REPORT ON THE INVESTIGATION OF IRON ORE DEPOSITS IN MERGUI DISTRICT, IN SHWEGYIN AREA, TOUNGOO DISTRICT, AND IN KYAIKTO AREA, THATON DISTRICT, BURMA

THE IRON ORE SURVEY TEAM OF JAPAN

DISPATCHED BY

OVERSEAS TECHNICAL COOPERATION AGENCY OF JAPAN

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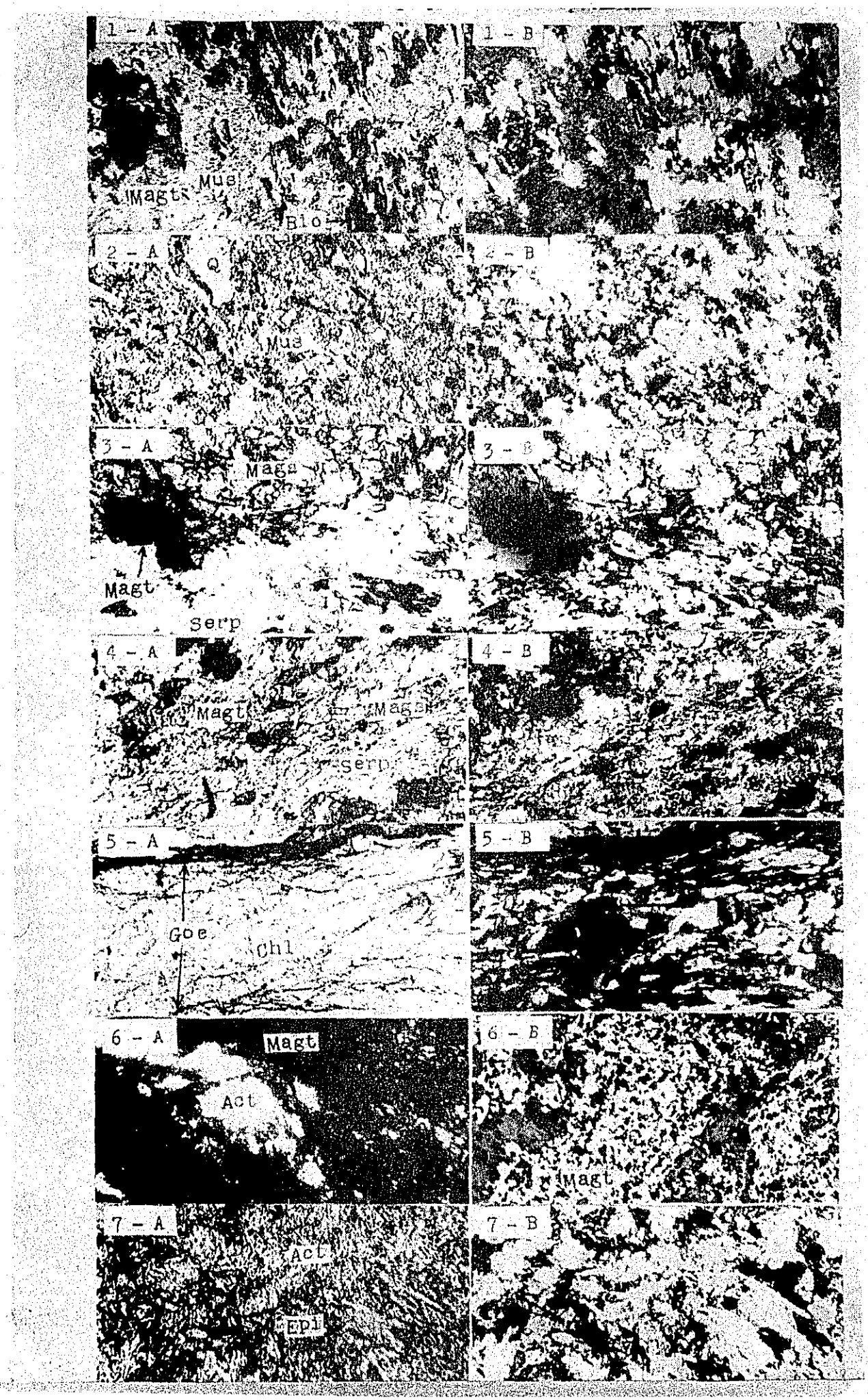

Description of Microscopic Observation

Remarks:

(1) Mark - A is shown by ordinary light, Mark - B, under crossed Nicols.

(2) Each Magnification is 80 except for 6-B.

(3) Abbreviations:

Mus.: Muscovite , Bio.: Biotite

Magt.: Magnetite , Mags.: Magnesite

Serp.: Serpentine, Coe.: Goethite

Chl.: Chlorite , Act.: Actinolite

Epi.: Epidote ,

Fig. 32 - 1

Name of Rock: Biotite - muscovite schist

Locality: Kalagyun Island, Mergui District

Microscopic observation:

Mineral constituents are biotite, muscovite in columnar shape having 80 - 160 μ and quartz. They are arranged in same orientation. Garnet (almandine) is observed in some parts.

Fig. 32 - 2

Name of Rock: Sandstone

Locality: Wadaw Auk, Shwegyin Area

Microscopic observation:

Quartz and muscovite are predominant. A little goethite, opaque mineral and epidote are observed.

Fig. 32 - 3 and 32 - 4

Name of Rock: Schistose Serpentine

Locality: Mayangyaung Chaung, Kyaikto Area, Thaton District

Microscopic observation:

Magnesite and serpentine are predominant.

A little goethite and opaque mineral are observed.

Fig. 32 - 5

Name of Rock: Chlorite Schist

Locality: Kywegaung Auk, Kaikto Area, Thaton District

Microscopic observation:

Chlorite is predominant, Goethite veinlets are observed along schistosity plane.

Fig. 32 - 6 (A --- by ordinary light, B --- polished section)

Name of Rock: Magnetite bearing Actinolite

Locality: Mobaw Auk, Kyaikto Area, Thaton, District.

Microscopic observation:

Actinolite veinlets penetrate magnetite in the shape of network.

Small amount of chalcopyrite is associated with magnetite.

Fig. 32 - 7

Name of Rock: Epidote - actinolite Schist

Locality: Mobaw Auk, Kyaikto Area, Thaton District.

Microscopic observation:

Actinolite and epidote are predominant. Some chlorite and goethite are observed.

I. Preface:

The present investigation was carried out with the cooperation of the Japanese Government upon the request of the Burmese

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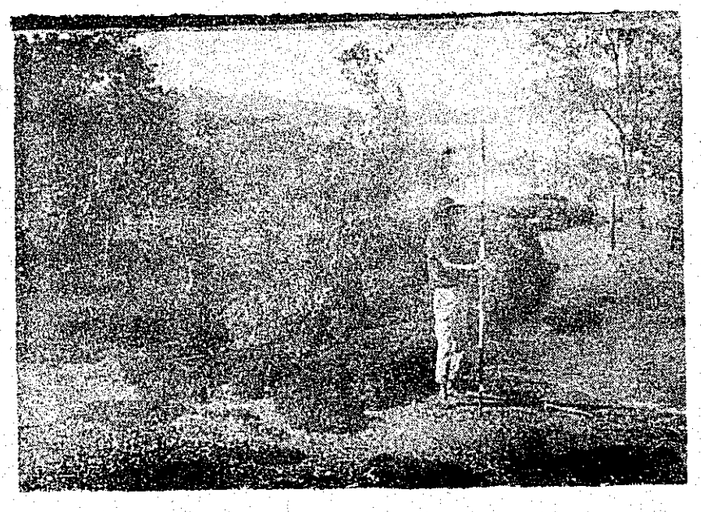

