## 2-3 Geochemical Prospecting

## 2-3-1 Survey method

1. Sampling and preparation

B-horizon solid samples were collected in the $100 \mathrm{~m} \times 50 \mathrm{~m}$ rectangular grid systems by the same method as Area A.

As a result of the geochemical prospecting by stream sediment in the Phase I survey, the anomalies of niobium, tantalum, tin, and tungsten are detected along Nam Mae Hong in the direction of NW-SE. The main direction of faults and geological structure show also NW-SE, It appeared from the above that the mineralization in this area was related to fracture system in the direction of NW-SE.

Because of these, Area C was set in this direction and sampling lines were arranged in the direction of NE-SW to detect mineral indication effectively.

The collected soil samples were natural air-dried and screened. - 80 mesh fraction were taken for chemical analyses.

The localities of samples are shown in PL. 9.
2. Pathfinder elements and chemical analysis

Pathfinder elements are niobium, tantalum, tin, and tungsten. They are the same elements as that of Area A.

The method of analysis is also the same as that of Area A.
Analysis data for each sample are shown in Appendix 6.

## 2-3-2 Analysis of geochemical data

1. Statistical analysis

The common logarithmic values of the analytical values were used in this analytical work.
The background of these elements presented a remarkably different values according to lithofacies, thefore Area C was divided into three subareas; sedimentary rock area, two mica granite area, and biotile granite area, by the result of statistical analysis.

The number of soil samples is 174 in sedimentary rock area, 858 in two mica granite area and 626 in biotite granite area.

The minimum values, maximum values, mean values ( $M$ ) and standard deviations ( 0 ) in Area C are shown in Table 8.

The relative frequency and cummulative frequency histograms for each subarea are shown in Appendix 13 to 18.

Table 8. Basic statistic quantities of geochemical analytic values (Area C)

| Area |  | Minimum value | Maximum value | Mean value M | Standard deviation $\sigma$ | $\mathrm{M}+\sigma$ | $M+20$ | $M+30$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Sedimentary rock | Nb | 14 | 54 | $\begin{array}{r} 1.43 \\ 27.0 \end{array}$ | 0.07 | $\begin{gathered} 1.50 \\ 31.4 \end{gathered}$ | $\begin{aligned} & 1.56 \\ & 36.6 \end{aligned}$ | $\begin{array}{r} 1.63 \\ 42.7 \end{array}$ |
|  | Ta | 1 | - 17 | 0.46 2.90 | 0.14 | $\begin{aligned} & 0.60 \\ & 4.0 \end{aligned}$ | 0.74 5.5 | $\begin{aligned} & 0.88 \\ & 7.6 \end{aligned}$ |
|  | Sn | 5 | 180 | $\begin{gathered} 1.00 \\ 10.1 \end{gathered}$ | 0.24 | $\begin{gathered} 1.24 \\ 17.3 \end{gathered}$ | $\begin{array}{r} 1.47 \\ 29.8 \end{array}$ | 1.71 51.2 |
|  | W | 3 | 1200 | 0.94 8.6 | 0.36 | $\begin{gathered} 1.30 \\ 19.8 \end{gathered}$ | $\begin{aligned} & 1.66 \\ & 45.3 \end{aligned}$ | $\begin{gathered} 2.02 \\ 103.5 \end{gathered}$ |
| Two mica granite | - Nb | 12 | 110 | $\begin{gathered} 1.51 \\ 32.5 \end{gathered}$ | 0.13 | $\begin{gathered} 1.64 \\ 43.9 \end{gathered}$ | $\begin{gathered} 1.77 \\ 59.3 \end{gathered}$ | $\begin{gathered} 1.90 \\ 80.1 \end{gathered}$ |
|  | Ta | 2 | 32. | $\begin{aligned} & 0.91 \\ & 8.1 \end{aligned}$ | 0.22 | $1.12$ | $\begin{array}{r} 1.34 \\ 21.8 \end{array}$ | $\begin{array}{r} 1.55 \\ 35.8 \end{array}$ |
|  | St | 8 | 2500 | $\begin{gathered} 1.94 \\ 86.1 \end{gathered}$ | $\therefore 0.35$ | $\begin{gathered} 2.28 \\ 192.1 \end{gathered}$ | $\begin{array}{r} 2.63 \\ 429.0 \end{array}$ | $\begin{array}{r} 2.98 \\ 957.7 \end{array}$ |
|  | W | 3 | 4000 | $\begin{gathered} 1.72 \\ 52.2 \end{gathered}$ | 0.42 | $\begin{array}{r} 2.14 \\ 137.1 \end{array}$ | $\begin{array}{r} 2.56 \\ 359.9 \end{array}$ | $\begin{array}{r} 2.98 \\ 945.0 \end{array}$ |
| Biotite granite | Nb | 12 | 42 | $\begin{gathered} 1.41 \\ 25.9 \end{gathered}$ | 0.08 | $\begin{gathered} 1.49 \\ 31.0 \end{gathered}$ | $\begin{aligned} & 1.57 \\ & 37.1 \end{aligned}$ | $\begin{aligned} & 1.65 \\ & 44.4 \end{aligned}$ |
|  | Ta | 6 | 12 | $\begin{aligned} & 0.62 \\ & 4.2 \end{aligned}$ | 0.10 | $\begin{aligned} & 0.72 \\ & 5.2 \end{aligned}$ | $\begin{aligned} & 0.82 \\ & 6.6 \end{aligned}$ | $\begin{aligned} & 0.91 \\ & 8.2 \end{aligned}$ |
|  | Sn | 12 | 2200 | $\begin{array}{r} 1.51 \\ 32.4 \end{array}$ | 0.22 | $\begin{gathered} 1.73 \\ 54.0 \end{gathered}$ | $\begin{array}{r} 1.95 \\ 89.9 \end{array}$ | $\begin{gathered} 2.17 \\ 149.6 \end{gathered}$ |
|  | W | 6 | 3600 | $\begin{gathered} 1.36 \\ 22.7 \end{gathered}$ | 0.38 | $\begin{gathered} 1.74 \\ 54.5 \end{gathered}$ | $\begin{array}{r} 2.12 \\ 130.9 \end{array}$ | $\begin{gathered} 2.50 \\ 314.3 \end{gathered}$ |
| Whole | Nb | 12 | 110 | $\begin{gathered} 1.47 \\ 29.3 \end{gathered}$ | $\therefore 0.12$ | $\begin{gathered} 1.59 \\ 38.6 \end{gathered}$ | $\begin{gathered} 1.70 \\ 50.7 \end{gathered}$ | $\begin{array}{r} 1.82 \\ 66.6 \end{array}$ |
|  | Ta | 1 | 32 | $\begin{aligned} & 0.76 \\ & 5.7 \end{aligned}$ | 0.24 | $\begin{gathered} 1.00 \\ 10.0 \end{gathered}$ | $\begin{array}{r} 1.24 \\ 17.3 \end{array}$ | $\begin{gathered} 1.48 \\ 29.9 \end{gathered}$ |
|  | Sn | 5 | 2500 | $\begin{aligned} & 1.69 \\ & 48.8 \end{aligned}$ | 0.42 | $\begin{array}{r} 2.11 \\ 127.8 \end{array}$ | $\begin{gathered} 2.52 \\ 334.7 \end{gathered}$ | $\begin{gathered} 2.94 \\ 876.7 \end{gathered}$ |
|  | W | 3 | 4000 | $\begin{gathered} 1.51 \\ 32.3 \end{gathered}$ | 0.47 | $\begin{gathered} 1.98 \\ 95.5 \end{gathered}$ | $\begin{gathered} 2.45 \\ 282.3 \end{gathered}$ | $\begin{array}{r} 2.92 \\ 834.6 \end{array}$ |

Upper row; Logarithmic value
Lover row; Natural value, unit : ppm

These statistics indicate as follows:
Two mica granite area contains much of niobium, tantalum, tin, and tungsten that other two subarcas.

