none were exhaustive. A more detailed account was however published in the *Cape Times* during 1926. The article was written by 'a government official' and gives a glimpse of how operations were conducted in the early stages.

The writer explained that 'the problem was to get the asbestos out without excessive cost in labour or supervision'. As a result, mining was often a family affair.

The men do the drilling, blasting and breaking of the rock while the women and children 'stamp' the asbestos, that is, they break up the asbestos-bearing fragments with light hammers, reject the waste rock, and throw the now partially separated fibre into sacks, according to length.

A bag of properly stamped asbestos is not so soft as a feather pillow, perhaps, but it is strange to think that this mass of woolly threads came out of an intensely hard rock, wherein it was formed by some natural process. At the end of each month the bags of asbestos are collected, taken to the mine store and weighed, each man being credited with his own output; after deducting debts to the store for clothes, food and explosives, the fortunate ones obtain a larger or smaller amount of cash.

This system has many drawbacks, but it appears as if it were the only method of running the industry with any chance of success. Under it a steady worker, with his 'stamper', can make a good living, according to native standards – accumulate goats and donkeys, buy a cart or wagon, and even save enough to purchase a small farm. The lazy and thriftless, of whom there are plenty, need not starve, though they are always in debt and are the bugbear of the manager's life.

By modern standards, even the 'lazy and thriftless' had to work hard if they were to produce fibre. As yet there were no jackhammer drills to bore blasting holes in the rock. Such holes were made by hand with a 'jumper', a long steel chisel which when blunted could be sharpened by a blacksmith. Miners had to 'hit and turn' – 'hit' the end of the chisel with a square hammer held in one hand, then with the other hand 'turn' the jumper ready for the next blow. If the rock was hard it might take all day to drill a single hole 30cm deep, but most men went faster than that.

The stamping was a manual process too, and the only machine used on the mines was a rotating 'trommel' used to screen out sand and grit. The trommel was a cylindrical screen of fine mesh, bolted on to iron hoops. It was about two metres long and set on a slight incline. The trommel was rotated with a handle and asbestos cobs were tipped in at the top. As they tumbled over and over, the sand and grit were rubbed off and fell through holes in the screen. Cleaned cobs inched forwards towards the bottom and were collected in bags. At Koegas, there was a trommel driven by an engine.

The visitor to a blue asbestos mine must not, therefore, expect to see tall headgears stretching tower-like to the sky, or extensive buildings full of engines or machinery. What he will see will be a few buildings of brick, stone, or iron, set in a fairly level spot among the hills; the manager's house, stores, and so on; a few clusters of native huts, generally placed convenient to a water supply; probably goats, donkeys and cattle peacefully grazing, and a ring of rugged hills, silent and seemingly unoccupied.

The only visible evidence of the mine is scattered heaps of debris on the feet of the hills, their raw colour showing their comparative newness. Presently a series of explosions issues from behind one of these heaps, accompanied by clouds of dust, proof that work is going on. If one climbs the hill by the stony native path, one comes across first a group of women and children 'stamping', keeping time with their hammers as likely as not to some oft repeated native chant, or to a hymn tune.

Higher up still, over the heaps of waste rock, a couple or so of 'asbestos boys' will be found busy with pick and shovel clearing away the rock broken by the blasting, picking out every piece containing the precious 'garen', or 'cotton', as they called it, and throwing the rubbish on the ever-increasing pile behind. They will show one the narrow bands of bluish asbestos threading through the rock, and though they can work in a burrow, not much larger than a jackal's hole, one sees that they have to remove about 20 tons of rock to get a ton of asbestos. Two 'boys' working well in an average place can get out about a ton of asbestos in a month which will bring them in GBP 14 according to quality.

In places where the deposits are consistent regular tunnels have been made with trolley-lines laid, and 'coco-pans' pushed by hand or hauled by donkeys to bring out the rock from the interior. Some of the best reefs dip nearly vertically and have to be worked by shafts fitted with bucket and windlass – hand-labour again. Looking down one may see the natives working 60 or 80 feet, perhaps, below; the adventurous visitor can descent in the bucket to watch them in the half light of candles.

Drilling and blasting have to be done here also, and after the fuses are lit, the miner must be hauled up by the bucket out of harm's way. These native miners are very careful in their work, and blasting accidents are practically unknown. The deepest workings are some 300 feet, reached by two or even three windlasses and ropes in succession; asbestos, for some reason, probably connected with pressure, does not seem to occur more than 300 feet from the surface – a naïve conclusion that amuses miners today.'

The official ended his article with a swift look at the economics of blue asbestos: There are no certain figures available as to the number of persons engaged in the industry, but one would not be far wrong in saying that about 10 000 natives, men, women and children depend on the asbestos work for their livelihood. The number of whites who are fully occupied with it are small, but a further number, including a good many farmers, derive benefit from the industry in the form of rent and royalties. Next to diamonds, blue asbestos is the chief mineral product of the Cape Province.



Woman cobber at Koegas

By 1925 the African Saltpetre Company (now Gefco) decided, instead of renewing the leases with independent tributors over their properties near Griquatown, to embark on mining the asbestos deposits themselves. This decision was taken after one of the directors, Mr George Raw, at his own expense, visited the sites and reported favourably on the asbestos potential on some of the farms. These sites included the farms Elandsfontein and Kranskloof. By 1927 Elandsfontein was operational.

Gefco did not operate any factories but had a cleaning plant in London. The first manager at Elandsfontein was Mr G Stott.

During 1927 Cape entered into an agreement with J H Thomas of De Aar for the purchase of asbestos produced at Prieskapoort, delivered to Prieska station. Purchase agreements were also entered into with L Werbeloff (Niekerkshoop) for asbestos produced on the farm Blaauwboskuil, in the district of Hay, I Hirschfield & Son of Prieska for asbestos produced on the farm Krantzfontein, district of Hay, Sascha Edelstein for asbestos produced on the farm Hopefield, district of Hay and also E G Bryant of Prieska.

During 1927 Cape London bought 460 tons of chrysotile asbestos from Munnik Myburgh (Kaapsche Hoop). The agreement with Theo Paton to mine Naauwpoort was also renewed.

In the Vryburg area Cape extended the prospecting agreements over the farms Cheddar & Gosike with Mr Olivier, and with Mrs Dickson over her farms. An option was also obtained from Visser Bros to acquire Pomfret, Shenuie, Adelaide and Innes. A prospecting agreement with Mrs M M van der Post over certain other farms in the same district was also concluded. Prieska Blue Asbestos Co. Ltd, owned by Joubert & Pieterse of Pretoria, was granted rights by the municipality to mine on a portion of the Prieska commonage.

During 1927 Cape produced fibre at all the properties worked during 1926, adding Pomfret to the list. Suppliers now also included Gericke & Thomas, Werbeloff & Co., Hirschfield & Son, Groenwater Asbestos and Union Manganese and Minerals, as well as Lomnitz (Leelykstaat) and other small operators. Lomnitz also offered asbestos from Klein Witberg and Lykwater.

During 1928 Cape agreed with W S Corbett that he could work the farms Klippoort and Kloof in the Hay district, as well as Naauwpoort and Kaffirskrantz. Cape also bought the farms Buisvlei, Naauwpoort and T'Keikamspoord during that year. Production during 1928 came from all the previously mentioned localities as well as from Botallack, in the Vryburg district. Crude was also purchased from all previously mentioned suppliers as well as from Attie Davids, Bechuanaland Farms Ltd, Stephen Smith and a few other small operators. Warrendale was now worked by a new syndicate, of which Mr Barry Burrow was a partner.

During 1929 The Great Western Asbestos Company took over the business of The Hay District Asbestos Development Co. in Griquatown from Mr Daryll Frankel, who in turn had acquired it from Mr Greenstein. However, Great Western did not survive long, and on 10 April 1931 it opted for voluntary liquidation.

Another Johannesburg firm, Transvaal & Delagoa Bay Investment Company, acquired an option over the farm Lovedale south-east of Prieska. The option to buy the farm was exercised but the asbestos deposit was considered too small for them. They opted to invite small operators to work the deposit against payment of royalties. It is not clear if they were successful, but they did sell some fibre to Cape during 1929.

Mann, Little & Co. of Johannesburg opened an agency in Griquatown, under the control of Mr Wright. The managing director of this firm was Mr Moshal. They were granted a mineral lease over a part of the town commonage where they developed a mine under the direction of Mr Lloyd.

A new company, Seekoneus Asbestos was working the farm Seekoneus near Niekerkshoop. The manager was Mr T T Bielski. Again, the venture may have been ill-timed (1929), as it was struck off the register during August 1930.

During 1929 Cape entered into an agreement to purchase asbestos from The Bretby Company, Kuruman. Cape's own production came from the same operations as in 1928. P J A van der Merwe was added to the list of suppliers of asbestos. He operated on the farms Kwakwas and Deelfontein, district of Hay. Others were J H Warren, Transvaal & Delagoa Bay Inv Ltd and I Horne.



A new major player entered the Northern Cape asbestos mining business during 1927. This was the British company Turner & Newall (T&N), with Mr Roland Starkey as mining engineer in charge of Southern African operations. His responsibilities included overseeing the Rhodesian and South African operations. Due to the great distances that he had to travel, he acquired a Tiger Moth aeroplane, dubbed Nil Desperandum, after one of the larger Rhodesian mines. Flying times were, however, still long. His next aeroplane was an all-metal-body Moth named 'Nil Desperandum II'.

Roland Starkey, T&N's Mining Engineer in charge of southern African operations

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Northern News (Wynburg)

(From our own Correspondent.)

24/1/1931. Kuruman, 20-1-'31.

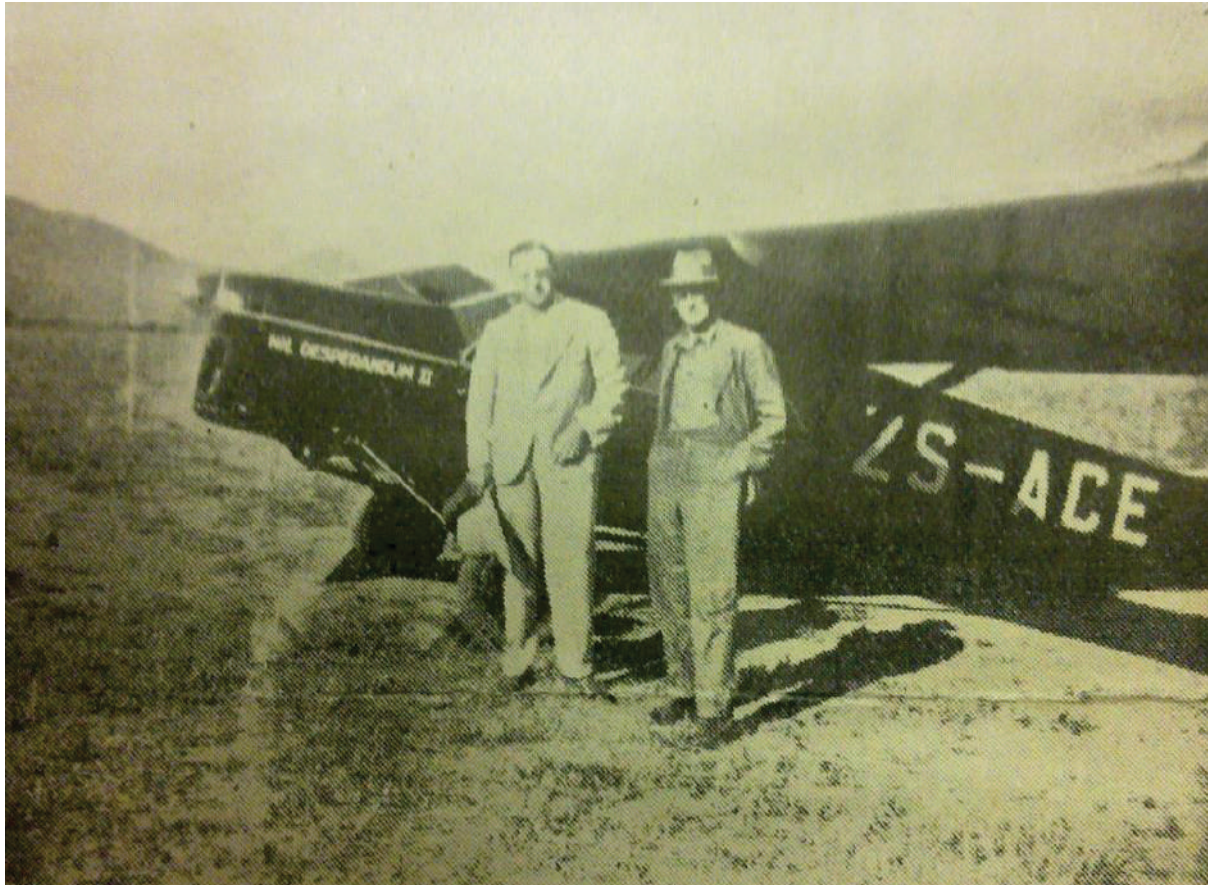
Mr. Starkey, the South African Manager of the Dominions Blue Asbestos Mines, and Pilot Hollingworth, arrived here last Thursday by Moth aeroplane, and left again on Sunday.

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News item on Mr Roland Starkey's visit to Kuruman by Tiger Moth



Mr Starkey with Mr Peel Nelson, his aviator, with the second, all-metal Tiger Moth, leaving Shabani Areodrome for Mashaba



*Dominium's blue asbestos mill in Kuruman. In the depression, Cape was to take it over, dismantle it and clean up the dump
(Photo: P.H.R. Snyman)*

Dominion Blue Asbestos (Pty) Ltd, a subsidiary of the British company Turner & Newall (T&N), acquired a number of operations in the Kuruman/Danielskuil area, including properties previously worked by Gillanders & Campbell. Amongst these were Hurley, Klipvlei, Maipeng and Mansfield. During 1928 they erected a mill in Kuruman, next to where the town's power station was; this was with the help of an experienced technical team drawn from their extensive operations in Southern Rhodesia. They also introduced standardised methods of grading, and the mill ran until the early 1930s.

Roland Starkey, with headquarters in Southern Rhodesia, was the mining engineer directing southern African operations for T&N, visiting the various operations by aeroplane. The local manager was Mr Kirkman.

Dominion treated asbestos from their own operations and also bought in crude from independent small scale operators around Kuruman.

Faan Riekert, a well-known Kurumanite who worked for them, was recorded (Hocking, n/d: 67) as describing how he was sent around the various sites to solve problems. He recalled that local labour was hard to come by, and that labourers were brought in from as far afield as Nyasaland (Malawi).

Dominium also bought farms in the Prieska/Griquatown area. These included Leelykstad, previously worked by The Hay Asbestos Syndicate, of which Weingarten was a member, and Seekoebaart, referred to earlier. They also took up options over various other farms in the Griquatown area, and secured a site in the town for purpose of grading asbestos. According to a *Diamond Fields Advertiser* article in September 1930, some of these farms were in production.

During 1928 the Nauga Asbestos Company was floated by Johannesburg financiers to work the farms Nauga near Koegas and Kalkgat (later known as The Willows) towards Griquatown. The directors were Frederick Schlimmer (chairman), Alexander Ferrier, A E Winder and S H Coronel. Mr H Sacke joined the board later in the year. They purchased Kalkgat from Mr Dunckers. Some earlier mining activities were conducted on this property by small-scale operators. According to the then well-known consulting engineer Mr Dudgeon, there were substantial reserves and they set about opening up a mine. All their production was contracted to Cape.

By 1930 work was well advanced and, due to labour shortage, they were planning the installation of machinery to process the crude. This plan was however delayed until sufficient ore was opened up. However, it seems that the timing was bad as Cape was forced to scale down its own operations and to discontinue all purchases. It is not clear what happened to this entity afterwards. It certainly did not feature as a major force after the depression. There is evidence of unhappiness amongst the directors as first Mr Ferrier and then Mr Schlimmer resigned, with Mr A G Owen joining the board by end 1930. By 1948 Cape was planning to re-open this property

in their own name. Earlier agreements with Weingarten were also cancelled and replaced with one for crude fibre from Springputs only.

During 1930 Cape rented out the Stilverlaat rights to P J A van der Merwe. To gain access to the asbestos on Klein Naute, Cape bought out the neighbouring farm Blaauwputs. Cape also learnt that The Bretby Co. was being liquidated. The farm and mine was advertised for sale during 1930.

In 1930, the South Africa Geological Survey published Dr A L Hall's Memoir 12, *Asbestos in the Union of South Africa*. The report focused on geological aspects and characteristics of the various types of asbestos but it included some information relevant to the mining thereof.

According to the report, the following companies were active in the Northern Cape area, together with the names of their mines:

- **Cape**, operating mines at Koegas and Westerberg, Klein Nauwte, Buisvley, Glen Allen, Klipfontein, Nauga East, Kameelpoort, Hounslow, Kliphuis, T'Keikamspoort (Carn Brea) and Blackridge in the southern section, as well as at Botallack and Pomfret in the Vryburg district.
- **Gefco**, mining on Elandsfontein near Griquatown. They also controlled the farms Spionkop, Kameel Rand, Klipnek, Kaffirskrantz and Grootboom (or Grootboom?) on which asbestos formations occurred.
- **Dominion Blue** working Klipvley, Hurley and Mansfield south of Kuruman, and Gamohaam, Sardinia, Mauratanche, Eldoret and Maipin north of Kuruman.



