

Federal Republic of Nigeria
Annual report of mines div. minl
mines & power 1964

NLN



50

FOREWORD

The report of the Chief Inspector of Mines for the year 1963/64 tells the story of progress, of development and of hope. Progress is reflected not only in the increase in export earnings from minerals but in the steady increase in production of tin and the modest recovery of the Columbite market. What the masses of statistics and factual statements comprising the report do not contain is the silent revolution which the mining industry is undergoing. The larger Mining Companies have opened the door for share participation to Nigerian citizens; and the training of Nigerians for the senior executive appointments in the industry has begun and is advancing. This is the reason why I hope that this report will reach every section of our community and be read with considerable interest.

The new feature of this report is the brief account given by each Inspectorate and the Mines School of their respective activities during the year. I have no doubt that this feature will develop as the years roll in and provide added attraction in the report of the Mines Division.

I wish to take this opportunity to express my appreciation to the Chief Inspector of Mines and his staff for their valuable work in ensuring that Nigeria's mineral resources are exploited in the most efficient and safe manner.

8th March, 1965.

YUSUFF MAITAMA SULE,
Minister of Mines and Power

OD
LTSIS
A28
M66.035
1963-64

ANNUAL REPORT OF THE MINES DIVISION OF THE MINISTRY OF
MINES AND POWER FOR THE YEAR ENDED MARCH 31ST, 1964

The Honourable,
The Minister of Mines and Power,
Lagos.

Sir,

I have the honour to submit my report on the Mining Industry in Nigeria during the year 1st April, 1963 to 31st March, 1964.

II.—OPERATORS

There was a total of 120 operators holding titles or licences under the Minerals Ordinance and engaged in mining and prospecting at the close of the financial year made up of :—

- 15 - Public Limited Liability Companies incorporated in the United Kingdom.
- 2 - Public Limited Liability Companies incorporated in Nigeria.
- 54 - Private Limited Liability Companies incorporated in Nigeria.
- 14 - Firms operating under Registered Business Names, and
- 35 - Private Operators.

Of the Private Limited Liability Companies incorporated in Nigeria,

- 11 - are Nigerian owned; 2 - are French owned;
- 2 - are Lebanese owned; 1 - is American owned;
- 34 - are British owned; 1 - is Portugese owned;
- 2 - are Greek owned; 1 - is Nigerian/Italian owned.

All the 14 firms operating under Registered Business Names are Nigerian owned.

Of the private mine owners,

- 16 - are Nigerians; 16 - are British;
- 1 - is Lebanese; 1 - is Sierra Leonean;
- 1 - is French.

Details of operators' holdings are given in Appendices A-J.

III.—REVENUE

The revised estimate of revenue expected to be produced in the financial year 1963/64 from mining all minerals and including revenue allocated to Regions was published in the Federal Estimates for 1964/65 as follows :—

GENERAL REVENUES

	£
1. Mining Fees	4,200
2. Tallies for Tributaries	20
3. Penalties for Arrears of Rent	300
4. Prospecting Right Fees	1,100

MINERALS

5. Rents on Water Licences	2,450
6. Rents on Exclusive Prospecting Licences	2,300
7. Rents on Mining Rights	30
8. Rents on Mining Leases	45,000
9. Royalty on Tin Ore	1,200,000
10. Royalty on Gold	400
11. Royalty on Columbite	60,000
12. Royalty on Tantalite	5,000
13. Royalty on Wolfram	10
14. Royalty on Silver-Lead Ores	1,000
15. Royalty on Zinc Ores	50
16. Royalty on Thorium Ores	100
17. Royalty on Zircon Ores	2,500

IV.—VALUE OF EXPENDITURE

The mining industry also expends money for purposes in Nigeria other than that given above, part of which contributes directly or indirectly to the country's revenue. These purposes are :—

	£
Railway Freight	66,435
Value of Emoluments paid in Kind	204,356
Materials and fuel purchased in Nigeria	203,532
Electric power purchased	533,210
Wages paid to Africans prospecting and Winning minerals (other than coal)	2,785,876
Compensation paid on farmland	41,426
*Nigerian Taxation	367,384
Maintenance of Mining Villages and Compounds	90,032
Welfare, Hospital, Medical, Educational and Technical Training, etc.	49,916
Security	59,529
Maintenance of Machinery, Buildings, Roads, Bridges, Dams and Leats	830,630
Import and Export duties and Harbour Dues	13,754
Duty on Diesel Oil and Petrol	50,635
Vehicle Licences and Fees	29,642
Telephones, Telegrams and Postage	8,752
TOTAL	£5,335,109

* This item does not include taxation paid by employees.

V.—MINERALS

(1) EXPORT

The quantity and value of minerals, excluding mineral oil, exported for the financial year 1963-64 are shown in the table below :—

<i>Minerals</i>	<i>Export Financial Year 1962-63 Tons</i>	<i>Export Value Financial Year 1962-63 £</i>	<i>Export Financial Year 1963-64 Tons</i>	<i>Export Value Financial Year 1963-64 £</i>
*Cassiterite	6	4,018	4	2,697
*Tin Metal	7,896	6,825,519	10,205	9,746,902
*Columbite	2,195	1,021,493	1,848	844,311
Tantalite	13	37,871	21	50,661
*Lead	255	13,871	554	23,493
*Wolfram	—	—	—	—
*Gold	—	—	—	—
†Monazite	—	—	—	—
Thorite	—	—	1.3	—
Zircon	495	19,271	876	162
*Zinc	—	—	—	213,815
Coal	35,033	121,740	15,753	56,882

* Figures supplied by the Chief Statistician, Lagos.

† No export of monazite during the year but quantity produced during the year (12.1 tons) was added to stock.

(2) TIN

Throughout the period under review, our efforts were directed towards attaining pre-restriction production. The production this year showed an improvement of approximately 5% over the previous year's production and is within 1,000 tons of the 1956/57 figure of 12,722 tons. Recovery has been slow but it has come in a most reassuring manner.

This period was a rather important one for tin in that the imbalance between production and consumption developed and it was necessary to an increasing extent to redress the imbalance by a corresponding increase in tin releases from the United States strategic stockpile. The General Services Administration continued from about this time to sell increasing amounts of tin without any apparent effect on the market. The figure of tin releases from the United States stockpile rose from 580 tons in April 1963 to the peak figure of 4,195 tons in February, 1964. The average London Metal Exchange prices of tin for these months were approximately £881 and £1,109 respectively. It was felt in Government circles that the least that Nigeria could do in the circumstances was to appeal to the major producers of tin in Nigeria to take advantage of the favourable situation both as regards price and demand to expand production. It was obvious from the General Services Administration long-term disposal plan published towards the end of the period under review that the expected life of surplus tin from United States strategic stocks could not exceed 8 years and if the world shortage after this time is to be met from normal commercial sources the most auspicious time to plan for the substantial increase indicated would be the immediate present. The tin industry has known the vicissitude of excessive price changes and producing control but its real test is the challenge of increasing demand. Of all the tin producing countries, Nigeria has been one of the fortunate ones—fortunate to have a stable Government and to have conditions favourable to expansion of investments and mining development. It is hoped therefore that she will exploit these advantages to expand development.

Nigeria continued to be represented in the International Tin Council by Mr S. O. Soyode whose performance at the various meetings and committees of the Council deserves special mention and praise. Apart from the 14th Meeting of the Second Council which was attended by Mr P. N. Dusu Bot as Alternate Delegate and Mr C. G. Hawkins as adviser, all the meetings of the Council during this period were attended on behalf of Nigeria by Mr Soyode alone.

A summary of matters affecting Nigeria which were brought up at the meetings of the International Tin Council is given below.

The 10th meeting of the Second Council was held in London on 11th to 13th June, 1963, and continued with the review of releases from governmental stockpiles. It also revised the votes of the consuming countries in accordance with the provisions in the agreement.

The Eleventh meeting of the Second Council was held in London on the 8th-10th October, 1963. The Council was notified that disposal of tonnage of tin on offer from the Italian non-commercial stockpile would be completed by end of 1963 and that Government would thereafter proceed to the liquidation of the second portion (2,500 tons) of its stockpile. It is also noted that sales of tin from the non-commercial stockpile of the Canadian Government have been completed.

The Council also examined the current and possible long term effects of releases of tin from the United States stockpile and decided on consultations being held in Washington with the United States of America Government with a view to obtaining a firm understanding between the Council and the United States Government on plans for future stockpile disposals with a view to ensuring that manner of disposals will safeguard future development of the tin-mining industry in the interest of both consumers and producers. The Council in itself embarked on enquiries on future trends in the world tin position.

The 12th meeting of the Second Council was held from the 2nd to 4th December, 1963. It considered under Article VI of the International Tin Agreement whether the existing floor and ceiling prices were appropriate for attainment of the objectives of the Agreement and as a result revised the price range; the floor price from £790 to £850 per ton and the ceiling price from £965 to £1,000 a ton, with the lower and middle sectors advanced by £50.

The 13th meeting of the Second Council was held in London on 23rd and 24th January, 1964 and considered the current tin position and the disposals that were being made from the United States of America Stockpile. The Council at this meeting accepted an invitation from the State Department for consultations in Washington on 12th to 14th February.

The 14th Meeting of the Second Council was held in London from the 4th to 6th March, 1964 and redetermined, the percentages and votes of producing members of the Agreement operating for the year beginning 1st July, 1964, in accordance with the provisions in the Agreement. By this revision Nigeria's percentage increased from 6.141 to 6.383 and its vote increased from 65 to 67.

The Council agreed to request the Secretary-General of the United Nations to convene in Spring of 1965 a Conference to draw up a third International Tin Agreement to come into operation on the termination in 1966 of the present Second Agreement, and appointed a Committee to prepare material for consideration at that Conference.

The Council received a report of its delegation to Washington in February. A special Committee of the Council met with representatives of the United States Administration on 5th and 6th March, for further exchange of views on the short-term and long-term aspects of the United States disposals plan.

TIN SMELTING

Nigeria's entire production of Tin concentrates was refined by Messrs Makeri Tin Smelting Company Limited during the year under review. The second smelter, the Embel Tin Smelting Company Nigeria Limited, remained closed, throughout the period but the possibility of its being recommissioned continued to be explored. A total of 70 tons of tin concentrates was imported from the Niger Republic for Smelting in Nigeria.

The Managing Director of the parent Company of the Makeri Smelting Company Limited visited the country and held preliminary discussions with officials of the Smelter and the producers on the possibility of introducing a more realistic Smelting charge which would be embodied in future contracts for the smelting of tin in Nigeria.

The following table shows the provinces producing cassiterite with the output and labour employed :—

Province	Financial Year 1962-63			Financial Year 1963-64		
	Average Labour		Production Long tons Ore	Average Labour		Production Long tons Ore
	Non-African	African		Non-African	African	
Bauchi	20	7,927	1,176	19	8,100	1,379
Benue	7	727	137	9	935	159
Kabba	—	46	4	—	32	2
Kano	6	917	218	6	928	245
Niger	—	150	7	—	130	5
Ondo	1	46	—	1	48	8
Oyo	—	2	—	—	—	—
Plateau	195	30,347	9,272	189	31,448	9,597
Zaria	11	2,237	454	11	2,584	450
Totals	240	42,399*	11,275	235	44,205†	11,845

* Of whom 2,274 are tributers.

† Of whom 1,840 are tributers.

(3) COLUMBITE

The demand for columbite has not improved and the price has fallen still lower in the world market. Both these factors were responsible for the fall in production of this mineral as is shown in the table below. Enquiries are being made from Europe and Japan which could bring about an improvement in the sales and therefore production.

The output of columbite, and labour employed for the purposes are shown by Provinces below :—

Province	Financial Year 1962-63			Financial Year 1963-64		
	Average Labour		Production Long tons Ore	Average Labour		Production Long tons Ore
	Non-African	African		Non-African	African	
Bauchi	2	405	101	1	253	80
Benue	11	323	385	9	227	380
Kano	2	203	98	1	138	95
Ondo	—	—	—	—	1	1
Plateau	4	529	1,590	1	473	1,372
Zaria	—	37	11	1	26	13
Totals	19	1,497*	2,185	13	1,118†	1,941

* Of whom 18 are tributers.

† Of whom 11 are tributers.

(4) GENERAL REMARKS ABOUT TIN AND COLUMBITE

(a) *Minesfield Police* : The Minesfield Police Unit has been maintained under the direct control of a superior Nigerian Officer. An Inspector of Mines has been available for liaison duties with the unit and to advise it on technical aspects of their functions. In addition junior staff were posted to the unit on full time duties. Their duties included the identification of rock and mineral samples and assisting the Police Officers to determine lease boundaries and the location of beacons.

(b) *Mines Division Engineering Section* : This section is responsible for the work of Preliminary Investigation carried out from Ropp. It also controls the hire of equipment to members of the mining public. The equipments hired out include Banka drills, Jack Hammer with compressor, and dewatering pumps.

During the year, 12,416 feet of banka drilling was achieved, and 1,847 samples were assayed by the Preliminary Investigation Unit.

(c) *Companies Activities* : Some Companies have supplied the following information on activities which are of interest :—

Gold and Base Metal Mines of Nigeria Limited : Apart from routine prospecting and exploratory work at Delimi and Leruien-Kano Areas, a significant feature of the Company's activities is a programme of re-drilling of the Company's alluvial deposits in the Jemma Area and diamond drilling of the pegmatites which abound in this area. The highly silicified pegmatite caused extensive wear on the bits and reduced the life of the bit to not more than 4 ins. per bit : the project proved very expensive. Normal drilling on the existing properties revealed additional reserve of some 275 tons cassiterite to the proved reserve.