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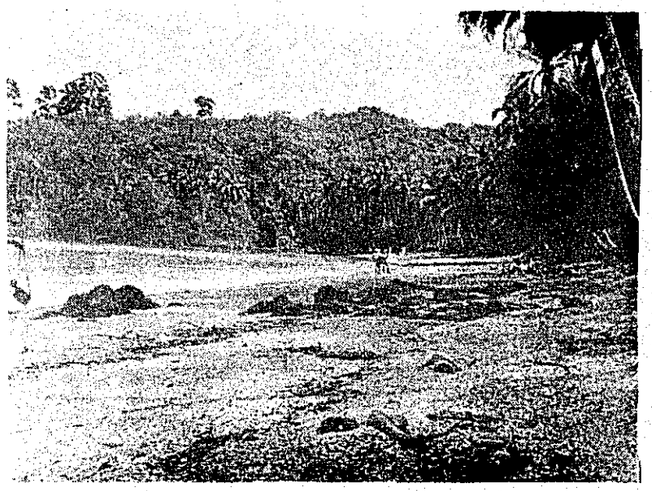
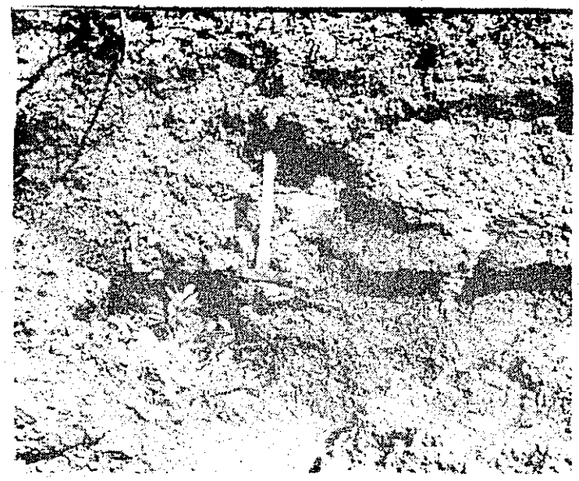


Photo. No.5 No.4 Deposit in in Kalagyun Island

Photo. No. 6 No.4 Deposit in Kalagyun Island



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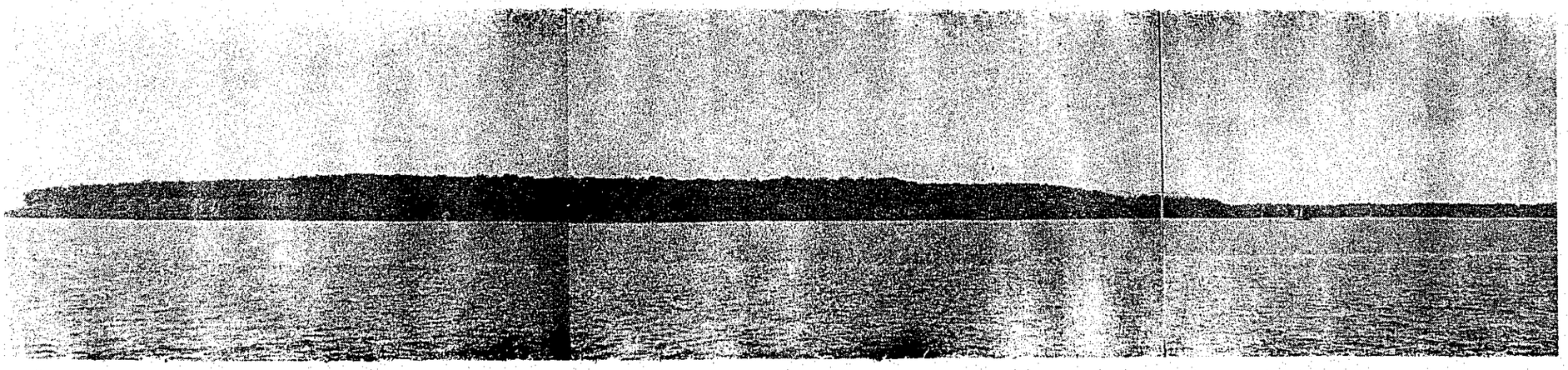

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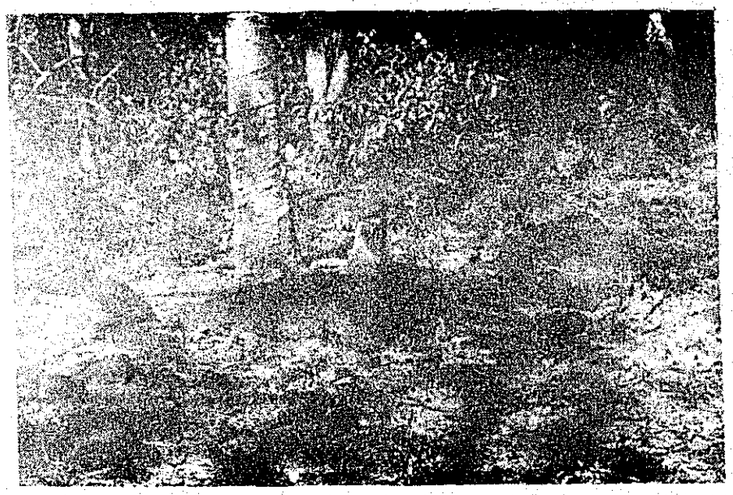

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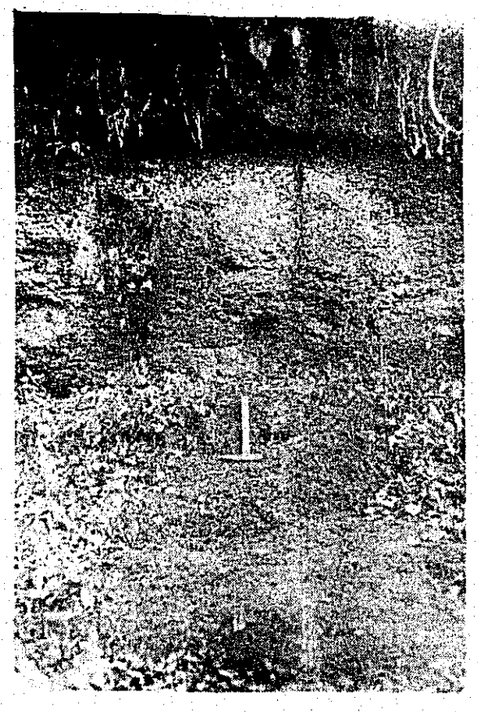

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Fig. 32 - 3 and 32 - 4

Name of Rock: Schistose Serpentine

I. Preface:

The present investigation was carried out with the cooperation of the Japanese Government upon the request of the Burmese Government, with a view to contributing to the future development of the iron and steel industry in Burma.

The survey team was dispatched by the Overseas Technical Cooperation Agency under the commission of the Japanese Government.

The survey of iron ore deposit was made from November 19th to December 26th, 1962 in three districts, i.e., Mergui District, Shwegyin Area, Toungoo District and Kyaikto Area, Thaton District.

The following methods were taken for the survey: Geographical survey with the use of plane table and distance meter; preparation of geological mapping; sampling for analysis; shallow test pitting and geomagnetic survey (measuring of total magnetic intensity with the use of Varian M. 49 type portable magnetometer).

The composition of the survey team is as follows:

Dr. Shigeru NISHIO (leader),
Professor Emeritus, University of Tokyo

Mr. Shunji NAKAJIMA,
Senior Geologist, Nippon Mining Co., Ltd.

Mr. Masayuki ABE,
Geologist, Nippon Mining Co., Ltd.

Mr. Toshiro SHIMADA,
Mining Engineer, Nippon Mining Co., Ltd.

Mr. Nobue SAURA,
Mining Engineer, Nippon Mining Co., Ltd.

Mr. Hiroshi SUZUKI,
Official, Ministry of Foreign Affairs

II Acknowledgements

The writer deeply appreciates the kind assistance and cooperation given by the Burmese Government.

However, special thanks are due to Col. Hla Aung, Director General, PMDC, U Minn Din. Deputy Director-General, PMDC, and U Saw Alaric, Assistant Director-General, PMDC for all necessary arrangements and also to U Khin Maung Nyo, U Maung Maung Khin, Maung Su, Maung Saw Tun and Maung Khin San for their efficient guidance in the fields.

He also wishes to extend his gratitude to the Defense authorities concerned for their kind cooperation in providing escorts, transportation and accommodation.