In comparison with each subarea by mean values of natural number, the mean value of nobium content is about same in the whole Area $C$, but the mean value of tantalum content in the two mica granite area is about three times that in the sedimentary area. Tin content in former area is about cight times that in the latter, and tungsten content in the former is about six times that in the latter.

The mean values and standard deviations values in the biotite granite area indicate almost same values as those in Area $A$.

The correlation coefficients between these elements are shown in Table 9.
The correlation between niobium and tantalum and the one between tin and tungsten are strong at every subareas. But the correlation between tin and tungsten is weak. Tungsten has hardly correlation with niobium and tantalum.

Table 9. Correlation coefficients of geochemical data (Area C)

| Area | Element | Nb | Ta | Sn | W |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Sedimentary rock | Nb | - | 0.45 | 0.28 | $\bigcirc 0.05$ |
|  | Ta | 0.45 | - | 0.66 | 0.43 |
|  | Sn | 0.28 | 0.66 | - | 0.84 |
|  | W | -0.05 | 0.43 | 0.84 | - |
| Two mica granite | Nb | - | 0.80 | 0.21 | 0.03 |
|  | Ta | 0.80 | - | 0.39 | 0.07 |
|  | Sn | 0.21 | 0.39 | - | 0.68 |
|  | W | 0.03 | 0.07 | 0.68 | - |
| Biotite granite | Nb | - | 0.50 | -0.05 | -0.02 |
|  | Ta | 0.50 | - | 0.39 | 0.19 |
|  | Sn | -0.05 | 0.39 | - | 0.66 |
|  | W | -0.02 | 0.19 | 0.66 | - |

## 2. Classification of anomaly values

Mean values (M) and standard deviation ( $\sigma$ ) were used to decide the threshold values. Each geochemical datum was divided into anomaly value and background value by $M+\sigma$ value.

The background zone was subdivided into the low background zone and high background zone by M value. The anomaly zone was subdivided into low anomaly zone, medium anoamly zone and high anomaly zone by approximate $\mathrm{M}+2 \sigma$ values.

The division of anomaly values is shown in Table 10.
3. Distribution of geochemical anomalous areas

The anomalies were extracted from elements content distribution maps (Appendix 19 to 22).

The distribution of the anomalies is described as follows;
The anomalies of each element in Area $C$ are recognized distinctly. Particularly notable anomalies for all elements were detected in two mica granite area.

The different distribution of anomalies are indicated between nobium - tantalum and tintungsten. The main anomaly of tin and tungsten is situated in the middle to northwest in Area $C$. The main anomaly of niobium and tantalum is found near Yang Kiang village in the South in Area C.
(i) Niobium

In the sedimentary rock area, a low anomaly is distributed from Line C26 to Line C30, which includes the maximum anomalous value of 54 ppm .

Table 10 Division into anomaly value levels (Area C)

| 景 | Divi- | Background area |  | Anomaly area |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Element | . Low | High | Low | Middle | High |
|  | Nb | $\sim 26$ | $27 \sim 31$ | $32 \sim 36$ | $37 \sim 42$ | $43 \sim$ |
|  | Ta | $\sim 2$ | 3 | $4 \sim 5$ | $6 \sim 7$ | $8 \sim$ |
|  | Sn | $\sim 10$ | $11 \sim 17$ | 18~29 | $30 \sim 51$ | $52 \sim$ |
|  | W | $\sim 8$ | $9 \sim 19$ | 20~45 | $46 \sim 103$ | $104 \sim$ |
|  | Nb | $\sim 32$ | $33 \sim 43$ | $44 \sim 59$ | $60 \sim 80$ | $81 \sim$ |
|  | Ta | $\sim 8$ | $9 \sim 13$ | $14 \sim 21$ | $22 \sim$ |  |
|  | Sn | $\sim 86$ | $87 \sim 192$ | $193 \sim 428$ | $429 \sim 957$ | $958 \sim$ |
|  | W | $\sim 52$ | $53 \sim 137$ | $138 \sim 359$ | $360 \sim 945$ | $946 \sim$ |
|  | Nb | $\sim 25$ | $26 \sim 31$ | $32 \sim 37$ | $38 \sim 44$ | 45~ |
|  | Ta | $\sim 4$ | 5 | 6 | 7 | 8~ |
|  | Sn | $\sim 32$ | $33 \sim 53$ | $54 \sim 89$ | $90 \sim 149$ | $150 \sim$ |
|  | W | $\sim 22$ | 23~54 | $55 \sim 130$ | $131 \sim 314$ | $315 \sim$ |

Unit : ppm

In the two mica granite area, medium to high anomalies are broadly distributed from Line C29 to Line C42. Especially high anomaly including the maximum value of 110 ppm is found in an extent of $100 \mathrm{~m} \times 250 \mathrm{~m}$ from Line C41 to Line C42. In addition some low anomalies with an orientation of NNW-SSE are distributed from Line C17 to Line C25.

In the biotite granite area, low anomalies lie sporadically in the south, showing no remarkable anomalous area.
(ii) Tantalum

In the sedimentary rock area a low anomaly, overlapping with that of niobium, is distributed from Line C26 to Line C30.

In the two mica granite area, low to medium anomaly extends from Line C28 to Line C42. This anomaly is a medium anomaly with the maximum anomalous value of 29 ppm , over an area of $350 \mathrm{~m} \times 500 \mathrm{~m}$ from Line C37 to Line C42. In addition, low to medium anomalies with an orientation of NNW-SSE are distributed. In the biotite granite area, smallscale low to medium anomalies are scattered on the south side of Line C30.
(iii) Tin

In the sedimentary rock area, medium to high anomalies are distributed on this area's border with two mica granite from Line C5 to Line C8.