Tailings dump at crocidolite workings of Klip Vley, north of Daniels Kuil



Crocidolite workings with cocopan on rails to the working face, on Oudeplaats, near Daniels Kuil

According to Cape's minute book, production during 1930 originated from the same farms as during 1929, and they also bought from all previous suppliers, adding Todd & Co. Cape also entered into an agreement with Corbett for him to exploit their newly acquired Naauwpoort property.

The period 1931 to 1950

Olds retired in 1931 due to ill health and Robert Falk took over as general manager of Cape's blue operations. Falk discontinued the practice of 'good-fors' introduced earlier by Olds. During 1931, Cape started the planning of a cleaning plant in Prieska, and commissioned it in March 1933.



Prieska mill, or treatment plant



Prieska tailings dump. After the plant closed, the tailings were removed and retreated at Joyner's Stofbakkies operation across the Orange River

By 1931 Harold Pascoe, a Cornish mining engineer, took over the management of the Gefco operations at Elandsfontein. Pascoe played a major role in the development of Gefco's blue asbestos mining activities in the Northern Cape, including in the Kuruman area.

Norah Bridge, whom he had met in England some time earlier, sailed out on the Gloucester Castle, married him in Cape Town and thereafter settled in with him at Elandsfontein mine. She later wrote her life story in which she records much of the day-to-day life of an 'asbestos wife' on the mines in those early days.



Gefco's Harold Pascoe, mine manager at Elandsfontein in the 1930s



Norah Pascoe, at 84, whose 'asbestos wife' experiences at Gefco are recorded in her autobiography

The Great Depression hit the asbestos industry hard. Prior to its onset, between 400 and 500 tons of asbestos was produced per month, providing work to between 200 and 300 white people and several thousand black people. These numbers fell by between 60% and 70%. Eventually, Cape was operating only the Koegas mine.

Cape's Local Office was also forced to finance their amosite operations in the then Eastern Transvaal from time to time. The Vryburg properties were closed down early in 1932. Pomfret reopened after the recession, only to close again during World War 2.

Production was resumed in 1948 and the first mill was built during 1954. A new syndicate was working Warrendale.

The depression caused activities to remain at a low ebb for some four years. During this time Dominion decided to withdraw from the Northern Cape blue asbestos areas. They closed most of their operations during late 1930, continuing only at Klipvlei and buying in some crude from tributors. By June 1931 they stopped buying crude and closed the Klipvlei mine. The Kuruman plant and certain rights were sold to Cape, who undertook to dismantle the plant and clean up and remove the dump. T&N henceforth mined blue asbestos in the Eastern Transvaal and later at Bute/Heuningvlei in the present North West province.

Gefco acquired the Bretby farm and mine during 1938 and closed down Elansfontein where reserves, according to Pascoe's evaluation, were running low.

The demand for asbestos improved during the run-up to World War 11 as navies fitted out ships with the best insulation materials available. By 1939, when the war broke out, governments bought in substantial tonnages of asbestos as strategic war material. Pascoe was advised by cable from London to produce as much fibre as possible.

Demand remained firm until after the war, when a short-lived slump was experienced, but the new industrial upswing soon resulted in an increase in demand, which far outstripped volumes to date.

During 1947 Cape produced for the full year at Koegas, Westerberg, Kliphuis, Blackridge, Enkeldewilge, Klipvlei, Mansfield, Naauwpoort (Wonderwerk) and Droeslout. Naauwpoort (Prieska area) was worked for ten months, Carn Brea and Klein Naute for nine months and Leelykstaat for eight months. There is no mention of fibre purchased from other suppliers, which may indicate that Cape was by this time self sufficient.

By 1948 Cape decided to reorganise its South African blue operations by incorporating a South African Management company, Cape Asbestos South Africa (Pty) Limited (CASAP), which entity would henceforth be responsible for the South African operations. Mr Justin McKeurten was appointed Managing Director.

At the same time all the blue asbestos operations were transferred to a newly incorporated South African subsidiary, Cape Blue Mines (Pty) Limited (CBM). CBM would in future acquire all blue fibre prospects with potential in its own name. This also included the blue fibre operations in the Eastern Transvaal.



Cape's Kimberley Offices until 1949, when the Head Office was moved to Johannesburg

Towards the peak

During 1948 Gefco also brought the Riries mine north of Kuruman into production. This farm had been listed by Dr Hall in 1930 as an asbestos-bearing property, but it was brought to the attention of Gefco's manager, Harold Pascoe, by the legendary Herero prospector, Piet Thomas. This prompted Pascoe to site a drill on a likely spot on the farm where rich zones of asbestos were intersected, roughly at the predicted depth. Riries was so rich that it propelled Gefco within a short space of time to one of the major players in asbestos mining. In 1949, under the new South African subsidiary, Cape Asbestos of South Africa (Pty) Limited (CASAP), the Head Office was moved from Kimberley to Johannesburg.



Riries Mine, north of Kuruman, opened up during 1948

Piet Thomas

Piet Thomas was a Herero labourer at Gefco's Bretby mine. According to Norah Pascoe he acted as a lay preacher at Bretby, organising open-air church services on Sundays.

Pascoe took him under his wing and taught him how to look for asbestos seams by locating and following the 'main marker'. Thomas scoured the areas from south to north and eventually told Pascoe that the Riries farm 'is full of asbestos'. This proved correct following the sinking of a drill hole on a likely spot.

Thomas was so taken up with his success that he suggested to Pascoe that they keep quiet and claim the deposit for themselves. Pascoe considered the proposal but argued against it, saying that they are employees of Gefco and that Gefco paid them for work done. Whatever they found belonged to Gefco. Pascoe did however propose to the visiting London directors that Piet Thomas should be given some shares in the company.

The idea of allotting shares to a black person must have sounded absurd to them and, after some exchanges with Thomas about how things work when you are employed by a company, he realised that he would not get anything and that he should rather part company with Gefco.

He later teamed up with Sarel de Witt. He took De Witt to Langley farm and

persuaded him to deepen an old winze. Five metres down, they struck fibre. De Witt described him as a born prospector who clearly understood the markers in the asbestos formations.

After leaving De Witt's employ, Thomas freelanced for some farmers in the area. On one such errand in the mountains it became bitterly cold and, together with his son, they stumbled upon a deserted shepherd's hut. They soon had a fire going, prepared a meal, then closed up the door and went to sleep – never to wake up again. Carbon monoxide fumes had overwhelmed them.

By this time fairly sophisticated mills were introduced, as witnessed in Cape's capital expenditure program for 1948, when new mills were planned for Koegas, Blackridge and Pomfret. Westerberg mill was reconstructed. However, none of these included dust suppression equipment, and they consequently discharged dust directly into the atmosphere. Mill sites could be seen from a few miles away.



Part of the Pomfret mill erected in 1954. Note the open conveyer belts



View of Pomfret, the tailings dump towards the right

During the period 1948 to 1950, CBM acquired rights over a number of farms in the Prieska, Danielskuil and Kuruman areas. These included the Kliphuis Base Mineral leases near Prieska and the Base Mineral Leases over Sardinia, north of Kuruman. They also terminated some leases like Ouplaas near Danielskuil, Droësloot and Whitebank near Kuruman, and ceded the Sardinia leases north of Kuruman to Mr Douglas Willmore, merchant of Kuruman.

During 1948 The Union Asbestos Mining Company (Pty) Limited, or Union, was incorporated, the major shareholder being Amalgamated Blue Asbestos Mining and Finance Corporation (Pty) Limited. Union acquired rights over Whitebank farm near Kuruman and Grasmere towards Postmasburg. Secretaries for the company were President Finansierings- en Aksepteringskorporasie Beperk.

By 1950 the following parties were represented at the second general meeting of this company:

- Die Kopersbond Beperk
- Van Riebeeck Mynbou- en Finansieringskorporasie Beperk
- Amalgamated Blue Asbestos Mining and Finance (Pty) Ltd; and
- President Finansierings- en Aksepteringskorporasie Beperk

By the time of the 3rd Annual General Meeting, South West Graphite Mining and Refining Company Limited, represented by Mr A J Arkin, had control of the company. However, by the time the 4th annual general meeting was held, Arkin was no longer involved.

Further north of Kuruman, asbestos was discovered near Heuningvlei, where Percy Armstrong and his brothers erected a mill. They used tributors to supply ore to the mill, mostly from the Bute mine area. One such tributor was Sarel de Witt. De Witt soon mastered the extraction techniques and started buying out fellow tributors. All went well and some time during 1951/52 the Armstrongs (and De Witt) sold out to a Turner & Newall subsidiary, Dublin Consolidated Asbestos (Pty) Ltd. T&N was last involved in the Northern Cape in 1932.

Other small operators like Hove Asbestos and Sweeney Estates also found prospects in that area and extracted ore. During 1951 to 1954 British Metal Corporation operated a mine on the Farm Koegasput, next to Cape's Koegas mine. By 1951 Cape withdrew from the Kuruman area but still allowed companies like Phillips Asbestos to work their properties Hurley and Mansfield.

By 1952 the Armstrongs, together with a certain G M Hopkins, formed Kuruman Cape Blue Asbestos (KCB) and started looking for asbestos propositions. Fritz Baunach of the Swiss-controlled SA Asbestos Trading (SAAT) acted as secretary. They soon took over Union Asbestos from South West Graphite. KCB borrowed R20 000 from SAAT to erect a mill on Whitebank farm. In the early stages KCB bought fibre from various tributors, namely Cape Crocidolite Asbestos, Goods and Spandow, and Swanepoel and Britz.

Loans were also provided to associated companies Boxmoor Carrington, Gamohaan Cape Blue, Hove Asbestos, Maipin Asbestos and Mine Finders. The last-mentioned company was the prospecting arm of the Group. KCB also entered into an agreement with Phillips Asbestos to mine the farm Kalkgat near Prieska, but this operation did not get off the ground.

Sarel de Witt, however, set out on his own. His first prospect was on the farm Carrington, where a water borehole was reported to have intersected asbestos. Together with his lieutenant, the well-known one-armed Sam van Rensburg, they sank a shaft next to the borehole and began developing drives, but the reef petered out after a few meters. De Witt lost out heavily. He then teamed up with Piet Thomas, the Herero prospector. Thomas showed him around Langley farm, next to Carrington, and pointed out an old prospecting winze abandoned by Gefco or T&N. Thomas told De Witt that Gefco stopped too soon and that the asbestos was slightly lower down. After drilling down another five meters they struck a rich seam of fibre. De Witt wanted to open up a mine but had no finances left.

He decided to again team up with the Armstrongs. The rights over Langley were still held by T&N via a subsidiary, and KCB negotiated a royalty agreement with them and started mining. Sorted concentrate was transported to the central Whitebank mill, where fibre was recovered. Langley was mined until 1958, after which KCB started mines at Bestwell, near Sishen, and at Newstead. KCB also arranged to take control of the old Salamander and East operations in the Ga-Tlthose reserve, where Percy Armstrong's prospecting indicated some additional reserves.

By 1954 KCB obtained the rights to Sardinia, previously mined by Gillanders & Campbell, later worked by Dominion Blue (T&N) and then taken over by Cape. When Cape withdrew from Kuruman area, they passed these rights over to Mr Doug Willmore of Kuruman. Gefco held these rights for some time but never mined Sardinia. KCB also took over Northern Cape Blue Asbestos and Boxmoor-Carrington.

A certain prospector, Dave Wandrag, found asbestos on the farm Depression, next to Whitebank. Together with Mr Ron Ebels they formed Wandrag Asbestos (Pty) Ltd. They started mining during 1954. Originally ore was sold to KCB. Wandrag later erected their own mill and then supplied crude fibre to KCB. Depending on market demand, KCB bought or discontinued purchasing fibre. It seems as if, by 1967, KCB and Wandrag severed their relationship and henceforth Wandrag sold its fibre to Gefco.

During 1958 Wandrag announced a change in control of the company. Bewick Moreing & Co. of Johannesburg became the major shareholder. However, Duiker Exploration, a subsidiary of Lonrho, UK, later acquired control.

All KCB fibre produced was sold through the associated Swiss-owned company, SAAT. The Swiss Asbesco company also had a stake in KCB and assisted with financing. KCB soon became a major force in the Kuruman area. During 1960 the Swiss bought out the Armstrongs and De Witt. The market for asbestos was growing and the larger companies like Cape, Gefco and KCB scrambled for rights in the area. Virtually all farms along the asbestos belt were taken up by them.

During 1955 The Asbes Mine near Kuruman was started by a consortium which included Messrs Doug Willmore, Kitch Rodgers and Doug Todd who succeeded Pascoe as Gefco's manager. They formed a private company for this, Griqualand Asbes (Pty) Limited.

However, the deposit was discovered by Gefco's geological personnel and, when some London directors, on a visit to South Africa, learnt about this, they were furious and insisted that the property be brought under Gefco's control. The founders were allowed a 15% shareholding only, to compensate for the moneys already invested. At a later stage these shareholders were bought out and other South African prospects like Strelly, Saamwerk Asbestos, Lake Asbestos and Sweeney Estates and Griqualand Chrysotile Mines were housed in the company, it being South African registered.

By 1956 Gefco also opened up the Mt Vera, Whiterock and Orcadia mines, milling the ore from these at the nearby Riries plant. Bretby continued to operate. By 1957 KCB started developing the Bestwell mine, which was worked until 1962 when a section of the mine caved in, It was thereafter considered unsafe for further exploitation. KCB operated concentrating plants at the various small mines, bringing enriched ore to their central mill at Whitebank, where fibre was extracted. In 1959 Gefco also opened up the Greyling mine on the farm Greyling, situated south of Bretby. Ore from Greyling was treated at Bretby.

Up to this time asbestos milling plants all operated on the basis that dust extracted in the plants was simply discharged into the atmosphere, which left the surroundings covered in dust and fine fibres.



*Typical discharge to atmosphere from an older plant.
(‘Klipvlei’ written on the back of the photograph)*

From about 1960 the health hazards attributable to asbestos, particularly mesothelioma, prompted the Inspectorate to introduce stricter dust control measures at the mines. These included dust suppression or extraction equipment at the mills. Initially, most extraction equipment was in the form of attachments to the existing milling structures, as no space had been allowed for extra equipment inside the older mills.

The South African Railways also insisted that all fibre railed be packed in non-permeable bags.

Regular visits by inspectors, announced and unannounced, became the order of the day. Because there was no suitable dust suppression technology available, everything had to be invented on a trial and error basis, and it took quite some time before effective equipment was developed, needless to say at great cost.

Dust counts however remained high, but as technology improved these were brought down more or less in line with world standards announced from time to time.



Dust extraction units attached to the existing milling structures, as seen at the Riries mill

After the Swiss bought out the Armstrongs and Sarel de Witt, the latter started looking for asbestos in other areas, particularly near Danielskuil. Together with Mr Uys, they took options over the farms Oudeplaas and Owendale. These properties had been worked before by old-time tributors, but not at depth. Drilling proved positive results and De Witt soon registered a new company, Danielskuil Cape Blue Asbestos (Pty) Limited, or DCBA.

De Witt wanted to start mining but again he needed money. He went to Switzerland to negotiate with Mr Schmidheiny, Chairman of the Swiss Asbesco group. They concluded an agreement drawn up on the back of a cigarette box and De Witt was put in funds and could start with mine development.

During 1958 Cape acquired Warrendale from a company known as Consolidated Blue Asbestos, owned by the Burrow brothers and Harry Baily, and started opening up new sections of the mine. De Witt obtained permission from Cape to visit this close-by site to get a better understanding of the mineralisation before commencing operations at Oudeplaas and Owendale.

Uys, together with another old-timer, also revisited the asbestos deposits in the Groenwater Native Reserve towards Postmasburg. These were already known for many years, but efforts to exploit them were not very successful.

Federale Mynbou, a South African Mining House, acquired the controlling interest in Gefco from the British controlling shareholders in 1962 and commenced with the transfer of management of the Group to South Africa. Federale was previously

involved in asbestos mining in Southern Rhodesia, and one such operation was the Rosy Cross mine. They also did some exploration in the blue asbestos fields north of Kuruman prior to acquiring a stake in Gefco.

During this time the Hans Merensky group also embarked on prospecting in the area north of Kuruman and established sufficient ore reserves on the farm Eldoret, where the Merencor mine was opened up and a mill erected. This mill was originally designed without dust suppression equipment but the budget had to be increased substantially when it was established that the inspectorate would not allow them to operate without such safety measures.

A payable orebody was also demarcated at Coretsi, within the Lower Kuruman Reserve, where the Coretsi Mine was started. This group first sold fibre to KCB, but by 1966 Gefco bought a controlling interest in the holding company, Elcor Investments (Pty) Limited, and took over management of these mines.

By 1965 Federale Mynbou and General Mining and Finance Corporation Limited (or Gencor) merged, the latter taking over all mining operations. From now on there were very few new entrants into the blue asbestos business, except for Jebolo Asbestos, run by Mr Andries van der Westhuizen and his son, Atta, shopkeepers at Tsineng; another new entrant was Mr Ronnie Johnson, owner of Hartlands Asbestos mine near Kuruman. Jebolo's fibre was bought by KCB whilst Hartlands sold its fibre first to KCB and later to Gefco.

By 1966 Cape concentrated all their efforts on the Koegas/Westerberg mines in the south and Pomfret in the north.