III Time Schedule of Investigation

Date	Time of Dep.	Time of Arr.	Remarks
19 Nov.	9.20	19.20	Advance Party: From Tokyo to Rangoon
20			Previous arrangements for schedule of investigation with U Saw Alaric (Assistant Director-General of Geological Section, PMDC), Mr. Kaido (Secretary, Embassy of Japan)
21			National Day
22			Courtesy call on Minn Din (Deputy, Director-General of Projects Section, PMDC) Sending instruments for survey to Mergui by boat.
	10.00	17.30	Main Party: From Tokyo to Rangoon.
23			Courtesy call on Dr. Ba Thi (Deputy Director-General of Geological Section, PMDC), U Soe (D.D.G. of Mines and Explosives Section, PMDC) and the Embassy of Japan
24			Courtesy call on Colonel Hla Aung (Director-General, PMDC). Dinner given by Dr. Ba Thi.
25			Sunday
26 Nov.			Study of geological data of Burma
27			Visit to Steel Mill, Ywama and Burma Institute of Technology.
28			Courtesy call on U Maung Maung Gyi (Chief of Economic and Reparation Division, Ministry of Foreign Office) and U Maung Maung (Secretary of Ministry of Defence)
29	8.30	12.00	From Rangoon to Mergui by plane
30	11.40	13.30	From Mergui Kalagyun Island by boat. Preliminary survey of No. 1 and No. 2 Deposit.
1 Dec.			Survey of No. 1 deposit

2			Survey of No. 2, No. 3 and No. 4 deposits.
	18:00	20:00	From Kalagyun Isl. to Linmalo Isl. by boat.
3	16:00	16:30	Survey of Linmalo Island. From Linmalo Isl. to Ma-aing Isl. by boat.
4	12:30	14:00	Survey of Ma-aing Island. From Ma-aing Isl. to Mergui by boat.
5	13:50	16:45	From Mergui to Rangoon by plane
6			Previous arrangements for next Schedule with U Minn Din, PMDC
7 Dec.			Assembling data
8 "			- do. -
9 "			Sunday
10 "			Preparation for Survey of Shwegyin Area, Toungoo District.
11	7:45 6:00 10:30	9:20 10:20 10:45	Group I: From Rangoon to Nyaunglebin by helicopter. Group II: and Instruments; From Rangoon to Nyaunglebin by car All members, From Nyaunglebin to Minlan-Tanzeik by helicopter. Preliminary survey of Minlan-Tanzeik deposit, Shweguin Area
12 "			Survey of Minlan-Tanzeik deposit Shwegyin Area.
13 "			- do. -
14 "			- do. -
15 "			- do. -
16 "			- do. -
17 "	12:40	13:40	From Minlan-Tanzeik to Rangoon by helicopter
18 "			Preparation for survey of Kyaikto Area, Thaton District.

19 "	7.45	8.50	From Rangoon to Kyaikto by helicopter. Survey of Kyaikto Area
20 "			- do. -
21 "			- do. -
22 Dec.	10.35	11.15	From Kyaikto to Rangoon by helicopter Dinner given by the Ambassador of Japan.
23 "			Assembling data. Reception and Dinner given by U Maung Maung.
24 "			Courtesy call on Brigadier Aung Gyi. Dinner given by the Japanese Iron Ore Survey Team.
25 "			Preparation for return trip to Japan
26 "			Departure from Rangoon.
27 "			Arrival at Tokyo.

IV. Mergui District (Fig. 1, and Fig. 2.)

A. Summary:

We have made a survey on the three islands -- Kalagyun Island, Linmalo Island and Ma-aing Island -- in the sea district which lies west of Mergui, a town some 600 km. to the south of Rangoon.

Although Kalagyun Island is mentioned as Kalagyungyi Island in the Report on Reconnaissance Survey for Iron Ore in Mergui District, October 1962, prepared by U Khim Maung Nyo who made a reconnaissance survey prior to the present survey, we list this island as Kalagyun Island, as is shown in the "1 inch to 4 miles map".

A report on a geological survey made formerly describes that the geological formation of this district consists of quartzite, slate, greywacke and metasediments which belong to Chaung Magyis series of Lower Carboniferous Age, but we found on these islands almost no exposure of rock with the exception of somewhat clayish biotite schist observed in the rock cut out of a well in the Aung Thein Kyn Property situated in the central part of Kalagyun Island.

Distributed along the coast line and on the top and slopes of hills, all the deposits in these three island are lateritic limonite mixed with boulders, several cm. to several m. in diameter and considered to have been formed through lateritization of sedimentary rocks of comparatively higher iron contents.

Ores are yellowish or blackish brown in color, porous, and with low specific gravity. The grade varies from Fe 22% - 59%; as shown on the table 1, 2, 3, 4, 5, 6, 59 samples taken in these islands show Fe 41.15% on the average.

Due to the progress of brecciation and weathering, near the surface the ore has become red lateric soil mixed with limonite pebbles. According to a rough estimation which puts the thickness of the iron ore deposit at 5 m. from the occurrence of outcrops on the coasts and sizes of floats, ore reserves in Kalagyun Island, Linmalo Island and Ma-aing Island are estimated respectively to 360,000 tons, 1,020,000 tons and 180,000 tons, totalling 1,560,000 tons. In addition, in areas still to be surveyed, some reserve can be expected to discover.

B. Geology and Iron Ore Deposit:

1. Kalagyun Island (Figs. 3, 4 and photo. No. 1);

Situated 10 km. to the west of the Town of Mergui and 4 km long from east to west and stretches 3.7 km. southward, this island shows gentle slopes, some 50 m. above the sea at the highest point, and covered almost entirely with rubber plantations.

Four (4) iron ore deposits -- No. 1 - No. 4 deposits -- were observed by the present survey which was carried out mainly on the north-western part of this island.

Iron ore deposits of the same type are expected to be found out in areas not surveyed yet.

No. 1 Deposit (Photos. No. 2 and 3)

In No. 1 deposit, situated some 700 m. north of the Hoteik's property and with a width of about 100 m. running some 300 m. northeast ward, innumerable brown and blackish brown porous laterite boulders, 2 - 3 m. in diameter are scattered on the slopes of a hill.

The No. 1 deposit can be devided into north and south deposits with the size respectively of 25,200 m^2 and 6,000 m^2. A survey made

by sinking shallow pits at four points in the north deposit, did not enable us to determine the thickness of the deposit and variation of Fe % caused by changes in depth. Samples for analysis were taken on the following methods (the same methods were adopted in the survey of areas other than Kalagyun Island).

(i) In areas scattered with boulders, a chip was taken from every boulder picked at random, making one sample from these chips, several to ten and above in number.

(ii) In the case of pits, deposit was divided into massive ore and power ore. In the case of massive ore, the method mentioned in (i) above was adopted and in that of the powder ore, some 1 kg. of the powder ore was taken from the bottom of the pit. Generally speaking, the powder ore is a mixture of limonite pebbles less than 10 mm. in diameter and red lateritic soil.

Data of Pits

Pit No.	Depth (cm)	Remarks	Fe %	
			Boulder	Powder
1	50	Massive ore or 50 - 100 cm. in diameter	43.85	37.95
2	70	Lateritic soil with limonite pebbles of 2 - 5 cm. in diameter	35.03	33.15
3	60	Lateritic soil with limonite pebbles of 1 - 5 cm. in diameter	Nd.	37.92
4	70	Lateritic soil with sub-angular limonite pebbles of 20 cm. in diameter	Nd.	34.82

No. 2 Deposit;

In an area, situated at northwestern end of the island, covering the distance of some 350 m. from the coast to the top of a hill, 47 m. above the sea, there are 3 outcrops. At the top of this hill, we dug No. 5 and No. 6 pits.

Date of Pits

Pit No.	Depth (cm)	Remarks	Fe %	
			Boulder	Powder
5	60	Yellowish brown lateritic soil with limonite pebbles of 1 - 3 cm. in diameter	Nd.	41.30
6	60	- do. -	52.49	34.26

The nature of ore is quite same as ore of No. 1 deposit. Ores are distributed extensively in an area of 5,100 m^2.

No. 3 Deposit;

In an area, about 2,400 m^2 in size and some 500 m. to the east of No. 2 deposit, ranging from the top of a hill, about 40 m. above the sea, to its eastern slope, laterite floats are distributed in groups.

No. 4 Deposit;

There is an outcrop, some 450 long and 10 m. wide and 4,500 m^2. in size, along the coast about 500 m. to the northeast of No. 2 deposit.

Ore is lateritic limonite, often accompanying quartz lens of irregular shape. The surface of this ore is black but brown inside. Most of the numerous boulders that lie on the seashore are massive,

several m. in diameter.

In the southwestern part of No. 4 deposit, conglomeratic limonite, 15 - 30 cm. in diameter, sub-angular limonite and irregular massive quartz are cemented together, an occurrence considered to have been brought about as a result of their secondary movement and sedimentation (Photo. No. 7).

Ore Reserve Rough Estimated:

Basis of Estimation;

Estimated Thickness of Deposit:	Estimated at 5m. taking into consideration the occurrence of outcrop on the coastal area and the size of floats.
Specific Gravity of Ore:	1.9, the average of figures obtained by actually measuring the specific gravity of several pieces of porous ore most extensively distributed.
Estimated Safety Factor:	Estimated at 80%.
Estimated Ratio of Concentration:	Estimated at 70% (Quantity of ore 10 mm. or above in diameter, in unit volume).