In the two mica granite area, medium to high anomalies with 100 to 500 m width are distributed intermittently in the direction of NNW-SSE near the area's border with biotite granite from Line C 1 to Line C 27 . Anomalous values exceeding 500 ppm are recognized in places. The maximum anomalous value of $2,500 \mathrm{ppm}$ is obtained in these anomalies. In the biotite granite area there are three medium to high anomalies near this area's border with two mica granite. Among them a high anomaly with the maximum anomalous value of $2,200 \mathrm{ppm}$ lying from Line Cl to Line C 5 and a medium anomalies with the maximum anomalous value of $1,100 \mathrm{ppm}$ extend from Line Cl 3 to Line C14. Both anomalies continue from anomalies in two mica granite. A medium to high anomaly lying from Line C31 to Line C32 has an area of $100 \mathrm{~m} \times 150 \mathrm{~m}$ approximately and presents the maximum anomalous value of $1,500 \mathrm{ppm}$.
(iv) Tungsten

At the boundary between sedimentary rock and two mica granite, lying from Line C1 to Line C3 and from Line C6 to Line C8, there are medium to high anomalies having the maximum anomalous values of 770 ppm and 1,200 ppm respectively.

Spreading over the two mica granite area and the biotite granite area, medium to high anomalies, ranging from 300 to 500 m in width, are distributed intermittently in the direc-
tion of NNW-SSE. Though this distribution nearly overlaps with that of tin anomalies There is a medium to high anomaly that does not overlap with a tin anomaly near Line C42.

The samples with concentration more than $1,000 \mathrm{ppm}$ were collected from many places, the maximum anomalous value coming up to $4,000 \mathrm{ppm}$ in the anomalies.

In the biotite granite area, there is a low to medium anomaly area distributed in the direction of NNW-SSE from Line C35 to Line C40.

## 2-4 Discussion

Based on the result of geological survey and geochemical data obtained so far, the geology, geological structure and ore deposits will be discussed hereunder.

The area is composed of three groups, namely sedimentary rocks ranging in age from Cambrian to Carboniferous, Granitic rocks intruded into the former sedimentary rocks and alluvium.

The sedimentary rocks are classified into three formations, that is Ordovician system and Devono-Carboniferous System covering a narrow zone in the southwestern side of the area, Cambro-Ordovician system distributed as scattered small scale roof pendant.

The granitic rocks composed of biotite granite and two mica granite cover a major portion of the area. The relation of the two granite is not clear, but in the regional sense the two mica granite occurs in a rectangular area of $1.5 \mathrm{~km} \times 5.0 \mathrm{~km}$, elongated to NW-SE to NNW-SSE. The straight boundary with biotite granite suggests that the two mica granite intrudes the other.

The lithology and texture of those two types of granite, biotite granite and two mica granite, are different suggesting that these two granites are independent rock masses.

The main structural trend of the area is NW-SE to NNW-SSE and faults of the same trend cutting the sedimentary rocks are developed in the northwest of the area. These facts suggest that after the igneous activity formed the biotite granite batholith, intrusion of two mica granite took place along the NW-SE to NNW-SSE trending structural line.

Many scattered gossans are found in the area of two mica granite. These gossans are distributed in a narrow gossan zone 200 m wide and about 3 km long, elongated NNW-SSE.

The gossan zone occurs with a skarn zone suggesting that the gossan is weathered product of skarn by oxidation on the ground surface.

The skarn zone is mainly composed of epidote and quartz and sporadically is occurring garnet and hedenbergite. In this skarn zone, mineralization of copper, zinc, tin, tungsten, and rare occurrence of lead and silver have been observed. A part of the skarn zone keeps a relic of original
texture of sandstone and shale. Judging from the relic texture as well as the surrounding geological setting, the original rock might be the Cambro-Ordovician sedimentary sequence. The sedimentary rocks forming roof pendant are considerd to be controlled structurally by the NNWSSE trending structural system.

The silicified zone altered from two mica granite carrying mineralization of iron and copper is underlying the skarn zone. Conclusively, the skarn zone and the silicified zone are the product of pneumatolytic to hydrothermal activity subsequent to the intrusion of the two mica granite. The skarn zone is formed in the sedimentary sequence and the silicified zone is formed in the granite. The difference of alteration product with each lithology may be caused by that of chemical composition of the mother rock.

In and around the contact boundary between the two mica granite and Ordovician-Carboniferous sedimentary sequence, distinct kaolinization is observed and forms a narrow kaolin zone continuing from the central part of the area to the south with increasing intensity of alteration. Component minerals are kaolinite, quartz, muscovite, and tourmaline suggesting penumatolytic and/or hydrothermal alteration took place in and around the boundary.

Both the kaolin zone and gossan zone are linearly arranged on the NNW-SSE trending line suggesting that the mineralization and alteration are controlled by the structure trending NNWSSE.

Geochemical exploration revealed the distribution of tin and tungsten anomalies trending NW-SE and those anomalies coincide with the distribution of the gossan zone.

As a whole, the anomalous area of tin and tungsten and the anomalous area of niobium and tantalum are continuously developed. This clear zonal distribution trending NW-SE suggests the existence of mineralization and alteration controlled by the structure of the same trend. In the anomalous area, many highly anomalous values exceeding $1,000 \mathrm{ppm}$ of tin and tungsten are included. This suggests the existence of undiscovered, promising mineralized zones in the area.

## Chapter 3 Geochemical Characteristics of Granites

The Yang Kiang area is dominantly underlain by Triassic granites. The Phase I survey defined them as the northeast, the southeast, the central, and the Mon Kathing Masses. Wholerock assay was performed for 12 samples, and the relationship between geochemical characteristics of the granites and tin-tungstem mineralization was studied. The results of the survey reveal that almost all granites in the area are granite proper, corresponding to S-type granite defined by Chappell and White (1974), and White and Chappell (1977), and high tin-content type granite.

The survey area for the second phase is in a distribution area of the Northeast Mass. The granites consist of biotite granite and two-mica granite. In the second phase survey, a whole rock assay has been performed for 11 granite samples obtained from different facies, and geochemical characteristics of the granites have been studied referring to the first year's results. Assayed components are $\mathrm{SiO}_{2}, \mathrm{TiO}_{2}, \mathrm{Al}_{2} \mathrm{O}_{3}, \mathrm{Fe}_{2} \mathrm{O}_{3}, \mathrm{FeO}, \mathrm{MnO}, \mathrm{MgO}, \mathrm{CaO}, \mathrm{Na}_{2} \mathrm{O}, \mathrm{K}_{2} \mathrm{O}, \mathrm{P}_{2} \mathrm{O}_{5}, \mathrm{BaO}$, L.O.I.

## 3-1 Differentiation Index (D.I.) and Normative Mineral

Table 11 shows principal chemical components and norm minerals of the granites. The differentiation indices of the granites, shown by the sum of the weight per cent of norm quartz, orthoclase, albite, nepheline, kalsilite, are 85.9 to 90.1 in the biotite granite in Area A, 87.2 to 95.7 in the two-mica granite in Area A, and 93.2 to 94.7 in the two-mica granite in Area C. The indices are higher than those of the Phase I survey, in which the samples were obtained from various locations of the whole area. The results suggest that the granites of the second phase survey area are of more differentiated stages.

Of these the biotite granite in Area $A$ and the two-mica granite in Area $C$ are the most differentiated, and the biotite granite in Area $C$ is the least differentiated. The biotite granite in Area A is of medium differentiation.