Ex-Lands Nigeria Limited : This company continued with efforts to mechanise its operations and in addition to the Monighan Dragline operating during the previous year the company acquired a reconditioned Lima 802 Dragline which went into operation during September 1963. A fleet of Euclid Dumpers and Caterpillar Bulldozers are now regular features of the type of mining equipment in use. This company has taken a good step forward not only in sponsoring candidates to the Mines Division Technical School but also has given employment to a good number of persons trained at the School.

Amalgamated Tin Mines of Nigeria Limited : The more important activities of the Company were in the direction of research into more efficient recovery methods by use of the Dual Jig Units, a unit comprising 8 cells of Pan American and 4 cells of Rouss Jigs and is mounted in four sections for ease of transportation. Further modernisation of the Company's earth-moving equipment was effected by the purchase of two Euclid S.18 Scrapers, a Scamell low loader of 35 ton capacity and three fuel tankers. There was an all-round improvement in the Labour relations and welfare of Company's employees.

Jantar Nigeria Company Limited : This Company's Headquarters was moved from Jos to Kuru 3. Generally there has been an increase in mining activity as a result of the acquisition of mining properties previously belonging to Minerals Research Syndicate Limited.

Nigerian Cement Company : The extensions of the works to a total annual capacity of 500,000 tons of Portland Cement were very nearly completed.

Plateau Development Company Limited : This Company was formed as a subsidiary of Messrs Consolidated Tin Smelters of London for the purpose, among other things, of marketing of galena acquired from the customary takings. It also assisted various operators in marketing of other minerals including tantalite.

(5) TANTALITE

This mineral is quite difficult to produce owing to its rare nature. Even the very favourable price which it enjoyed for most of the year did not result in an improvement in production. During the year, it became known that the final slags discarded in the process of tin smelting could be the source of quite substantial amounts of tantalite. Two shipments of slags made during the year each approximately 800 tons were found to contain 76 tons of tantalite.

The table below shows the output of tantalite and labour employed for the purpose :—

Province	Financial Year 1962-63			Financial Year 1963-64		
	Average Labour		Production Long Tons Ore	Average Labour		Production Long tons Ore
	Non-African	African		Non-African	African	
Benue	—	65	4.4	—	60	5.1
Kabba	—	57	1.3	—	50	1.6
Niger	—	16	4.7	—	7	2.4
Plateau	—	65	1.7	—	5	1.1
Zaria	—	1	5.2	—	2	5.6
Totals	—	204	17.3	—	124	15.9

(6) GOLD

The Iperindo Reef continued to be a main source of the scanty gold production from Nigeria. Production from this source was be-devilled by breakdowns of the stamp mill and dewatering pump and the rule of thumb upon which operations are based. Another producer in Oyo province has fared reasonably well during the year.

The table below shows the output and labour employed in mining gold :—

Province	Financial Year 1962-63			Financial Year 1963-64		
	Average Labour		Production Ozs. Troy	Average Labour		Production Ozs. Troy
	Non-African	African		Non-African	African	
Kabba	1	58	41.4	—	4	11.5
Niger	—	16	9.3	—	9	3.5
Oyo	1	90	359.7	1	74	294.0
Totals	2	164	410.4	1	87	309.0

(7) LEAD-ZINC

Though there was no production by mine operators during the year, customary takings continued at much the same level of production as in the previous year. The price trend showed substantial improvement and thus facilitated the quest for funds and preparations for re-opening the mines of the Nigerian Lead-Zinc Mining Company at Abakaliki.

(8) LIMESTONE

The production of Limestone increased from 736,066 in 1962-63 to 822,497 tons during the year under review with maximum production attained by the Nigerian Cement Company in Ogoja Province, Eastern Nigeria following the installation of the 4th Kiln and a new jaw crusher. Sales of cement however showed some periodic slackness due to shortage of railway waggons and occasionally also of locomotives.

The Cement Company of Northern Nigeria Limited continued with the preparation of a site for the erection of a cement factory and the construction of staff quarters made good progress. The foundation stone for the new factory was laid by the Honourable Premier, Sir Ahmadu Bello, the Sardauna of Sokoto, in December 1963.

The table below shows the output and labour employed in mining Limestone:—

Province	Financial Year 1962-63			Financial Year 1963-64		
	Average Labour		Production Long Tons	Average Labour		Production Long Tons
	Non-African	African		Non-African	African	
Abeokuta	1	64	284,665	2	74	299,815
Ogoja	2	187	451,401	2	183	522,682
Totals	3	251	736,066	4	257	822,497

(9) KAOLIN AND FELSPAR

Although various enquiries have been made for supply of Kaolin to certain Overseas countries, no actual exportation of this mineral has begun. Only 8 tons was produced to meet a local order as against 15 tons last year.

(10) CLAY

The production of clay by Denchukwu Limited at Bende was retarded and finally brought to a standstill owing to the substance having not proved a suitable substitute for bentonite in the production of drilling mud. Only 510 tons were produced as against 2,985 tons during 1962-63.

(11) MARBLE

Marble is being produced by a newly formed company. The first lorry load of marble from the mine at Jakura to the workshop in Apapa where it is cut and polished was moved in February 1964. The total amount of marble produced in the year was 40 tons.

(12) RADIO-ACTIVE MINERALS

Monazite : This mineral continues to be recovered as a by-product of tin mining. The production during the year shows some slight increase over the previous year.

The production of monazite and labour employed were as follows :—

Province	Financial Year 1962-63			Financial Year 1963-64		
	Average Labour		Production Long Tons Ore	Average Labour		Production Long Tons Ore
	Non-African	African		Non-African	African	
Plateau	—	14	8.8	—	15	12.1
Zaria	—	—	0.1*	—	—	—
Totals	—	14	8.9	—	15†	12.1

* Recovered from tailings. † Of whom 2 are tributers.

(13) ZIRCON

The year's production almost doubled that of the previous year but this was due to occasional demand for supply received by the major producer during the last quarter of the year.

The table below shows the output and labour employed in mining Zircon.

Province	Financial Year 1962-63			Financial Year 1963-64		
	Average Labour		Production Long Tons Ore	Average Labour		Production Long Tons Ore
	Non-African	African		Non-African	African	
Benue	—	—	415.2*	—	—	795.1
Plateau	—	—	—	—	—	109.3
Totals	—	—	415.2	—	—	904.4*

* Won as a by-product.

(14) MOLYBDENITE

No progress has been made in the production of this mineral owing to lack of finance and know-how. Officials of the Mines Division paid frequent visits to the mine site and offered advice on the installation and operation of the mill that had been set up.

Difficulty in obtaining necessary spare parts of machinery which have been ordered is causing some delay in exploitation.

(15) BARYTES

No progress was made in the production of barytes but renewed interests were shown.

(16) COAL

The production of Coal was 590,505 tons, a decrease of 34,483 tons on the previous year's output and this did not meet with the estimated sales of 690,000 tons.

The estimate of coal reserves for the year was revised and the quantity stood at 29.11 million tons allowing 10% loss in working instead of the original 29.91 million tons.

Mr T. H. G. Cotsworth arrived in Enugu in February 1964, as a consultant to the Coal Corporation to advise on the reserves of easily developed coal to meet demands and the proposed drilling programme shortly to be undertaken to prove the continuity of the existing mine workings.

Details of output and labour are as follows :—

	Financial Year 1962-63		Financial Year 1963-64	
	Average Labour	Production Tons	Average Labour	Production Tons
1st Quarter	3,366	143,146	3,401	143,484
2nd Quarter	3,406	162,606	3,358	147,065
3rd Quarter	3,494	161,425	3,376	143,935
4th Quarter	3,494	148,502	3,557	165,744
Totals		615,679		600,229

Nigerian Coal Mines Examination Board

The Board received in the month of August copies of the "Rules" concerning statutory examinations and "Information to Candidates" both of which were approved by the Honourable Minister, Ministry of Mines and Power. These documents should be read in conjunction with Safe Mining Regulations 111 and 112 amended in Legal Notice No. 128 of 1963 and published in the Federal Republic of Nigeria Gazette No. 79, Volume 50 of 3rd October, 1963.

Mr W. A. Vaughan, Chief Surveyor, Nigerian Coal Corporation was appointed a member of the Board by the Honourable Minister of Mines and Power. This appointment was recommended by the Board who felt that Mr Vaughan's knowledge and experience in surveying would help in dealing with matters arising in connection with Mine Surveyor's Examination.

The Second Mine Surveyor's Examination was held by the Board of Examiners on the 13th and 14th of November, 1963. Three candidates from the Nigerian Coal Corporation sat the examination for the second time and all failed in both written papers and it was not necessary to hold the practical test.

**VI.—METHODS OF MINING ALLUVIAL GROUND FOR TIN
AND ASSOCIATED MINERALS**

The yardage worked and the mining cost per cubic yard by the various methods of working are shown below :—

<i>Method of Mining</i>	<i>Horse Power</i>	<i>Cubic Yards</i>	<i>Percentage of total yardage</i>	<i>Cost in pence per cubic yard</i>
ELECTRO-MECHANICAL				
Draglines: Electric	3,554	6,827,516	22.13	25.22
Draglines: Diesel	303	55,714	0.18	26.29
All Draglines	3,857	6,883,230	22.31	25.23
Dredges	940	984,200	3.19	28.38
Gravel Pumps (Electric)	1,465,043	9,801,186	31.77	32.16
Gravel Pumps (Diesel)	1,240	953,601	3.09	28.91
All Gravel Pumps	1,466,283	10,754,787	34.86	31.87
Shovels (Electric)	200	103,100	0.34	5.76
Shovels (Diesel)	505	238,340	0.77	9.81
All Shovels	705	341,440	1.11	8.59
HYDRAULIC				
Monitors and Elevators	2,315	490,862	1.59	31.49
Ground Sluicing	418	1,578,528	5.12	20.08
Hydro-Turbine Gravel Pumps	28	43,560	0.14	3.00
All Hydraulic	2,761	2,112,950	6.85	22.38
DIRECT LABOUR				
Opencast Hand-Paddocks	3,698	9,011,434	29.21	27.82
*Underground Pillar & Stall	—	24,479	0.08	—
Tributing	142	736,357	2.39	30.72

* The cost in pence per cubic yard has been omitted because no accurate figure can be given, as the cost included remuneration of the labour depending on the quantity and quality of the mineral won.

The total yardage mined was 30,848,877 cubic yards. The average cost by mechanical methods was 25.97 pence per cubic yard as against 29.18 pence per cubic yard last year, a decrease of 11.00 per cent. The cost of hand-paddockng was 27.82 pence per cubic yard as against 28.51 pence per cubic yard last year, a decrease of 2.42 per cent.

The direct cost of some stripping only by mechanical means although included in the table shown above, is shown separately below :—

<i>Method</i>	<i>Horse Power</i>	<i>Cubic yards</i>	<i>Direct cost per Cubic yard</i>
Draglines	2,700	5,662,200	7.62
Euclid Loaders and Dumpers ...	5,800	1,557,100	18.99
Shovels (Electric)	200	103,100	5.76

The average recovery of cassiterite from the ground worked during the year was approximately 0.86 lbs. per cubic yard compared with 0.91 lbs. per cubic yard in 1962-63.

VII.—RESTORATION AND RECLAMATION

Government's policy regarding the restoration of mining land within congested areas continued to be enforced. Reclamation work continued in respect of disused excavations in old mines and in areas surrendered for the purpose in existing mining leases. This work is carried out by the Mines Reclamation Unit of the Northern Nigeria Ministry of Agriculture, and made good progress although difficulty has been experienced in finding sufficient land for reclamation. During the year about 270 acres of land was levelled of which 228.53 acres were ripped ready for planting. A total of 184,000 trees were planted in areas reclaimed during the previous year.

There were increasing numbers of operators who accepted restoration conditions on grant of mining leases in congested areas but did not care to fulfil these conditions. In order to keep this tendency in check the Honourable Minister of Mines and Power has set up a Mining Concessions Appeal Committee to consider cases of default brought before it and to recommend suitable action to the Minister. It is hoped that the worst offenders would be denied the privilege of new grants or renewals and that this would serve to ensure that restoration proceeds in all mining leases as provided in the covenants of their Title Deeds.

VIII.—PROSPECTING

A total of 113 Exclusive Prospecting Licences were extant on the 31st March, all being in the Northern Region. The area covered by these Exclusive Prospecting Licences was 75.0 square miles. Two Special Exclusive Prospecting Licences were extant, one being in the Northern Region and one in the Eastern Region. The area covered by these Special Exclusive Prospecting Licences was 73,050 square miles. Details of the geographical distribution and minerals for which they are held are shown in Appendix M.

The Prospecting Rights issued between 1st April, 1963 and 31st March, 1964 according to nationalities of the holders are as follows :—

Nigerian	...	...	...	...	...	...	67
British	...	...	...	...	...	...	43
German	...	...	...	...	...	...	1
Lebanese	...	...	...	...	...	...	1
Italian	...	...	...	...	...	...	1
Pakistani	...	...	...	...	...	...	1
Sierra Leonian	...	...	...	...	...	...	2
Cameronian	...	...	...	...	...	...	1
French	...	...	...	...	...	...	1
Ghanian	...	...	...	...	...	...	1

The average gross cost per foot of pitting and drilling alluvial ground for prospecting purposes calculated from figures supplied by operators was as follows :—

Method	1962-63		1963-64	
	Footage	Cost pence per foot	Footage	Cost pence per foot
Pitting	282,036	10.45	268,807	17.64
Drilling (Manual)	759,496	27.07	881,761	27.49
Drilling (Power)	9,614	30.70	20,138	34.20

IX.—LAND HELD UNDER MINING AND ANCILLARY TITLES

(a) *Mining Leases* — Mining Leases granted during 1963-64 are as follows :—

Northern Region	324
Western Region	1
Eastern Region	

On 31st March, 1964 there was a total number of 3,585 leases covering 262,912 acres held under mining lease titles in the Northern Region, 8 leases covering 2,565 acres in the Western Region and 4 comprising 13,616 acres in the Eastern Region, totalling for Nigeria 3,597 leases covering 279,093 acres.