Table Showing Estimation of Ore Reserve:

No. of Deposit	Size (m^2.)	Thickness (m.)	Safety Factor %	Specific Gravity	Ratio of Concentration	Ore Reserve (tons)	Grade (Fe %)
No.1	31,200	5	80	1.9	70	259,584	42.36
No.2	5,100	5	80	1.9	70	42,432	40.60
No.3	2,400	5	80	1.9	70	19.968	41.00
No.4	4,500	5	80	1.9	70	37,440	42.50

2. Linmalo Island (Fig. 5 and Photos. No. 8, 9)

Situated some 20 km. to the southwest of the Town of Mergui and stretching maily northeastward, 960m. long and 200m. wide, this island is slender and flat one, 18.8m. above the sea at the highest point, totally covered by well tended rubber plantations.

The deposit of this island is also composed of porous lateritic limonite and consists of an outcrop along the coast and floats scattered almost all over the island.

Therefore it is considered that the extent of the area in which deposit is distributed may be as large as that of this island, i.e. 192,000 m^2. We could not see any rock exposures at all other than lateritic ore which covered with whole area. We dug shallow pits at two places, of which data are shown below:

Data of Pits

Pit No.	Depth (cm)	Remarks	Fe %	
			Boulder	Powder
1	100	Yellowish brown lateritic soil with limonite pebbles of 3 cm. in diameter		27.61
2	50	- do -		28.72

Ore Reserve Rough Estimated

Basis of Estimation: Same as in the case of Kalagyun Island

Table showing Estimation of Ore Reserve

Size (m^2)	Thickness (m)	Safety Factor (%)	Specific Gravity	Ratio of Ore concentration	Ore Reserve (tons)	Grade (Fe %)
192,000	5	80	1.90	70	1,021,000	38.79

3. Ma-aing Island (Fig. 6 and Photo. No. 10)

Situated some 15 km. to the west of Mergui Ma-aing Island is a little round one, 170 m. in diameter and 16 m. above the sea, and contains lateritic limonite along the coast and in its slopes.

The nature and occurrence of ores are same as those of the two islands mentioned above and the extent of area in which ore is distributed is as large as the size of the island, i.e., 22,700 m^2.

Ore Reserve Rough Estimated

Basis of Estimation: Same as the one mentioned above

Table Showing Estimation of Ore Reserve

Size (m^2)	Thickness (m)	Safety Factor (%)	Specific Gravity	Ratio of Concentration (%)	Ore Reserve (tons)	Grade (Fe %)
22,700	5	80	1.9	70	188,864	38.80

C. Magnetic Prospecting (Figs. 7, 8, 9, 10)

On each of the three islands mentioned above, the total intensity of

earth magnetic field was measured at intervals of 20 m. along the profile lines drawn in making topographyical surveys and within the areas of main deposits.

For this purpose, Varian M-49 type portable magnetometer was used.

As is shown in the table below, changes in value are extremely small. Therefore existence of magnetic bodies can not be inferred, as is expected from the results of the geological surveys.

	Normal field value (γ)	Maximum value (γ)	Minimum value (γ)
Kalagyun Isl.	41,400	41,480	41,380
Limalo Isl.	41,500		
Ma-aing Isl.	41,540	41,600	41,500

V. Shwegyin Area, Tonngoo District

A. Summary

The distribution of lateritic iron ores was confirmed in an area, with the village of Minlan-Tanzeik at its center, 4 km. east to west and 9 km. south to north in size.

Most of the ores are porous lateritic limonite, yellowish brown, reddish brown or blackish brown in color but some of them massive, or pisolitic in shape or mixed with magnetite or hematite pebbles.

Fe % is shown at 20 - 50%, on the table 6, with Fe % of 127 samples taken for analysis showing 33.3% on the average. Judging from the height of a cliff showing outcrop, the thickness of deposit can be estimated at some 5 - 10 m. On the basis of a rough estimation putting the thickness at 5 m., ore reserve amounts to about 120,000,000 tons.

B. Geology and Ore Deposit (Fig. 11)

A survey was carried out all over an area, with the village of Minlan-Tanzeik at its center, some 9 km. south to north and about 4 km. east to west in size.

Shwegyin is a town some 150 km., straight, to the north of Rangoon. One can reach there by ferry across the River Sittang from Madauk, the terminal of a branch line, of Rangoon - Mandalay Railway, branching off at Nyaunglebin Station.

According to the data available prior to the present survey, the geological formation of this area consists of crystalline rock of unknown age, but in an area covered by the present survey, we could not find any rock exposures except exposures of light grey sandstone (Fig. 32-2)

observed along the creek Tat 4 km. to the east of the village of Minlan-Tanzeik and floats of igneous rock found near the River Zepyu, 2.5 km to the north of this village.

This area consists of rolling hills, some 200 - 250 m. above the sea, and is covered almost entirely by jungle. A survey was carried out on a number of roads cutting through this area and on "Laha" (a Burmese word for grass field) scattering across the area. From the occurrence, it seems that lateritic iron ore are distributed in all the area surveyed, i.e., an area, 23 km^2 in size, eastside of a drive-way that goes up north from Shwegyin through the Village of Minlan-Tanzeik.

Because the "Lahas" become swamps or flooded with creeks during the rainy season. They have a better tendency in showing exposures of ore deposits. (Photos. Nos. 11, 12, 13, 14)

Most of the ores are porous lateritic limonite, yellowish or blackish brown in color. Along with this kind of ore, we saw massive laterite, pisolitic laterite, laterite mixed with magnetite and hematite, lateritic soil with limonite pebbles and lateritic soil. The thickness of deposit could not be determined but from the cliffs, in the vicinity of stations 137, 159, etc., exposing ores, it may be estimated at several - 10 m. The various kind of ores may be classified into the following types according to their external characteristics.

Porous laterite

Porous limonite, yellowish to blackish brown in color, account for most of the ores.

A typical outcrop was seen on the side of a cliff, more than 5 m. high, in the vicinity of station 159. As is shown in the table below,

no sizable change was discerned in Fe % due to changes in depth. (Photo No. 15)

Sample No.	Depth from surface (m.)	Fe %
152	1.50	28.71
153	3.00	28.27
154	4.00	28.08

Comparatively higher grade ores, with Fe 40 % or above, were discovered in some part of Kyauk Pon Laha (Fig. 16), Kaing Laha (Fig. 14) and Kyauk Tan Laha (Fig. 18). Because of the presence of an old open pit working, we saw at Kyauk-O-O Laha (Fig. 15), it could be assumed that higher grade ores existed in old days. Samples of ore taken at Inbet Laha (Fig. 17), Myauk Kya Laha (Fig. 12), Pan-in Kywegyun Laha (Fig. 13) and most of the sampling points on the survey route proved to be of low grade, less than Fe 40 %.

Massive laterite

The grade of ore varies from Fe 35 to 44%. Massive laterite was seen between stations 320 and 335, near the stream Zayt (in the vicinity of station 342), near station 292, near station 336, near station 370 and in some part of Kyuak Tan Laha. Massive laterite in this area is black or blackish brown in color, and relatively compact. Its specific gravity is also relatively high.

Pisolitic laterite

Pisolitic laterite of this area is massive ore formed by cementation of laterite pebbles, several mm. - 1 cm. in diameter and resembling peas in shape. The distribution of this ore is localized to certain areas of Kyauk Pon Laha. The grade of ore is Fe 53.91%.

Laterite mixed with magnetite and hematite

The distribution of this type of ore is also comparatively limited. It can be seen at Kaing Laha and at a part of Kyauk Pon Laha.

Both magnetite and hematite are roundish, 5 - 30 cm in diameter, show Fe 44.54 %.

Lateritic Soil with limonite pebbles

This type of ore is distributed from station 12 to Kaing Laha and between stations 335 and 340.

This ore is composed of the red soil in which conglomeratic limonite of 2 cm. in diameter is formed. It is of low grade, showing Fe 20 - 33 %.

This ore, resulting from brecciation and weathering of laterite, is considered an intermediate product of laterite also before its transformation, at the next stage, into lateritic soil.

Lateritic Soil

The red sand, resulting from, brecciation and weathering, of the laterite can be distinguished from lateritic soil with limonite pebbles by the almost complete absence of limonite pebbles contained and from

alluvial soil by the degree of redness.

Ore Reserve Rough Estimated

Basis of Estimation

Estimated thickness of deposit: 5 m.

Specific Gravity of Ore: 1.9

Estimated Safety Factor: 80 %

Estimated Ratio of Concentration: 70 %

(Quantity of ore more than 10 mm.

in diameter contained in unit volume)

Table Showing Estimation of Ore Reserve

Size (m^2)	Thickness (m.)	Safety Factor (%)	Gravity	Ratio of Concentration (%)	Ore Reserve (tons)	Grade (Fe %)
23,000,000	5	80	1.90	70	122,360,000	33.30

C. Magnetic Prospecting:

Basing Pagoda, Minlan-Tanzeik as the base point, total intensity of earth magnetic field was measured on the roads and "Laha" alongside the roads at intervals of 20 m.