Figure 9 shows the relationship between the differentiation indices and principal components, combined with the results of the first year's survey. The differentiation indices and $\mathrm{SiO}_{2}$ contents show strong positive correlation. However, $\mathrm{TiO}_{2}, \mathrm{Fe}_{2} \mathrm{O}_{3}, \mathrm{FeO}, \mathrm{MnO}, \mathrm{MgO}, \mathrm{CaO}, \mathrm{BaO}$ show negative correlation with the differentiation indices, especially in the case of CaO . Other components, $\mathrm{Al}_{2} \mathrm{O}_{3}, \mathrm{Na}_{2} \mathrm{O}, \mathrm{K}_{2} \mathrm{O}$, and $\mathrm{P}_{2} \mathrm{O}_{5}$ show no correlations.

According to the ratio of the norm quartz, plagioclase, and orthoclase, the granites in the area are classified as granite proper except for granodiorite and quartz monzonite in Area A (samples AR-1 and AR-4). This result is well coincident to the results of the Phase I survey (Fig. 10).
Table 11．Chemical analyses of granitic rocks

| $\left\lvert\,\right.$ | $\left\lvert\, \begin{gathered} \hat{\alpha} \\ \dot{4} \\ \hline \end{gathered}\right.$ | 发 a o B B |  जomooo mo m no o－ |  |  m NaNo in oo oo ol |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\left\|\begin{array}{c} y \\ a \\ 0 \end{array}\right\|$ |  |  No | $\begin{aligned} & \alpha \\ & \alpha \\ & \alpha \end{aligned}$ |  |
|  | $\left\|\begin{array}{l} \dot{3} \\ \dot{8} \\ 0 \end{array}\right\|$ |  |  サo mo o oo minoo | $\stackrel{\circ}{\circ}$ |  |
|  | $\left\|\begin{array}{c} \hat{\alpha} \\ \underset{\sim}{0} \end{array}\right\|$ | 范总 |  | $\begin{gathered} \infty \\ \infty \\ 0 \\ \alpha \\ \hline \end{gathered}$ |  <br>  |
|  | 寍 |  |  | $\stackrel{N}{N}$ |  |
|  | $\left\|\begin{array}{c} \dot{0} \\ \dot{\alpha} \\ \dot{4} \end{array}\right\|$ |  |  <br>  | $\stackrel{\infty}{\infty} \underset{\sim}{\alpha}$ |  |
|  |  |  |  <br>  | $\begin{aligned} & 0 \\ & 0 \\ & 8 \\ & \hline 1 \end{aligned}$ |  <br>  |
|  | $\underset{y}{\pi}$ | 步 |  |  |  <br>  |
|  | $\left\lvert\, \begin{gathered} \dot{m} \\ \dot{x} \\ \dot{4} \end{gathered}\right.$ |  |  रo no iocoo vioo | $\begin{aligned} & \infty \\ & \infty \\ & \alpha \\ & \hline \end{aligned}$ |  |
|  | $\left\|\begin{array}{c} \alpha \\ \dot{\alpha} \\ \hline \end{array}\right\|$ | $\begin{aligned} & 9 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  | 侖 |  |
|  | $\left\|\begin{array}{c} \vec{\alpha} \\ \text { a } \end{array}\right\|$ |  |  Nono óo minioó |  | $\begin{gathered} \text { G G } \\ \cdots \\ \cdots \\ \cdots \end{gathered}$ |
|  |  |  |  | 淢 |  |










|  | Legend |
| :--- | :--- |
| $\Delta$ Biotite granile (area A) |  |
| $\square$ Two mica granite (area A) |  |
| $\Delta$ Biotite granite (area C) |  |
| O Two mica granite (area C) |  |
| $0 \quad$ Sample of Pbase I survey |  |

Fig. 9 Variation diagrams of granitic rocks


Fig. 10 Normative Q-Ab-Or diagram


Fig. $11 \quad \mathrm{Na}_{2} \mathrm{O}-\mathrm{K}_{2} \mathrm{O}$ diagram

Norm corundum is calculated to be present in all samples for the second phase as was the case with almost all of the Phase I samples. It suggests that the granites have been derived from per-aluminum magma.

## 3-2 Classification of the Granitic Rocks

An attempt to determine the origin of magma, which gave rise to granites, using parameters of certain principal chemical components started in the middle of 1970's. Chappell and White (1974), and white and Chappell (1977) classified the granites into S-type (Sedimentary-type) and I-type (Igneous type), based on their principal chemical components. The S-type shows the following chemical characteristics.
(1) $\mathrm{Na}_{2} \mathrm{O}$ content is less than 3.2 percent in cases where $\mathrm{K}_{2} \mathrm{O}$ content is about 5 percent. $\mathrm{Na}_{2} \mathrm{O}$ content is less than 2.2 percent in cases where $\mathrm{K}_{2} \mathrm{O}$ content is about 2 percent.
(2) $\mathrm{Al}_{2} \mathrm{O}_{3} /\left(\mathrm{Na}_{2} \mathrm{O}+\mathrm{K}_{2} \mathrm{O}+\mathrm{CaO}\right)$ mol ratio is less than 1.1 percent.
(3) Norm corundum weight percent is more than 1.0 .
(4) It is plotted in the less Ca content area in the ACF diagram.

The I-type shows reverse chatacteristics for each of the above parameters.
In the correlation diagram of $\mathrm{Na}_{2} \mathrm{O}-\mathrm{K}_{2} \mathrm{O}$ (Fig. 11), all the samples of the first year's survey are plotted in the $S$-type area. However, the samples of the second phase survey are mainly plotted in the I-type area and the border area of I-type and S-type, except for a few samples, i.e. AR-5, AR-6, and CR-2.

According to the criteria of $\mathrm{Al}_{2} \mathrm{O}_{3} /\left(\mathrm{Na}_{2} \mathrm{O}+\mathrm{K}_{2} \mathrm{O}+\mathrm{CaO}\right)$, the biotite granite is classified as I-type and the rest as S-type.

On the other hand, according to the criteria of norm corundum, all the granite samples in the area are classified into S-type except for one sample collected in Area A, AR-4.

As the ACF diagram (Fig. 12) shows, a sample of the biotite granite in Area A, AR-1, is plotted in the S-type area, two samples of the two mica granite in Area C, CR-4 and CR-5, are plotted in a border area of the two types, and all the rest of the samples are plotted in the S-type area.

Ishihara (1976) indicated the importance of the relations among $\mathrm{CaO}, \mathrm{Na}_{2} \mathrm{O}$, and $\mathrm{K}_{2} \mathrm{O}$, and classified the Miocene granites in Japan into three, the Outer zone of Southwest Japan showing high $\mathrm{K}_{2} \mathrm{O} / \mathrm{Na}_{2} \mathrm{O}$ ratios in the $\mathrm{CNK}\left(\mathrm{CaO}-\mathrm{Na}_{2} \mathrm{O}-\mathrm{K}_{2} \mathrm{O}\right)$ diagram, the Tanzawa-Niijima trend showing significantly low $\mathrm{K}_{2} \mathrm{O} / \mathrm{Na}_{2} \mathrm{O}$ ratios, and the Middle trend between the foregoing two.