This is an increase of 63 leases and 3,506 acres compared with the figures as at 31st March, 1963. There were 184 temporary titles granted for mining leases in the Northern Region, none in both the Western Region and the Eastern Region.

(b) *Mining Rights* : Two Mining Rights were in existence on 31st March, 1964 with a total yardage of 2,189 in the Northern Region.

(c) *Water Rights and Water Licences* : 12 Water Licences were granted in the Northern Region during 1963-64. The total number of Water Rights and Water Licences in existence on 31st March, 1964 was 393 all in the Northern Region. Geographical distribution of the above is shown in Appendices N-P.

X.—ORE RESERVES

Reports from operators show that the estimated reserves of Cassiterite and Columbite at 31st March, 1964, stand at :—

(a) Cassiterite—Proved	...	...	...	...	...	Tons
Indicated	...	...	...	...	...	111,960
	...	...	...	...	...	29,549
Total	...	...	...	...	...	141,509
(b) Columbite—Proved	...	...	...	...	...	26,982
Indicated	...	...	...	...	...	9,648
Total	...	...	...	...	...	36,630

XI.—HYDRO-ELECTRIC POWER

The Nigerian Electricity Supply Corporation Limited supplied the following information regarding electricity supplied during the period under review :—

<i>Hydro-Electric Station</i>	<i>Units Generated</i>
Jekko I	29,232,260
Jekko II	28,672,240
Kurra	39,465,480
Ankwil I	1,601,400
Ankwil II	3,750,800
Kwall	15,966,400
Sub-Total	118,688,580
<i>Thermal :</i>	
Bukuru (Diesel)	2,534,000
Total	121,222,580

Units sold to mines were 93,491,728 being 87.83 per cent of the total units sold. The average day load was between 15,000 and 18,000 kilowatts. The maximum generated on one day was 398,020 units. The latter represented an increase of approximately 2.62 per cent over the corresponding period last year.

Rain-fall : The rainfall figures given below were recorded by the Meteorological Department at Jos Airport and cannot be taken as representative of the Plateau generally :

<i>Month</i>	1962-63 <i>inches</i>	1963-64 <i>inches</i>
April	5.13	6.86
May	4.06	4.85
June	8.42	8.07
July	10.29	16.69
August	7.13	12.46
September	12.71	5.60
October	1.97	5.50
November	—	—
December	—	—
January	—	—
February	0.12	—
March	2.40	0.03
Total	52.23	60.06

The average yearly rainfall over a period of 50 years is 52.90 inches.

XII.—MINERAL DEALERS, GOLD DEALERS AND GOLDSMITHS

(a) *Mineral Dealers :* are licensed by the Chief Inspector of Mines under Section 68 of the Minerals Ordinance, Chapter 121 of the Laws of Nigeria. 31 licences were issued during the year made up as follows :—

- 12 for Cassiterite
- 3 for Columbite
- 11 for Cassiterite and Columbite
- 3 for Tailings
- 1 for Tantalite
- 1 for Zinc Ore.

(b) *Gold Dealers* : are licensed by the Chief Inspector of Mines under the Gold Trading Ordinance, Chapter 76 of the Laws of Nigeria. A total of 18 licences were granted, of which 17 were issued to Nigerian and 1 to Lebanese. The distribution of the licences as at 31st March, 1964 is shown in the table hereunder :—

Region	Province	Town	Licences
Eastern	Enugu	Enugu	1
Mid-Western	Warri	Sapele	1
Northern	Zaria	Zaria	1
	Plateau	Jos	1
	Kano	Kano	1
	Kaduna	Kaduna	1
	Capital territory	Ilorin	1
Western	Niger	Offa	1
	Ibadan	Minna	1
	Ijebu	Ibadan	2
	Ondo	Ijebu-Ode	1
	Ondo	Ondo	1
	Oyo	Okitipupa	1
		Ilesha	1
Federal	Federal Territory	Lagos	3
	Federal Territory	Ebute Metta	1

(c) Gold Mine Operators gave the following data on their returns :—

	Ounces
Gold brought forward from 31st March 1963	65.8
Gold won from April 1963 to March 1964	309.0
Gold sold to Gold Dealers	352.9†
Gold used by an operator	3.1
Gold carried forward to April 1964	18.8

† Includes 3 ounces declared sold by one operator but not completely accounted for. Investigation still in progress.

(d) Gold Dealers gave the following data :—

	Ounces
Gold brought forward from 31st March, 1963	107.6
Gold bought	487.4*
Gold sold to Goldsmiths	532.4
Gold carried forward to April 1964	62.6

* Includes 137.5 ounces of raw Gold imported from the United Kingdom.

XIII.—IMPORTATION OF CYANIDE

It is one of the duties of the Chief Inspector of Mines to issue Licences for the importation of Cyanide used in connection with mining.

During the year 1963-64 such licences were issued as follows :—

Date	To whom issued	Quantity
23.4.63	Amalgamated Tin Mines of Nigeria Limited	1 Case (6 × 10 lbs.)
10.6.63	Fidelity Mining Syndicate	200 lbs.
7.8.63	Amalgamated Tin Mines of Nigeria Limited	1 Case (6 × 10 lbs.)

XIV.—LABOUR

A summary of the average African and non-African Labour employed and the total wages paid to Africans in the mining industry is given below :—

<i>Mineral mined</i>	<i>Non-African</i>	<i>African</i>		<i>Total (African)</i>	<i>Total remuneration paid to Africans</i>
		<i>Direct Labour</i>	<i>Tributers</i>		
					£
Cassiterite	236	42,365	1,840	44,205	2,598,871
Columbite	13	1,107	11	1,118	90,546
Gold	1	87	—	87	3,218
Lead-Zinc	1	30	—	30	2,784
Non-Metalliferous Minerals	6	407	—	407	65,479
Other Metalliferous Minerals	2	196	2	198	9,283
Prospecting on E.P.Ls. ...	2	236	—	236	15,695
Totals	261	44,428	1,853	46,281	2,785,876

The above figures do not include labour employed in coal mining, or by Prospecting Right holders during prospecting work on open ground for which no returns are required.

XV.—ACCIDENTS

Any accident involving loss of life or serious injury to any person occurring in any mine, or in connection with mining or prospecting operations has to be reported to this Division. Serious injury is defined in the Minerals Act as :—

- (a) a fractured skull, pelvis, arms or thigh or spine fore-arm or leg;
- (b) a dislocated shoulder;
- (c) the amputation of an arm, hand, or of one finger or more on the same hand, or of a leg or foot;
- (d) the loss of the sight of an eye;
- (e) any other serious body injury, including internal haemorrhage, or burns, or asphyxia, if such injury is likely to endanger life, cause permanent incapacity or impair efficiency substantially.

When under Section 89 of the Minerals Act an enquiry is deemed to be necessary, it is held by an Inspector of Mines who makes a "Finding".

The number of fatal accidents in metalliferous mines dropped to ten, all occurring on the surface in opencast workings and none in underground workings. Seven of these were due to falls of ground. One was due to electric shock and the remaining two were due to other miscellaneous causes. Of the 10 accidents 5 were attributed to wilful misconduct on the part of the victims including two accidents in which it was decided the victims were mining illegally. 3 accidents were attributed to the failure of the operators to take reasonable precautions, 1 accident was attributed to inexperience of the victims.

In coal mines fatal accidents still stood at 2, permanent incapacity rose to 132 and emporary incapacity dropped to 450.

No fatal accidents were reported in the limestone and clay quarries in the Eastern and Western Regions of Nigeria.

Accidents classified in accordance with International rulings are shown in Appendices Q1-Q4.

XVI.—EXPLOSIVES

The basic legislation dealing with explosives remains the Explosives Act of 1915 and the Regulations made thereunder as subsequently amended. In addition legislation dealing with the use of explosives in the mining industry is contained in Part IV of the Safe Mining Regulations, made under the Minerals Act. A new Act, the Explosives Act, 1964, was passed in January 1964, but will not be brought into force until new regulations have been made under it.

The Mines Division controls the importation, sale, transport and use of explosives used in mining, oil prospecting and allied operations. Import permits and magazine licences are issued by the Chief Inspector of Mines, Lagos. Explosives store licences and permits for approved storage boxes are issued by Area Inspectors of Mines, who also issue permits to purchase explosives examine applicants for mining blasting certificates and carry out routine inspections.

STORAGE

The position of licensed storage facilities as at 31st March, 1964, was as follows:—

(a)	Explosives Magazines Licensed	33
	21 are Permanent Magazines	
	8 are Floating Magazines	
	4 are Trailer Magazines.	

They are situated as follows :

- 18 are in the Eastern Region
- 5 are in the Mid-Western Region
- 7 are in the Northern Region
- 3 are in the Western Region.

(b)	Licensed Explosives Stores	24
	8 are situated in the Eastern Region	
	13 are situated in the Northern Region	
	3 are situated in the Western Region.	

(c)	Storage box permits	115
	45 are situated in the Eastern Region	
	12 are situated in the Mid-Western Region	
	55 are situated in the Northern Region	
	3 are situated in the Western Region.	

(d)	Mining Blasting Certificates issued during the year	65
	of which ten were renewals.	
	36 in the Eastern Region	
	6 in the Mid-Western Region	
	22 in the Northern Region	
	1 in the Western Region.	

(e) During the financial year, the Division issued a total of 53 import permits for High Explosives :—

- 34 were issued to non-mining companies (which include quarry owners, construction companies and cement manufacturers).
- 2 were issued to Mining Companies
- 12 were issued to Oil Exploration Companies
- 5 were issued to dealers.

XVII.—PROSECUTIONS

Prosecutions for mining and mineral offences are taken either by the Mines Division or by the Police. During the year under review the Mines Division was responsible for initiating cases classified as follows :—

- (a) Offences relating to minerals (i.e. unlawful possession, receipt and purchase)—Nil
- (b) Illegal mining offences—3; one accused convicted, one discharged and the third case is still proceeding.
- (c) Other offences relating to mining 7; three cases were withdrawn, two accused persons convicted, one discharged and one case not concluded.

In addition the Police on the Plateau Minesfield in the North-Eastern Inspectorate dealt with 379 cases classified as follows :—

(a) Offences relating to minerals	103
(b) Illegal mining offences	234
(c) Other offences relating to mining	42

Of this number convictions were obtained as follows :—

- (i) For offences relating to minerals, 42 persons were convicted; 8 persons were discharged; 37 cases are awaiting trial and 25 cases are under investigation.
- (ii) For illegal mining, 220 persons were convicted and 28 persons discharged. 46 cases are awaiting trial and 5 cases still under investigation.
- (iii) For other offences relating to mining, 4 persons were convicted and 2 persons discharged. 14 cases are awaiting trial and 18 cases are under investigation.

In the Western Region, the Mines Division and the Police instituted prosecutions classified as follows :—

- (a) 1 Illegal mining offences
- (b) 2 Cases of unlawful possession of raw Gold. Three persons were convicted.

XVIII.—LEGISLATION

The following legislation affecting the mining industry was brought into effect during the period 1st April, 1963, to 31st March, 1964.

REGULATIONS

Legal Notice No. 103 of 1963. Minerals (Amendment) (No. 2) Regulations, 1963. This amended "the Principal Regulations" by the substitution for the word "Governor-General" of the word "Minister" wherever the former word occurs in the Principal Regulations.

Legal Notice No. 128 of 1963. Minerals (Safe Mining) (Amendment) Regulations, 1963, made several amendments to Sections, 34, 36, 111, 112, 134 and 135 of the Safe Mining Regulations.

ACTS

Legal Notice No. 150 of 1963. Delegation of Powers (Eastern Nigeria) Notice, 1963. The exercise within the Eastern Region under the Minerals Act was delegated to the Minister of Town Planning of Regulations 11, 13(2), 14, 15, 16, 18, 19(3) (b), 27, 38, 39, 42 and 67.

Legal Notice No. 56 of 1964. Open General Import Licence (all countries) No. 1 of 1964. This Notice replaces Legal Notice No. 44 of 1964 and excepted from this licence—Petroleum products, Tin Ore, Zirconium and Slag resulting from the processing of Tin.

DECLARATIONS

Legal Notice No. 104 of 1963. **Prospecting (Areas and Minerals) Prohibition (Amendment) (No. 3) Declaration, 1963.** This amended Public Notice No. 22 of 1964 by the addition of new paragraph No. 41 closing to prospecting for all minerals Mines Reclamation Area No. 41 in the Ropp District of Plateau Province.

Legal Notice No. 139 of 1963. **Prospecting (Areas and Minerals) Prohibition (Amendment) (No. 4) Declaration, 1963.** This amended paragraph 41 of the Law—1964, and declared close to prospecting for all minerals that parcel of land known as Mines Reclamation Area No. 54 in the Forum District of Plateau Province.

Legal Notice No. 34 of 1964.—**Prospecting (Areas and Minerals) Prohibition (Amendment) Declaration, 1964.** Paragraph 16 of the Law was revoked by this Notice.

ORDINANCES

No. 9 of 1964.—The Explosives Act, 1964. This empowers the Federal Minister to regulate :

- (a) the importation of explosives into Nigeria.
- (b) the manufacture, storage, transport or use of explosives.
- (c) the ownership or possession of explosives (including changes of ownership or possession).
- (d) fees in respect of licences.
- (e) penalties for offences against the regulations.
- (f) the seizure of explosives in respect of which such an offence is alleged to have been or has been committed.

XIX.—MINING ASSOCIATIONS

The Minesfield continues to be represented by the Nigerian Chamber of Mines and the Association of African Miners.