Fig. 19 shows the results of a survey made in this area.

A - B Profile Line:

Total intensity between STA-1 and STA-32, shows a normal field value of 43,300 γ or thereabouts.

As is shown by the magnetic profile listed on Fig. 23, no magnetic anomaly was observed at Kyauk-O-O Laha, despite the presence of an old open-pit mining site.

A weak anomaly was descerned between STA-38 and STA-40. This weak anomaly is strictly confined to a very limited area and probably may have been caused by the presence of magnetite floats.

At Kaing Laha, between STA-52 and STA-60, an anomaly covering a wider range was observed, the most conspicuous of which was observed within Minlan-Tanzeik deposit. At some points in the vicinity of STA-58, measurement was impossible because of high magnetic gradients.

The discovery of floats within the "Lahas" induced us to plan detailed investigation of the surrounding areas but this was not carried out due to a sudden change in our schedule.

Since, with only the data of a single profile line available, an accurate distribution of magnetic anomaly cannot be determined, for the purpose of correct determination. However, judging from high local magnetic gradients and extreme variation in total intensity, the

magnetic anomaly found here is inferred to have been strongly affected by magnetite floats scattered near the surface of earth.

A - C Profile Line:

A strong magnetic anomaly was observed between STA-355 and STA-364 to the west of Kyauk Pon Laha. Since the results of a survey made at intervals of 5 m. and 10 m. in an area showing high magnetic gradients revealed indications of locally violent and irregular changes in magnetic anomaly, it can be presumed that this anomaly is caused by the boulders of iron ore. A weak anomaly was observed in the vicinity of STA-6 and STA-7 situated in Kyauk Pon Laha, presumed to be the continuation of the anomaly zone mentioned above. (Fig. 24)

D - 4 Profile Line:

At a somewhat higher elevation on the middle part of a profile line to Myauk Kya Laha via Pan-in Kywegyan Laha, a weak anomaly presumably caused by base rock was observed. Each of the said two Laha showed a normal field value. (Fig. 20, 21)

F - G Profile Line:

In the case of a profile line that runs along a road to the north of the starting point, a magnetic anomaly was observed between STA-120 and STA - 140. This anomaly registered 42,600γ , a value lower than normal field value of 43,300 γ, while values of some 43,200γ and 43,400 γ were registered respectively in the north and the south.. The same tendency was noted over a profile line to Gon-Nyin Dan Laha via STA - 120 to STA - 131. This anomaly is considered to have been caused by the made of occurrence and differing nature of the wide spread base rock.

G - H Profile Line:

This profile line runs along the road which lies to the south of the starting point. No notable magnetic anomaly is visible over this line. At each of Inbet Laha and Kyauk Tan Laha no field value other than normal was registered. (Fig. 25, 26)

VI. Kyaikto Area, Thaton District:

A. Summary (Fig. 27)

A survey was made on an area at a westside foot of the Kyaikto Mountain Range, some 50 km. to the northeast of the Town of Kyaikto.

At two places in the vicinity of Kwegaung, on the northern part of the area surveyed, float zones of magnetite and limonite were observed.

All the magnetite found here show Fe 60% or above. Due, however, to dense jungles, it was impossible to trase the origin of floats.

In the vicinity of Mobaw Auk, a southern part of the area, a magnetite outcrop of lenticular shape, 2.5 m. in thickness, was observed in green metamorphic rock. From the green schist and scattering floats of green rock and granitic rock observed in many places of this area, it is probable that there exist a number of lenticular deposits occurring in the neighborhood of the contact zone of these two rocks.

B. Geology and Ore Deposit;

a) Floats area near Kywegaung Auk (Fig. 28)

Situated on the western foot of the Kyaikto Mountain Range at about 500 m. above the sea and eroded by river to be somewhat advanced stage, this area belongs to a younger topography, so that there are comparatively many exposures of rock.

Magnetite and lateritic limonite floats, several cm. in diameter of the size of a humanhead, are scattered upstream of Mayangyaung Chaung and on the slopes of a mountain to the west of Kywegaung Auk.

Showing Fe 60% or above, magnetite floats in this area are fairly good in quality but because of their sparce distribution they are not economically workable.

Limonite occurs on larger quantities than magnetite, but is porous and mixed with fragments of quartz and country rock, The grade is Fe % (FE 14 - 30%), as shown on the table 8.

b) Outcrop at Mobaw Auk (Fig. 29 and Photo. No. 16)

This outcrop is situated some 4 km. to the south of Kywegaung and in the vicinity of the confluence of Kadaingdut Chaung and Mobaw Chaung.

The deposit is composed of magnetite, in the shape of irregular lens, accompanying veinlets bearing traces of chalcapyrite and pyrite. In some part of the deposit shows Fe 50 - 60%, as is described in Fig. 29, but the average grade for a thickness of 2.5 m. is Fe 46.97%.

The strike of the lens shows N 80°W with a sharp dip but we could not trace its continuity due to dense jungle in the case of northside and to a river in the southside. As is described later, the result of magnetic prospecting could not enable us to confirm the continuity in the north.

C. Magnetic Prospecting

a) Floats area near Kywegaung Auk (Fig. 30)

It was continuously observed that total magnetic intensity starts to change sharply in the neighborhood of STA. - 17, where magnetic floats are visible on the upstream of Mayangyaung, and that a conspicuous magnetic anomaly continues to the last point of a profile line of STA. - 30.

For the purpose of examining the anomaly zone, an observation of magnetic gradients was made at two points in STA. - 17 and STA. - 24,

where many magnetite floats are visible, by raising the height of the sensing head of magneto-meter.

The result of this observation revealed that, as is described in the table below, a value near normal for this area was registered at both points some 5 m. above the ground.

	Height above Ground		
	1 m	2 m	5 m
STA. - 17	40,900 γ	———	42,200 γ
STA. - 24	43,340 γ	44,310γ	42,580 γ

From the fact that magnetic intensity changes inversely with cubic distance, the anomaly near the above mentioned two points is considered to have been caused by a magnetic body distributed locally on or near the surface of earth, and also at shallow depth of the overburden --- namely magnetite floats. Consequently, it is presumed that no primary magnetic deposit exisist below the layer of overburden.

Since, a detailed investigation for determining the anomaly zone beyond STA. - 26, was not carried out, a definite conclusion can not be reached. However, it was presumed that this magnetic anomaly is caused by base rock, basing upon the fact that a measurement made on the magnetic susceptibility of chlorite schist and massive green rock taken at STA. - 29 and STA. - 30 registered respectively 400×10^{-6} and 530×11^{-6} and that the observation was made on the outcrop of

rock at the bottom of a valley and that the residual magnetism of the said specimen is higher than that of specimen taken from other places.

With the exception of a magnetic anomaly observed between STA. - 55 and STA. - 60, an area where magnetite floats can be seen, no notable anomaly was observed in the floats area to the west of Kywegaung Auk.

b) Mobaw Auk Outcrop (Fig. 31)

A survey was made northside of this outcrop alone. In the vicinity of STA. - 2, which lies on the extension of this outcrop, a weak anomaly, 400 γ less than the normal value of 43,300 γ in this area was observed. A high anomaly can be observed from the neighborhood of STA. - 14. A magnetic anomaly in the vicinity of this outcrop is too small in scope to make it possible to presume the continuity northward of anomaly.

VII *Conclusion and Recommendation*

It was made clear that, in Mergui District and Shwegyin Area, iron ore deposits are distributed in large occurrence over wide areas. However, it is the superficial distribution alone that was revealed by the present survey ----- depth of the deposit is still unknown. Therefore, in order to confirm ore reserves, it is necessary, further, to prospect by pitting or diamond drilling.

Open pit mining can be carried out in both areas. However, in view of the fact that the area is mostly low grade laterite, and the difficulties involved from the technical standpoint as well as the economies in treating such material under present conditions, it would be desirable to plan the development of these ore deposits after conducting further careful studies regarding these phases, confirmed the existence of outcrops of magnetite and floats in Kyaikto Area, it is necessary to confirm the extension of outcrop and the origin of floats before taking up the question of the development of ore deposit.