Takahashi (1985) described the Outer zone of Southwest Japan as seemingly of typical S-type trend, and the Tanzawa-Niijima trend as close to the M-type (Mantle source type),


Fig. $12 \mathrm{ACF}\left(\mathrm{Al}_{2} \mathrm{O}_{3}-\mathrm{Na}_{2} \mathrm{O}-\mathrm{K}_{2} \mathrm{O} / \mathrm{CaO} / \mathrm{FeO}+\mathrm{MgO}\right)$ diagram


Fig. $13 \mathrm{CNK}\left(\mathrm{CaO}-\mathrm{Na}_{2} \mathrm{O}-\mathrm{K}_{2} \mathrm{O}\right)$ diagram
proposed by White (1979) as an independent series apart from the I-type.
As Figure 16 shows, the granites in the Yang Kiang area show nearly the same trend in CNK (CaO- $\mathrm{Na}_{2} \mathrm{O}-\mathrm{K}_{2} \mathrm{O}$ ) diagram as that of the Outer zone of southwest Japan, namely of S-type (Fig. 13).

Ishihara (1975 and 1977) proposed two granite-series, the Magnetite-serics and Ilmeniteseries, based on his studies on magnetic susceptibility and opaque minerals of the granites. According to this, the former was formed under the conditions of oxidization when the magma was consolidating, and the latter was formed under the conditions of reduction. The two have different principal chemical components. The Magnetite-series shows more than 0.5 and the Ilmenite-series shows less than 0.5 in $\mathrm{Fe}_{2} \mathrm{O}_{3} / \mathrm{FeO}$ ratio.

Furthermore, Ishihara (1981) plotted granites in the Thai Peninsula on a $\mathrm{Fe}^{3+} / \mathrm{Fe}^{2+}$-Differentiation diagram (Fig. 14) and classified them into the above mentioned two series, showing dotted line for the Magnetite-series area and solid line for the Ilmenite-series area. Based on this study, he suggested that the granites of the Ilmenite-series are associated with cassiteritewolframite mineralization.


Fig. $14 \mathrm{Fe}^{3+} / \mathrm{Fe}^{2+}$ - Differentiation index diagram

Applying Ishihara's criteria, the granites in the suryey area are generally classified into the Ilmenite-series except for a few samples, AR-6, CR-3, CR-5, which show enormously high differentiation indices. Therefore, the granites are adequate for associating the above mentioned mineralization, judging from their characteristics.

Table 12 summarizes the results of the classification.
Classifications of the Magnetite-series and Ilmenite-series, and the I-type and S-type are principally based on different criteria. However, most of S-type granites are in the Imeniteseries, and I-type granites are in both series. In summary, the granites in the area are mainly of the S-type and the Ilmenite-series.

## 3-3 Discussions

The mineralization in the area is principally associated with pegmatites in Area A, and associated with two mica granites in Area C. This suggests that two mica granites and pegmatites showing significantly high differentiation indices are presumably the final differentiation products of the magma which formed the Northeast mass, and are closely associated with mineralization.
Table 12. Classification of granite series

| Sample No. <br> Item | Locality | Rock name | Norm corundum | $\mathrm{Na}_{2} \mathrm{O} / \mathrm{K}_{2} \mathrm{O}$ | $\frac{\mathrm{Al}_{2} \mathrm{O}_{3}}{\mathrm{Na}_{2} \mathrm{O}+\mathrm{K}_{2} \mathrm{O}+\mathrm{CaO}}$ | ACF | CNK | $\mathrm{Fe}_{2} \mathrm{O}_{3} / \mathrm{FeO}$ | Microscopic observation |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AR-1 | Huai Sa Ngin $(\mathrm{X} 0, \mathrm{Y} 7.5)$ | Biotite granite | S (1.19) | I (5.44/1.93) | I (1.07) | I | S ? | mg (0.60) | il |
| AR-2 | $\begin{aligned} & \text { Huai U Tum } \\ & (\mathrm{X} 18, \mathrm{Y} 05) \end{aligned}$ | Biotite granite | S (1.37) | I (3.34/5.20) | I (1.07) | S | S | mg (0.50) | mg |
| AR-3 | Huai Sa Ngin $(X 32, Y 19)$ | Biotite Granite | S (1.93) | I. (4.40/5.12) | I (1.08) | S | S | $\mathrm{mg}(0.51)$ | il |
| AR-4 | Branch of Huai U Tum (X36, Y10) | Biotite granite | 1 (0.35) | 1 (4.36/7.89) | 1 (1.01) | S | S | ii (0.49) | il |
| AR-5 | Huai U Tum $(X 22, Y 4)$ | Two mica granite | S (3.14) | S (2.55/5.28) | S (1.23) | S | S | il (0.34) | il |
| AR-6 | Branch of Huai Sa Ngin $(X 43, Y 14)$ | Two mica granite | S (1.49) | S (2.21/7.06) | S (1.12) | S | S | mg (1.23) | il |
| CR-1 | Branch of Nam Mae Hong (C6-37) | Biotite granite | S (2.32) | 1 (3.18/4.30) | S (1.14) | S | S | il (0.24) | il |
| CR-2 | Nam Mae Hong $(\mathrm{CS}-32)$ | Biotite granite | S (2.49) | S (2.81/5.12) | S (1:16) | S | S | il (0.35) | il |
| CR-3 | Branch of Nam Mae Hong (C31-35) | Two mica granite | S (2.41) | S (3.25/5.18) | S (1.17) | S | S | mg (1.10) | mg |
| CR-4 | Branch of Nam Mae Hong (C24-24) | Two mica granite | S (3.14) | I (4.01/3.96) | S (1.22) | S-1 | S | $\mathrm{mg}(1.48)$ | il |
| CR-5 | Nam Mae Hong (C9-28) | Two mica granite | S (2.92) | I (3.26/5.03) | $\therefore \quad \mathrm{S}(1.21)$ | S-I | S | mg (3.90) | $i 1$ |

S;S-type, I; I-type, mg ; Magnetite series, il ; ilmenite series

## PART III CONCLUSION AND RECOMMENDATION

## Chapter 1 Conclusion

For the second phase, geological and geochemical survey was carried out in Area A and Area C which were identified as potential areas by the first phase survey. The results of the second phase survey are as the Triassic.

Area A
(1) The area is underlain by biotite granite, two mica granite, pegmatite, aplite, and quartz veins being regarded as the Triassic.
(2) It is inferred from difference of distribution, form, lithology, and texture that after the biotite granite batholith was formed, the two mica granite intruded and the pegmatite, aplite, and quartz veins subsequently intruded into both granites.
(3) It is confirmed by chemical analyses of panning concentrates that the pegmatites contain niobium, tantalum, tin, and tungsten. The pegmatites supplied placer deposits with tin and tungsten in the area. The pegmatites with beryl show high contents of all the aforementioned elements.
(4) Placer deposits and mineral indications correspond to the locations of the pegmatites. tin, and tungsten.
(5) Locations of geochemically anomalous zones rich in all analized elements generally coincide, especially around old workings along tributaries of Huai U Tum and mineral indications in the middle course of Huai Sa Ngin. Those anomalous zones have potentiality for existence of pegmatites rich in niobium, tantalum, tin, and tungsten.