XX.—MINES DIVISION

(1) ESTABLISHMENT POSITION OF SENIOR STAFF AT 31ST MARCH, 1964

Chief Inspector of Mines	...	...	...	Mr E. A. Ifaturoti, B.Sc., D.R.T.C. (Glasgow) A.M.I.M.M.
Deputy Chief Inspector of Mines	...	...	...	Vacant
Asst. Chief Inspector of Mines	...	...	...	Vacant
Principal (Training & Research)	...	...	...	Mr J. A. Ndulue M.S., (Mineral Dressing) M.S. Mineral Dressing Engineering, B.S., (Mineral Dressing Engineering and Metallurgical Engineering).
3 Principal Inspectors of Mines	...	...	...	Mr G. W. Warner, N.A.C.M., Mr D. O. Obiabo, A.C.S.M., A.M.I.M.M. A.M.I.E. 1 Vacant
1 Senior Inspector of Mines	...	...	...	Vacant.

15 Inspectors of Mines and Pupil Inspectors of Mines	Mr J. D. A. Omalu, A.C.S.M. Mr G. N. Onyemenam, A.C.S.M. Mr J. N. Emodi, A.C.S.M. Mr J. F. Awoniyi, A.C.S.M. Mr G. N. C. Emeghalu, A.C.S.M. Mr J. H. Glew, B.Sc., A.M.MIN.E., A.M.I.M.M. T. O. Martyn, A.C.S.M., A.M.I.M.M. Mr S. N. Ofomah, A.C.S.M. Mallam Inuwa Gombe, A.C.S.M. Mr J. R. Lee, A.I.M.M. Mr P. Swainston, B.sc. Mr G. J. Coslett, A.C.S.M., A.M.I.M.M. Mr J. C. Torrington, B.sc. Mallam R. Lukman, B.Sc., A.R.S.M. Mr G. C. Nwali, B.Sc. Mr P. A. Okaka, A.C.S.M.
3 Ore Dressers	Mr W. H. Bradford, B.Sc., A.R.S.M. Mr P. G. Polsue, A.C.S.M. 1 Vacant
1 Chemist	Mr R. R. Sikorski, B.sc.
2 Technical Officers	Mallam M. I. Morrow Mr C. S. O. Egbuonu
6 Assistant Technical Officers-in-Training	Mr P. J. Okoro Mr G. Ume Mr V. M. Ekwezia Mr J. O. Afilaka Mr H. K. Erewa Mr S. N. Nwosuagwu
1 Instructor (School of Mines)	Mr E. O. J. Umunnakwe.

Retirements :—It is with deep regret that I announce the retirement of professional colleagues who have in some of the cases played a very important part over a considerable period in maintaining the high standard of work with which this Division prides itself. Brief details of the retiring officers are given below :—

Mr W. P. Gaskell, M.B.E., Chief Inspector of Mines, proceeded on retirement leave on 12th February, 1964, after nearly 27 years of distinguished service in Nigeria, eleven of which was in the post of Chief Inspector of Mines. He will long be remembered for the rapid Nigerianisation which took place during his term of office and the fact that his devotion to equity and fairness made the changes in the Division possible and smooth.

Mr K. M. Collins, A.C.S.M., A.M.I.M.M., Assistant Chief Inspector of Mines retired with effect from the 27th August, 1963, after 10 years service.

Mr P. D. Coakley, A.C.S.M., Principal Inspector of Mines, retired on 16th December, 1963, after 10 years service.

Mr P. G. Polsue, A.C.S.M., Ore Dresser on contract proceeded on retirement leave on 18th February, 1964, on completion of his tour on contract.

Officers-in-Training : Mr J. C. Ndupuechi was at the University of Birmingham on Federal Government Training Course Award while Messrs P. C. Okonkwo, M. C. Ikwelle, S. Ibe, S. M. Oparaugo and E. Ekpenyong were at the Federal Science School, Lagos.

(2) SUMMARY OF THE SENIOR STAFF POSITION

<i>Post</i>	<i>Estab- lishment</i>	<i>Strength</i>	<i>Nigerian</i>	<i>European</i>	<i>Nigerians in Training</i>
Chief Inspector of Mines ...	1	1			
Deputy Chief Insp. of Mines	1	—	1	—	—
Asst. Chief Insp. of Mines	1	—	—	—	—
Principal (Training & Re- search)	1	1	—	—	—
Principal Inspectors of Mines	3	2	1	—	—
Senior Inspector of Mines ...	1	—	1	1	—
Inspectors of Mines ...	15	16	—	—	—
Ore Dressers	3	2	10	6	1
Personal Secretary	1	1	—	2	—
Technical Officers	2	2	—	1	—
Asst. Tech. Officers-in-Train- ing	6	6	2	—	6
Instructor (School of Mines)	1	1	6	—	3
			1	—	—
Total	36	32	22	10	10

MINES DIVISION ORGANISATION CHART

CHIEF INSPECTOR OF MINES, LAGOS

DEPUTY CHIEF INSPECTOR OF MINES, JOS

Asst. Chief Inspector of
Mines, Kaduna.

Senior Research Officer
(Principal) School of Mines,
Jos.

Senior Inspector of Mines
(Explosives) Lagos.

Senior Inspector of Mines
(Engineering).

Area Inspector of Mines (S.I.M.)
Central Inspectorate, Minna.

Area Inspector of Mines,
(A.C.I.M.) North-Eastern
Inspectorate, Jos.

Area Inspector of Mines
(S.I.M.) North-Western
Inspectorate, Jos.

Area Inspector of Mines,
(S.I.M.) Eastern
Inspectorate, Enugu.

Area Inspector of Mines,
(S.I.M.) Western Inspectorate,
Ibadan.

(3) EXPENDITURE

The actual expenditure for the financial year 1963-64 for the Mines Division is shown below :

(a) *Headquarters and Administration :*

Personal Emoluments ...	...	...	...	...	...	£	s	d
Other Charges ...	...	...	...	...	...	82,142	6	—
Special Expenditure ...	...	...	...	...	...	18,028	—	9
						720	12	6

(b) *Training and Research :*

Personal Emoluments ...	...	...	...	...	...	£	s	d
Other Charges ...	...	...	...	...	...	11,023	9	11
Special Expenditure ...	...	...	...	...	...	4,291	17	8
						£15,315	7	7

XXI.—ACKNOWLEDGEMENTS

I wish to acknowledge the help of all Mine Operators who have submitted statistical material which has been incorporated in this report.

I also acknowledge and thank all the staff of this Division for their work and devotion to duty throughout the year.

Lagos, 2nd March, 1965.

E. A. IFATUROTU,
Chief Inspector of Mines.

APPENDIX A. 1
COMPANIES INCORPORATED IN THE UNITED KINGDOM — MINING ORES OF TIN AND ASSOCIATED METALS

Operators	Mining Titles held at 31st March, 1964						Output for the Year 1963/64				Average African Miners Employed During 1963-64				
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights	Cassite		Colomite	Tin-telluride	Tons	Tons
	No.	Sq. Mths.	No.	Sq. Mths.	No.	Yards	No.	Acres	Yards	Tons		Tons	Tons		
1. Amalgamated Tin Mines of Nigeria Limited ...	41	23.1	—	—	72	280,875½	621	59,265	—	—	5,226.0	483.0	—	—	8,434
2. Amari Mines Limited ...	1	0.2	—	—	5	16,067	39	3,638	—	—	28.8	—	—	—	383
3. Bisichi Tin Co. (N) Ltd.	5	1.4	—	—	26	116,357½	210	18,731	—	—	753.3	399.5	—	—	2,580
4. Ex-Lands Nigeria Limited	1	0.3	—	—	29	109,013½	66	11,379	—	—	615.0	—	—	—	1,539
5. Forum Extended Ltd. ...	10	22.6	—	—	22	132,963½	117	10,051	1	1,016½	342.3	2.7	—	—	1,954
6. Gold & Base Metal Mines (N) Limited ...	2	3.2	—	—	10	34,873½	145	14,261	—	—	803.8	48.2	4.1	—	1,635
7. Gold Coast Consolidated Lands Ltd. ...	—	—	—	—	11	15,555½	80	2,833	—	—	48.7	8.5	—	—	355
8. Jantar Nigeria Co. Ltd.	2	1.1	—	—	12	45,053½	100	10,883	—	—	275.3	479.2	—	—	1,746
9. Jos Tin Areas (N) Ltd. ...	—	—	—	—	14	43,006	45	3,337	—	—	182.5	4.0	—	—	930
10. Kaduna Prospectors Ltd. ...	1	—	—	—	16	108,363½	70	11,164	—	—	146.0	—	—	—	816
*11. Kaduna Syndicate Ltd. ...	—	—	—	—	—	—	—	—	—	—	196.0	—	—	—	1,230
12. Minerals Research Syndicate Limited ...	—	—	—	—	1	948½	17	993	—	—	51.0	66.0	—	—	408
*13. Naraguta Karama Areas Ltd. ...	—	—	—	—	—	—	—	—	—	—	2.7	—	—	—	28
14. United Tin Areas (N) Ltd.	4	2.4	—	—	26	101,208½	146	10,365	—	—	231.7	14.0	—	—	1,329
Totals	67	54.3	—	—	244	1,004,287½	1,656	156,901	1	1,016½	8,903.1	1,505.1	4.1	—	23,367

* Mining titles held during the year ended 31st March, 1964 were assigned to another company before 31st March, 1964.

COMPANIES INCORPORATED IN NIGERIA—MINING ORES OF TIN AND ASSOCIATED MINERALS

Operators	Mining titles held at 31st March, 1964										Output for the Year 1963/64				Average African Labour Employed During 1963-64	
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Cassite-rite	Columbite	Tantalite	Wolframite		
	No.	Sq. mls.	No.	Sq. mls.	No.	Yards	No.	Acres	No.	Yards						Tons
1. Abu Mining Co. Ltd. ...	—	—	—	—	8	70,862½	—	24	1,689	—	—	—	—	—	—	285
2. Afo Tin Mines Ltd. ...	—	—	—	—	—	—	—	16	1,200	—	—	—	—	—	—	170
3. Alheri Mining Co. Limited ...	1	0.7	—	—	—	—	—	30	1,542	—	—	—	—	—	—	324
4. Anglo-Niger Mining and Engineering Co. Limited ...	—	—	—	—	—	—	—	8	247	—	—	—	—	—	—	72
5. Athol Jones Mines Ltd. ...	2	0.2	—	—	1	836½	—	64	1,887	—	—	—	—	—	—	488
6. Azigbo Brothers Limited ...	2	0.4	—	—	—	—	54	2,080	—	—	—	—	—	—	—	624
7. Bassa Mining Area Ltd. ...	—	—	—	—	12	32,841½	—	35	1,640	—	—	—	—	—	—	120
8. Barlow Mines Limited ...	—	—	—	—	—	—	—	15	4,346	—	—	—	—	—	—	287
9. Bauchi Mining Company Limited ...	—	—	—	—	—	—	—	11	611	—	—	—	—	—	—	42
10. Birnin Mines Limited ...	1	0.1	—	—	6	6,231	—	70	2,884	—	—	—	—	—	—	642
11. Bukuru Limited ...	—	—	—	—	5	11,661½	—	66	2,702	—	—	—	—	—	—	402
12. C. A. Menta Limited ...	1	0.1	—	—	—	—	—	32	894	—	—	—	—	—	—	323
13. Chini Mines Limited ...	—	—	—	—	3	2,595½	—	21	802	—	—	—	—	—	—	142
14. D. K. Eukorlem and Co. Limited ...	4	1.9	—	—	—	—	—	14	826	—	—	—	—	—	—	328
15. Egeba Mining Syndicate Limited ...	2	0.3	—	—	—	—	—	46	1,791	—	—	—	—	—	—	301
16. Eland Company Limited ...	—	—	—	—	—	—	—	35	1,331	—	—	—	—	—	—	321
17. F. & B. Limited ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	124
18. F. O. Nyambunwo and Sons Limited ...	—	—	—	—	—	—	—	17	518	—	—	—	—	—	—	157
19. Indo Mining Company (N) Limited ...	—	—	—	—	—	—	—	56	2,829	—	—	—	—	—	—	423
20. Jos Altuwa's Limited ...	—	—	—	—	—	—	—	15	1,071	—	—	—	—	—	—	237
21. Joseph Reccallah and Sons ...	—	—	—	—	16	63,297½	—	38	3,284	—	—	—	—	—	—	653
22. Kato Mines Limited ...	—	—	—	—	6	201	—	6	201	—	—	—	—	—	—	90
23. Kassa Mining Company Limited ...	—	—	—	—	8	15,849½	—	26	1,548	—	—	—	—	—	—	175
24. Kassa Mining Company Limited ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19
25. Lisabi Mining Association Limited ...	—	—	—	—	11	273	—	11	273	—	—	—	—	—	—	59