Table 1. Assay Values of No. 1 Deposit in Kalagyun Island, Mergui District

Sample No.	Fe	Ni	Cr	Co	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	H_2O^+	H_2O^-	Remarks
2	46.26																	Blackish brown, porous
14	47.80																	Brown, porous
Mix.	47.12	0.01	–0.01	–0.01	0.601	0.07	0.01	–0.01	–0.01	10.15	0.14	8.60	67.03	0.31	0.29	10.26	1.70	Mixture of 2, 14
4	46.88	–0.01	–0.01	–0.01	0.325	0.07	–0.01	0.01	–0.01	11.59	0.04	8.52	66.34	0.62	0.34	9.84	1.27	Brown, porous
5	52.96																	Blackish brown, porous
13	48.31																	Yellowish brown, porous
20	42.53																	Reddish brown, porous
Mix.	47.62	–0.01	–0.01	–0.01	0.220	0.07	–0.01	–0.01	–0.01	10.08	0.13	8.60	67.74	0.31	0.39	10.52	1.54	Mixture of 5, 13, 20
6	51.26																	Blackish brown, porous
8	46.08																	Reddish brown, porous
Mix.	48.48	0.01	–0.01	–0.01	0.180	0.07	–0.01	–0.01	–0.01	10.69	0.34	6.03	68.97	0.31	0.25	10.12	1.05	Mixture of 6, 8
9	43.85	0.01	0.01	–0.01	0.208	0.09	–0.01	–0.01	–0.01	10.78	0.35	11.15	62.35	0.31	0.41	11.70	1.50	Yellowish brown (Pit-1)
11	37.95	–0.01	0.03	–0.01	0.139	0.07	0.02	0.01	–0.01	18.66	0.09	14.32	53.58	0.62	0.55	11.02	1.67	Lateritic soil with limonite pebble (Pit-1)
15	37.92	–0.01	0.02	–0.01	0.092	0.07	–0.01	–0.01	–0.01	18.30	0.09	15.17	53.54	0.62	0.66	10.08	1.58	– do. – (Pit-3)
16	45.49	0.01	–0.01	–0.01	0.356	0.06	–0.01	–0.01	–0.01	11.59	0.14	6.71	64.70	0.31	0.30	10.22	1.08	Brown
17	34.84	–0.01	–0.02	–0.01	0.047	0.09	–0.01	–0.01	–0.01	18.35	0.13	15.14	49.13	0.62	0.68	11.10	1.62	Lateritic soil with limonite pebble (Pit-4)
18	33.15	–0.01	0.03	–0.01	0.107	0.09	–0.01	–0.01	–0.01	19.00	0.10	16.77	46.71	0.62	0.75	13.52	1.79	– do. – (Pit-2)
19	35.03	–0.01	–0.01	–0.01	0.010	0.11	–0.01	0.02	–0.01	13.21	0.08	18.90	49.74	0.31	0.64	12.04	1.57	Red (Pit-2)
Average	43.36																	

Table 2 Assay Values of No. 2 Deposit in Kalagyun Island, Mergui District

Sample No.	Fe	Ni	Cr	Co	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	$+H_2O$	$-H_2O$	Remarks
23	46.11																	Yellowish brown, porous
24	41.36																	- do. -
Mix.	44.08	-0.01	-0.01	-0.01	0.026	0.08	-0.01	-0.01	-0.01	19.41	0.09	6.18	6.268	0.31	0.32	8.74	0.82	Mixture of 23.24
22	49.60																	Reddish brown, porous
25	52.49																	Brown porous (Pit-6)
Mix.	51.19	0.01	-0.01	-0.01	0.302	0.08	-0.01	-0.01	-0.01	5.96	0.26	6.59	7.285	0.31	0.29	9.86	1.52	Mixture of 22.25
26	34.26	-0.01	0.02	-0.01	0.104	0.10	-0.01	-0.01	-0.01	17.06	0.06	15.77	47.61	1.24	0.60	11.66	1.78	Lateritic soil with limonite pebble (Pit-6)
21	49.49																	Blackish Brown, porous
27	51.00																	Brown, porous
Mix.	50.46	-0.01	0.05	-0.01	0.160	0.08	-0.01	-0.01	0.01	5.73	0.15	8.14	71.63	0.46	0.36	11.54	1.25	Mixture of 21, 27
28	41.30	-0.01	0.04	-0.01	0.144	0.06	-0.01	-0.01	-0.01	12.86	0.12	12.33	58.54	0.46	0.58	11.02	1.58	Lateritic soil with limonite pebble (Pit-5)
29	36.05	0.02	-0.01	-0.01	0.178	0.21	-0.01	-0.01	-0.01	29.39	0.28	6.34	51.20	0.31	0.27	9.34	1.38	Yellowish brown, porous
30	22.52	-0.01	0.02	-0.01	0.152	0.22	0.01	-0.01	-0.01	41.56	0.28	10.87	31.17	0.93	0.40	9.18	1.76	- do. -
31	40.04																	- do. -
32	40.55																	- do. -
33	35.39																	Brown, porous
34	29.32																	Blackish brown, porous
Mix.	36.59	-0.01	0.01	-0.01	0.175	0.21	0.01	-0.01	-0.01	18.68	0.28	10.31	52.32	-0.05	0.42	10.56	1.47	Mixture of 31, 32, 33, 34
Average	40.60																	

Table 3. Assay Values of No. 3 Deposit in Kalagyun Island, Mergui District

Sample No.	Fe	Ni	Cr	CO	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	H_2O^+	H_2O^-	Remarks
51	4662																	Brown, porous
52	3689																	Reddish brown, porous
53	3850																	- do. -
54	4444																	Brown, porous
55	3942																	Reddish brown, porous
Mix.	41.35	002	033	-001	0.109	0.10	-001	-001	-0.01	891	037	1646	5878	031	067	13.14	1.70	Mixture of 51, 52, 53, 54, 55
Average	41.00																	

Table 4. Assay Values of No. 4 Deposit in Kalagyun Island, Mergui District

Sample No.	Fe	Ni	Cr	Co	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	H_2O^+	H_2O^-	Remarks
35	4381																	Blackish brown, porous
36	4206																	- do. -
37	4043																	Yellowish brown, porous
38	4606																	Blackish brown, porous
Mix.	4291	-001	-001	-001	0300	022	002	-001	-001	1189	083	682	61.35	-005	027	11.28	180	Mixture of 35, 36, 37, 38
39	3794																	Reddish brown, porous
40	3947																	- do. -
41	4536																	Yellowish brown, porous
Mix.	4198	002	-001	-001	0188	023	-001	-001	-0.01	1205	035	844	59.85	015	041	11.32	178	Mixture of 39, 40, 41
42	4450																	
Average	4250																	

Table 5. Assay Values of Linmalo Island, Mergui District

Sample No.	Fe	Ni	Cr	Co	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	H_2^+O	H_2^-O	Remarks
57	45.82																	Brown, porous
59	32.76																	Yellowish brown, porous
60	28.40																	Blackish brown with quartz
61	47.38																	Brown
62	32.78																	Yellowish brown, porous
Mix.	37.71	0.02	0.01	—0.01	0.327	0.17	0.02	—0.01	—0.01	18.65	0.46	10.31	53.92	—0.05	0.46	10.94	1.29	Mixture of 57, 59, 60, 61, 62
63	46.13																	Yellowish brown, porous
64	42.51																	Brown
65	39.07																	Reddish brown, porous
Mix.	42.37	0.01	0.02	—0.01	0.119	0.08	0.01	—0.01	—0.01	9.48	0.40	14.42	60.24	0.31	0.60	10.82	1.32	Mixture of 63, 64, 65
66	51.00																	Yellowish brown
67	38.65																	Reddish yellow, porous
68	42.73																	Yellowish brown, porous
Mix.	43.95	0.02	—0.01	—0.01	0.564	0.10	—0.01	—0.01	0.01	12.09	0.30	9.20	62.67	0.15	0.36	10.68	1.15	Mixture of 66, 67, 68
69	27.61	—0.01	0.05	—0.01	0.042	0.09	0.02	—0.01	—0.01	20.60	0.18	22.41	38.96	0.46	0.91	11.74	1.76	Lateritic soil with limonite pebble (Pit-1)
70	39.13	0.01	0.05	—0.01	0.062	0.10	0.05	—0.01	—0.01	14.13	0.14	13.30	55.43	0.46	0.68	10.14	1.77	Reddish brown, porous
71	28.72	—0.06	0.03	—0.01	0.124	0.08	0.01	—0.01	—0.01	22.98	0.09	19.22	40.21	0.77	0.72	10.68	1.70	Lateritic soil with limonite pebble (Pit-2)
	38.79																	

Table 6 Assay Values of Ma-aing Island, Mergui District

Sample No.	Fe	Ni	Cr	Co	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	H_2O^+	H_2O^-	Remarks
72	5021																	Yellowish brown, porous
76	3674																	Brown, porous
77	2957																	Blackish brown, porous
Mix.	3884	001	002	—001	0403	012	003	001	—001	773	953	863	5553	—005	036	1128	154	Mixture of 72, 76, 77
Average	3880																	