Westerberg Mine, across the Orange River from above Koegas, and looking over tailings dumps



Mine Manager's residence, Koegas



Kokerboom (Aloe Dichotoma or Large Aloe) overlooking Koegas

The mine compound policemen were referred to by workers as 'kokerbome'; this dry region is home to the kokerboom (*Aloe Dichotoma*, or Large Aloe). In the photograph of the kokerboom overlooking Koegas, there is a resemblance to the lone, watchful presence of the policeman.



Mine workers preparing dinner, Koegas Compound. Proper kitchens for preparing food were later introduced

African workers were mainly contract workers coming to the mines by law without their families, and hence no family facilities, schools, churches, clinics were ever provided, as no communities in a traditional sense existed.

Most coloured workers however lived on the mine properties, and hence there was a need to provide for housing, schooling, clinics as well as churches. These facilities were either paid for by the mine management and or the local municipal authorities. These areas however remained segregated from the white communities on the mines.



Koegas Coloured School with three teachers and over 50 pupils, uniformly dressed and a few children with shoes and short socks



Koegas mine police force on parade

The Koegas Mine Police Force were organised on military lines, with traditional military uniforms and formal parade exercises. Discipline on the mines was of utmost importance, hence the need for a disciplined mine police force. The Chief Officer was known as the Induna.

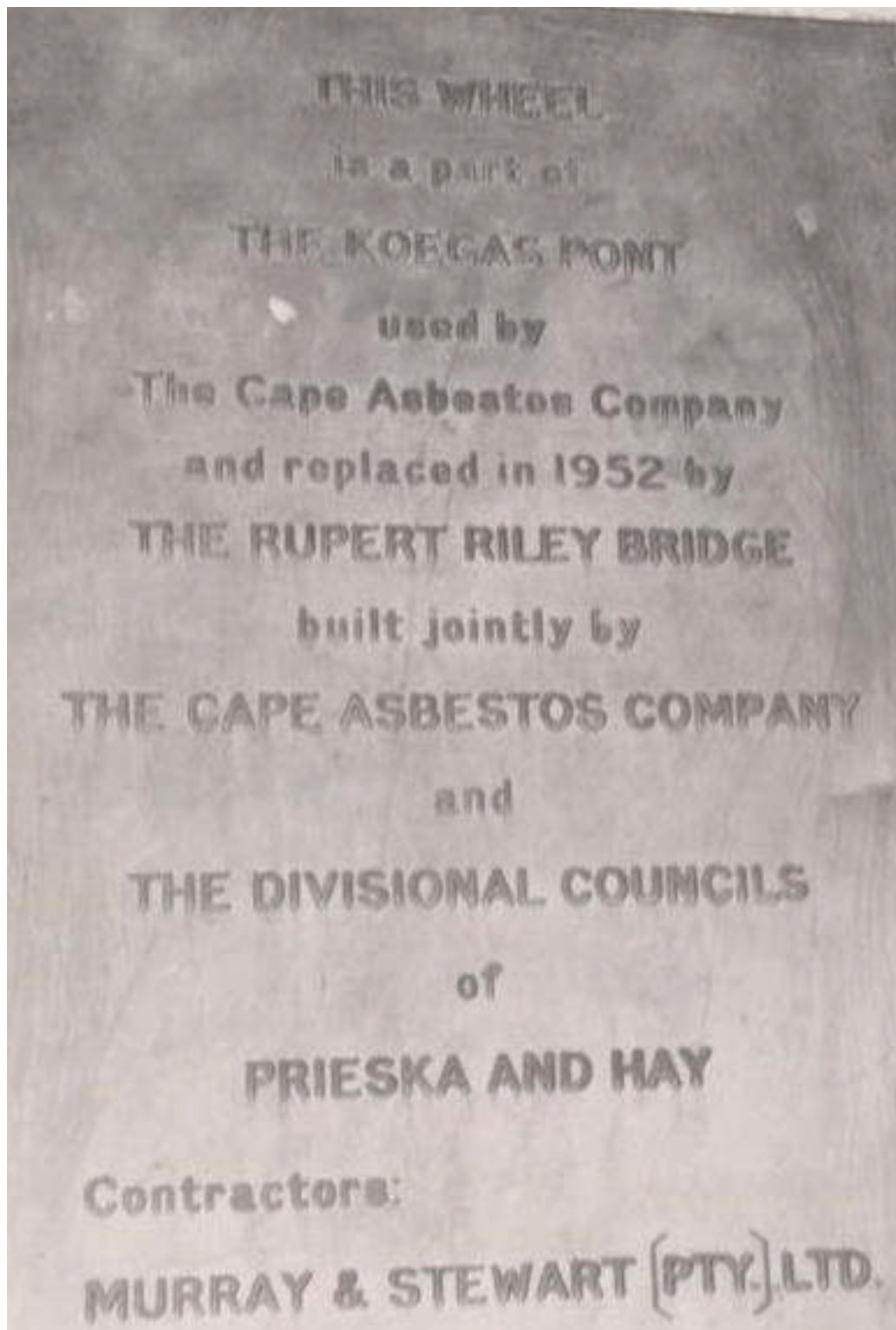


The Riley Bridge across the Orange River

The Orange River flowed between Koegas and Westerberg mines. Since 1907 a pontoon bridge had been used to ferry men and material across the river, but by 1952 the Riley Bridge was constructed to facilitate passage. The bridge was named after the then Chairman of Cape, Sir Rupert Riley.



The wheel from the Cape company old pont, displayed on the north bank of the Orange River



Commemorative plaque on foundation of old pont wheel



Fully loaded Albion lorry and trailer ready to depart from Koegas, 25 km from Draghoender Station

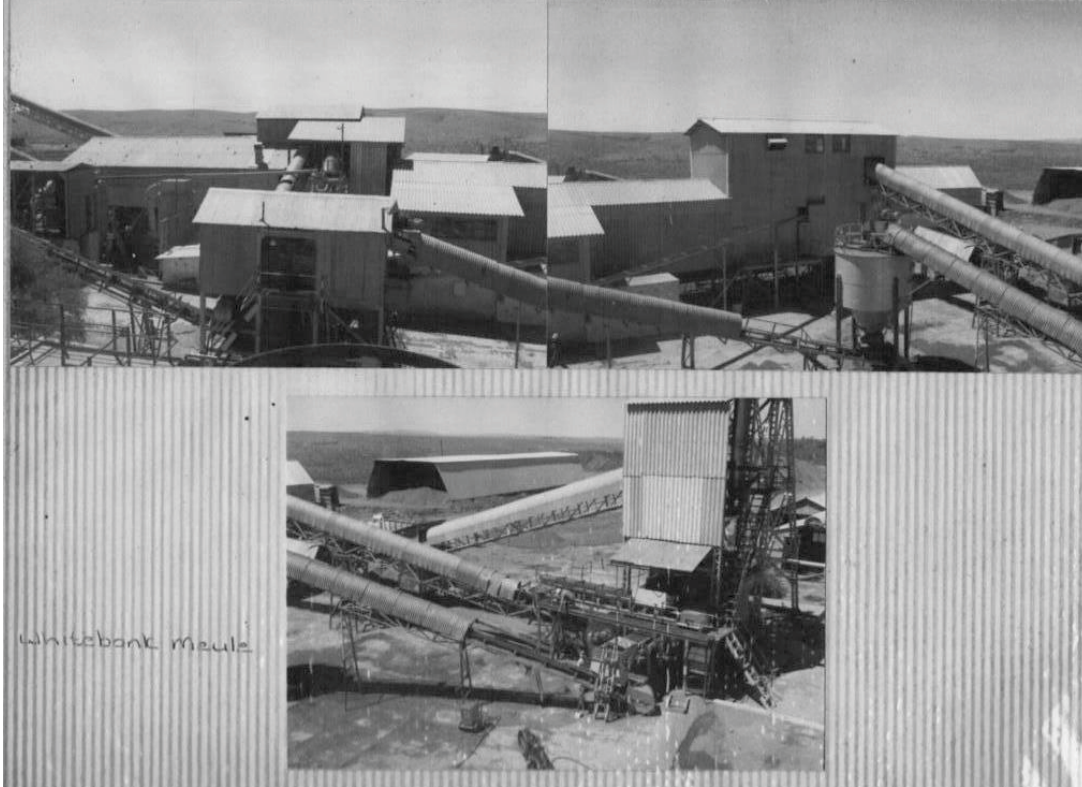
Gefco was mining at Riries, Mt Vera, Whiterock, Orcadia, Eldoret (Merencor) and Coretsi in the north, Asbes mine west of Kuruman, and Bretby and Greyling mines in the south. During 1965 Gefco applied for and was granted a secondary listing for its shares on the Johannesburg Stock Exchange. KCB was mining at Whitebank, where several substantial deposits were found (Whitebank, New Shaft, Whitekloof, Whitedale, etc.). The asbestos rights over the farm Bosrand were held by a company known as BDM Ontwikkelings Maatskappy. KCB negotiated with them for the right to mine and brought this mine into production in 1967.



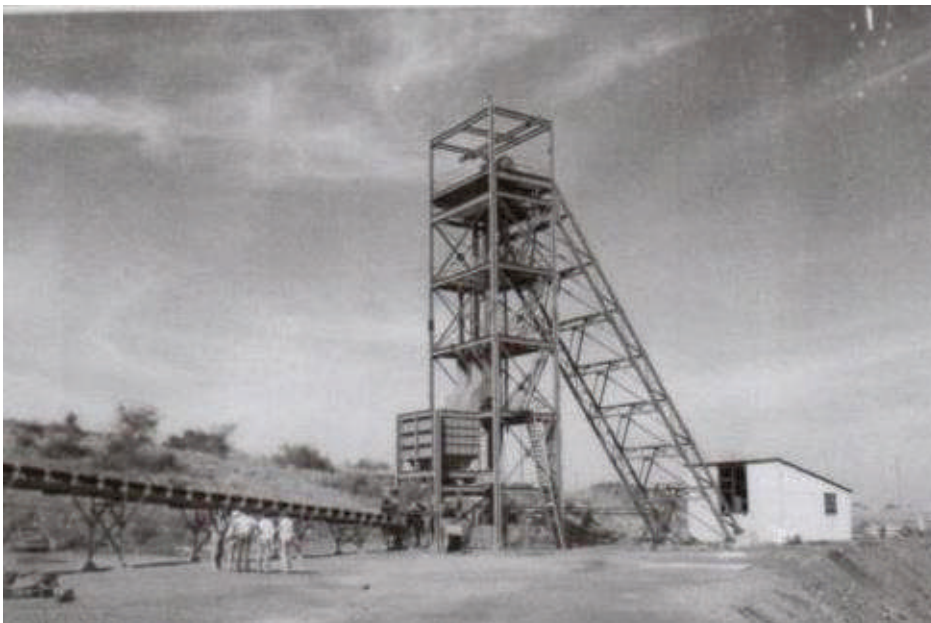
Bosrand concentrating plant, where waste rock was sorted

Bosrand concentrating plant provided a useful process. Where waste rock could be sorted at such outlying mines, there was saving on transport costs and it ensured a richer feed at the main mill.

The last KCB mine to be opened up was Corheim. All ore produced by KCB at their mines in the Kuruman area was treated at their Central Mill at Whitebank.



KCB's Central Mill at Whitebank, where concentrate from all their nearby mines was treated



KCB's Whitedale shaft headgear

DCBA was mining at Ouplaas and Owendale near Danielskuil. Warrendale was only started during 1969. Dublin Consolidated operated the Bute/Heuningvlei mine. Jebolo was mining at Jebolo north of Tsineng. Hartlands Asbestos was working their mine on the farm Hartlands near Kuruman.

From 1966 to 1970 the industry steadily settled down to meet the new, stricter dust control regulations introduced from time to time. No new operators came in, partly because the new regulations implied higher start-up capital cost and partly because the larger players controlled the markets.

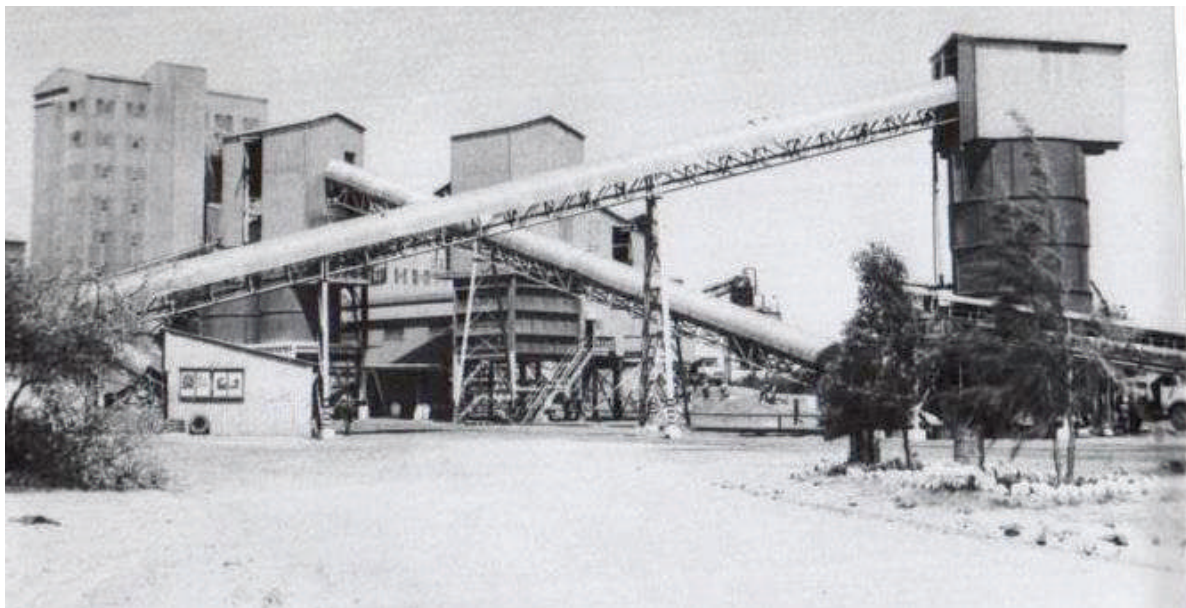
During 1970 Gencor decided to establish a South African company, styled Gefco (SA) (Pty) Limited, to take over the South African assets of Gefco (UK). The scheme was approved by both the UK and South African courts and Gefco henceforth became a South African company. The UK company was struck off the register during 1976, as directed by the UK court.

During 1974/75 T&N was withdrawing from the asbestos scene in South Africa, having closed their Kempville operation in the Malipsdrift area. They offered their remaining blue asbestos operation, Heuningvlei/Bute, to Gencor, although this operation had a remaining life of some five years only. Gencor took it over, beginning in 1976, and operated it until 1981.

Except for recessionary conditions from time to time, the volumes of blue fibre produced increased steadily. Dust control became a major focus point and absorbed substantial amounts of capital.

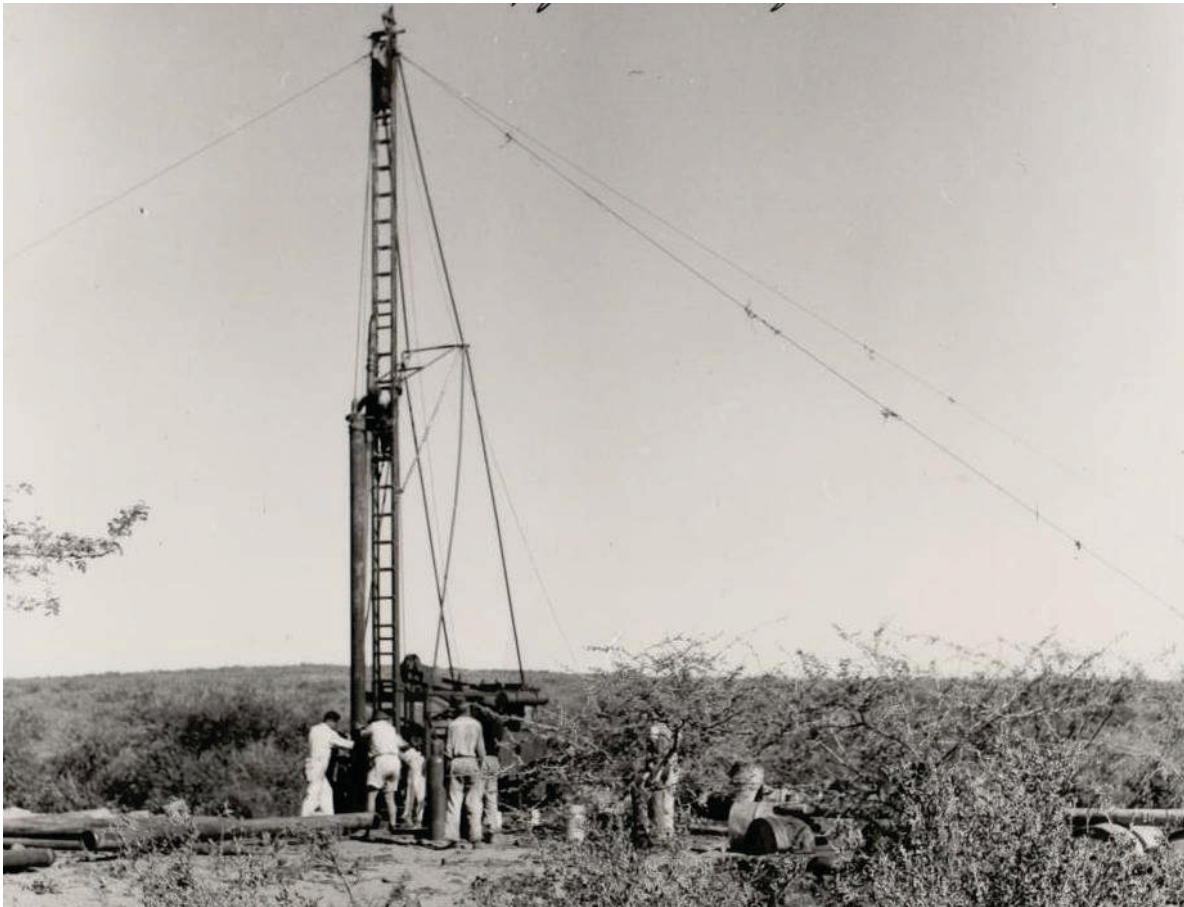
During 1975/76 Canadian production was severely affected by a cave-in at an opencast mine and a late start on the opening up of another. This provided blue fibre producers an opportunity to supply some of the Canadian customers. Canadian mines produced substantial quantities of longer chrysotile grades, which could easily be replaced by long blue fibre. This period saw the peak of blue fibre production.