APPENDIX A. 2—continued
COMPANIES INCORPORATED IN NIGERIA MINING ORES OF TIN AND ASSOCIATED MINERALS

Operators	Mining Titles held at 31st March, 1964						Output for the year 1963/64														
	E.P. Ls.		S.E.P. Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Cassite		Columbite		Tantalite		Wolframite		Average African Labour Employed During 1963-64		
	No.	Sq. mls.	No.	Sq. mls.	No.	Yards	No.	Acres	No.	Yards	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	
26. Leruwie Limited ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	159
27. Nigerian Alluvials Ltd. ...	—	—	—	—	—	7,117	—	—	—	—	—	4.9	—	—	—	—	—	—	—	—	380
28. Nigerian Metals Limited ...	—	—	—	—	—	—	—	—	—	—	—	47.0	9.3	—	—	—	—	—	—	—	43
29. Nigerian Minerals and Dev. Company Limited ...	—	—	—	—	—	20,998	—	—	—	—	—	5.1	—	—	—	—	—	—	—	—	—
30. Ningi Mining Co. Ltd. ...	2	1.5	—	—	—	—	—	—	—	—	—	44.7	—	—	—	—	—	—	—	—	429
31. Northern Tin Co. Ltd. ...	2	3.1	—	—	—	—	—	—	—	—	—	60.8	8.4	—	—	—	—	—	—	—	480
32. Owoh Brothers Min. Co. ...	—	—	—	—	—	—	—	—	—	—	—	4.1	—	—	—	—	—	—	—	—	76
33. Plateau Quarry and Contracting Co. Ltd. ...	—	—	—	—	—	—	—	—	—	—	—	38.3	1.8	—	—	—	—	—	—	—	352
34. Plateau Concessions Ltd. ...	—	—	—	—	—	—	—	—	—	—	—	30.8	—	—	—	—	—	—	—	—	238
35. Plateau Tin Mines (N) Limited ...	—	—	—	—	—	9,887½	—	—	—	—	—	24.0	—	—	—	—	—	—	—	—	275
36. Quiva Mining Co. Ltd. ...	1	0.1	—	—	—	463½	—	—	—	—	—	48.2	2.2	—	—	—	—	—	—	—	370
37. Rishi Mines Limited ...	—	—	—	—	—	—	—	—	—	—	—	8.3	—	—	—	—	—	—	—	—	119
38. Ron Mining and Dev. Company Limited ...	—	—	—	—	—	—	—	—	—	—	—	15.4	0.3	—	—	—	—	—	—	—	113
*39. Rowe Mining Company Limited ...	1	0.5	—	—	—	86,032½	—	—	—	—	—	210.4	—	—	—	—	—	—	—	—	1,499
40. Tend Mines Limited ...	1	0.1	—	—	—	16,476	—	—	—	—	—	2.4	—	—	—	—	—	—	—	—	83
41. Tin and Associated Minerals Limited ...	—	—	—	—	—	—	—	—	—	—	—	23.5	—	—	—	—	—	—	—	—	360
42. Tokkos Mining and Dev. Company Limited ...	—	—	—	—	—	33,180	—	—	—	—	—	86.9	365.0	—	—	—	—	—	—	—	303
43. Tongolo Mining Company Limited ...	—	—	—	—	—	—	—	—	—	—	—	28.6	—	—	—	—	—	—	—	—	513
44. Trenwith Mines Limited ...	—	—	—	—	—	1,600	—	—	—	—	—	5.3	0.3	—	—	—	—	—	—	—	72
45. Tsayo Mines Limited ...	—	—	—	—	—	3,817½	—	—	—	—	—	39.2	1.1	—	—	—	—	—	—	—	420
46. Vectis ...	6	1.0	—	—	—	4,591	—	—	—	—	—	29.1	—	—	—	—	—	—	—	—	329
47. Warri Mining Syndicate Limited ...	1	0.5	—	—	—	1,473½	—	—	—	—	—	68.7	—	—	—	—	—	—	—	—	428
48. Zaramaganda Tin Mines Limited ...	3	0.6	—	—	—	2,086½	—	—	—	—	—	20.1	0.9	—	—	—	—	—	—	—	129
49. Zealu Mining Company Limited ...	—	—	—	—	—	9,102	—	—	—	—	—	37.5	—	—	—	—	—	—	—	—	328
Totals ...	30	11.1	—	—	—	40,100½	—	—	—	—	—	178.5	422.4	—	—	—	—	—	—	—	14,478

* Mining titles held during the year ended 31st March, 1964 were assigned to another company before 31st March, 1964.

APPENDIX A. 3
FIRMS OPERATING UNDER REGISTERED BUSINESS NAMES—MINING ORES OF TIN AND ASSOCIATED METALS

Operators	Mining Titles held at 31st March, 1964										Output for the year 1963/64				Average African Labour Employed During 1963/64		
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Castile-rite	Coltan-bite	Tantalite	Tons		Tons	Tons
	No.	Sq. Mts.	No.	Sq. Mts.	No.	Yards	No.	Acres	No.	Yards	Tons	Tons	Tons				
1. Agbenor Mining Syndicate	—	—	—	—	—	—	—	8	404	—	—	—	—	—	—	—	56
2. Awani Brothers ...	—	—	—	—	6	16,185	—	10	1,257	—	—	—	—	—	—	—	332
3. Ayana Mining Syndicate	—	—	—	—	—	—	—	24	1,001	—	—	—	—	—	—	—	300
4. Eburutu Mining Syndicate	3	1.9	—	—	—	—	—	18	696	—	—	—	—	0.6	—	—	296
5. Edo Mining Company ...	—	—	—	—	—	—	—	10	467	—	—	—	—	—	—	—	212
6. Elechi Brothers & Company	1	0.8	—	—	—	—	—	3	470	—	—	—	—	—	—	—	84
7. Fidelity Mining Synd.	—	—	—	—	—	—	—	3	124	—	—	—	—	—	—	—	84
8. Gumo Mining Syndicate ...	—	—	—	—	—	—	—	10	247	—	—	—	—	—	—	—	63
9. J. O. Niemoglia & Sons ...	—	—	—	—	2	4,473½	—	27	1,143	—	—	—	—	—	—	—	86
10. Mbanefo Brothers...	—	—	—	—	—	—	—	24	757	—	—	—	—	—	—	—	389
11. Okpe Mining Syndicate ...	—	—	—	—	—	—	—	10	332	—	—	—	—	—	—	—	176
12. Plateau Mining Syndicate	—	—	—	—	—	—	—	32	1,206	—	—	—	—	—	—	—	119
13. S. A. Onwuegbu & Sons ...	—	—	—	—	1	846½	—	5	204	—	—	—	—	—	—	—	356
14. Uzuakoli Mining & Trading Company	—	—	—	—	—	—	—	16	708	—	—	—	—	—	—	—	46
Totals	4	2.7	—	—	9	21,505	—	213	9,106	—	—	—	—	365.2	7.8	1	2,708

PRIVATE OPERATORS MINING ORES OF TIN AND ASSOCIATED METALS

Operators	Mining Titles held at 31st March, 1964										Output for the year 1963/64				Average African Labour Employed During 1963/64
	E.P. Ls.		S.E.P. Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Cassite-rite	Column-bite	Tan-wolf-ramite		
	No.	Sq. Mts.	No.	Sq. Mts.	No.	Yards	No.	Acres	No.	Yards	Tons	Tons	Tons		
1. Aiboh, P. E. O.	—	—	—	—	1	1,266‡	28	1,036	—	—	46.8	—	—	342	
2. Bolokor, M. K.	—	—	—	—	31	1,506	3	1,506	—	—	75.2	—	—	387	
3. Clarke, F. H.	—	—	—	—	4	176	4	176	—	—	2.8	—	—	27	
4. Cocking, J. A.	—	—	—	—	—	—	—	—	—	—	3.0	—	—	59	
5. Cole, J. C.	1	0.9	—	—	—	—	1	72	—	—	2.0	—	—	18	
6. Cooper, Mrs M.	—	—	—	—	—	—	—	—	—	—	6.2	—	—	55	
7. Dognun & Nikoro	—	—	—	—	7	335	7	335	—	—	30.8	—	—	189	
8. Emeghara, A. O.	—	—	—	—	1	983‡	12	435	—	—	13.6	—	—	130	
9. Eisevaise, W. A.	—	—	—	—	2	3,493	17	790	—	—	0.4	—	—	30	
10. Iwericbor, P. I.	—	—	—	—	17	790	7	28	—	—	30.9	0.3	—	185	
11. McNab, W. B.	—	—	—	—	7	28	2	124	—	—	1.9	—	—	108	
12. Miles, Mrs F. M.	—	—	—	—	—	—	—	—	—	—	—	—	—	9	
*13. N'emoghia, Dogun & Nikoro	—	—	—	—	—	—	—	—	—	—	4.7	—	—	60	
14. Nwafor, R. N.	—	—	—	—	2	29	2	29	—	—	21.7	—	—	211	
15. Obaze, R. A.	1	0.3	—	—	7	371	13	578	—	—	15.5	—	—	118	
16. Ochogu, S. O.	—	—	—	—	—	—	—	—	—	—	—	—	—	5	
17. Ogudazi, O.	—	—	—	—	—	—	—	—	—	—	—	—	—	64	
18. Okuboye, D. O.	2	0.1	—	—	4	6,140	52	1,712	—	—	7.3	2.8	1.6	874	
19. Onwukeme, E. N.	2	1.1	—	—	1	5,386‡	21	743	—	—	15.0	1.5	—	179	
20. Passman, J.	—	—	—	—	1	333‡	1	27	—	—	0.3	—	—	30	
21. Parker, T. F.	—	—	—	—	4	19,076‡	6	352	—	—	11.1	—	5.5	207	
22. Paravicini, J. D.	—	—	—	—	2	906‡	7	370	—	—	9.9	—	—	72	
23. Priestley, N. de B.	—	—	—	—	1	19,076‡	6	352	—	—	0.6	—	—	4	
24. Roche, V.	—	—	—	—	2	10,100	6	298	—	—	3.3	—	—	107	
25. Sandford, S.	—	—	—	—	5	13,581‡	3	323	—	—	4.8	—	—	36	
26. Spurr, W. P.	—	—	—	—	3	3,323	3	38	—	—	3.3	—	—	147	
27. Swift, H. L.	—	—	—	—	6	24,198‡	23	1,157	—	—	19.2	1.3	—	79	
28. Tollenaere, D. J. Rex	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
29. Townsend, F. H.	—	—	—	—	6	24,198‡	23	1,157	—	—	19.0	—	—	147	
30. Turner, Mrs A. G. & Miss V. I.	—	—	—	—	1	718‡	16	1,026	—	—	11.5	—	—	85	
31. Umerah, C. O.	—	—	—	—	2	108	2	108	—	—	1.6	—	—	20	
32. Usochi, J. O.	—	—	—	—	10	6,500	10	399	—	—	3.2	—	—	83	
33. Yates, J. J.	—	—	—	—	32	1,351	32	1,351	—	—	278.7	—	—	795	
34. Zang, D. B.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Totals	12	7.2	—	—	31	92,774‡	330	17,094	1	1,172	794.0	5.9	9.2	4,686	

* Mining titles held during the year ended 31st March, 1964, was assigned to another operator before 31st March, 1964.

PRIVATE OPERATORS MINING GOLD

APPENDIX B

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64 (ounces)	Average African Labour Employed During 1963/64	
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights				
	No.	Sq. Mils.	No.	Sq. Mils.	No.	Yards	No.	Acres	No.	Yards			
5. Cole, J. C.	—	—	—	—	—	—	—	1	31	—	—	2.5	84
35. Gamra, C.	—	—	—	—	—	—	—	2	33	—	—	136.4	245
20. Passman, J.	—	—	—	—	—	—	—	2	171	—	—	157.6	635
25. Sandford, S.	—	—	—	—	—	—	—	1	23	—	—	12.5	70
Totals	—	—	—	—	—	—	—	6	258	—	—	309.0	1,034

OPERATORS MINING ORES OF LEAD

APPENDIX C

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64			Average African Labour Employed During 1963/64
	E.P.Ls.		S.E.P.Ls.		Water Rights and Water Licences		Mining Leases		Mining Rights		Argentiferous Galena	Zinc	Sphalerite	
	No.	Square Miles	No.	Square Miles	No.	Yards	No.	Acres	No.	Yards	Tons	Tons	Tons	
* 3. Clarke, F. H.	—	—	—	—	—	—	—	1	35	—	—	—	—	—
† 51. Nigerian Embel Tin Smelting Co. Ltd.	—	—	—	—	—	—	—	5	34	—	—	—	—	—
† 52. Nigerian Lead-Zinc Mining Company Limited	—	—	—	—	—	—	—	1	4,454	—	—	—	—	30
Totals	—	—	—	—	—	—	—	7	4,523	—	—	—	—	30

† Incorporated in Nigeria

* Private Operator.

OPERATORS MINING FELSPAR, GRANITE & KAOLIN

APPENDIX D

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64			Average African Labour Employed During 1963/64	
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Felspar	Granite	Kaolin		
	No.	Square Miles	No.	Square Miles	No.	Yards	No.	Acres	No.	Yards	Tons	Tons	Tons		
Jos Tin Areas (N) Ltd.	—	—	—	—	—	—	—	—	—	—	—	—	—	8.0	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	8.0	—

† Production from base metal leases.

* U. K. Company

OPERATORS MINING CLAY

APPENDIX E. 1

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64 Clay Tons	Average African Labour Employed During 1963/64	
	E.P.Ls.		S.E.P.Ls.		Water Rights and Water Licences		Mining Leases		Mining Rights				
	No.	Square Miles	No.	Square Miles	No.	Yards	No.	Acres	No.	Yards			
	—	—	—	—	—	—	—	—	—	—			
53. Denchukwu Ltd. ...	—	—	—	—	—	—	—	1	33	—	—	510.3	29
Total	—	—	—	—	—	—	—	1	33	—	—	510.3	29

OPERATORS MINING MARBLE

APPENDIX E. 2

Name	Mining Title held at 31st March, 1964										Output for the year 1963/64 Marble Tons	Average African Labour Employed During 1963/64	
	E.P.Ls.		S.E.P.Ls.		Water Rights and Water Licences		Mining Leases		Mining Rights				
	No.	Square Miles	No.	Square Miles	No.	Yards	No.	Acres	No.	Yards			
	—	—	—	—	—	—	—	—	—	—			
54. Nigerian Marble Industry Limited†	—	—	—	—	—	—	—	1	205.97	—	—	40.0	120
Total	—	—	—	—	—	—	—	1	205.97	—	—	40.0	120

† Nigerian Company

OPERATORS MINING MONAZITE

APPENDIX F. 1

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64 Mozzate tons	Average African Labour Employed During 1963/64	
	E.P.Ls.		S.E.P.Ls.		Water Right and Water Licences		Mining Leases		Mining Rights				
	No.	Square Miles	No.	Square Miles	No.	Yards	No.	Acres	No.	Yards			
	—	—	—	—	—	—	—	—	—	—			
21. Joseph Rezcallah and Sons Limited†	—	—	—	—	—	—	—	—	—	—	—	12.1	15
Total	—	—	—	—	—	—	—	—	—	—	—	12.1	15

† Nigerian Company

OPERATORS MINING XENOTIME

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64 Xenotime Tons	Average African Labour Employed During 1963/64	
	E.P.L.s.		S.E.P.L.s.		Water Rights and Water Licences		Mining Leases		Mining Rights				
	No.	Square Miles	No.	Square Miles	No.	Yards	No.	Acres	No.	Yards			
I. Amalgamated Tin Mines of Nigeria Limited												1.3	
Total												1.3*	

* Won as by-product.