Area C
(1) The area is underlain by Cambrian to Carboniferous sedimentary sequence, Triassic granites, and alluvium,
(2) The sedimentary rocks consist of Cambrian to Ordovician system, Ordovician system, and Devonian to Carboniferous system. The first one is distributed in small areas as roof pendants and the latter two are distributed long and narrowly in the southwestern part.
(3) The granites are biotite granite and two mica granite same as Area A. It is inferred from lithology, texture, distribution and shape that the latter grantite intruded the former one. Pegmatite is not seen in the area.
(4) Many small gossans are seen in the two mica granite area and is aligned in NNW-SSE direction. They form a gossan zone in approximately 200 m wide and 3 knt long strip.
(5) Some gossans accompany skarn zones and silicified zones and show mineralization of tin, tungsten, copper, zinc, and others. It is inferred that the mineralization is controlled in SSW-SSE direction.
(6) A kaolin zone which consists of kaolinite, quartz, muscovite and tourmaline is in the two mica granite zone in the center to the southem part. The kaolin zone seems to be continuous to the gossan zone.
(7) Geochemically anomalous zones rich in tin and tungsten are distributed in a NNW-SSE strip and overlap the gossan zone. An anomalous zone rich in niobium and tantalum is continuous to the aforementioned anomalous zone and overlaps the kaolin alteration zone. These anomalous zones contain many high assay values of tin and tungsten suggesting high potential for economical mineralization zones.

## Chapter 2 Recommendation for the Third Phase Survey

As a result, the following two places are identified as highly potential areas for economical ore deposits:
(1) Around the old workings along a tributary of Huai U Tum, and a geochemically anomalous zone in the middle course of Huai Sa Ngin in Area A.
(2) A geochemically anomalous zone extending NNW-SSE which overlap the gossan zone and the kaolin zone in Area C.

The geochemically anomalous zone in Area C has the highest potential in containing more promising ore deposit because of mineral content and extent of anomalous zone.

Therefore, we recommend for the third phase survey that trench survey and shallow drilling to 30 to 50 m deep should be carried out to confirm existence of mineral indications and extent of mineralized zone at the geochemically anomalous zone in Area C.

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Appendix 1. Microscopic observation of rock thin sections

| No. | Sample No. | Locality | Rock name | Texture | Primary mineral |  |  |  |  |  |  |  |  |  |  |  |  |  | Secondarymineral |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | qz | pg | kf | bi | mu | tl | ap | ti | Zr | gt | ru | by | mz | op | ch | Sr | qz |
| 1 | AR- 1 | Huai Sa Ngin (X0, Y7.5) | biotite granite | granitic | $\bigcirc$ | (0) | O | 0 | - |  | - |  | - |  |  |  |  | - | - | - |  |
| 2 | AR-2 | $\begin{aligned} & \text { Huai U Tum } \\ & \text { (X18, Y0.5) } \\ & \hline \end{aligned}$ | biotite granite | granitic, porphyritic | 0 | (0) | © | 0 | - |  |  | - | - |  |  |  |  | - |  | $\bigcirc$ |  |
| 3 | AR- 3 | Huai Sa Ngin (X32, Y19) | gneissose biotite granite | granoblastic | (0) | (0) | O | 0 |  |  | - | - | - |  |  |  |  | - |  |  |  |
| 4 | AR-4 | $\begin{aligned} & \text { Branch of Huai U Tum } \\ & (X 36, Y 10) \end{aligned}$ | biotite granite | granitic, porphyritic | 0 | 0 | © | $\bigcirc$ |  | - | - | - | - | - |  |  |  | - | 0 |  |  |
| 5 | AR-5 | $\begin{aligned} & \text { Huai U Tum } \\ & (\mathrm{X} 22, \mathrm{Y} 4) \end{aligned}$ | two mica granite | granitic | © | (0) | (0) | 0 | 0 |  | $\bullet$ |  | $\bullet$ |  |  |  |  | - | - | $\bigcirc$ |  |
| 6 | AR-6 | Branch of Huai Sa Ngin (X43, Y14) | two mica granite | granitic, cataclastic | - | O | 0 | $\bigcirc$ | $\bigcirc$ |  | - |  | - |  |  |  |  | - | - | - |  |
| 7 | AR-8 | $\begin{aligned} & \text { Huai Sa Ngin } \\ & \text { (X1, Y9) } \end{aligned}$ | pegmatite | pegmatitic | © | O | (0) | 0 |  |  |  |  | $\bullet$ | $\bigcirc$ | - | $\bigcirc$ |  |  | $\bullet$ |  |  |
| 8 | AR- 9 | $\begin{aligned} & \text { Huai Sa Ngin } \\ & (\mathrm{X} 28, \mathrm{Y} 16.5) \end{aligned}$ | pegmatite | pegmatitic | © | (0) |  |  | - |  |  |  |  | 0 |  |  | - |  |  |  |  |
| 9 | AR-10 | $\begin{aligned} & \text { Huai Sa Ngin } \\ & (\mathrm{X} 31, \mathrm{Y} 19) \end{aligned}$ | pegmatite | pegmatitic | 0 | 0 | © |  | $\bigcirc$ |  |  |  |  | $\bigcirc$ |  |  |  |  |  |  |  |
| 10 | CR-1 | Branch of Nam Mae Hong (C6-37) | biotite granite | granitic, porphyritic | (0) | 0 | (0) | - | - | - | $\bullet$ | $\bullet$ | - |  |  |  |  | - | - | 0 |  |
| 11 | CR-2 | $\begin{aligned} & \text { Nam Mae Hong } \\ & \text { (C5-32) } \end{aligned}$ | biotite granite | granitic, porphyritic | (0) | 0 | (0) | 0 |  | - | - | . | $\bullet$ |  |  |  |  | - | 0 | 0 | - |
| 12 | CR-3 | Branch of Nam Mae Hong (C31-35) | two mica granite | granitic | © | 0 | © | 0 | 0 |  | - |  | - |  |  |  |  | - | - | $\bullet$ |  |
| 13 | CR-4 | Branch of Nam Mae Hong (C24-24) | two mica granite | granitic, cataclastic | © | 0 | © | 0 | $\bigcirc$ | 0 | - |  |  |  |  |  |  | - | 0. | $\bigcirc$ |  |
| 14 | CR-5 | Nam Mae Hong (C9-28) | mylonitic granite | mylonitic | © | 0 | (0) |  | $\bigcirc$ |  | - |  | - |  |  |  |  | - |  | $\bigcirc$ |  |
| 15 | CR-6 | Branch of Nam Mae Hong (C27-20) | leucocratic granite | granitic | $\bigcirc$ |  | © |  |  |  | $\bullet$ |  |  |  |  |  |  |  |  |  |  |

Abbreviations: $\quad \mathrm{qz}$;quartz, pg;plagioclase, $\mathrm{kf} ; \mathrm{K}$-feldspar, bi; biotite, mu; muscovite, ti ; tourmaline, ap ; apatite, ti; sphene, zr ; zircon, Abbreviations: Symbols: ©; abundant, $O$; common, 0 ; rare, • ;trace