By 1977 sales volumes started dropping, mainly due to health concerns, following massive litigation from about 1974 against American factories. These claims soon threatened to bankrupt their insurance carriers. During 1978, however, Cape commissioned a brand new, state of the art mill at Pomfret.



Pomfret Mill: sheltered conveyor belts link tall structures, at Pomfret asbestos mine, Vryburg district, North West province

Cape scaled down its Koegas operations during 1978, laying off 1 600 labour-category workers. However, no cutbacks were implemented at Pomfret.

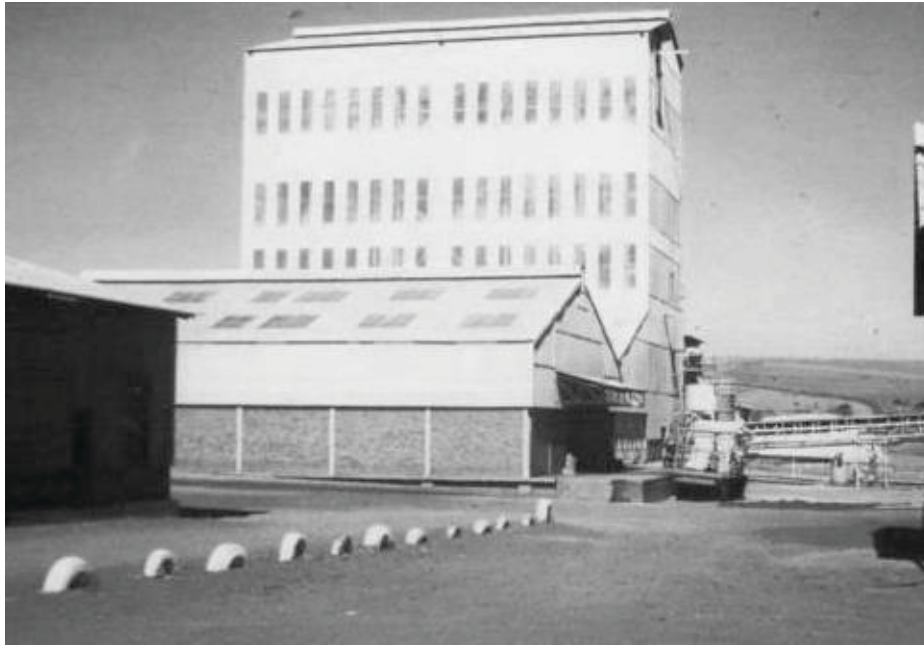


Drilling for water at the Pomfret mine. Water is a precious commodity in such areas, adjoining the Northern Cape province

At this time Cape disposed of its blue asbestos operations to Transvaal Consolidated Land & Exploration Company Limited (TCL), a company in the Rand Mines/Barlows stable. The Koegas/Westerberg mines were finally closed during late 1978, leaving only Pomfret as a blue producer under TCL. Fighting for market share intensified and price-cutting became the order of the day.

At this time KCB was the biggest producer of blue fibre in the Kuruman/ Danielskuil area. DCBA opened up the Noordhoek mine near Danielskuil and then Klipfontein north of Danielskuil.

To streamline its holdings KCB embarked on a rationalisation exercise and transferred all mines and mineral rights into the name of KCB, liquidating all the dormant shells.



The Klipfontein Mill



Mr Hans Thoeni, Managing Director of KCB, handing over an award to Mr Nic du Toit at a function held for long serving employees. Because alternative employment opportunities were scarce in the Northern Cape, most employees who were permanently employed stayed with the mines for many years

Commencement of the decline

By 1981 it was clear that the blue market was under severe pressure and that survival depended on drastic actions. The chairman of Gencor, Dr Wim de Villiers, and Tony Petersen, chairman of TCL, met and concluded that there was room for only one South African operator in the market. After lengthy discussions it was agreed that one company would take over the other. In the end the parties agreed that Gencor would buy out TCL's interests. This decision was most probably influenced by the fact that TCL was the junior entrant, and it was learnt on good authority that Petersen was not altogether happy with the deal struck with Cape, accusing them of not having disclosed all the risks attaching to asbestos. TCL

however negotiated an indemnity from Cape against claims from the United States for a fixed period, should they suffer any loss.

TCL afterwards disclosed to Gencor that they were negotiating and had already concluded a deal to also take over Swiss-Eternit's blue asbestos mines under KCB. One of the conditions that the Swiss included in the agreement of sale was that TCL would not dispose of these properties to Gencor. However, KCB was nonetheless included in the Gencor/TCL deal.

When news of the Gencor/TCL deal broke, the Swiss accused TCL of having dealt with them in bad faith. In terms of the deal between the Swiss and TCL, Eternit factories were obliged to take a substantial minimum tonnage of blue fibre from TCL for three years, and the quantities would then be reviewed. This hiccup provided the Swiss with an opportunity to renegotiate the undertaking, and their factories stopped using blue fibre earlier than anticipated. In addition to the blue fibre mines, Gencor also acquired the Penge Amosite mine from TCL.

Pomfret had just completed the construction of its new mill and Gencor was keen to operate this facility to its designed capacity. However, the market for blue asbestos was declining sharply, and soon stocks were at levels far in excess of storage capacity on surface.

The polypropylene bags in which asbestos was packed cannot be stored in direct sunlight and the only solution was to store it underground in mined-out areas. The mine manager at the time commented that it was the first time in his long career that he experienced a phenomenon of this nature.

Although marketing staff remained optimistic, the actual sales figures soon proved them wrong. Production cutbacks had to be implemented urgently during 1984 at both Pomfret and KCB. By 1986 Pomfret was closed down completely.

During 1985 the Atmospheric Pollution act of 1965, originally applicable to gold mines, was made applicable to asbestos mining as well. The Heuningvlei site, having already been closed, was the first to be rehabilitated, with a closure certificate issued end 1985. No prescribed standards were as yet in place and the 'best practice' method was applied.

By September 1985 Wandrag was given notice that Gefco would no longer be able to buy fibre from them. By 1986 Gencor decided that it would dispose of its asbestos interests, and for the next 18 months various options were considered. In the end it was decided that the most logical option was to dispose of it to a management consortium. This ensured a responsible approach to the protection of the interests of shareholders and the remaining workforce.

Although the lower levels of production and sales at that time rendered the operations uneconomical, the fall in the Rand/dollar exchange rate brought welcome relief and the operations were able to wind down in an orderly fashion.

From then on no exploration was undertaken and only known reserves were exploited. The last deposit considered for mining was Zukudu near Riries, but shaftsinking was abandoned before the ore horizons were reached.

Gefco's own known ore reserves were low and an agreement was entered into with Wandrag to mine their England mine for about two years. Ore from Coretsi and Asbes South mines was then treated at the Merencor mill until all operations were discontinued during September 1997.

Sales from accumulated stocks continued for a further two years but, due to the cancellation of the last order from Egypt, following intense media pressure in that country, the remaining 1100 metric tons of blue fibre had to be buried at the Riries mine.

In accordance with the then applicable legislation regarding the rehabilitation of defunct asbestos mines, Gefco entered into negotiations with the Department of Minerals and Energy to determine Gefco's liabilities. In the end the State accepted responsibility for the rehabilitation of certain mines, whilst Gefco attended to the mines considered its own responsibility.

Stripping of the mines commenced and rehabilitation actions continued through to 2006, when closure certificates were obtained for all the Gefco blue asbestos mines in the North West and Northern Cape provinces.

So ended the exploitation of blue asbestos in South Africa, after more than 100 years.

AMOSITE

Amosite asbestos is found mainly in an area starting roughly 40 kilometres (25 miles) south-east of Polokwane (formerly Pietersburg), stretching in an easterly direction through the Strydpoort mountains into Sekhukhuneland, then swinging slightly east-south-eastwards to include farms as far south as Kromellenboog east of Burgersfort. Although there appears to be a definable blue fibre zone and an amosite fibre zone, in many localities the amosite occurs together with Transvaal blue asbestos. On sites where amosite was the predominant type, an amosite mine would be established. If blue was predominant, a blue fibre mine would be established.

The occurrences towards the south are referred to as the Lydenburg fields whilst those in the northern parts are known as the Pietersburg fields. The latter occur mostly in mountainous country where access was generally difficult and infrastructure non-existent in the early years. Because of these problems, opening up and operating a mine here presented some real challenges.

Mineralisation in the Pietersburg fields was concentrated in an area roughly 30 kilometres (about 20 miles) west to east and 25 kilometres (15 miles) north to south. The middle area around Bewaarskloof was particularly rich. Some deposits were however situated slightly away to the east, up to the farm Dublin.

Most deposits could only be exploited by way of adits (so running horizontally) into the mountainside. Ore needed to be sorted on site and the concentrate transported to a nearby treatment plant, usually erected on a more accessible site on lower ground.



Mountainous countryside of the Pietersburg fields, showing adit workings high above the valley floor

The cheapest and most flexible mode of transport was by pack animals (usually donkeys). Some of the larger firms could consider the luxury of an aerial ropeway to take concentrate down to the valley floors. These were rather primitive contraptions,

known as 'dare-devils', with the loaded car going down pulling up an empty one as a counterweight.

Not all operators could erect treatment plants and the smaller ones were obliged to sell their ore to companies with milling plants, subject always to there being spare capacity and a need for more feedstock. This of necessity led to most of these operations being stop-start ventures.

Transport of final product to Pietersburg was by way of donkey- or ox-wagon, until proper roads were constructed and mechanised transport introduced.

The countryside in the southern (Lydenburg) section was not nearly as challenging as in the north, and this facilitated easier access. However, infrastructure was lacking and transport of final product to the nearest railway facility was also initially reliant on draught animals.

EARLY DISCOVERIES

Lydenburg fields

As previously mentioned, in 1907 asbestos deposits were found by Mr Cecil J Ward on the banks of the Olifants River, on the farm Penge near Burgersfort. Ward, a general dealer on the farm Mooihoek, had come from Ireland in 1899 and fought on the British side during the Anglo-Boer War. After the war he settled at Driekop and was joined by other family members and friends, from where they embarked on prospecting ventures.

It is said that these occurrences were earlier identified by a certain Charlie the Reefer, but little is known about the exploits of this individual. However, Dr A L Hall of The South African Geological Survey noted the existence of old trenches during his visit to the area in 1907.

The discovery was recorded in the 1907 annual report of The Transvaal Geological Survey. These sites were visited by Mr Kuhlman, compound manager at Premier Diamond Mines at Cullinan. Kuhlman did not think that the deposits could be mined economically, as the cost of transport to the nearest railhead, at the time Belfast, appeared prohibitive.

Apparently Ward obtained mining rights from the chief; at the time the *kgoš'i'* (chief or king of the Bapedi), a nephew of the late Chief Sekhukhune, was Malekutu III (1905–1958). By 1910 Ward constructed a road from Mooihoek to the site and started mining accessible outcrops on a limited scale.

Two years later he was joined by Mr J P Winter, son of the Reverend Winter, who was farming on nearby Kromellenboog. They took up a number of claims on properties in the area which showed potential. These included the farms Streatham, Hovercroft, Weltevreden, Zameloo and Kromellenboog.

During 1912 Messrs Solomon Weingarten and J B Wayne of Johannesburg secured an option over the mineral rights at Penge and some adjoining farms. They started mining on a commercial scale during 1914. This is the same Weingarten who was involved in blue asbestos mining in the Northern Cape. Mr Wayne was appointed as manager, and Ward was to receive a royalty of two shillings and sixpence per ton of asbestos sold from the above farms.

At the time land companies like SA Land and SA Townships owned substantial freehold property in South Africa, including some farms in this area. These companies would normally lease the mineral rights to other mining companies or individuals against payment of royalties.

Two companies, Egnep Limited (known as Egnep) and Asbestos Mines of South Africa (Amosa) were incorporated, with Weingarten as chairman. The other directors were Messrs H Jeary and A Burmeister.

The Penge farm fell under Egnep whilst the Ward farms, Streatham, Havercroft, Weltevreden, Zameloop, and Kromellenboog fell under Amosa.

However, marketing this new type of fibre proved extremely difficult. Unrelated parties with an interest in obtaining new business eagerly assisted in canvassing orders. In this way a Cape Town shipping company, Divine Gates & Co., obtained some orders during 1916 which they passed on to Egnep/Amosa.

According to Dr Hall, 55 tons of amosite was produced during 1915, going up to 3192 in 1917.

Pietersburg fields

The earliest reference to the existence of asbestos deposits in this area was in a paper by Professor G A F Molengraaff in 1907, describing a solidified crocidolite (blue) sample from the farm Job's Kop no. 589 near the M'thlapitsi River.

During the survey of the Haenertsburg gold fields (1907/08) in Eastern Sekhukhuneland, further occurrences were noted on Lot 263 between the Malips and Molapatsie rivers. Further finds were reported during 1908.

By 1917 the existence of amosite deposits in the Malips River valley and on the farms Uitval 1791, Holkloof 1581 and Krantzklouf 1786 were well known, as was the case with crocidolite on Lot 244. These finds soon led to an influx of prospectors, all trying to obtain rights over farms and Government land in the area. The most prominent of these prospectors were a Captain Leather and the McBean brothers. Captain Leather held claims over Lot 126 whilst the McBean brothers held claims over Lot 120.



Crocidolite workings in gently inclined banded ironstone: Leather's Mine (Pietersburg Asbestos Ltd) east of the Malips River

The McBean brothers, working Lot 120 by 1917, seem to have been first off the mark in marketing amosite, as the first fibre produced at Egnep and Amosa was offered to them. Mr W McBean is considered the pioneer in the Pietersburg fields.

The difficulties with the marketing of this type of fibre in competition with chrysotile and blue persisted. However, it seems that Weingarten's overseas contacts with factories paid off. Before long the McBean brothers were offering between 20 and 100 tons of fibre per month to Egnep/Amosa for disposal. By 1917 it was planned to increase production at the Penge mines to 500 tons per month.

Up to now this fibre type did not have a specific name and was only referred to as a whitish amphibole type, not being a chrysotile. Fibre originating from the farm Montana, to the north of the main Pietersburg belt, was of a particularly white colour, rather soft, and was referred to as montasite.

In 1918, Dr Hall suggested that the name amosite, acronym for Asbestos Mines of South Africa, be applied to all these amphibole or fibrous types. During 1920 amosite attracted the attention of Cape Asbestos, London. Apparently Cape feared the exhaustion of their blue asbestos reserves in the Northern Cape. Although exploratory talks commenced, these were stalled due to recessionary conditions prevailing at the time.

By 1921 the Amosa operations were discontinued, with Egnep still holding out. Some effort went into disposing of the properties and there is record of Mr A Oppenheimer

planning to introduce a prospective buyer. Details were also made available to Mr J W Johnson with a view to disposing of the properties in England.

By 1925 economic conditions improved to such an extent that negotiations between Cape and the owners of Egnep and Amosa could resume, and by September 1925 Cape took over the two companies for an amount of GBP50 000. Mr J G Bunney, who had been involved with the companies since 1917, was appointed first mine manager under Cape.

By 1928 Cape started planning the erection of a mill at Penge. The mill was at Egnep Mine, across the valley from Amosa Hill, where there was an outcrop of the principal amosite horizon. A series of adits along the line of the outcrop provided access. Workers' houses were conveniently located at the foot of the hill.



*First mill erected at Penge, north of Lydenburg, during 1928/9
(Photo: Dr. Hall)*

During 1928 there was a lot of interest in these fields and a number of ventures were announced. By the end of May 1927, 47 301 claims had been registered in the Pietersburg fields, and this rose to 61 617 a year later.

Pietersburg Asbestos Company, essentially Captain Leather's outfit, conducted some small-scale operations on its claims. After about five years a new company, Premier Asbestos, was floated to take over these properties. The company's prospectus was issued early in 1928, but by October of that year insufficient interest from the public caused the failure of the transaction, and the claims reverted to the original owners.

During 1928 Cape took over the claims held by the McBean brothers over Lot 120 for GBP35 000. This area is generally known as Bewaarskloof. The McBeans were retained for some time to manage the mines for Cape. A mill was erected on this site during 1930.

The Baragwanath family was also involved in mining in these areas, even as early as 1906. Later on the Cork mine was run by Roy Baragwanath until 1968, when he sold it to T&N.



Narrow amosite seams in banded ironstone, Malips Drift Asbestos Mine, later taken over by Cape

Another proposition, commonly known as the Blue Asbest block, comprising some 2000 claims, was acquired by a new company, S A Consolidated Asbestos Co. Ltd (or Consolidated) which was floated in 1928. These claims were adjoining the McBean and Captain Leather properties.