Table 7 Assay Values of Minlan-Tanzeik Deposit, Shwegyin Area, Toungoo District

	Sample No.	Fe	Ni	Cr	Co	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	H_2O^+	H_2O^-	Remarks
Kyauk-O-O Laha	101	2331	001	012	–001	0159	005	001	–001	–001	2547	010	2005	4013	031	065	1202	183	Yellowish brown, porous
	102	2905																	Lateritic soil with limonite pebble
	103	3258																	- do. -
	104	2449																	- do. -
	Mix.	2895	001	008	–001	0204	004	002	001	–001	2832	010	1669	4036	093	068	1038	223	Mixture of 102, 103, 104
	105	2673																	Red lateritic soil with limonite pebble
	106	3002																	- do. -
	107	2552																	- do. -
	Mix.	2738	001	012	–001	0119	003	001	001	–001	2905	008	1890	3846	062	075	1084	223	Mixture of 105, 106, 107
	108	2712																	Yellowish, porous
	109	2697																	- do. -
	Mix.	2698	–001	007	–001	0159	003	–001	–001	001	2232	006	2225	3825	072	072	1322	192	Mixture of 108, 109
	111	3206																	Reddish brown, porous
	112	4268																	Blackish brown, porous
	114	3944																	- do. -
	Mix.	3781	–001	008	–001	0428	005	001	001	–001	1439	019	1558	5372	031	060	1296	236	Mixture of 111, 112, 114
	136	2878																	Black massive (Pit-2)
	137	2954																	Reddish brown massive (Pit-3)
	138	4017																	Blackish brown massive (Pit-4)
	139	4413																	Reddish brown massive (Pit-5)
	Mix.	3572	001	007	–001	0253	003	001	001	–001	2073	048	1397	5107	–005	061	1154	241	Mixture of 136, 137, 138, 139
	140	3944	–001	003	–001	0192	003	–001	001	–001	1426	010	1258	5640	–005	062	1156	215	Reddish brown, porous (Pit-1)

	115	3280																
	116	3020																
	Mix.	3390	002	008	-001	0209	003	002	001	-001	1788	030	1817	4847	-005	069	1515	216
	117	4594																Yellowish, brown, porous
	119	3688																Brown, porous
	120	3100																- do. -
	Mix.	3776	003	010	002	0309	004	003	001	-001	1474	083	1468	5399	-005	053	1232	457	Mixture of 117, 119, 120
	121	3792	002	030	-001	0130	004	003	-001	-001	1718	009	1586	5234	124	054	948	204	Red lateritic soil with limonite pebble
Kaing Laha	122	3605	002	029	-001	0150	003	002	-001	-001	2132	006	1559	5017	124	063	878	229	- do. -
	123	5405																	Black laterite with magnetite
	124	3846																	Blackish brown, laterite
	125	4177																	- do. -
	126	3959																	- do. -
	Mix.	4351	004	012	001	0410	006	009	-001	-001	1167	103	1279	6135	077	038	1003	210	Mixture of 123, 124, 125, 126
	129	2001	001	013	-001	0090	004	002	-001	002	4162	010	1408	2672	170	081	956	300	Lateritic soil with limonite pebble
	130	2346	001	012	-001	0124	003	002	-001	001	2895	012	2064	3200	139	092	1208	355	- do. -
	131	3923																	Reddish brown, porous
	132	3704																	Blackish brown, porous
	133	2787																	Reddish brown, porous
	Mix.	3486	002	008	-001	0222	004	002	002	-001	1830	067	1627	4984	-005	067	1074	229	Mixture of 131, 132, 133
	134	3381																	Yellowish brown, porous
	135	3401																	- do. -
	Mix.	3388	003	008	001	0153	004	003	002	-001	1499	109	1771	4844	-005	056	1406	193	Mixture of 134, 135
	141	2938	-001	008	-001	0172	004	001	-001	-001	2267	005	1884	4149	046	075	1204	195	Reddish brown, porous

142	2693	001	001	-001	0250	005	003	001	-001	3090	009	1665	3816	031	058	1144	190	Yellowish brown, porous
143	2933																	Reddish brown, porous
144	3036																	Yellowish btown, porous
145	3109																	- do.-
Mix.	3032	002	008	-001	0153	005	001	001	-001	2390	012	1745	4301	031	067	1206	215	Mixture of 143, 144, 145
146	2630																	Reddish brown, porous
147	2925																	Yellowish brown, porous
148	3230																	- do.-
Mix.	2841	001	009	-001	0251	008	003	001	-001	2513	017	1764	4062	-005	068	1224	219	Mixture of 146, 147, 148
149	2967	-001	011	-001	0266	003	002	002	-001	2235	004	1749	4242	-005	068	1220	199	Yellowish brown, porous
150	2645	-001	012	-001	0265	004	002	-001	-001	2638	005	1800	3748	031	084	1214	214	Reddish brown, porous
152	2871																	Yellowish brown, porous
153	2872																	- do.-
154	2808																	- do.-
Mix.	2845	001	012	-001	0292	005	002	001	-001	2102	026	2070	4068	-005	079	1374	214	Mixture of 152, 153, 154
155	2886	001	006	-001	0253	005	002	-001	-001	2334	014	1816	4092	031	072	1320	254	Brown, porous
157	3156																	Yellowish brown, porous
158	2992																	- do.-
Mix.	3092	001	012	-001	0246	009	006	001	-001	2078	046	1705	4387	031	059	1348	254	Mixture of 157, 158
159	3295	002	010	-001	0158	002	002	-001	-001	2059	028	1658	4691	015	068	1182	252	Brown, porous
160	3001	001	017	001	0161	004	002	-001	-001	2054	049	1817	4291	-005	078	1240	178	Reddish brown, porous

	161	2623																Yellowish brown, porous
	162	2349																- do. -
	Mix.	2507	002	0.15	001	0107	0.05	002	-001	-0.01	1833	067	2541	3584	-005	066	1596	275	Mixture of 161, 162
	163	2875	-001	0.12	-0.01	0.143	0.06	001	-001	-0.01	1446	022	2439	4076	031	077	1610	248	Yellowish brown, porous
	164	3071																	- do. -
	165	2698																	Reddish brown, porous
	Mix.	2867	001	0.10	-0.01	0.143	004	002	001	-0.01	19.66	0.19	21.18	4099	-0.05	075	1378	273	Mixture of 164, 165
	166	26.61																	Yellowish brown, porous
	167	3891																	- do. -
	168	30.16																	Reddish brown, porous
	169	2827																	Yellowish brown, porous
	Mix.	3090	001	006	-006	0.179	004	002	-001	-0.01	2458	005	1691	4584	031	050	11.14	226	Mixture of 166, 167, 168, 169
	170	27.87	-001	0.05	-0.01	0.187	0.03	001	-0.01	-001	19.28	0.05	2223	39.16	062	068	1420	244	Yellowish brown, porous
Inbet Laha	171	4050																	Brown porous
	172	4067																	- do. -
	174	3347																	- do. -
	Mix.	3835	-001	0.10	-0.01	0376	004	-001	-0.01	-001	14.13	0.17	1339	5449	031	054	1236	242	Mixture of 171, 172, 174
	176	3383																	Reddish brown, porous
	177	3784																	Brown porous
	Mix.	3580	-001	009	-001	0354	004	002	-001	-001	19.16	023	1505	5084	031	042	11.94	223	Mixture of 176, 177
	178	39.22	002	008	-001	0374	002	001	-001	-001	1671	088	1196	5573	031	040	1218	240	Yellowish brown, porous
	179	2887	-001	0.15	-001	0171	002	001	-0.01	-001	17.42	009	2266	41.28	-0.05	047	15.26	251	Brown, porous

Kyauk Tan Laha

180	3590																Blackish brown, porous
182	41.11																- do. -
183	3788																Brown, porous
Mix.	3817	005	008	001	0253	004	001	-001	-001	1740	1.08	1366	5458	-005	040	11.10	250	Mixture of 180, 182, 183
184	3810																Brown, porous
185	4443																Blackish brown, porous
187	5481																Reddish brown, porous
188	4207																Brown, porous
Mix.	4243	001	010	-001	0267	004	-001	-001	-001	1437	036	11.51	6067	-005	029	11.28	233	Mixture of 184, 185, 187, 188
189	3143	001	007	-001	0255	004	-001	-001	-001	2245	018	1741	4442	046	058	11.74	217	Yellowish brown, porous
190	4388																	Blackish brown , Massive laterite
191	3992																	Reddish brown, massive laterite
Mix.	41.74	002	007	-001	0245	003	-001	-001	-001	1680	075	11.94	59.68	-005	044	9.51	224	Mixture of 190, 191
192	3934																	Yellowish brown, porous
193	2948																	Brown, porous
Mix.	3424	006	020	002	0275	003	002	-001	-001	1978	288	1445	4896	-005	086	1058	265	Mixture of 192, 193
194	3485																	Yellowish brown, porous
196	2674																	Brown, porous
Mix.	3073	001	009	-001	0259	006	003	-001	-001	2562	030	1544	4359	031	044	11.28	219	Mixture of 194, 196
195	3190	002	011	-01	0279	010	003	-001	-001	2049	063	1733	4527	031	050	1280	238	Brown, porous