APPENDIX G

COMPANIES INCORPORATED IN NIGERIA MINING ZIRCON

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64 Zircon tons	Average African Labour Employed During 1963/64
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights			
	No.	Sq. Mts.	No.	Sq. Mts.	No.	Yards	No.	Acres	No.	Yards		
8. Jantar Nigeria Company Limited	—	—	—	—	—	—	—	—	—	—	109.3*	—
42. Tin & Associated Minerals Ltd.	—	—	—	—	—	—	—	—	—	—	795.1*	—
Total	—	—	—	—	—	—	—	—	—	—	904.4	—

* Produced from base metal leases.

APPENDIX H

HOLDERS OF TITLES AND LICENCES FOR LIMESTONE/SHALE

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64		Average African Labour Employed During 1963/64
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Limestone	Tons	
	No.	Sq. Mts.	No.	Sq. Mts.	No.	Yards	No.	Acres	No.	Yards	Tons	Tons	
55. Nigerian Cement Company Limited	—	—	1	50	—	—	2	9,129	—	—	522,682.0	—	150
56. West African Portland Cement Company Ltd.	—	—	—	—	—	—	2	2,300	—	—	299,815.0	—	74
Totals	—	—	1	50	—	—	4	11,429	—	—	822,497.0	—	224

APPENDIX I

COMPANIES INCORPORATED IN THE UNITED KINGDOM PROSPECTING FOR DIAMOND

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64		Average African Labour Employed During 1963/64
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Diamond Carats		
	No.	Sq. Mts.	No.	Sq. Mts.	No.	Yards	No.	Acres	No.	Yards			
											No.	Yards	
15. Diamond Corporation Sierra Leone Nigeia Limited	...	—	—	1	73,000	—	—	—	—	—	—	—	—
Total	—	—	—	1	73,000	—	—	—	—	—	—	—	—

APPENDIX J

FIRMS OPERATING UNDER REGISTERED BUSINESS NAMES MINING MOLYBDENITE

Name	Mining Titles held at 31st March, 1964										Output for the year 1963/64		Average African Labour Employed During 1963/64	
	E.P.Ls.		S.E.P.Ls.		Water Rights & Water Licences		Mining Leases		Mining Rights		Molybdenite Tons			
	No.	Sq. Mts.	No.	Sq. Mts.	No.	Yards	No.	Acres	No.	Yards				
											No.	Yards		
7. Fidelity Mining Synd.	—	—	—	—	—	—	—	1	26	—	—	—	3.5	63
Total	—	—	—	—	—	—	—	1	26	—	—	—	3.5	63

TOTAL PRODUCTION OF MINERALS

Year	Gold (Billion oz. troy)	Niobium (Collom- bite) tons	Lead (ton) tons	Tantalum (Tantal- ite) tons	Tin (Cassit- terite) tons	Tungsten (Wolfr- amite) tons	Zinc (Sphal- erite) tons	Fels- par tons	Kao- lin tons	Moner- zite tons	Tho- rium- muth. tons	Clay tons	Lime- stone tons	Moly- bdenite tons	Zircon tons	Mar- ble tons	Xeno- time tons
1951-52	1,840	1,115	9	2.75	11,596	18.85	44	—	—	—	—	—	—	—	—	—	—
1952-53	1,774	1,406	54	1.06	11,758	21.50	37	—	386	—	—	—	—	—	—	—	—
1953-54	1,776	3,100	23	4.18	10,910	12.96	112	—	14	—	—	—	—	—	—	—	—
1954-55	1,010	2,182	12	8.93	11,026	2.72	—	—	—	—	—	—	—	—	100.00	—	—
1955-56	780	2,382	42	21.01	11,681	4.31	—	4	—	—	—	—	—	—	996.34	—	—
1956-57	573	2,397	395	10.43	12,722	4.60	—	10	234	80.26	—	—	—	—	781.64	—	—
1957-58	539	1,709	493	18.26	12,242	1.15	—	—	24	80.26	—	—	—	—	44.64	—	—
1958-59	877	846	633	21.62	7,414	0.08	—	—	80	35.7	—	0.03	—	—	165.313	—	—
1959-60	1,000	1,701	428	10.37	8,310	0.21	1	—	—	93.33	—	—	79,448	—	186,985	—	—
1960-61	891	2,701	164	10.45	10,396	0.02	85	2	2	11.9	—	—	165,313	—	1,575.11	—	—
1961-62	560	2,416	—	17.60	10,324	—	—	—	—	10.08	—	—	325,004	—	1,681.33	—	—
1962-63	4,103	2,183	—	17.70	11,272	0.05	—	—	—	7.68	—	—	619,233	—	415.21	—	—
1963-64	309	1,941	—	15.87	11,845	—	—	—	8	8.9	—	—	73,6066	5.0	904.4	40	1.3
										12.1		510.3	822,497	3.5			

SUMMARY OF TITLES HELD

MINING RIGHTS

	No.	Yards	
Valid for Cassiterite and Associated Minerals	1	1,017	U.K. Companies Nigerian Companies Firms: Business Names Private Operators
	—	—	
	1	1,172	
Total	2	2,189	

WATER RIGHTS AND WATER LICENCES

	No.	Yards	
Valid for Cassiterite and Associated Minerals	244	1,004,287½	U.K. Companies Nigerian Companies Firms: Business Names Private Operators
	108	401,001½	
	9	21,505	
	31	92,774½	
Valid for Gold	—	—	Nigerian Companies Firms: Business Names Private Operator
	1	4,666½	
Total	393	1,524,235½	

SPECIAL EXCLUSIVE PROSPECTING LICENCES

	No.	Sq. Miles	
Valid for Cassiterite and Associated Minerals	—	—	U.K. Companies Nigerian Companies Firms: Business Names Private Operators
	—	—	
	—	—	
	1	73,000	
Valid for Diamond	—	—	U.K. Companies Nigerian Companies Firms: Business Names
	—	—	
Total	1	73,000	

EXCLUSIVE PROSPECTING LICENCES

	No.	Sq. Miles	
Valid for Tin and Associated Metals	67	54.3	U.K. Companies
	80	11.0	Nigerian Companies
	4	2.6	Firms: Business Names
	12	7.1	Private Operators
Valid for Lead	—	—	U.K. Companies
	—	—	Nigerian Companies
	—	—	Firms: Business Names
	—	—	Private Operators
Valid for Gold	—	—	U.K. Companies
	—	—	Nigerian Companies
	—	—	Firms: Business Names
	—	—	Private Operators
Total	113	75.0	

MINING LEASES

	No.	Acres	
Valid for Tin and Associated Metals	1,655	156,875	U.K. Companies
	1,378	79,691	Nigerian Companies
	213	9,106	Firms: Business Names
	332	17,156	Private Operators
	6	4,488	Nigerian Companies
Valid for lead and Associated Metals	—	—	Firms: Business Names
	1	35	Private Operators
	—	—	Nigerian Companies
Valid for Precious Metals ...	—	—	Firms: Business Names
Valid for Molybdenite	6	256	Private Operators
	—	—	Nigerian Companies
Non-Metallic- Minerals	1	26	Firms: Business Names
	1	33	Private Operators
	4	11,429	Firms: Business Names
Total	3,597	279,093	

SUMMARY OF
MINNING LEASES

	No.	Acres
Cassiterite, etc.	(3578)	262,828
Lead & Associated Metals	(7)	4,523
Precious Metals	(6)	256
Molybdenite	(1)	26
Non-Metallic Minerals	(5)	11,462

APPENDIX M

GEOGRAPHICAL DISTRIBUTION OF LAND HELD UNDER EXCLUSIVE PROSPECTING LICENCES AND SPECIAL EXCLUSIVE PROSPECTING LICENCES

Region	Provinces	Tin and Associated Metals		Lead-Silver-Zinc		Precious Metals		Limestone/Shale		Barytes		Totals		
		E.P.L.s. No.	S.E.P.L.s. Square Miles	E.P.L.s. No.	S.E.F.L.s. Square Miles	E.P.L.s. No.	Square Miles	E.P.L.s. No.	Square Miles	E.P.L.s. No.	Square Miles	E.P.L.s. No.	Square Miles	E.P.L.s. No.	Square Miles
Northern	Adamawa ...	16	27.0	—	—	—	—	—	—	—	—	16	27.0	—
	Bauchi ...	5	6.4	—	—	—	—	—	—	—	—	5	6.4	—
	Benue ...	—	—	—	—	—	—	—	—	—	—	—	—	—
	Plateau ...	3	0.6	—	—	—	—	—	—	—	—	3	0.6	—
	Katsina ...	—	—	—	—	—	—	—	—	—	—	—	—	—
	Niger ...	77	35.4	—	—	1	73,000	—	—	—	—	77	35.4	1
	Plateau ...	12	5.6	—	—	—	—	—	—	—	—	12	5.6	—
	Sokoto ...	—	—	—	—	—	—	—	—	—	—	—	—	—
	Zaria ...	—	—	—	—	—	—	—	—	—	—	—	—	—
	Totals ...	113	75.0	—	—	1	73,000	—	—	—	—	113	75.0	1
Eastern	Enugu/Opola	—	—	—	—	—	—	—	1	50	—	—	—	1
	Totals ...	—	—	—	—	—	—	—	1	50	—	—	—	1
Western	Totals ...	—	—	—	—	—	—	—	—	—	—	—	—	—
	Totals ...	—	—	—	—	—	—	—	—	—	—	—	—	—
Mid-Western	Totals ...	—	—	—	—	—	—	—	—	—	—	—	—	—
	Totals ...	—	—	—	—	—	—	—	—	—	—	—	—	—
Nigerian	Totals ...	113	75.0	—	—	1	73,000	—	1	50	—	113	75.0	2
	Totals ...	—	—	—	—	—	—	—	—	—	—	—	—	—

APPENDIX N

GEOGRAPHICAL DISTRIBUTION OF LAND HELD UNDER WATER RIGHTS AND WATER LICENCES

Region	Province	Water Rights (Granted under Minerals Ordinances)			Water Licences (Granted under Minerals Ordinances)			Totals		
		No.	Cases	Water Rent	No.	Cases	Water Rent	No.	Cases	Water Rent
Northern	Adamawa	—	—	—	—	—	—	—	—	—
	Bauchi	20	282	90	25	187	187	45	469	277
	Benue	—	—	—	19	229	230	19	299	230
	Plateau	—	—	—	—	—	—	—	—	—
	Kano	2	20	20	1	48	48	5	68	68
	Katsina	—	—	—	—	—	—	—	—	—
	Plateau	—	—	—	—	—	—	—	—	—
	Pigeon	119	1,227	393	8	10	30	9	42	22
	Sokoto	—	—	—	172	1,405	1,297	291	2,142	1,552
	Zaria	8	45	45	14	112	80	22	157	135
	Regionals Totals	150	1,586	452	243	2,120	1,841	393	3,706	2,293
Eastern	Regionals Totals	—	—	—	—	—	—	—	—	—
Western	Regionals Totals	—	—	—	—	—	—	—	—	—
Mid-Western	Regionals Totals	—	—	—	—	—	—	—	—	—
	Nigerian Totals	150	1,586	452	243	2,120	1,841	393	3,706	2,293

GEOGRAPHICAL DISTRIBUTION OF LAND HELD UNDER MINING LEASES

Region	Province	Tin & Associated Metals		Lead-Silver-Zinc		Precious Metals		Limestone/ Shale		Granite/ Kaolin/ Felspar/ Clay		Molybdenite		Total	
		No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres
NORTHERN	Adamawa ...	—	—	1	2	—	—	—	—	—	—	—	—	1	2
	Bauchi ...	730	48,277	—	—	—	—	—	—	—	—	—	—	730	48,277
	Benue ...	165	11,975	—	—	—	—	—	—	—	—	—	—	165	11,975
	Kabba ...	10	308	—	—	—	—	—	—	—	—	—	—	10	308
	Kano ...	130	9,343	—	—	—	—	—	—	—	—	—	—	130	9,343
	Katsina ...	7	3,503	—	—	—	—	—	—	—	—	—	—	7	3,556
	Niger ...	2,316	172,815	5	67	2	53	—	—	—	—	—	—	2,321	172,882
	Plateau ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sokoto ...	218	16,393	—	—	—	—	—	—	—	—	—	1	26	16,419
Zaria ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Regional Totals ...	3576	262,764	6	69	2	53	—	—	—	—	1	26	3,585	262,912	
EASTERN	Osoja ...	—	—	1	4,454	—	—	2	9,129	1	33	—	—	3	13,583
	Umuahia ...	—	—	—	—	—	—	—	—	—	—	—	—	1	33
	Regionals Totals ...	—	—	1	4,454	—	—	2	9,129	1	33	—	—	4	13,616
WESTERN	Abeokuta ...	—	—	—	—	—	—	2	2,300	—	—	—	—	2	2,300
	Ondo ...	1	5	—	—	—	—	—	—	—	—	—	—	1	5
	Oyo ...	1	57	—	—	4	203	—	—	—	—	—	—	5	260
Regionals Totals ...	2	62	—	—	4	203	—	—	—	—	—	—	8	2,565	
MID-WESTERN	Regional Totals ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Nigerian Totals ...	3,578	262,826	7	4,523	6	256	4	11,429	1	33	1	26	3,597	279,093