Highly favourable reports regarding the potential of these claims, which contained both blue and amosite fibre, were compiled by the well-known consulting engineer in the asbestos business at the time, Mr W F H Dudgeon. These claims were situated on Lots 121 and 125. The chairman of the company was Mr Reg B Saner, a Johannesburg attorney. The mine manager was Mr Harris Freedman (previously associated with the Barnato mines). Strangely enough, a notice published in the Government Gazette of 27 April 1928 seems to put this company in voluntary liquidation, scarcely a month after its incorporation. The liquidator was Mr Michael Haskell, who later emerges as the chairman of the company and it is business as usual. Haskell is later credited for his belief in the future of the Pietersburg asbestos fields. With the assistance of his good lieutenant, Mr Albert Schechter, they pegged many claims in these areas, some of which were disposed of to mining houses on the Rand. A plant was also erected on this (Lot 120) property.

Whilst at S A Consolidated, in an effort to overcome the extreme transport difficulties between the mines and Pietersburg, Haskell experimented with Caterpillar truck-trailers, but these efforts failed, as the braking capabilities going downhill proved inadequate. By March 1929 Mr Haskell resigned and Mr Nielsen took over as chairman.

It seems as if Haskell disposed only of part of his interests to Consolidated. By April 1929 it was reported in the *South African Mining and Engineering Journal* (SAM&EJ) that the British firm Turner & Newall acquired some of Mr Haskell's claims, including the Montana block. This obviously did not include the Consolidated properties. According to the SAM&EJ of 18 April 1929, T&N's subsidiary, Dominion Blue Asbestos Corporation, were to manage the Haskell properties. Mr Kirkman was appointed mine manager.



Mr Michael Haskell, whose perseverance in the development of the Pietersburg asbestos fields was generally acknowledged

Consolidated continued to operate and lodged an application during September 1928 for the erection of an aerial ropeway, traversing its own (Lot 121) and the adjoining property of Cape (Lot 120).

During 1928 Mr J S Hancock, an Australian businessman who operated asbestos-cement factories in Durban and Newtown, Johannesburg, acquired rights over the farms Langkloof No. 575 and Stylkop No. 535, some 60 kilometres (40 miles) south-east of Pietersburg in the Chunies mountains. A company, Chunies Asbestos Limited (or Chunies), was floated with a capital of GBP50 000. A contemporary photograph shows a rudimentary cobbing plant, with fibre being bagged for despatch.

Altogether 904 claims were held and deposits included both blue and amosite fibre. These properties stood a good chance of success, as Hancock's factories took a fixed tonnage per month. He also sent a trial shipment to James Hardy in Australia. A milling plant was also erected on this property. Hancock was also involved in Rhodesian chrysotile mining.



*Rudimentary workings at Mr Hancock's Chunies Mine
(Photo: Dr. Hall)*

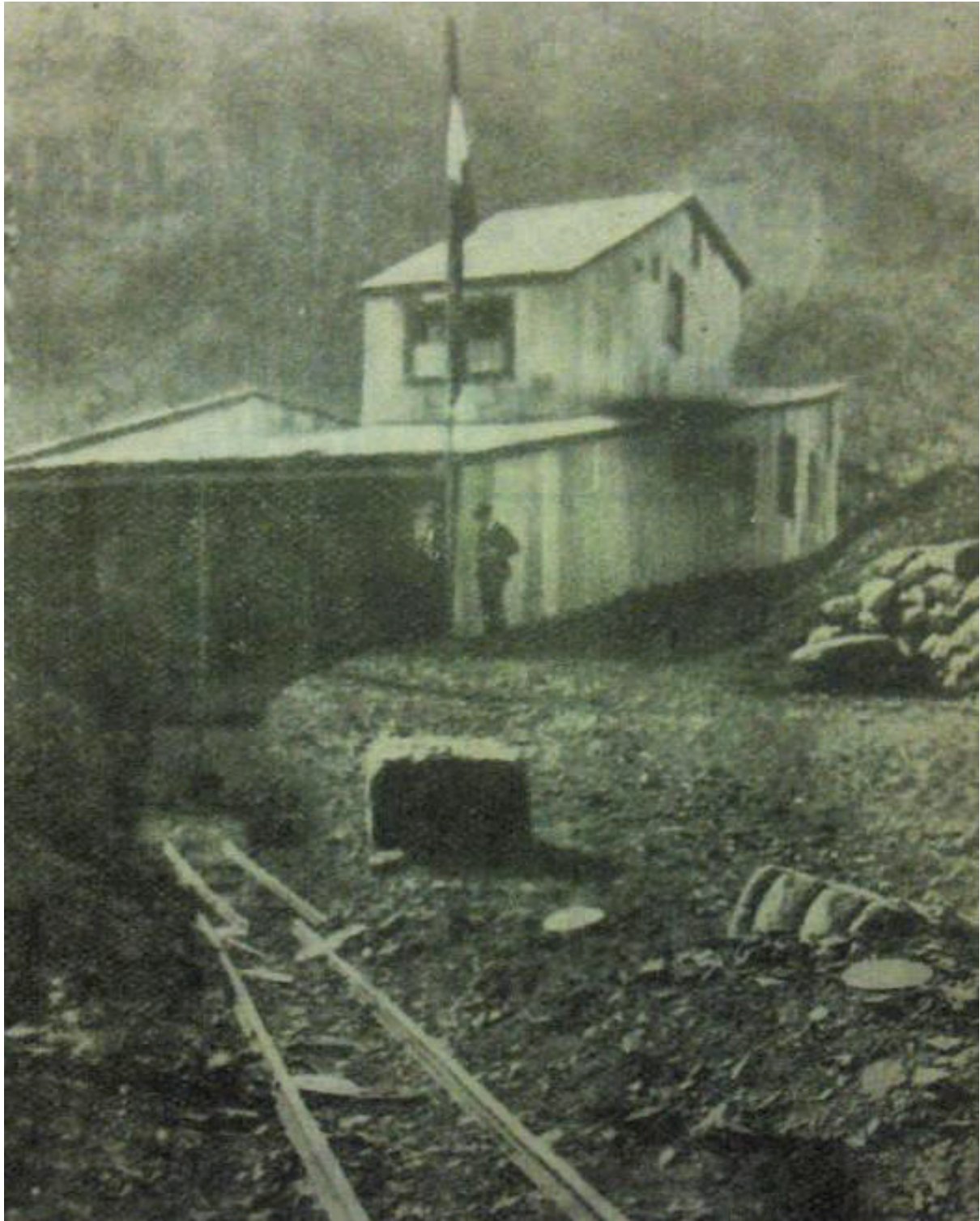
An offer by Mr. J. S. Hancock, of the Asbestos Cement Company, Johannesburg, to donate one ton of asbestos fibre to reinforce and harden a section of the Verneuk Pan speedway has been accepted. Mr. Hancock controls two asbestos concerns in the Pietersburg district—Chuenies Asbestos, Ltd., and Hancock's Asbestos Mine. A considerable quantity of asbestos from these mines is used in the Johannesburg factory.

Snippet from the Zoutpansberg Review of 5/3/1929, on the attempt by Malcolm Campbell (later Sir) to raise the world land speed record at Verneukpan

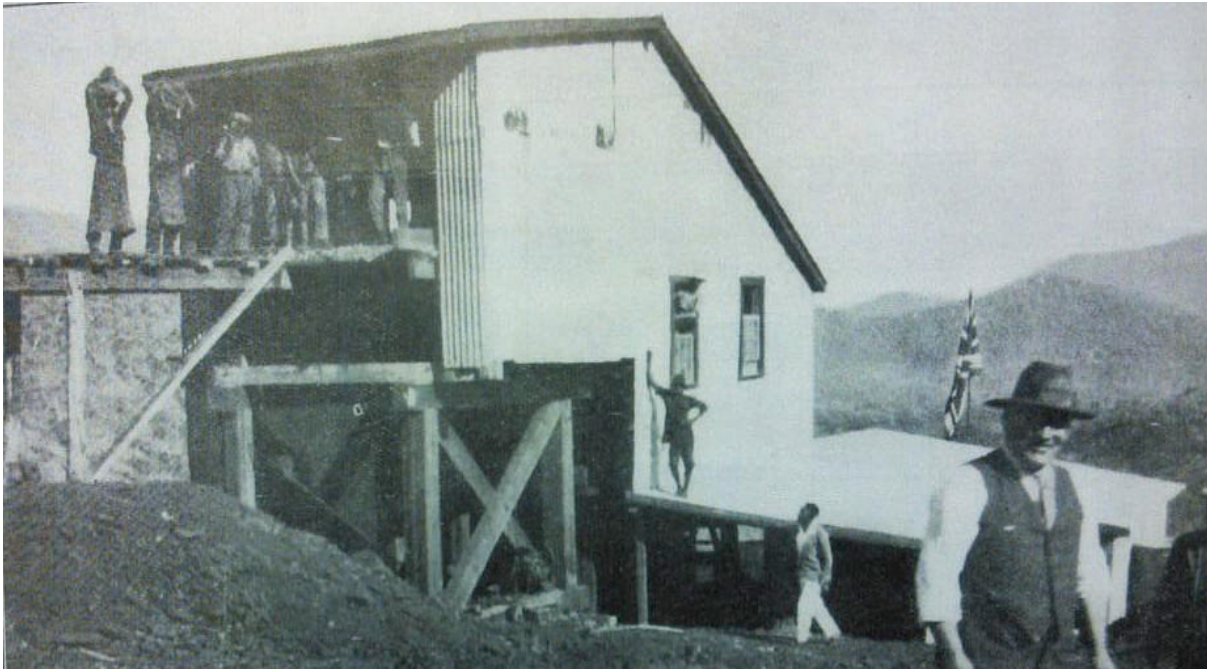
Another company, known as Selig Asbestos Mines Ltd, was also floated during 1928. The directors were a Colonel Donaldson and Messrs W Carlis and H Selig, with Mr W F Ryan as manager.



Newspaper photograph of Mr H Selig and some associates, of the Pietersburg district



The rock mill at the Selig Asbestos Mine in the Pietersburg district, designed to treat 300 tons per month



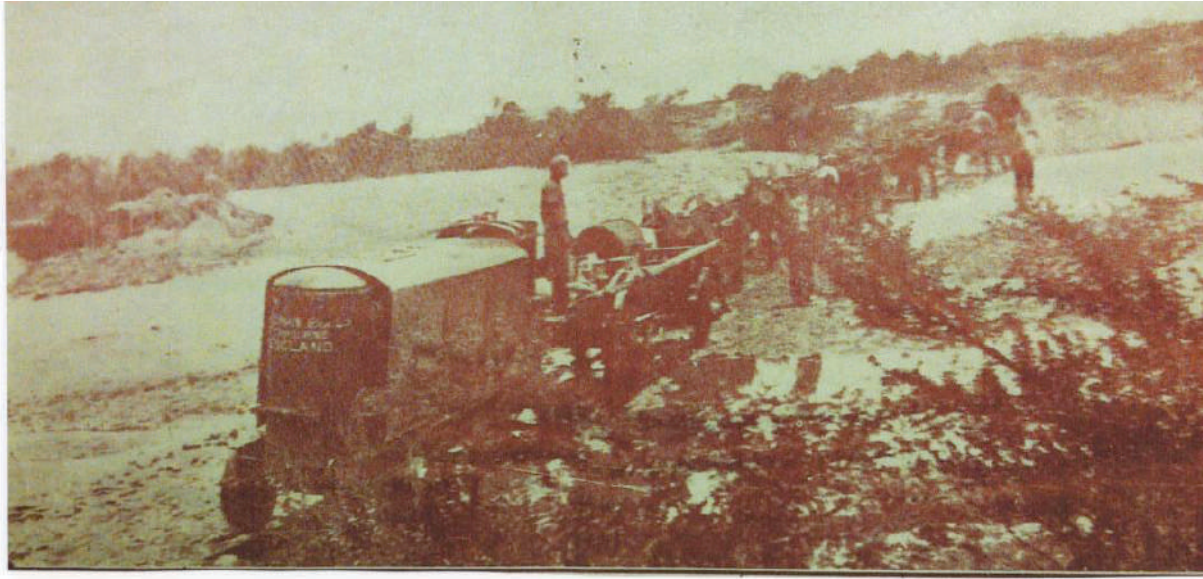
The crusher house at the Selig Mine, which had recently commenced productive operations with every prospect of a long and successful life

Selig produced cinematic films to advertise his operations. They also operated a depot in Pietersburg from 'the building behind the bottle store'. He died prior to 1930, and the company was then run by Donaldson; the operations later became known as Transvaal Asbestos Limited.

The Lucerne Asbestos Company entered into an agreement with a certain Mr Becker to acquire rights over the farms Lucerne and Gemini. However, this deal ended up in court and Lucerne was awarded damages of GBP5 000 against Becker, who had apparently not kept his end of the deal.

Another company, Standard Asbestos Company Ltd, was formed in Johannesburg to acquire some 3500 claims situated on the farms Cork and Eton. They also acquired a right to obtain a lease from Government over a portion of the farm Gemini. The first directors were Messrs Percy G Heywood, L Zagury and Arthur Pratt. By February 1931 the company was however voluntarily liquidated.

Many other individuals and companies were actively involved in prospecting these areas. The SAM&EJ of 22 September 1928 reported that hardly a day goes by without news of a new discovery.



A portable compressor being towed behind an ox wagon

The well-known Cape wine merchants Kramers started the Northern Asbestos Co. Ltd on the farms Uitval and Kranskloof.



*Thick seam of amosite interbedded in, and folded with, banded ironstone, Kramersgasp working, Kranskloof, south-east of Pietersburg
(Photo: Dr. Hall)*

Seen from a geological perspective, the mineralisation occurred over a defined area and most of the prospects were reported on by Dr Hall in his memoirs published 1930. Some land companies just accumulated properties with some potential, land being very cheap at the time. Efforts to dispose of finds were the order of the day. There is record of at least one individual who tried to dispose of his 'valuable' claims in America, seemingly without success. However, some of the smaller ventures were later taken over by the larger international companies. A map of the western section of the Pietersburg Fields published during December 1928 shows the following owners/operators in this area.

Name of Mine	Location	Owner	Address	Comments
SA Consolidated	Lots 121, 125 & 123 (Blue Asbest Block)	Mr Saner	P O Box 1244 Johannesburg	Taken over by Michael Haskell, then by Nielsen
Haskell's	Montana including Lots 127 & 124. Also Lots 122, 246, 262 and 263	Mr Michael Haskell	Johannesburg	Sold to Turner & Newall (Dominion Blue Asbestos Mines (Prop) Ltd) – closed shortly thereafter – See <i>Zoutpansberg Review</i> January 1930
Egnep (Pty) Ltd	Lots 120 & 245. Also Discoverers Claims over farm Uitkyk	Cape Asbestos	P O Box 1676 Cape Town	These were previously the McBean claims. Cape worked these properties until 1968. This area is generally referred to as Malipsdrift
Selig Asbestos	Middelrand 480 and Lot 119	Mr Selig	P O Box 3308 Johannesburg	One of the first plants erected in the area
Chunies Asbestos	Farms Langkloof & Stylkop, also claims east of Cape's Lots 120 & 245	Mr J C Hancock	P O Box 1920 Johannesburg	Mr Hancock was a well-known Australian businessman and owned asbestos-cement factories in Durban & Johannesburg
Pietersburg Asbestos	Lots 126, George's claims including Montana Block and Wolf & Simpson claims	Captain Leather	P O Box 152 Pietersburg	Previously known as Leather's claims
Central Asbestos Mines of South Africa Ltd	Farms Holkloof 1581 & Topfontein, Slaapkraal & Koedoeskloof	J C Bitcon & others	39/41 Calcutta House cnr Loveday & Anderson Streets Johannesburg	
Northern Asbestos	Farms Uitval & Kranskloof	Mr L Kramer	P O Box 7505 Johannesburg	Well-known Cape wine merchant

London African Tin	Farm Bergplaats No. 569 & small areas over Stylhoogte	London African Tin	Johannesburg	
Chalmers	Farm Piesangdraai 1789, Lagersdraai 1793, Benoudheid 539 & Lot 251	Mr Chalmers	Johannesburg	
SA Townships (Land Company)	Claims adjoining Lot 123 – east	Public	Johannesburg	
SA Townships Extension (Land Company)	Claims east of Lot 263	Public	Johannesburg	
Warren Syndicate	Claims east of Lots 120 & 245	Warren Syndicate	Johannesburg	
R L Esson	Claims south of Lots 121 & 125	R L Esson	Johannesburg	
Asbestos Options	Farms Yzermyn 524 & Rooikrans 486	J C Bitcon & others	39/41 Calcutta House cnr Loveday & Anderson Streets Johannesburg	
J S Richardson	Farm Warmberg 573	Mr Richardson	Johannesburg	

In addition, the Government held claims over another seven farms in the area.

Many individuals who conducted prospecting in the area applied for what was known as discoverer's claims. The Government Gazette of 20 April 1929 contains such a notice in favour of Mr G D Kotzee and Mr A J S Visser for discovering asbestos on portion of the farm Kempville No 111, entitling them to peg 25 claims.

Likewise the Government Gazette of 3/1/1930 contains a notice in respect of the farms Driekop No. 637, (in favour of P J J van Rensburg of the farm Diepsloot) and Onverwaght No. 482 (in favour of Mrs C F Verreyne of Jaskraal, Pietersburg). This illustrates the way in which many other prospectors or fortune hunters flocked to the area and, if anything worthwhile was found, claims could be pegged.