	197	3258	–001	0.12	–001	0352	004	002	002	–0.01	2213	0.14	1604	4624	031	022	11.96	242	Reddish brown, porous
	198	3820	001	008	–0.01	0422	004	–0.1	002	–0.01	1606	0.15	1482	5445	015	044	1214	235	– do. –
	200	3632	–001	008	–0.1	0578	002	001	001	–001	1642	030	1633	5193	–005	041	1298	265	Reddish brown, massive
	201	3153																	Yellowish brown, porous
	202	2679																	Reddish brown, porous
	Mix.	2917	002	016	–001	0318	004	002	001	–001	1937	006	2119	4136	031	055	1332	263	Mixture of 201, 202
	203	2619	001	009	–001	0135	004	002	002	–001	2647	036	2003	3745	–006	061	1264	229	Brown, porous
	204	2845	–001	017	–001	0215	005	001	002	–001	2156	019	1976	4033	031	071	1366	245	Yellowish brown, massive
	205	3191	–001	009	–001	0167	004	002	001	–001	1862	014	2006	4562	–006	066	1282	253	Reddish brown, porous
	206	3337	002	009	–001	0227	005	002	002	–001	2126	062	1538	4771	–005	043	1250	211	Blackish brown, massive
	207	3295	001	017	–001	0163	004	002	–001	–001	2251	012	1625	4540	154	058	934	241	Lateritic soil with limonite pebble
	208	3969	002	006	–001	0330	004	001	001	–001	1390	061	1451	5675	–005	059	11.16	219	Blackish brown, massive
	209	3320																	Yellowish brown, porous
	210	3310																	– do. –
	211	3130																	Brown porous
	Mix.	3259	002	010	–001	0201	004	002	002	–001	1878	071	1787	4597	031	052	1284	212	Mixture of 209, 210, 211
Kyauk Pon Laha	212	4254																	Brown massive
	213	2980																	Reddish brown, porous
	214	5391																	Blackish brown, massive
	Mix.	4195	001	015	–001	0310	005	002	002	–0.0 1	1158	013	1499	5826	154	044	1182	182	Mixture of 212, 213, 214
	216	4385	005	009	–001	0314	006	002	001	002	1006	062	1250	6167	093	034	1148	195	Blackish brown, porous laterite with magnetite pebble

	218	41.75	0.01	0.10	−0.01	0.334	0.03	0.01	0.02	−0.01	1361	0.17	1486	59.35	0.31	0.43	10.06	2.12	Yellowish brown, porous
	219	37.74	0.01	0.09	−0.01	0.088	0.05	0.02	−0.01	−0.01	1457	0.28	1639	53.96	−0.05	0.34	13.06	1.82	- do.-
	220	33.07	0.02	0.08	−0.01	0.163	0.08	0.02	0.02	−0.01	21.89	0.70	16.07	46.94	0.31	0.36	12.22	1.69	- do.-
	221	33.10	−0.01	0.05	−0.01	0.151	0.04	−0.01	−0.01	−0.01	19.98	0.52	18.28	47.16	0.15	0.53	10.84	1.97	Reddish yellow, porous
	222	32.02	−0.01	0.04	−0.01	0.191	0.05	−0.01	0.01	−0.01	17.71	0.06	20.41	45.27	0.46	0.80	12.64	1.97	Reddish brown, porous
	223	34.07																	- do.-
	224	30.44																	- do.-
	Mix.	32.16	0.01	0.04	−0.01	0.127	0.06	0.02	0.01	−0.01	23.14	0.54	15.25	45.81	0.15	1.16	11.06	1.72	Mixture of 223, 224
Pan-in Kywegyan Laha	227	38.31																	Blackish brown, porous
	228	30.55																	Blackish brown, massive
	229	30.29																	Blackish brown, porous
	Mix.	33.22	0.01	0.10	−0.01	0.299	0.03	0.02	0.01	0.01	18.45	0.44	16.74	47.50	−0.05	0.57	12.48	2.74	Mixture of 227, 228, 229
	230	28.73	0.01	0.10	−0.01	0.299	0.03	0.02	0.01	−0.01	23.17	0.36	19.98	41.08	−0.05	0.63	13.14	2.44	Yellowish brown, porous
	231	33.16																	- do.-
	243	31.65																	- do.-
	Mix.	32.27	0.02	0.16	−0.01	0.458	0.04	0.01	0.01	−0.01	22.56	0.13	16.37	44.77	1.24	0.57	12.38	2.33	Mixture of 231, 243
	232	32.90	0.02	0.20	−0.01	0.521	0.04	0.02	0.02	−0.01	19.71	0.14	17.02	46.70	0.31	0.58	12.10	2.08	Yellowish brown, porous
	233	33.47	0.01	0.15	−0.01	0.249	0.04	0.01	0.01	−0.01	16.62	0.18	20.17	47.86	−0.05	0.66	12.44	2.30	- do.-
	234	31.99	0.03	0.13	−0.01	0.290	0.04	0.02	0.01	−0.01	18.41	1.22	18.10	45.57	0.15	0.61	13.40	2.30	Blackish brown, massive

Myauk Kya Laha	235	3272	–001	012	–001	0195	004	001	001	–001	1989	012	2115	4610	062	086	958	290	Reddish brown, porous
	236	2906																	- do. -
	237	3212																	Yellowish brown, porous
	238	3215																	Yellow, porous
	Mix.	3109	001	009	–001	0239	004	001	–001	–001	2007	012	1964	4394	046	074	1240	231	Mixture of 236, 237, 238
	239	2778																	Yellowish brown, porous
	240	3168																	Brown, porous
	Mix.	2966	002	014	–001	0314	004	002	–001	–001	2315	022	1946	4189	046	064	1204	241	Mixture of 239, 240
	241	3031																	Yellowish brown, porous
	242	2918																	- do. -
	Mix.	2976	002	027	–001	0267	005	002	–001	–001	2024	012	1986	4204	046	068	1404	240	Mixture of 241, 242
	Average	3330																	

Table 8 Assay Values of Kaikto Area, Thaton District

Sample No.	Fe	Ni	Cr	Co	P	S	Cu	As	Sn	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	$+H_2O$	$-H_2O$	Remarks
247	63.16	0.17	0.76	0.05	0.004	0.04	–0.01	–0.01	–0.01	1.56	0.44	2.30	70.75	17.59	0.09	3.32	0.54	Magnetite
249	44.92	0.44	1.84	0.08	0.004	0.02	–0.01	0.01	–0.01	11.27	1.35	5.01	62.51	1.54	0.14	11.36	1.52	Yellowish brown, porous laterite
253	65.59	0.12	0.66	0.01	0.004	0.05	–0.01	–0.01	–0.01	3.51	0.18	0.83	63.61	27.14	0.07	1.22	0.10	Magnetite
255	42.59	0.01	0.06	–0.01	0.692	0.04	–0.01	–0.01	–0.01	14.91	0.09	8.90	60.21	0.62	0.24	12.28	2.43	- do. -
256	14.32																	Red, porous laterite
257	13.90																	- do. -
258	25.56																	- do. -
Mix.	18.00	0.03	0.28	–0.01	0.036	0.05	0.01	–0.01	–0.01	31.36	0.30	23.99	24.36	1.24	0.82	10.64	1.26	Mixture of 256, 257, 258
260	61.63	0.25	0.07	0.01	0.040	0.02	–0.01	–0.01	–0.01	6.21	0.15	1.71	76.12	10.79	0.05	2.52	0.46	Magnetite
261	31.98	0.06	1.01	0.06	0.020	0.04	–0.01	–0.01	–0.01	25.84	0.85	7.22	44.70	0.93	0.15	9.00	1.25	Yellowish brown, porous laterite
262	59.93																	Magnetite wd. 60 cm.
263	51.96																	- do. - wd. 40 cm.
264	29.02																	Magnetite with green rock wd. 150 cm.
265	21.92																	Gossan
268	58.69																	Magnetite wd. 50 cm.
Mix.	44.47	–0.01	0.01	–0.01	0.020	0.28	0.04	–0.01	–0.01	22.06	0.19	6.82	44.72	16.97	0.20	5.12	2.16	Mixture of 262, 263, 264, 265, 268