GEOGRAPHICAL DISTRIBUTION OF LAND HELD UNDER MINING RIGHTS

APPENDIX P

Region	Province	Tin & Associated Metals		Lead-Silver-Zinc		Precious Metals		Limestone/Slate		Granite/Kaolin/Felspar		Totals	
		No.	Yards	No.	Yards	No.	Yards	No.	Yards	No.	Yards	No.	Yards
NORTHERN ...	Bauchi ...	2	2,189	—	—	—	—	—	—	—	—	2	2,189
	Regional Totals ...	2	2,189	—	—	—	—	—	—	—	—	2	2,189
EASTERN ...	Regional Totals ...	—	—	—	—	—	—	—	—	—	—	—	—
WESTERN ...	Regional Totals ...	—	—	—	—	—	—	—	—	—	—	—	—
MID-WESTERN ...	Regional Totals ...	—	—	—	—	—	—	—	—	—	—	—	—
Nigerian Totals ...	Nigerian Totals ...	2	2,189	—	—	—	—	—	—	—	—	2	2,189

ACCIDENTS IN METALLIFEROUS MINES

APPENDIX Q. 1

Classifications	Opencast and Surface				Underground			
	Fatal	Permanent Incapacity	Temporary Incapacity	Total	Fatal	Permanent Incapacity	Temporary Incapacity	Total
1. Electricity ...	1	—	—	1	—	—	—	—
2. Explosions ...	—	1	—	1	—	—	—	—
(a) Explosives	—	—	—	—	—	—	—	—
(b) Fire ...	—	—	—	—	—	—	—	—
(c) Gas ...	—	—	—	—	—	—	—	—
3. Falls of ground	7	—	3	10	—	—	—	—
(a) Opencast	—	—	—	—	—	—	—	—
(b) Underground	7	—	3	10	—	—	—	—
(i) Face	—	—	—	—	—	—	—	—
(ii) Shafts and winzes	—	—	—	—	—	—	—	—
4. Handling without Machinery	—	—	—	—	—	—	—	—
(a) Erecting and withdrawing supports	—	—	—	—	—	—	—	—
(b) Handling Materials	1	—	2	3	—	—	—	—
(c) Handling tools	—	—	—	—	—	—	—	—
5. Machinery	—	1	—	1	—	—	—	—
(a) Draglines	—	—	—	—	—	—	—	—
(b) Dredges	—	—	—	—	—	—	—	—
(c) Gravel Pumps	—	1	—	1	—	—	—	—
(d) Haulage	—	—	—	—	—	—	—	—
(e) Hydraulic	—	—	1	1	—	—	—	—
(f) Screening	—	—	—	—	—	—	—	—
(g) Other Machinery	—	—	—	—	—	—	—	—
6. Miscellaneous	2	—	—	2	—	—	—	—
Totals	10	4	7	21	—	—	—	—

ACCIDENTS IN COAL MINES

Classifications	Underground			Opencast and Surface		
	Fatal	Permanent Incapacity	Temporary Incapacity	Fatal	Permanent Incapacity	Temporary Incapacity
	Total	Total	Total	Total	Total	Total
1. Electricity :	—	—	—	—	—	—
2. Explosions :	—	—	—	—	—	—
(a) Explosives	—	2	—	—	—	—
(b) Fire	—	—	—	—	—	—
(c) Gas	—	—	7	—	—	1
3. Falls of ground :	—	—	—	—	—	—
(a) Opencast	—	—	—	—	—	—
(b) Underground	—	12	22	—	—	—
(i) Coal face	—	—	—	—	—	—
(ii) Shafts and Winzes	—	1	2	—	—	—
(iii) Other grounds	—	—	—	—	—	—
4. Handling without Machinery :	2	11	43	—	—	1
(a) Erecting and withdrawing supports	—	21	46	—	11	25
(b) Handling Materials	—	15	117	—	3	8
(c) Handling tools	—	—	—	—	—	—
5. Machinery :	—	—	—	—	—	—
(a) Draglines	—	—	—	—	—	—
(b) Dredges	—	—	—	—	—	—
(c) Gravel Pumps	—	—	3	—	2	3
(d) Haulage	—	—	—	—	—	—
(e) Hydraulic	—	—	—	—	—	—
(f) Screening	—	—	1	—	—	—
(g) Winding	1	1	—	—	—	—
(h) Other Machinery	—	6	4	—	—	1
16. Miscellaneous :	—	6	20	—	2	6
Totals	2	132	450	584	23	59
						82†

† Excluding 24 non-mining accidents.

CLASSIFICATION OF DISABILITIES

Classification	Coal Mines		Metalliferous Mines	
	Labour	No. per 1,000 of all Races	Labour	No. per 1,000 of all races
Fatal Accidents, underground and surface	2	0.494	11	0.24
Permanent Disability	—	—	—	—
100% ...	—	—	—	—
100-80% ...	—	—	—	—
80-60% ...	1	0.247	—	—
60-40% ...	—	—	2	0.04
40-20% ...	1	0.247	—	—
20- 0% ...	108	26.693	3	0.08
Not yet assessed	5	1.236	4	0.09
Totals	117	28.917	20	0.45

APPENDIX R. 1

NORTH-EASTERN INSPECTORATE
PROGRESS IN EXPLORATION AND MINING DURING THE YEAR
BY J. D. A. OMALU, A.C.S.M.

It will be observed that in addition to the general desire for increased reserves for tin and associated minerals which led to intensive exploration during the year, there was also search for other economic minerals which are in demand in the country's growing industries:

- (i) The Nigerian Marble Industries Limited, incorporated and registered in Nigeria were granted the first Mining Lease for Marble near Jakura in Kabba Province. The lease will provide marble to be polished and made into decorative tiles for building and furniture in Nigeria and for export. It is hoped that there will be demand for the marble in other major industries.
- (ii) The Cement Company of Northern Nigeria were during the year following the exploration of the Kalambaina Limestone deposits in Sokoto Province granted a mining lease for limestone, clay and gravel for their cement industry.
- (iii) The Nigerian Minerals Development Company Limited was granted an Exclusive Prospecting Licence in Damaturu Division of the Bornu Province to enable them prospect for Diatomite. This economic non-metalliferous mineral as an absorbent, polishing powder, filtering medium and particularly as an insulator for high temperatures will play an indispensable role in many new industries. It is also used in the cement industry, in glazes and pigments. This Company was also granted permission under Section 8(2) of the Minerals Act to erect beacons in the Gombe - Ashaka area for the purpose of prospecting for limestone. The area was closed to prospecting under Legal Notice No. 56 of 1958. The Limestone if proved suitable will be needed for tin Smelting in Jos.
- (iv) The United Tin Areas of Nigeria Limited intensified their exploration of the mineral reserves of the "Odegi" and "Jantar" albite granites in Odegi, Benue Province. Messrs Mackay and Schnellman consultant Geologists were employed on the economic geological study of the area.

- (v) (a) The new 480-W, Bucyrus-Eric of Milwaukee U.S.A. (Special) walking dragline of the Amalgamated Tin Mines of Nigeria Limited on the Gona Valley scheme went into full operation during the year. It is estimated that the ore reserve of the valley is about 6,000 tons of Cassiterite and 1,500 tons of Columbite. Depth of ground in places is over 100 feet and to cope with this the boom is 45 feet longer than that normally fitted to this type of machine. A 7 cubic yard capacity bucket is used. The power supply is at 3300-V Alternating Current. An 800 H.P. main motor drives a generating set which produces direct current at 3230 Volts only to the main motors.
- (b) Also during the year the first stage of river diversion in their 15 years Ladi Valley Scheme was completed. The scheme involves a number of mining leases and consists of diverting the Kassa River and removing overburden to a depth of up to 100 feet to uncover about 20,000,000 cubic yards of wash.
- (c) As a further step in the improvement of mineral dressing and recovery, a new semi-portable jig plant was brought into operation on Mining Lease 8838 near Bukuru. The plant is fed by a 10 inch Gravel Pump and consists of a vibrating screen, two sand settling cones, 2-two cell primary jigs in parallel and 2-two cell cleaning jigs in parallel. A feature of the plant is the elimination of hydrocyclones and the use of settling cones. The plant has been made as thief-proof as possible. Automatic samplers sample the feed and tailings.

Accidents :

In his address to the Nigerian Chamber of Mines on 18th March, 1963, the Honourable Minister of Mines and Power, Alhaji Yusuf Maitama Sule, M.P., implored the members to co-operate with his Inspectors of Mines, who are charged with an intensive coverage of the Minesfield so as to discover unsafe matters and take steps to remedy them. He further appealed to them to organise within the industry a campaign for accident prevention. This was followed up by the Mines Division Staff. All deep workings and machinery employed were regularly inspected and requirements of the Safe Mining Regulations were strictly enforced. Thirty-one Safety Orders were issued to remedy unsafe and dangerous mining practices. Fatal accidents were consequently reduced from 17 in 1962/63 to 11 in the current year. Of the Eleven, seven were due to falls of ground, one to electricity and three to miscellaneous causes, as compared with 10 due to falls of ground, one to explosives and five to miscellaneous causes in 1962/63.

Overseas Visitors :

A party of ten United Kingdom Educationists led by one Mr Bridges accompanied by Mr. Afolayan of the Ministry of Education, Zaria, visited the minesfield and the Makeri Smelters on 26th August, 1963. At Delimi Gold and Base Metal Mines of Nigeria Limited, the party saw a hydraulic monitor at work and at Makeri they were conducted round the works. Another important visitor was Dr. R. A. Mackay of Messrs Mackay and Schnellman, Consultant Geologists. He showed interest in Basalt deposits. He was on his way to Odegi where they were working on Odegi granites.

Note : The North-Eastern Inspectorate at the material time covered the entire area of Northern Nigeria.

APPENDIX R. 2

Mines Division Technical School, by J. A. Ndulue, M.S. (Mineral Dressing), M.S. (Mineral Dressing Engineering) B.S. (Mineral Dressing Engineering and Metallurgical Engineering)

The School continued its functions during the year with a staff which consisted of a Principal, two ore Dressers, one Chemist and one Instructor.

Training :

- (a) *Diploma Course*: The two year course for the Nigerian Diploma continued to be offered to members of the Public who wished to take up careers as sub-professional technical men in the alluvial mining field in the country. In September, 1963, a new intake of 14 students was admitted to the First Year of the course. Nine public students who were successful at the end of the 1962/63 First Year Session of the course in June, 1963 were also admitted to do the Second Year Course in September of the same year. Nearly 50% of the student body were on full scholarships awarded them by the Nigerian Chamber of Mines, Mining Companies and individual mine operators on the Plateau.
- (b) *Diploma in Alluvial Mining Practice* : Seven students of the School who satisfactorily completed the prescribed courses for the Diploma in Alluvial Mining Practice in July, 1963 at the end of the 1962/63 Session were presented with this Diploma at a ceremony on the 13th July, 1963, by the Honourable Alhaji Ahmadu Fatika, Parliamentary Secretary to the Minister of Mines and Power.
- (c) *Assistant Technical Officers' Course* : Three members of the junior technical staff of the Mines Division were admitted to the Second Year of this Course in September, 1963.
- (d) *Sub-Inspectors' Course* : Five Sub-Inspectors employed by the Mines Division attended the 13 weeks Sub-Inspectors First Year Course between September and December, 1963, and two Sub-Inspectors attended the 13 weeks Second Year Sub-Inspectors Course between January and April, 1964, under the Mines Division junior technical staff training scheme.
- (e) *Evening Classes for Minesfield Workers* : The first evening classes for Minesfield workers was organised in the School during the year. The aim of the evening classes was to afford members of the public who are already engaged in the minesfield an opportunity to improve their knowledge of the work in which they are engaged and also to improve the general technical standards of these workers in the field. The courses offered in these classes were Alluvial Mining Practice, Alluvial Prospecting and Valuation, Mining Law, Mineral Dressing, and Surveying. During the year under review, the following records give figures of candidate registration in these classes.

Session	Dates	Alluvial Practice	Alluvial Prospecting and Valuation	Mining Law	Mineral Dressing	Surveying	Mineralogy
First ...	16/4/63 22/6/63	29	37	27	14	27	—
Second ...	7/10/63 14/12/63	18	14	18	10	9	—
Third ...	15/1/64 14/3/64	—	—	—	—	—	7
Totals ...	—	47	51	45	24	36	7

- (f) *First Aid Course* : A full time first aid course was organised for the first time at the School between July and August, 1963, for the Mines School students and members of the mining community. The aim of the course was to improve the general standards of First Aid Practice in the Minesfield. Thirty-three candidates took the course which was lectured by Mr R. F. Christie, organiser of the St. John's Ambulance Association in Nigeria. In January, 1964, Mr Christie returned to give further lectures to ten Potential Lay Lecturers in First Aid who earned outstanding merit in the first course. By this arrangement, it was hoped to have at all times in the Minesfield a cadre of men who are qualified to lecture in First Aid.
- (g) *Minesfield Supervision Post Tests* : During the year, the following tests which were aimed at assessing the suitability of individuals for appointment in mining supervision under various sections of the government's Mineral Act were conducted by the Principal (Training and Research).