By 1930 the depression set in. Most smaller mines closed. T&N closed the Montana mine by January 1930, some eight months after take-over. By June 1930 SA Consolidated also suspended operations, but Chunies (Mr Hancock) continued, as he supplied his own factories. By 19 March 1932 S A Consolidated (in liquidation) invited tenders for its assets on the farm Haenertsburg, including 491 claims.

As can be seen, the Great Depression played havoc amongst the smaller ventures. Only those with captive, own factory markets stood a chance of surviving. Apart from Hancock's Chunies Asbestos, there was Cape Asbestos. However, times were tough

for even these ventures, and by 1932 the Managing Director of Egnep offered to forego his remuneration. By 1933 Cape's Malipsdrift mine was temporarily closed, except for treating small quantities of ore from the adjoining Parkers Kloof.

By 1935 conditions improved to such an extent that some operators reopened on a small scale, whilst others tried to dispose of their properties to the larger outfits. Cape resumed normal operations at Malipsdrift, subject to review depending on sustained recovery in the marketplace. Seligs also resumed operations, asking Cape for permission to mine right up to their common boundary.

Cape entered into negotiations with Pietersburg Asbestos Ltd to acquire their Beatrice mine, but the transaction fell through by mid 1937. By March 1938 Cape was operating the Penge, Malipsdrift and Kromellenboog mines. However, by June 1938 Malips was scaled down again. These many changes illustrate the uncertainties that surrounded the amosite market prior to WW II.

By 1940 Transvaal Asbestos Limited, under Lt Col Donaldson, controlled most of what was known as the 'Central Block'. This included the Selig property on Lot 119, and the 75 claims on the farm Pylkop. They also held rights over the areas Mashupaloni Blocks A & B.

During 1941 Haskell offered Cape his 2000 claims on the farm Dublin, but Cape did not take up the offer. By 1942 the market for amosite was benefiting from the demand for war materials, and Cape concluded large bulk orders with the United States Government. During 1942 Cape also brought Weltevreden mine near Penge into production.

A commission was appointed to look into the problem of asbestosis. One of the employees at Penge, Mr De Klerck, was suffering from this condition. With growing awareness of the significance of mine dust generally, this was to become a recurring theme in the asbestos industry.

As most of the deposits were now known and largely evaluated, the opportunistic trading in rights in the local and overseas markets came to an end. Henceforth those wanting to dispose of their properties could only offer to the more prominent players like Cape, Transvaal Asbestos and T&N.

SWEET ARE THE USES OF—ASBESTOS

During the hearing of a case concerning asbestos in the Johannesburg Magistrate's Court the magistrate (Mr. Van Renen), holding up a piece of asbestos and pulling out its threads, asked what the material was used for.

"Is it for stuffing mattresses?" he said.

"No, your worship," replied Mr. Curlewis (Messrs. Kent and Curlewis), "it is principally employed for promoting companies."

Even the legal profession benefited from asbestos mining

T&N increased their interests in the area over time, and by mid 1949 one of their subsidiaries, Dublin Consolidated Asbestos (DCA), obtained permission from Cape to erect a mill on Cape's property at Malipsdrift. This mill was known as Kempville.

T&N acquired most of the larger operations in the area, and by 1971 they controlled the following properties:

- The Dublin mine on the farm Dublin KT86. During 1940 Mr Haskell held some 211 claims over this farm. This operation also had a milling plant.
- The Dalton mine on the farm Cork KT64 and Dalton KT87.
- Beatrice mine on Lots 123 to 126 and 263.
- Kromdraai on Lot KS286.
- Cowan's Claims on Lot 123, previously also worked by Cape.
- Rabieskloof on Lot 245.
- Uitkyk (Laagersdraai) on Lot 246.
- Tubex Mine on Lot 300.
- The Selig mine on Lot 119.

Associated Asbestos, T&N's Rhodesian Company, now held the rights over the Montana block on Lots 124 & 127. These properties were originally operated for T&N

by another T&N subsidiary, Dominion Blue Asbestos, which also operated in the Kuruman area. Associated also held rights over Lot 246.

However, most of these properties were worked by contractors whilst the ore was milled at DCA's mills at Kempville, Voorspoed, Cork and Seligs (Lot 119).

JMA Le Cordieur was the contractor at the Beatrice East and Central mines, whilst Mr van Wyk of Voorspoed Asbestos worked Kromdraai, Cowan's Claims, Rabieskloof, Uitkyk (Laagersdraai), Tubex, Dalton, Dublin and Selig mines. Dublin also operated a blending plant in Pietersburg.

From 1960 onwards stricter regulations regarding dust control were in force in an effort to improve working conditions on all asbestos mines in South Africa. The Pretoria Inspectorate's progress report for the period July to December 1966 shows that pressure was kept up on operators in the Pietersburg field to improve dust standards and that in two instances where there was insufficient progress, recommendations were made that the owners and/or tributors be brought before the Special Mining Court. The relevant Inspector noted that, whilst approaching one of the sites, it appeared from a distance as if the mill was on fire!

The report listed the following operations in the area under its jurisdiction:

- Cape Asbestos
- Penge Mine, here a new plant, the S33 section, had recently been commissioned.
- Malipsdrift Milling operation, where a similar plant was commissioned
- Voorspoed Mine, Lagersdraai Section.
- Union Minerals (closed during the year).
- Eerstegeluk Asbestos Mine (now Hooggenoeg Asbestos Mine), where the owner/manager was to be prosecuted.
- Island Blue Asbestos Mine, restarted without permission, owner/manager to be prosecuted in the Special Mining Court.
- Tubex Asbestos Mill, where the tributor was treating a tailings dump.
- Dublin Consolidated Asbestos, operating a blending plant in Pietersburg.
- Metal and General Blending Mill in Pietersburg.

The January to June 1966 report shows that DCA was still working the Beatrice mine, that SA Kirton's asbestos mills in Bewaarskloof were still operating, that Ruighoek Chrome's 'M' section (asbestos) was still working and that Senekal Mines operated a section, but that Chrome Corporation of SA had taken over management of this operation.

All of these must have closed by the middle of 1966 as they do not appear in the next report as still operational. This report does, however, state clearly that only the Penge and Malipsdrift mills were of modern design, and that all the others were quoting shortage of funds as the reason why they could not modernise their plants. It was clear that smaller outfits stood no chance of surviving.

During 1968 Cape discontinued all their mining and milling activities in the Malipsdrift area. By 1971 the only operators were Voorspoed Asbestos, working on part of Lot 246, SA Kirton working the old Consolidated mine on Lots 120 & 121, De Beer's Mine (Tubex) on Lot 310 worked by Mr P S van Eeden, and Asbescor, of Commonwealth and Overseas Asbestos Corporation, working on Lot 295 and Gemini 62KT.

During 1972 a further number of mining sites in the Pietersburg fields closed. The Pretoria Inspectorate's report for the period ended September 1972 list these as:

- Cork Mines
- Devil's Peak
- Laagersdraai (Portion worked by SA Kirton)
- Tubex (Portion worked by SA Kirton)
- Baboons
- Kranskloof
- Holkloof
- Pylkop

The remaining milling plants however continued to operate, treating ore from existing sites. These plants were at:

- Kempville (T&N)
- Selig (T&N)
- Voorspoed
- Asbescor
- Anglo-Dutch Antophyllite on the farm Bridgewater No 263

In the south, Penge mine, Kromellenboog and Weltevreden were all still operating in 1972. Weltevreden mine was closed during 1973. Kromellenboog mine was closed during 1975. In the Pietersburg fields the Beatrice sections were closed during 1976. By 1978 only one milling plant, Seligs, was operating in the Pietersburg fields. The contractors were Messrs D & W P Elwers, working Lots 119, 120 and 121 and Lot 120 Haenertsburg. The only other operator was Mr J J van Schalkwyk, working the PS van Eeden property on the farm Hooggenoeg 293KS.



Rehabilitation team members approached abandoned sites in the Pietersburg fields along overgrown deserted tracks



Team arriving at an abandoned site

Only the Penge mine survived in the south, still enjoying firm demand for its product, mainly from Japan. During 1978 Cape disposed of its South African asbestos

interests to Transvaal Consolidated Land (Rand Mines). This included the Penge mine.

During 1981 Gefco, via Gencor, took over the Penge mine. By this time there were no other amosite or Transvaal Blue mines operating in these areas. Penge mine continued to operate until June 1992, when its Japanese customers announced the phasing out of amosite, which signalled the end of amosite mining.

The Penge mine was rehabilitated in accordance with ruling environmental legislation and a closure certificate obtained during 1995. The property (farm and housing infrastructure) was sold to the Lebowa Government.

After Penge was taken over by Gencor/Gefco at the end of 1981, the Mines Inspectorate embarked on a countrywide program to catalogue old and abandoned mine sites with a view of rehabilitating them. The Ecological Department of Potchefstroom assisted in this program, and many sites were rehabilitated during the period up to 1990.



Penge mill, showing extensive modern dust-control facilities



A new school building has been donated to the authorities in the area on ground free from asbestos dust.

Open-air classes were preferred during the hot summer months

The old school building at Kromellenboog was built next to the tailings dump and considered unsafe for staff and pupils. Gefco donated a new building away from this site on ground free from asbestos. During summer time it was, however, much cooler to hold classes under a nearby tree.

CHRYBOTILE

Marketing

Marketing of this white type of fibre was much easier than was the case with blue and amosite, due to the fact that Canadian and, later, Russian chrysotile had already been widely in use since 1870.

The viability of any prospect, and in particular a South African deposit, was mainly determined in relation to its size, the fibre length, local infrastructure and, then, landed cost at the consuming factories.

Because mines are where you find them, nearby infrastructure is generally non-existent. In earlier years this was normally the case. To get the product to the nearest railway line usually implied long haulage distances. The usual mode of transport was by animal-drawn wagons. As mines were developed, infrastructure was provided by the State, failing which, by the mining companies themselves.

Factories wanted to be assured of regular supplies of a consistent quality and therefore they would only contract with more sizeable outfits. Mines being part of larger groups, preferably with their own factories, like the T&N and Cape Groups, stood the best chance of survival.

Discovery of deposits

Chrysotile is mostly found in Mpumalanga province, in the districts of Barberton, Carolina and Belfast. There are, however, smaller occurrences in Gauteng province near Krugersdorp, in the old Western Transvaal near Zeerust, near Messina in Limpopo province, and in KwaZulu-Natal near Dundee, Lusikisiki and Nkandla.

A fairly large deposit has also been located in Northern Swaziland at Bulembu (Havelock). Large deposits are also present in Zimbabwe.

SOUTH AFRICAN DEPOSITS

Barberton and Carolina area

History has it that two gentlemen, Messrs G A Troye and A von Dessauer, whilst traversing the Barberton district, were camped for lunch in the De Kaap valley during 1902 when they observed, on the farm Joubertsdal No. 299, the characteristic appearance of chrysotile asbestos, countless parallel seams in the rock formations (see the photograph below).

The owners of the property happened to be Sallies (S A Lands). The two gentlemen suggested that Sallies follow up on this exciting information, but they refrained, as, at the time, they were presumably in the process of trying to float another proposition on the London Stock Exchange and feared that this new information might jeopardise their current efforts.

For at least 12 years nothing was done in this area, until 1916 when intensive prospecting work was carried out and the extent of the occurrences determined. By 1922 a company, Amianthus Mines, obtained rights over a portion of Joubertsdal and started mining. Other smaller ventures were also started, some on portions of the same farm, others in close proximity. The Amianthus outfit boasted the largest deposit.

Turner & Newall (T&N), the British company already extensively involved in chrysotile mining in the then Rhodesia, were keen to acquire deposits of substance in the Southern African fields. After having inspected the potential of the area around Kaapsche Hoop, they bought out the Amianthus Mine as well as some smaller adjoining properties.

They renamed their combined operations The New Amianthus Mines, appointed Mr H N Fuller from the ERPM Gold Mine as manager, and started to exploit the deposits along modern production lines.

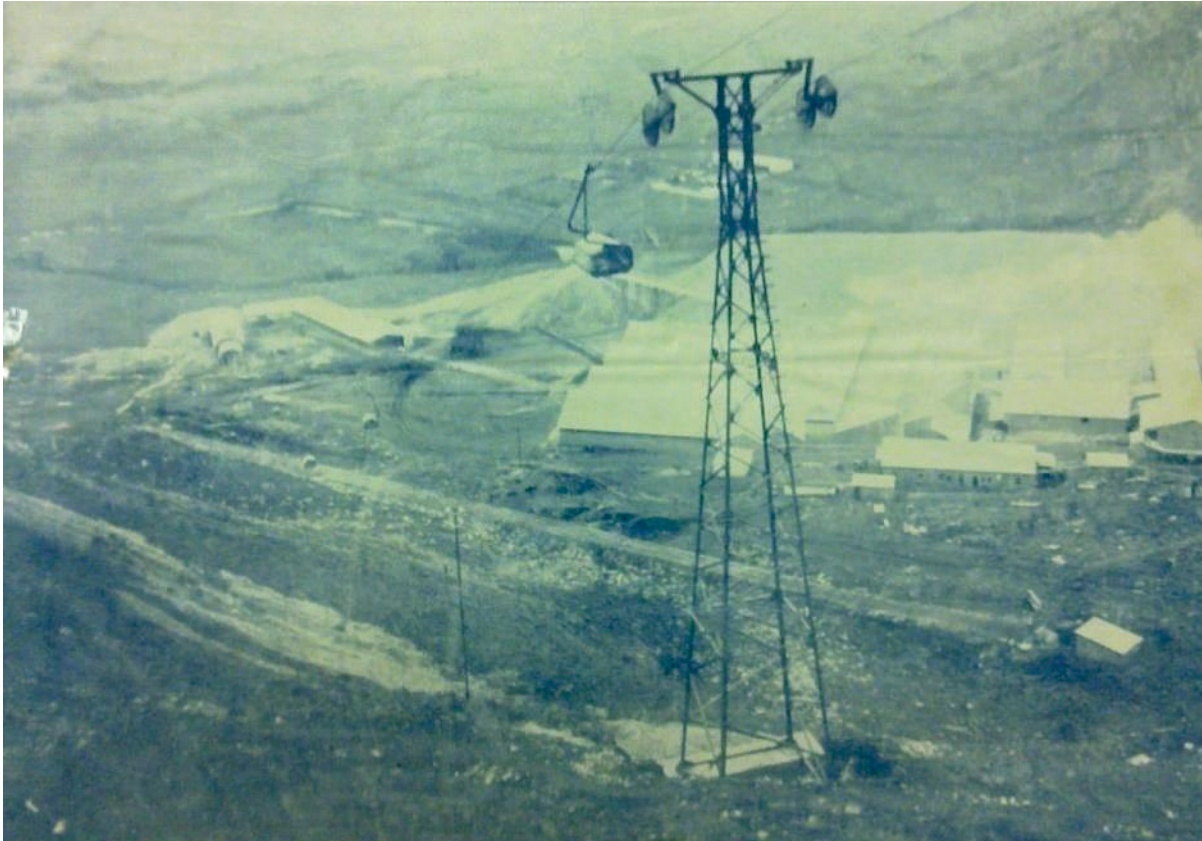


Chrysotile ribbon fibre, New Amianthus Mine, Kaapsche Hoop, near Nelspruit in Mpumalanga

(Photo: Dr. Hall)

One of the drawbacks of this location was the 27 mile (43 km) journey by sometimes impassable roads to the nearest railway station at Godwan River on the Pretoria–Delagoa Bay line.

During 1929 T&N awarded a contract to a South African engineering firm, Dowson & Dobson, to erect an aerial ropeway over the mountains, thereby cutting the distance to seven miles (11 km). Aerial ropeways were not novel to the area at the time. Near Barberton the pylons of a ropeway installed and operated by the legendary French Bob of gold mining fame in that area were still standing.



Aerial ropeway from New Amianthus Mine, Kaapsche Hoop, to Godwan River Station. This facility shortened the 27 mile road link to only six miles

Some independent operations were also started prior to and during this time. Munnik-Myburgh Asbestos (K.H.) Ltd, listed on the Johannesburg Stock Exchange, also obtained rights on a portion of the same Joubertsdal farm.

The *South African Mining and Engineering Journal* (SAM&EJ) of 13/10/1929 reported on the 4th Annual General Meeting of Amianthus Mine, held on 3/10/1928. The meeting was informed that profits were increasing. The *Rand Daily Mail* of 26/09/1929 reported on their first dividend and additions being made to their plant.

However, the depression that set in during 1930 caused all operations to be suspended. Virtually all contracts of this firm were with Australian buyers and the adverse movement in the exchange rate rendered all trade non-payable. However,

SAM&EJ of 9/02/1935 reported that the mine was back in production and that all was going well.