Appendix 2. Microscopic observation of ore polished sections

| No. | Sample No. | Locality | Description | Ore minerals |  |  |  |  |  |  |  |  |  |  |  |  | Gang minerals |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | cs | sh | w | gn | cr | po | py | cp | goe | ct | il | mag | hem | $\mathrm{qz}^{2}$ | kf | pg | sr | ch | ep | gt | t1 | ru | zr | ap | an | $\mathrm{xe}^{\text {e }}$ | mz | ca |
| 1 | AO-13 | Huai Sa Ngin (X11, Y14) | Panning concentrate (Pegmatite) | - |  |  |  |  |  |  |  |  | - | - | - |  | - |  | - | - |  |  | - | - |  | - |  | - | - | $\bigcirc$ |  |
| 2 | AO-20 | $\begin{aligned} & \text { Huai Sa Ngin } \\ & (\times 25, Y 16) \end{aligned}$ | Panning concentrate (Pegmatite) | $\bigcirc$ |  |  |  |  |  |  |  |  | - |  |  |  | - |  |  | - |  |  | (0) | - | - | O |  | - |  |  |  |
| 3 | AO-31 | $\begin{aligned} & \text { Huai Sa Ngin } \\ & \text { (X31, Y19 } \end{aligned}$ | Pauning concentrate (Stream sediment) | © |  |  |  |  |  |  |  |  |  |  |  |  |  | - |  |  |  |  | $\bigcirc$ |  |  |  |  |  |  |  |  |
| 4 | AO-43 | Branch of Huai $\cup$ Tum (X6, Y5) | Panning concentrate (Pegmatite) | (0) |  |  |  |  |  | - |  |  | O |  |  |  | - | - |  | - |  |  | - | O |  |  |  |  |  |  |  |
| 5 | AO-57 | Branch of Huai $U$ Tum (X8, Y1.5) | Panning concentrate (Stream sediment) | © | - |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | (0) | - | - | O |  | - |  |  |  |
| 6 | AO-70 | Branch of Huai U Tum (X47. Y9.5) | Panning concentrate (Stream sediment) | - | - |  |  |  |  |  |  |  | - |  | - |  |  |  |  |  |  |  |  |  |  | O |  |  |  |  |  |
| 7 | CO-11 | $\begin{aligned} & \mathrm{Nam} \text { Mae Hong } \\ & (\mathrm{C} 41-3) \end{aligned}$ | Panning concentrate (Stream sediment) | © | - |  |  |  |  |  |  |  | - | O |  |  | - |  |  |  |  |  |  | - | 。 |  |  | - | - | $\bigcirc$ |  |
| 8 | CO-19 | Branch of Nam Mae Hong (C24-24) | Panning concentrate (Stream sedinient) | 0 | - |  |  |  |  |  |  |  | - | © |  |  | $\bullet$ |  |  |  |  |  |  | - | - | O |  | - |  |  |  |
| 9 | CO -24 | Branch of Nam Mae Hong (C30-28) | Panning concentrate (Stream sediment) |  |  |  |  |  |  |  |  |  | - | O |  |  | © |  |  |  |  |  |  | - | - | 。 |  |  |  |  |  |
| 10 | CO-27 | Branch of Nam Mae Hong (C43-9) | Panning concentrate (Stream sediment) | O | - |  |  |  |  | (0) |  |  |  |  | - |  | - |  |  |  |  |  |  | - |  |  |  |  |  |  |  |
| 11 | CO-29 | Branch of Nam Mae Hong (C46-25) | Panning concentrate (Stream sediment) | 0 | - |  |  |  |  |  |  |  | - | $\bigcirc$ |  |  | - |  |  |  |  |  |  | - | - | () |  | - |  |  |  |
| 12 | CO-100 | $\begin{aligned} & \text { C2 ore body } \\ & \text { (C9-29) } \end{aligned}$ | Oxidized ore (Gossan) |  |  |  |  |  |  |  |  | $\bigcirc$ |  |  |  |  | 0 | - |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | CO-101 | $\begin{aligned} & \text { C2 ore body } \\ & \text { (C9-29) } \end{aligned}$ | Green skarn (Banded) |  |  |  |  |  |  | - | - | $\bigcirc$ |  |  |  |  | - | O |  | () | - | O |  |  |  | - | - |  |  |  |  |
| 14 | CO-102 | $\begin{aligned} & \mathrm{C} 2 \text { ore body } \\ & (\mathrm{C} 9-29) \end{aligned}$ | Green skarn |  |  |  |  |  |  | $\bigcirc$ | - |  |  | - |  |  | (0) |  |  | () |  | © |  | - |  |  |  |  |  |  |  |
| 15 | CO-103 | $\begin{aligned} & \text { C2 ore body } \\ & \text { (C9-29) } \end{aligned}$ | Silicified ore |  |  |  |  |  |  | - | - | - |  |  | 0 | - | © |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 | Co-104 | $\begin{aligned} & \text { C2 ore body } \\ & \text { (C9-29) } \\ & \hline \end{aligned}$ | Green skarn |  |  |  |  |  | (0) | - | - |  |  |  |  |  | 0 |  |  | O |  | - |  | - |  |  |  |  |  |  |  |
| 17 | CO-105 | $\begin{aligned} & \mathrm{C} \text { ore body } \\ & \text { (C9-29) } \end{aligned}$ | Sulfide ore |  |  |  | - | - |  | - | - | $\bigcirc$ |  |  |  |  | © |  |  |  | - | - |  |  |  |  |  |  |  |  |  |
| 18 | CO-106 | $\begin{aligned} & \text { C1 ore body } \\ & (\mathrm{C} 28-17) \end{aligned}$ | Silicified ore |  |  |  |  |  |  |  | - |  |  |  | - |  | (0) | © | 0 | - | - |  |  | - |  |  |  |  |  |  |  |
| 19 | CO-107 | $\begin{aligned} & \text { C1 ore body } \\ & \text { (C28-17) } \\ & \hline \end{aligned}$ | Suffide ore |  |  |  |  |  | O | © | O |  |  |  |  | - | © |  | - | - | - |  |  |  |  | - |  |  |  |  |  |
| 20. | CO-108 | $\begin{aligned} & \text { C1 ore body } \\ & (\mathrm{C} 28-17) \\ & \hline \end{aligned}$ | Green skarn |  |  |  |  |  |  | - |  |  |  |  |  |  | O |  |  |  |  | (0) | © |  |  |  |  |  |  |  | $\bigcirc$ |
| 21 | CO-109 | $\begin{aligned} & \text { C2 ore body } \\ & \text { (C11-31) } \end{aligned}$ | Oxidized ore (Gossan) |  |  |  |  |  |  |  |  |  |  |  | (9) | - | (0) |  |  |  |  |  |  |  |  |  | - |  |  |  |  |


xe ; xenotime, mz ; monazite, ca; calcite
Symbols: ©; abundant, $O$; cormmon, $\circ$; rare, $\cdot$; trace