Name of Test	Number Tested	Number Recommended for approval
Competence for Section 36 Manager	10	6
Competence for Manager under safe Mining Regulation 134	20	11
Prospecting Right	14	4

- (h) *General* : During the year a number of specialists in the field of mining and industry were invited to the School to give talks to Final Year Students on subjects of their speciality. Among those who lectured and the subjects of their lecture were :

Mr J. L. Farrington	— of Amalgamated Tin Mines of Nigeria Limited, on "Mine Organisation and Management".
Miss E. Tullock	— of General Hospital, Jos, on "First Aid Treatment to an Injured Worker".
Mr W. S. A. Baker	— of Amalgamated Tin Mines of Nigeria Limited, on "Business and Professional Ethics in Mining".
Mr M. O. Feyde	— of Ministry of Mines and Power on "Petroleum Industry in Nigeria".
Mr E. K. Furze	— of Amalgamated Tin Mines of Nigeria Limited, on "Commercial Ore Dressing Practice on the Plateau".
Mr G. Griffin	— of the Nigerian Chamber of Mines, on "Safety and Safety Programme in the Mining Industry".
Mr A. E. H. Johnson	— of the Amalgamated Tin Mines of Nigeria Limited, on "A Mining Company's Repair Workshop Practice".
Mr J. A. Meehan	— of Amalgamated Tin Mines of Nigeria Limited, on "Geology of the Nigerian Tinfields and Mineral Associations".

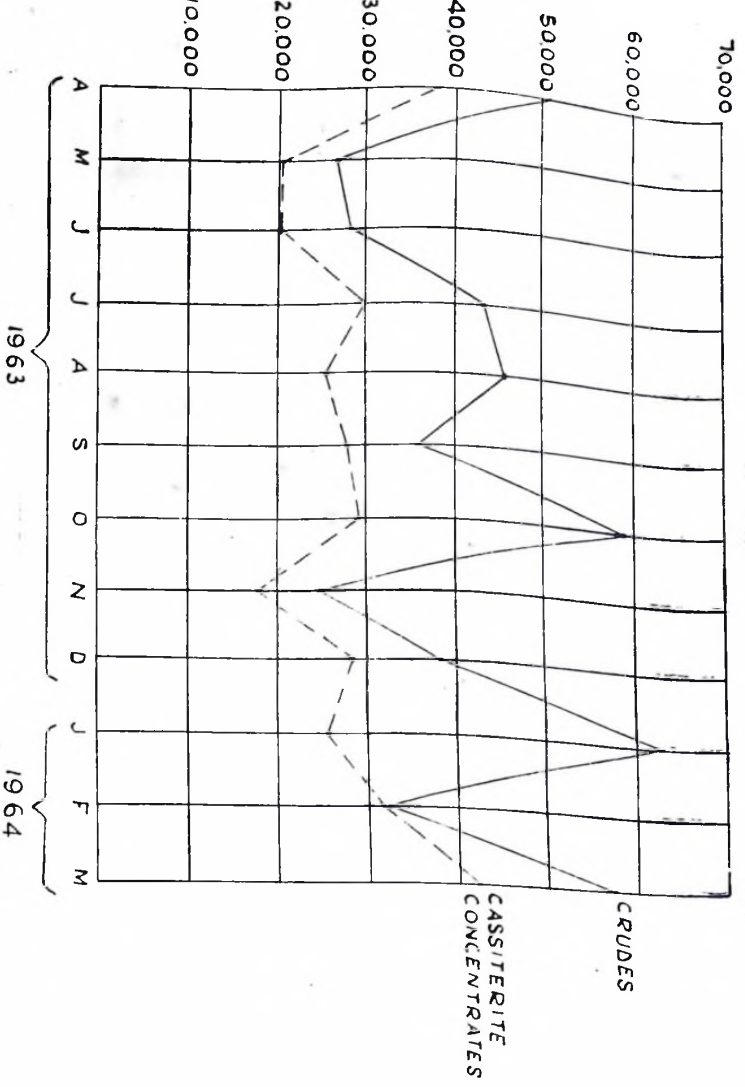
ORE DRESSING SERVICE

- (a) *Custom Ore Dressing Plant* : This plant completed its full fifth year of service to the Mining Community at the end of the period under review. A summary of the activities in this plant during the year is given below. For comparison, the statistics for the previous year 1962/63 are also shown :—

	1962/63	1963/64
(i) Number of Consignors Patronising the Mill :	31	39
(ii) Total Weight of Crude Minerals Received :	228.16 tons	228.96 tons
(iii) Total weight of Concentrates produced :		
(a) Cassiterite	160.72 tons	153.93 tons
(b) Columbite	9.03 tons	7.95 tons
(c) Tantalite	3.21 tons	2.75 tons
(d) Wolframite	0.14 tons	—
(iv) Revenue obtained	£900 - 18s - 9d	£1,009 - 11s - 1d
(v) Time spent on Custom Milling (Machine hours)	2,838	2,923
(vi) Electric Power used in Milling : ...	7,750 Kwh	6,524 Kwh
(vii) Number of Consignments Received : ...	680	877
(viii) Operating Costs :		
(a) Labour (excluding salaried staff) ...	—	£1,548 - 17s - 0d
(b) Services	—	£281 - 2s - 6d
(ix) Government Confiscated Mineral Received :		
(a) Cassiterite	0.20 ton	0.68 ton
(b) Columbite	—	0.061 ton

No radical additions or alterations were made in this plant during the year, and the service offered to small mine operators appears to satisfy them. A comparison of the 1963/64 year's figures with the figures for the previous year as shown above would suggest that the volume of work which the mill handles may not increase materially during the coming 1964/65 year. The monthly figures for the 1963/64 receipts of crude mineral consignments and the production of cassiterite concentrates in the ore dressing plant are shown in the graph below. The very considerable fluctuations in this graph are attributable to variations in mining conditions e.g. the changes from dry season to wet season, labour shortages at sowing and harvesting seasons, etc.

Weight of Mineral (lbs)



GRAPH SHOWING MONTHLY FIGURES OF MINERAL
 CONSIGNMENTS DELIVERED TO MINES SCHOOL
 CUSTOM MILL 1963/64

- (b) *Ore Dressing Advisory Service* : During the year, three problems of interest were investigated, namely :
- (i) One of the larger mining companies consigned a quantity of cassiterite/columbite/ilmenite/magnetite middling in which these minerals appear to form an endless series of inter-growths and therefore very difficult to separate by conventional processes. The treatment was undertaken at the School on an investigational basis and the method of treatment evolved proved successful. A report on this work was issued to the company.
 - (ii) One of the private operators brought up a middling problem similar to (i) above and investigation on this is still continuing.
 - (iii) The operator of Kigom Molybdenite deposit sought advice on the treatment and plant layout for dressing the mineral at Kigom. Investigations on the grinding and flotation of this ore were carried out in the School laboratory and in the existing company plant at Kigom, and further a complete survey and report on how to modernise the existing plant layout and flowsheet was issued to the operator.
- It is hoped the ore dressing research and advisory service available at the School would be expanded during the coming year.

THE LABORATORIES

- (a) Towards the middle of the year under review, the School started a chemical assay service dealing with metals and minerals produced in Nigeria for the benefit of the mining community. For this purpose, £1,500 worth of chemicals and smaller laboratory equipments were ordered although much of these were not received until after the end of the year.
- (b) The Spekker analytical instrument was commissioned for the assay of such minerals as columbite, tantalite, manganese, and titanium.
- (c) The following chemical assays were made in the laboratory during the year :
 - (i) For Mine Operators :
 - 6 Assays for tin
 - 8 Assays for Lead
 - 6 Assays for Zinc
 - 1 Assay each for iron, gold and copper.
 - (ii) For the Mines Division :
 - 1 Assay each for tin, Columbite/tantalite, and limestone.
- (d) The following samples were tendered in the Laboratory for physical tests and identifications :
 - (i) For the Mine Operators :
 - 14 physical assays for cassiterite
 - 1 sample each of haematite, scheelite, bismuthinite and jewelry.
 - (ii) For the Department of Antiquities :
 - 2 Antique pieces of brass
 - (iii) For the Nigeria Police :
 - 1 Weighing of Indian Hemp
 - 1 Gold identification sample
 - (iv) For the Mines Division :
 - 1 Raw gold smelting from which 584.08 grams of gold was recovered.

Overseas Visit : In May and June, 1963, the Principal (Training and Research), Mr J. A. Ndulue, attended a Conference of Co-ordinators of the Commonwealth Committee on Mineral Processing and also the 6th International Mineral Processing Congress in Cannes, France. At the end of the Conference and Congress he visited important mineral processing plants in Italy.

Visitors to the School :

- (a) The Federal Training Officer, Mr R. G. Kendall visited the School in December, 1963.
- (b) The Permanent Secretary of the Ministry of Mines and Power, Alhaji Musa Daggash in company of the Deputy Chief Inspector of Mines visited and inspected the School and laboratories in December 1963.

APPENDIX R. 3

EASTERN INSPECTORATE - MINING ACTIVITIES
By G. W. WARNER, N.A.C.M.

COAL

The Nigerian Coal Corporation continued as the sole producer of coal within the Region, gaining their output from four collieries. Total production amounted to 590,505 tons which is 34,483 tons less than the previous year. Demand for coal from customers was strong during the latter half of the year and stocks fell to a low level during the workers annual leave period following a short spell of labour unrest which had affected production. A further restriction on output was the continual inability of the Nigerian Railway Corporation to supply the requisite number of wagons for loading. As a result, to maintain the mines in regular work, large quantities of coal had to be dumped on the ground as stock with the added cost of lifting when required for despatch.

The main method of working at all collieries is by Bord and Pillar following initial development. Experimentalization with single panel longwall retreat faces has continued at one mine, and the system is now established. Face and trunk belt conveyors are in use, coupled with loco main line haulage between the loading point and surface. Further development at this mine provides for future longwall panels as the main feature. The presence of underground water in all sections adds to the working difficulties and makes the atmosphere warm and humid.

Existing and future prospects of the Corporation concerning coal resources, and economic operational efficiency were investigated by Mr J. T. B. Welbourne, Mining Engineering Consultant of Messrs Powel Duffryn Technical Services Limited, England, and Mr Helmut B. P. Langerberg, Industrial Consultant of a West German firm. Separate reports were submitted to Government.

A main feature of the investigation revealed the impossibility of formulating a long term policy for development owing to the low quantity of known reserves of coal and strongly recommended further prospecting and drilling to prove continuation of the seam beyond already proved areas.

While productivity of the Corporation is adequate to meet existing demand there is no reserve to provide for sudden increase from new sources.

LIMESTONE

Quarrying of limestone by the Nigerian Cement Company Limited, Nkalagu, has increased to meet requirement at the factory for cement manufacture. Throughout the year three kilns have been in regular operation while a fourth unit is in the process of assembly and will go into production at the beginning of the next financial year.

Sufficient reserves of uncovered limestone are maintained to provide for two years supply. Lack of adequate supply of Railway wagons caused stocks of cement to build up towards the end of the year, and for the same reason shortage of coal supplies almost caused a closure of manufacture on one occasion.

Extensive prospecting has been carried out by the Company to locate suitable beds of limestone for future reserves. At the time of writing concentrated drilling and trenching is confined to the Odomoke Area where results so far attained indicate a localised bed of good quality stone approximately 100 metres in thickness with very little overburden cover.

IRON ORE

The Enugu Iron Ore bed was further checked for quantity and quality at the request of Government by Mr Hans-Helmut Junge, of Messrs Interconsulting Limited, Zurich. The results of his findings are not yet published but it is thought that his estimates of both quantity and quality are lower than was previously indicated.

LEAD-ZINC

The mines in Abakaliki area remained dormant throughout the year but the Mines Development Syndicate (W.A.) Limited, assigned their lease covering the property to the Nigerian Lead-Zinc Mining Company and there are now signs that mining activities may soon be resumed.

LEAD ORE

"Customary Taking" of lead ore continued in the Ishiagu area with small despatches to Europe. purchased and despatched by a Port Harcourt trader.

SAFETY IN MINING OPERATIONS

Safety was maintained in all mines except at the "Customary Taking" of Lead Ore at Ishiagu where workings were found to be deep and dangerous and a Safety Order was issued to the village heads limiting workings to the depth of 10 feet.

NOTE : Eastern Inspectorate covers the entire area of Eastern Nigeria.

APPENDIX R. 4

WESTERN INSPECTORATE

PROGRESS IN MINING AND EXPLORATION

By D. O. OBIAGO, A.C.S.M., A.M.I.M.M., A.M.I.E.

The fact that the same number of mining leases were worked during the year, as in the previous year, indicated no advancement in the acquisition of new mining land. The extant mining leases were held by 3 private operators and one Public Limited Liability Company. Difficulties had been experienced in searching for new mining lands for Cassiterite and Gold owing to fear of paying exorbitant compensations for cocoa and kola-nut trees in farms scattered all over good virgin grounds. Basically the complaints from private operators is that lack of funds has made it difficult for them to engage in prospecting for new areas, because they will be expected to pay high compensation for economic trees which would unavoidably be cut down during their mining or prospecting. They very much regret that there is no Government assistance to them and even the Local Council Authorities do not help to intervene in their dealings with local farmers.

Around Ewekoro, where limestone is mined for the manufacture of cement, the West African Portland Cement Company have proposed to acquire a 3rd mining lease of 4,967 acres to cover some reserve limestone known as "Area F", but the Company still await the ruling of the Honourable Minister of Lands and Housing regarding what would be the reasonable surface-rent and Compensation to apply on such a mining lease during the period it is not being mined.

SAFETY ORDERS

No Safety Orders were issued during the year. The reason was that there were no unsafe workings, and most of the workings were shallow. Where the workings were deep, they have been so well benched and sloped by the lessees that no danger was ever threatened. In addition, the visits to the workings by Mines Division staff were so regular and frequent that no occasion for unsafe mining existed before the workings were re-visited.

NOTE : Western Inspectorate covers the entire areas of Western and Mid-Western Nigeria.