Other operators in the area included the following:

- Joubertsdal Asbestos Co. under Mr G.S. Persse of Johannesburg
- Greenstone Asbestos Syndicate on the farm Dolton No. 261
- Hancocks Asbestos Co. on the farm Koodoo No. 332
- De Kaap Valley Asbestos Co. (Pty) Ltd on a site 22 miles north of Barberton, nine miles east of the New Amianthus and Munnik-Myburg mines and 16 miles from Nelspruit
- Kaapsche Hoop Asbestos (Prop) Ltd under Mr F Bennetts on the farm Berlin (their other property, on Joubertsdal, was taken over by New Amianthus Mines)
- PODS Consolidated on Government Ground near Barberton under Mr A De Klerk
- Sebato Mineral Exploration (Prop) Ltd on the farm Diepgezet No. 37 and others, in the Barberton area
- Southern Amianthus Development Co. on the farms Uitkyk No. 446 and 165 and Sunnyside (all Government land) next to Joubertsdal

The directors of Southern included such eminent names at the time as Lt Col. Cresswell Clark, George Hay MLA and Samuel Morel, who was also Chairman. In an effort to attract investment in the venture, they displayed samples of fibre as far afield as in the office windows of Henderson & Co. and the Savoy Hotel in Kimberley. As usual, the promise of instant riches was also present.

The Star of 8 February 1929 reported on a court case where 'a 10-fold rise in the value of any investment in this venture within 2 months' did not materialise and was the subject of the dispute.

In the Carolina district deposits were identified as early as 1904 on the farms Diepgezet No.33, Rietfontein No. 70, Goedverwacht No. 32, Victoriaspoort and Silverkop No. 31.

The first mining activities in this area date back to 1904. Prospecting by Anglo-Swiss began on Rietfontein during 1905. No development was, however, undertaken. At about the same time the deposits on Diepgezet were opened up and worked through to about 1909. Records show that about 281 tons of fibre was produced from this property during 1908. During 1906 the Carolina fields were evaluated, but the results were not published. The Transvaal Asbestos Syndicate and the Carolina Asbestos Company were mostly involved here in the early stages.

During 1909 some of these properties were offered to Cape by Consolidated Goldfields. Cape sent Rundle Olds of Koegas fame out to inspect the farms. Olds was not convinced of the viability of these occurrences and advised against Cape's involvement. Another (unnamed) firm took over the properties during 1913 and worked until the outbreak of the Great War in 1914.

During 1914 The Andes Prospecting syndicate acquired the interests of the previous owners over Rietfontein, but later transferred to Goedverwacht, where a steady

output of good quality fibre was maintained for about 18 months. Production started in late 1915 and by August 1917 some 200 tons of good quality fibre was extracted.

Other locations within the Carolina district included

Kalkkloof No. 250
Sterkspruit No. 239
Stolzberg
Doyershoek No 145

The deposits on Kalkkloof were discovered as early as 1904, but not worked immediately. Following a very positive report by the well-known mining engineer Mr W F H Dudgeon during 1928, the then owners, Kloof Asbestos, disposed of their rights to a new company, African Asbestos Trust (AAT), formed to exploit the property.

AAT applied for a listing on the London Stock Exchange during 1928. The directors were James Nielsen, Share & Stockbroker of Johannesburg, who was also involved in the vendor company; James Chapman, chairman & managing director of Fraser & Chalmers (SA); C E Hertog, solicitor, of Kimberley; and H J Owen-Bowen, solicitor, of Johannesburg.

The purchase price of £350 000 was a significant amount at the time. Like in so many instances, the Great Depression also seemed to have caught up with this venture. SAM&EJ of 23 September 1933 reported that AAT was applying for voluntary liquidation, the reason quoted being the untimely death of a would-be financier. However, the mine came back into production and continued to operate until 1976, albeit not always at full capacity.

Sterkspruit was first mined by Union Minerals Exploration Syndicate Ltd, under Mr G A E Becker, but by 1929 this firm was in liquidation. Thereafter a company, Fibratus (Prop.) Ltd of Pretoria, under Sir J v. Boeschoten, held the rights. By 1962 Gefco, at the instance of Federale Mynbou, acquired the rights from Mr Blomkamp. Gefco then operated the mine until it was closed in 1971. For a short period following, the Therons, an ex-Rhodesian asbestos mining family, tried to make a go of it, but without success.

The deposit on Stolzberg was discovered by 1930, but not developed. It was later worked by a French company, Pont-a-Mousson, until it closed in about 1961. Although both Gencor and Eternit subsequently did geological evaluations of its potential, neither followed through.

Doyershoek is nearer Carolina. S A Townships Mining & Finance held rights over this property, as well as over Groenvallei No. 204 and Bellevue No. 82 in the Barberton district. They published progress reports from time to time. Doyershoek opened up but did not last for long.

The Msauli Mine

According to SAM&EJ of 19 April 1930, The Steynsdorp Asbestos Company, registered during 1930 with Mr F Hedley Tarlton as Chairman, held rights over

Diepgezet No. 388, Kranskop and Nooitgezien, but they only worked another proposition in the Steynsdorp valley for a short while. By 1933 this company seems to have given up.

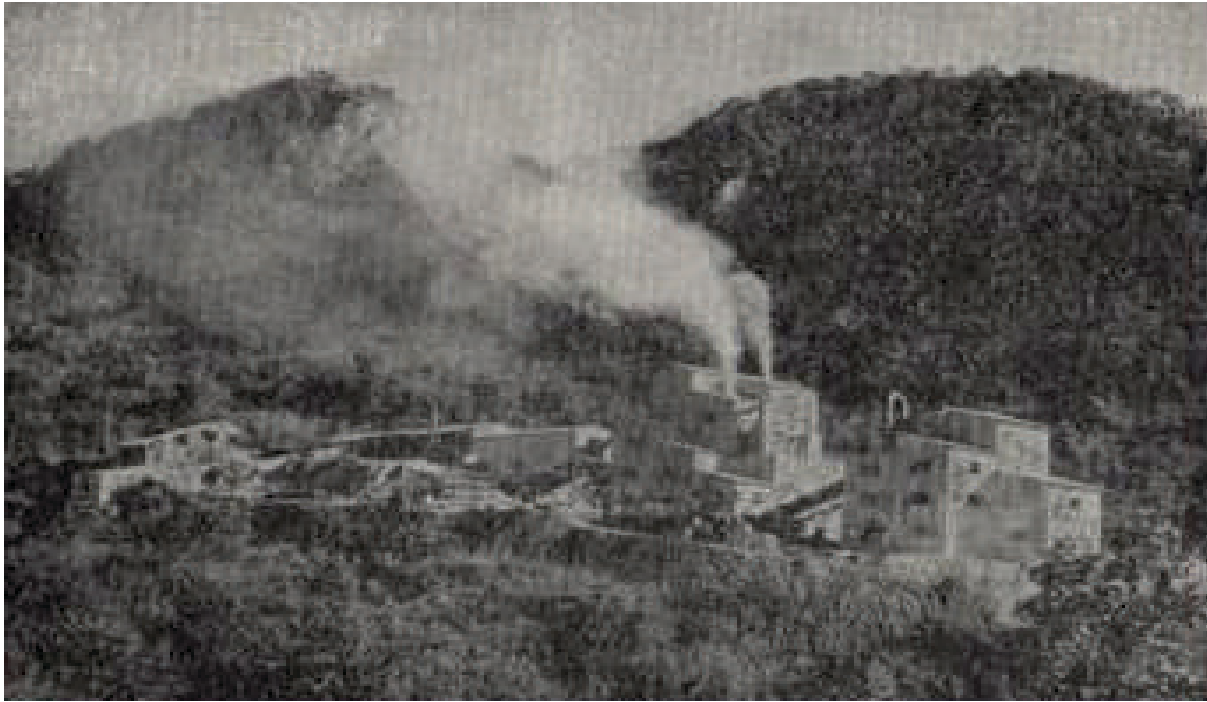
Following the above abortive effort, Mr H F Cronje and Mr C J Yssel registered about 125 claims over the farm Diepgezet and started the Diepgezet Asbesmaatskappy (Edms) Bpk. During 1942 they dispatched the first 148 tons of fibre to Breyten station. During 1943 they exchanged certain assets for a share in a newly-formed company, African Chrysotile Asbestos Limited (or ACA). This company also acquired some adjoining claims and developed another mine on it. By 1951 control over ACA passed to a new company, Msauli Asbestos Mining and Exploration Co. Ltd, which was listed on the Johannesburg Stock Exchange.



Waterwheel driving the first mill at Msauli

Mr Jimmy Ferreira was chairman of this company. They entered into a tributing agreement with Diepgezet Asbes and worked both properties through to 1962, when Federale Mynbou Beperk acquired an interest in the holding company, the name then being shortened to Msauli Asbes Beperk. By 1963 Federale took over the management of the mine and, following the merger of Federale and Gencor during 1965, Gencor were appointed managers.

Since about 1960 the Mines Department had become very strict regarding dust management on mines, and the Msauli mine came under severe pressure to improve on its inefficient old milling facilities.



Typical asbestos mine in South Africa

Although not specified by the publisher of the photograph, this is believed to be the mill of African Chrysotile Asbestos Limited, at the Msauli mine. Putten's Asbestos acted as selling agent for a number of South African asbestos mines

During 1969 a new milling plant (11 storeys high) was commissioned. Having been designed by Canadian engineers, it was comparable to the best in the world. The same firm concurrently constructed a similar plant for the Russian Government in the Ural mountains.



Crane to erect Msauli's new 11 storey mill building on site



*Inauguration of the new mill at Msauli, 28th of August, 1969
From left to right: P F de Villiers (Project Engineer), Phil Wiser (General Engineering Co. Toronto), Dolf Schuman (General Manager, Coal and Base Minerals, Gencor), John Kula (General Engineering Co. Toronto), and Oscar Collett (Resident Engineer, Msauli)*



*Mr Sas de Wet (in white overcoat) explaining the operational features of the new mill with the aid of a scale model
From left to right: Mr W B Coetzer, Mr de Wet, Mr P F de Villiers, Dr Carel de Wet (Minister of Mines), Dr T F Muller, and Mr A W S Schumann*

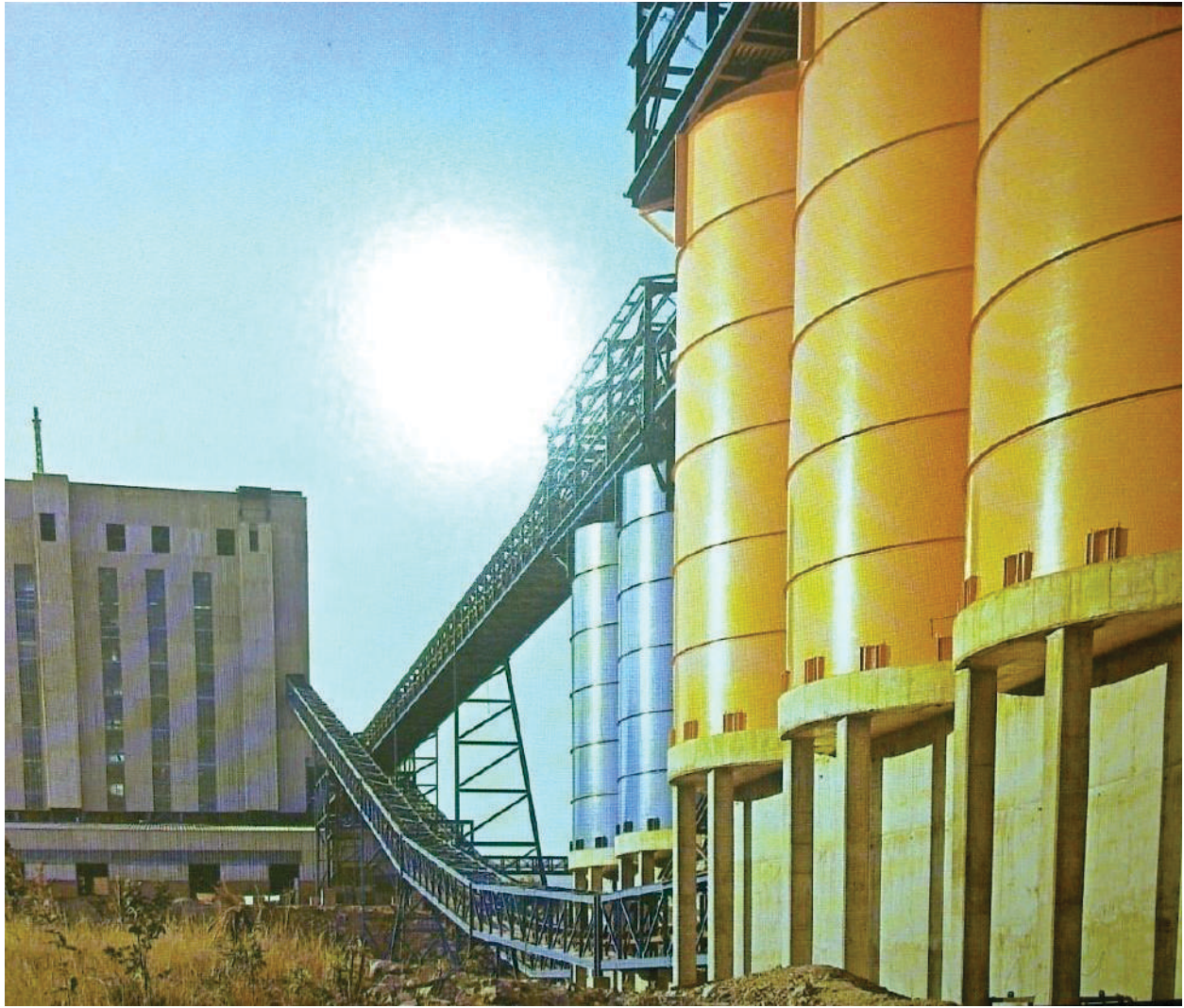


Dust cloud from major blast in the Anna open pit at Msauli, marking the inauguration of the new mill

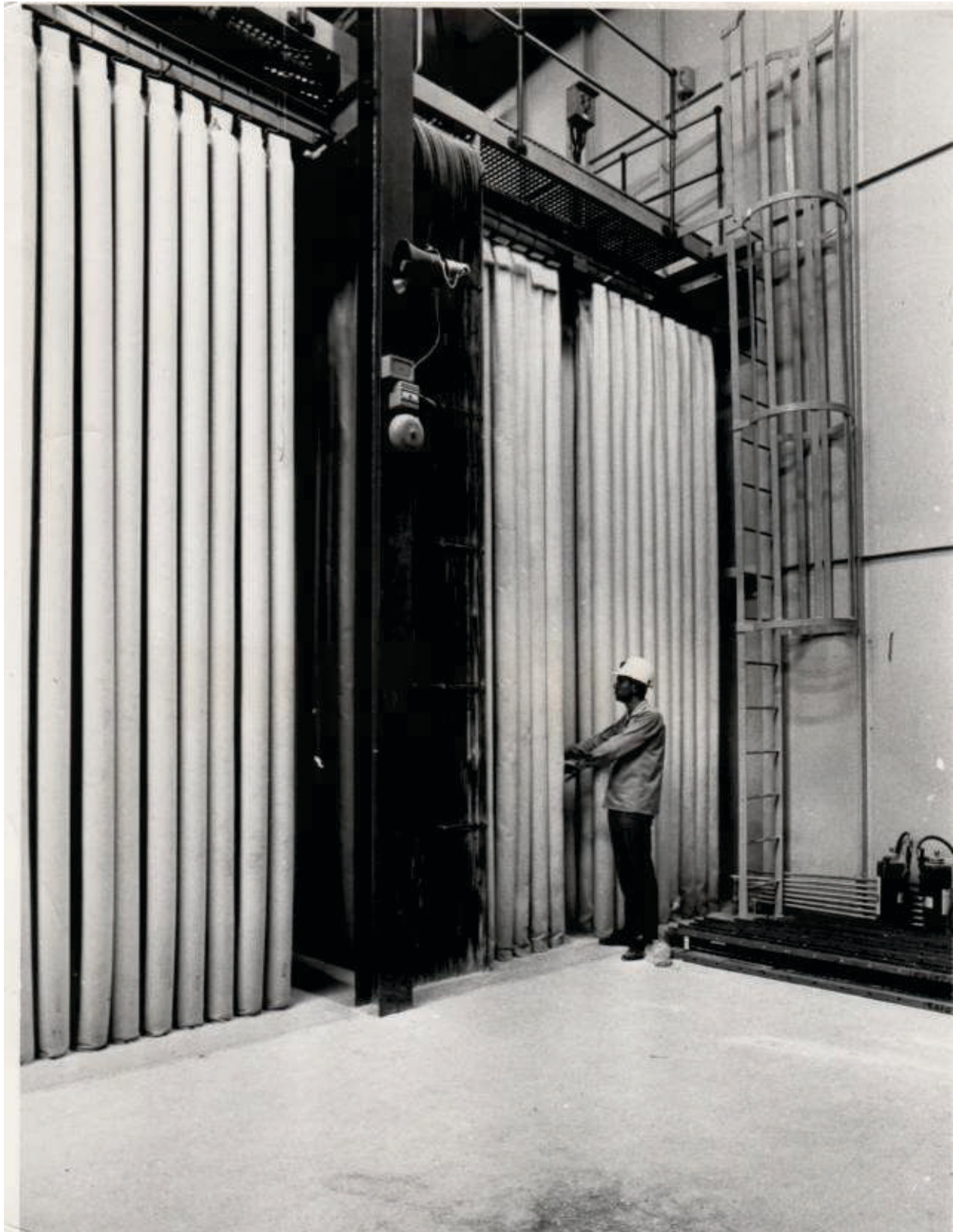


Anna Quarry at Msauli, named after Anna Hoehler, wife of Mr Chris Hoehler, a shareholder in African Chrysotile Asbestos

Dust control in this milling plant was of an exceptionally high standard. However, substantial improvements were still required outside of the plant environment, particularly as regards handling and dumping of tailings.



New 11-storey Msauli Mine plant (left), with ore conveyer belts and silos for dry and wet storage in the foreground



Dust filter bags inside the new Msauli mill

Until its closure in September 2001, the Msauli mine was by far the largest chrysotile operation in South Africa, with a 2000 strong workforce, at its peak producing more than 100 000 tons of fibre per year.

After closure the mining site was completely rehabilitated and it obtained a closure certificate in terms of the latest legal requirements. Of all the chrysotile mines mentioned, this was the only one to have achieved this milestone.



Covering and shaping the Msauli mine dump in accordance with rehabilitation requirements



Part of the same Msauli site, overgrown after a few years

Most of the smaller sites in the Barberton/Carolina fields either closed down or ownership changed from time to time. This was due largely to the Great Depression or otherwise tight market conditions. According to a report by the Witbank Inspectorate of 1966, only six sites were still being worked.

These included:

- The Msauli mine on the farm Diepgezet No. 388
- Kaapsche Hoop Asbestos on Joubertsdal (T&N)
- Congovaal (also known as the Duiker Mine)
- Kalkkloof No. 250 near Badplaas
- Sterkspruit No. 239 near Badplaas, owned by Gefco
- Marbestos, owned and operated by Marble Lime and Associated Industries Ltd
- Stella Mine, near Kaapsche Hoop Asbestos, previously worked by Star Asbestos (Mr Pratt), now owned by Anglo-Dutch Exploration
- Three Cats, near Malelane (later taken over by Senekal Mines Ltd)

Compared to the Msauli mine, these were rather small outfits.

The labour complement in the milling plants during 1974 were:

- Msauli 324
- Kaapsche Hoop 19
- Congovaal (stopped 1971)
- Kalkkloof 17 (stopped 1970, but restarted intermittently, but at low levels until 1976)
- Sterkspruit (stopped 1971)
- Marbestos (stopped 1974)
- Stella 14
- Three Cats (now Senekal Mines) (stopped 1977) 63



Senekal Mine dump, prior to being reshaped and covered ready for revegetation



Senekal Mine dump, after reshaping and revegetation

New legislation introduced during 1991 made it compulsory to obtain an operating permit for a milling plant. It was financially virtually impossible for smaller outfits to raise the money required to modernise old inefficient plants and, despite some brave efforts, mandatory letters to stop some of these plants were issued by the Department of Mines.

Due to the fact that some operations only involved retreatment of dumps, coupled with the fact that ore reserves at most sites were virtually depleted, eventual closure was inevitable.

An exception was the Kaapsche Hoop outfit, which had a fairly large, reasonably efficient mill built by T&N during better times. It also had a captive market in T&N's asbestos manufacturing plant in Zambia. However, it also had to fall back on retreating old dumps as underground ore became scarcer.

By 1980 only the Msauli mine was fully operational, with some dump retreatment ongoing at Kaapsche Hoop.

Belfast district

Prior to 1928, chrysotile was discovered on several farms in this district, mainly by three prospectors, Nikolaas Swanepoel, P P Joubert and F J Pieterse.

During September 1928 a company, Chrysotile Asbestos Co. Ltd, was founded by a Dr Thomas Visser, Mr Frank Widdicombe, solicitor, and Nikolaas Swanepoel, prospector, to exploit the deposits on portions of the farms Roodekrans and Elandskloof. These properties were approximately five miles from Dullstroom.

Positive reports on the properties were produced by Mr Mackay Ritchie. An experienced mining man, Mr S Kennedy, was appointed to take charge of operations. Messrs A.R.R Weedon and Thomas Greig later agreed to join the board, whilst Visser, Widdicombe and Swanepoel resigned. *The Middelburg Observer* of 16 November 1928 reported that difficulties were being experienced with the opening up of the reserves, 'due to a scarcity of native labour'.

To strengthen the board, Messrs Charles Dewar of Dewar and Bell, Mr W K Sutton of Mansfield and Sutton and Mr S Kennedy were nominated to join as directors. According to the SAM&EJ of 29 December 1928, Messrs Dewar and Sutton's appointments did not materialise as certain pre-conditions could not be satisfied. Activities soon ground to a halt, and according to a notice in the Government Gazette of 1 November 1929, the company was to be struck off the register.

Another company, Belfast Asbestos Co. Ltd, obtained rights over portions of the farms Vriscgewaagd No. 1452 and Elandsfontein No. 462, about 31 miles north of Belfast. These rights were acquired from prospectors Joubert and Pieterse. Mr Kunst, Mining Engineer, produced a positive report on these properties.

However, by notice in the Government Gazette of 31 January 1930, the company was to be struck off the register. Although a number of other firms started out in this area, none seem to have made it beyond the initial excitement stage. These included the Belfast Extension Asbestos Co. Ltd who acquired rights over a portion of Elandspruit No. 462, Lunsklip No. 1446 and Groenvlei No. 500, and Skilpad Diamonds Co. Ltd with rights over Morgenson No. 1445.

Standard Diamonds Co. also acquired rights over a portion of the farm Elandsfontein No. 624. The *Sunday Times* of 18 November 1928 reported on the gratitude of a shareholder of this company to the board for investing in this lucrative business, which should assist in recouping losses suffered with alluvial diamond mining. At the same time, he was recommending to other alluvial diamond companies to follow this example. There is no record of whether his belief in this investment decision was ever justified.

Lydenburg Area

Although there are reports of chrysotile occurrences in this district, very little was done in connection with development. Dr Hall refers to one such occurrence in the Kaspersnek area.

In the Pilgims Rest area, The Graskop Asbestos mine (Mr R Wham) on the farm Graskop No. 27 was listed by Dr Hall as a producing mine during 1929. It was however only a small mine.

The Standard Asbestos Co. started a mine on the farm Eton No. 510 (and others) in the Letaba district. This was near the amosite mines.

Messina Area

Some occurrences were reported in this area, but these were not exploited.

Krugersdorp

Discoveries on the farms Driefontein and Honingklip were made prior to 1930. Another deposit was identified on the nearby farm Rietfontein. Rights over these properties were held by Mr Kent, who offered them to T&N in 1928. T&N however eventually declined. Thereafter it was offered to Cape, but they also declined. The well-known Mr J S Hancock later mined some of the deposits and supplied his Newtown, Johannesburg, factory from here.

Western Transvaal

There is record of occurrences in the Zeerust area, on the farm Renosterfontein No. 50. This property was owned by The Zeerust Asbes (Pty) Ltd and the mine known as Klarstroom Mine.

KwaZulu-Natal

Chrysotile occurrences in this province are mainly found near Dundee, Lusikisiki and in the N'khandhla/Kranskop area. The most significant of these is where the Sitilo mine near Middeldrift was operational for some years. During 1913 and 1914 some 23 tons and 95 tons respectively were produced and shipped to the English market. However, it was found to be of inferior quality and could only be used for the manufacture of cement slate and for steam-lagging purposes.

Some tremolite deposits were also opened up, one by The Buffalo Asbestos Co. in the Klipriver Location and another by The African Asbestos Co. near Elandskraal. The fibre was not of good quality but some was used in a Dundee plant to produce stove bricks, Buffalo jointing for steam or acid joints, and boiler lagging.

These ventures did not survive for long. The only two companies remaining by 1930 were The Brightside Asbestos Syndicate (Mr S W Brewer) in the Reserve in the Alfred district, and Zululand Asbestos Syndicate (Mr J Pullar) operating at N'Khandhla.

APPENDIX

ASBESTOS: ALPHABETIC MINE/SITE LIST BY PROVINCE

Name of Mine	Nearest Town	Co-ordinates *	
		East	South
Province: Gauteng			
Geldenhuis hoop	Krugersdorp	27°31.9	26°05
Province: Limpopo			
Baboons	Pietersburg	30°03.0	24°08.8
Baviaanskop	Pietersburg	29°33.8	24°14.5
Beatrix	Pietersburg	29°51.0	24°09.0
Bewaarskloof Donkerhoek Berg Kloof	Pietersburg	29°41.5	24°10.5
Bewaarskloof Egnep	Pietersburg	29°48.0	24°09.8
Bewaarskloof Kempville	Pietersburg	29°46.8	24°10.5
Bewaarskloof Kloof 1	Pietersburg	29°41.0	24°10.5
Bewaarskloof Kloof 2 Consolidated	Pietersburg	29°48.0	24°09.0
Bewaarskloof Kloof 3	Pietersburg	29°48.0	24°09.8
Bewaarskloof Kranskloof	Pietersburg	29°43.5	24°09.8
Bewaarskloof M&S (Riverdump & mine)	Pietersburg	29°46.5	24°10.5
Bewaarskloof Dev.	Pietersburg	29°46.5	24°10.5
Bewaarskloof Pylkop	Pietersburg	29°46.0	24°09.8
Bewaarskloof Rooiwal	Pietersburg	29°44.5	24°10.8
Bewaarskloof Zeelig	Pietersburg	29°46.8	24°10.0
Cowans Claims	Pietersburg	29°51.2	24°10.0
Cork	Pietersburg	30°09.5	24°11.0
Dalton	Pietersburg	30°11.0	24°12.2
Dublin	Pietersburg	30°10.8	24°13.8
Faroux Dump	Pietersburg	29°27.0	24°50.0
Fertilis	Mafefe	30°06.0	27°07.05
Gemini	Pietersburg	30°07.0	24°10.0
Hartbeeshoek	Makapeng	-	-
Island Blue (Hooggenoeg (Waterval) (Island North)	Pietersburg	29°56.0	24°09.0
Island North Claims	Pietersburg	-	-
Japie-se-hoop	Pietersburg	30°04.5	24°10.8
Kromellenboog	Burgersfort	30°22.5	24°27.5
Lagersdraai/Piesangdraai	Pietersburg	29°47.2	24°11.5
Lucerne	Pietersburg	30°09.0	24°16.0
Mahlatsane	Pietersburg	30°03.5	24°10.8
Malipsdrift	Pietersburg	29°49.5	24°10.0
Masupaloni	Pietersburg	30°04.5	24°08.2

Name of Mine	Nearest Town	Co-ordinates*	
		East	South
Montana	Pietersburg	29°51.0	24°09.0
NTJ-Kompleks(16,25)	Pietersburg	30°04.0	24°10.0
Penge	Burgersfort	30°16.5	24°22.7
Rabes kloof	Pietersburg	29°49.0	24°11.2
Rondawelhoop (Diggings)	Pietersburg	30°08.8	24°11.3
Ruighoek 1	Pietersburg	30°07.0	24°10.0
Ruighoek 2	Pietersburg	29°38.0	24°10.8
Springbok	Pietersburg	30°04.0	24°13.6
Streatham	Burgersfort	30°16.5	24°22.7
Tommys kloof	Pietersburg	29°50.7	24°10.0
Tubex	Pietersburg	29°59.0	24°10.5
Voorspoed	Pietersburg	29°49.0	24°11.2
Weltevreden	Burgersfort	30°20.0	24°25.0
Province: Mpumalanga			
Badgat (Badplaas Mine, Sterkpruit)	Badplaas	30°43.0	25°56.0
Badplaas Asbestos Co./ Suikerboskop	Badplaas	30°25.0	26°00.0
Congovaal Corporation	Badplaas	30°24.0	26°03.0
Diepgezet	Badplaas	30°27.0	25°57.0
Doyershoek Asbestos Mines	Badplaas	30°47.0	25°54.0
Hall Mines	Nelspruit	30°49.1	25°03.1
Heynecke's Kaapschehoop	Nelspruit	30°50.0	25°30.0
Kalkkloof Asbestos (Pty)	Badplaas/Kalkkloof	30°31.0	25°53.0
Msauli	Barberton	30°05.0	26°00.0
Munnik Myburgh	Nelspruit	30°44.0	25°07.0
Phoenix Asbestos	Nelspruit	-	-
Senekal	Malelane	31°28.0	25°33.5
Stella Mining Complex	Nelspruit	30°31.0	25°32.0
Steynsdorp	Badplaas	31°00.0	26°15.0
Stolzburg Asbestos Co Ltd	Badplaas	30°45.5	25°54.0
Zilverkop Asbestos Co (Pty)	Carolina	30°27.0	26°00.0
Province: North West			
Arcadia (Galotolo)	Kuruman	23°12.5	27°15.0
Bute	Heuningvleipan	23°10.3	26°07.75
Cheddar	Pomfret	23°30.0	26°16.0
Coretsi East	Hotazel	23°05.5	27°12.0
Coretsi South	Hotazel	23°04.75	27°10.75
Coretsi West	Hotazel	23°04.5	27°11.3

Name of Mine	Nearest Town	Co-ordinates*	
		East	South
Gamopedi	Kuruman	23°21.8	27°23.3
Gasehubane	Gasehubane	23°27.7	27°27.8
Heuningvlei	Heuningvleipan	23°05.7	26°20.5
Lokaleng (Gamotsamai)	Ga-motsamai	23°10.1	27°21.3
Morotowanche	Moroto Wa Nche	23°11.0	27°16.0
Nweng	Kuruman	23°25.2	27°25.0
Orcadia	Kuruman	23°14.0	27°15.3
Penwith		-	-
Pomfret	Pomfret	23°31.7	25°49.6
Sardinia	Nweng	23°13.7	27°15.25
Whiterock	Kuruman	23°15.0	27°17.7
Zukudu	Kuruman	23°14.0	27°20.0
Province: Northern Cape			
Asbes Mine and Plant	Kuruman	23°19.0	27°27.75
Asbes South	Kuruman	23°20.0	27°28.75
Asbestos Reefs Mine	Prieska	-	-
Bestwell	Kathu	23°08.25	27°42.5
Blaauwputs	Near Koegas	-	-
Black Ridge	Griekwastad	22°36	28°51
Bosrandmyn	Kuruman	23°22	27°42.0
Botallack	Pomfret	23°15	25°55
Bretby Complex	Danielskuil	23°29.5	27°49.0
Buisvlei	Prieska	22°37.5	29°34.2
Carn Brae Mine 3	Prieska	22°82.1	29°86.5
Carrington	Kuruman	23°19.7	27°32.5
Corheim	Kuruman	23°20.0	27°31
Danielskuil Commonage	Danielskuil	23°35	28°15
Draghoender Station	Marydale	22°7.2	29°22.9
Droë Sloot	Kuruman	23°40	27°26
Duiker Exploration Ltd	Kuruman	23°16	27°24.0
Emmarentia & Garingkloof	Danielskuil	23°27.5	28°03.0
Engeland (Roويمyn)	Kuruman	23°08.75	27°15.75
Enkeldewilge	Prieska	22°41.5	29°30.6
Fransenhof/Kalklaagte	Prieska	22°28.75	29°36.8
Geduld(Middelwater)	Prieska	22°35.5	29°31.0
Geelbeksdam/Springputs	Prieska	22°16	29°26
Glen Allen	Prieska	22°34.0	29°38.0

Name of Mine	Nearest Town	Co-ordinates*	
		East	South
Greyling Complex	Danielskuil	23°28.5	27°54
Groenwater	Danielskuil	23°16.2	28°14.5
Hartland	Kuruman	23°20.5	27°29.5
Hurley	Danielskuil	23°32	27°47
Innes	Pomfret	23°30.7	25°48.0
Jebola	Kuruman	22°59.36	26°45.83
Kameelpoort 186		21°29.1	29°29.1
Keikamspoort	Prieska	22°47.5	29°50.5
Klein Naauwte Mine	Prieska/Hay	22°40	29°30
Klipfontein	Danielskuil	23°30.5	27°59.5
Klipfontein (Prieska)	Prieska	22°32	29°40
Klipvlei	Danielskuil	23°40	28°10
Koegas	Marydale	22°21.37	29°18.0
Kliphuis/Kransfontein	Prieska	22°45.5	29°33.0
Langley	Kuruman	23°22.25	27°35.8
Leelykstaat Mine	Hay	22°16	29°11
Mansfield	Kuruman	23°30.0	27°41.25
Merencor	Hotazel	23°05.75	27°13.0
Mimosa		23°18.2	28°30.0
Mt Vera	Kuruman	23°09.0	27°16.25
Naauwpoort (Prieska)	Prieska	-	-
Naauwpoort/Wonderwerk (Kuruman)	Danielskuil	23°33.6	27°54
Nauga (Geelbeksdam)	Prieska	22°21	29°26
Naugekneld	Prieska	22°40	29°34
Newstead	Kuruman	23°23.25	27°41
Noordhoek	Danielskuil	23°29.5	28°0.5
Orange View/Oranjezicht	Prieska	22°40	29°32
Oudeplaats	Barkley West	-	-
Ouplaas	Danielskuil	23°27.42	28°13.5
Owendale	Owendale	23°26.2	28°16.0
Penwith	Kuruman		
Prieska town Erwe/Stands)	Prieska	22°67.0	29°67.9
Prieska town (Mill site)	Prieska	22°67.0	29°67.9
Riries	Kuruman	23°10.5	27°19.6
Rooiberg	Prieska	22°57	29°54
Salamander	Kuruman	23°18	27°50
Stilverlaat		-	-

Name of Mine	Nearest Town	Co-ordinates*	
		East	South
Stofbakkies/Prieska	Prieska	22°44.5	29°38.0
Strelley	Kuruman	23°23.25	27°38.8
Warrendale(Dassiekloof)	Danielskuil	23°27.0	28°19
Westerberg (Part of Koegas)	Koegas	22°34.2	29°31.7
Whitebank	Kuruman	23°17.75	27°25.75
Winstead(Hillstead)	Kuruman	23°23.25	27°41.9

*If available

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