Appendix 3. Results of X-ray diffraction

| No. | Sample No. | Locality | Description | cs | sh | w | ct | cp | sp | po | py | ma | mag | hem | goe | is | kf | pg | qz | gt | 12 | ru | ar | an | xe | niz | hd | ep. | ca | ch | mu |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | AO-13 | Huai Sa Ngin $(\mathrm{Xi1} . \mathrm{Y} 14)$ | Panning concentrate (Pegmatite) | © |  |  | $\bigcirc$ |  |  |  |  |  |  |  |  |  |  |  | $\bigcirc$ | (0) |  | - | © |  | - | - |  |  |  |  |  |
| 2 | AO-15 | Huai Sa Ngin (X17, Y15) | Panning concentrate (Pegmatite) | - |  |  | - |  |  |  |  |  |  |  |  |  |  |  |  | - |  | - | O |  | 0 | 0 |  |  |  |  |  |
| 3 | AO-20 | Huai Sa Ngin (X25, Y16) | Panning concentrate (Pegmatite) | $\bigcirc$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | (0) |  | - | O |  |  |  |  |  |  |  | (0) |
| 4 | $\mathrm{AO}-31$ | Huai Sa Ngin (X31, Y19) | Panning concentrate (Stream sediment) | - |  |  | - |  |  |  |  |  |  |  |  |  |  |  | - | 0 |  |  |  |  |  |  |  |  |  |  |  |
| 5 | AO-43 | Branch of Huai U Tum (X6; Y5) | Panning concentrate (Pegmatite) | (0) |  |  | 0 |  |  |  |  |  |  |  |  |  | - |  |  | 0 | - |  |  |  |  |  |  |  |  |  |  |
| 6 | AO-57 | Branch of Huai U Tum ( $88 . \mathrm{Y}^{2} 5$ ) (X8, Y1.5) | Panning concentrate (Stream sediment) | © | - |  | - |  |  |  |  |  |  |  |  |  |  |  |  | 0 |  | - | O |  |  |  |  |  |  |  |  |
| 7. | AO-70 | Branch of Huai U Tum (X47, Y9.5) | Panning concentrate (Stream sediment) | - | O |  | - |  |  |  |  |  |  | $\because$ |  |  |  |  |  |  |  | - | - |  |  | $\bigcirc$ |  |  |  |  |  |
| 8. | $\mathrm{CO}-11$ | $\begin{aligned} & \text { Nam Ma Hong } \\ & (\mathrm{C} 41-3) \end{aligned}$ | Panning concentrate (Stream sediment) | (0) | - |  | - |  |  |  |  |  |  |  |  | - |  |  | - |  |  | - |  | - | - | - |  |  |  |  | © |
| 9 | CO-18 | Branch of Nam Mae fining (C24-37) | Panning concentate (Stream sediment) | $\bigcirc$ | - |  |  |  |  |  |  |  |  |  |  | $\bigcirc$ |  |  |  |  |  | - | (1) |  |  | O |  |  |  |  |  |
| 10 | CO-19 | Branch of Nam Mae Hong (C24-24) | Panning concentrate (Stream sediment) | 0 | - |  | - |  |  |  |  |  |  |  |  | (1) |  |  |  |  |  | - | - | - |  |  |  |  |  |  |  |
| 11 | CO-24 | Branch of Nam Mae Hong $(\mathrm{C} 30-28)$ | Panning concentrate (Stream sediment) |  |  |  | - |  |  |  |  |  |  |  |  | $\bigcirc$ |  |  | 0 |  |  | O | () | 0 |  | - |  |  |  |  |  |
| 12 | CO-27 | Branch of Nam Mae Hong (C43-9) | Panning concentrate (Stream sediment) | 0 |  | 0 |  |  |  |  | © |  |  | - |  |  |  |  | - |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | Co-29 | Branch of Nam Mae Hong (C46-25) | Panning concentrate (Stream sediment) | 0 |  |  | - |  |  |  |  |  |  |  |  | © |  |  | - |  |  | - | © | - |  | - |  |  |  |  |  |
| 14 | CO 33 | Branch of Nam Mae Hong (C26-13) | Panning concentrate (Tvo mica granite) |  |  |  |  |  |  |  |  |  |  |  |  | - |  | - | $\bigcirc$ |  | © | 0 | - | - |  |  |  |  |  |  |  |
| 15 | CO-100 | $\begin{aligned} & \mathrm{C} 2 \text { ore body } \\ & (\mathrm{C}-29) \end{aligned}$ | Oxidized ore (Gosssn) |  |  |  |  |  |  |  |  |  |  | - | (o) |  |  |  | - |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 | CO-101 | $\begin{aligned} & \text { C2 ore body } \\ & \text { (C9-29) } \end{aligned}$ | Green skarn (Banded) |  |  |  |  |  |  |  | - |  |  |  | O |  | (0) | $\bullet$ |  |  | - |  |  |  |  |  |  | $\bullet$ |  |  |  |
| 17 | CO-102 | $\begin{aligned} & \text { C2 ore body } \\ & \text { (C9-29) } \end{aligned}$ | Green skarn |  |  |  |  | - |  |  | - |  |  |  |  |  |  | - | © |  |  |  |  |  |  |  |  | - |  |  | (0) |
| 18 | CO-103 | $\begin{aligned} & \text { C2 ore body } \\ & (\mathrm{C} 9-29) \end{aligned}$ | Silicified ore |  |  |  |  | - |  |  |  |  | - |  |  |  |  |  | © |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 | CO-104 | $\begin{aligned} & \mathrm{C}_{2} \text { ore b ody } \\ & (\mathrm{Cy}-29) \end{aligned}$ | Green skarn |  |  |  |  | - |  | - |  | - |  | - |  |  |  |  | $\bigcirc$ |  | - |  |  |  |  |  |  |  |  | - | 0 |
| 20 | Co-105 | $\begin{aligned} & \text { C2 ore body } \\ & (\mathrm{C}-29) \end{aligned}$ | Sulfide ore |  |  |  |  |  | O |  | () | - |  |  |  |  |  |  | © |  |  |  |  |  |  |  |  |  |  |  | - |
| 21. | Co-106 | $\begin{aligned} & \mathrm{Cl} \text { ore body } \\ & (\mathrm{C} 28-17) \end{aligned}$ | Silicified ore |  |  |  |  |  |  |  | $\bullet$ |  | $\bigcirc$ |  |  |  |  | 0 | © |  | - |  |  |  |  |  |  |  |  | 0 | - |
| 22 | co-107 | $\begin{aligned} & \mathrm{Cl} \text { ore body } \\ & \text { (C28-17) } \end{aligned}$ | Sulfide ore |  |  |  |  | - |  | - | o | - |  |  |  |  |  | - | 0 |  |  |  |  |  |  |  |  |  |  | O | O |
| 23 | CO-108 | $\begin{aligned} & \text { Cl ore body } \\ & (\mathrm{C} 28-17) \end{aligned}$ | Green skarn |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | © | 0 |  |  |  |  |  |  | 0 | $\bigcirc$ | - |  |  |
| 28 | CO-109 | $\begin{aligned} & \text { C2 ore body } \\ & (\mathrm{C} 11-31) \\ & \hline \end{aligned}$ | Oxidized ore (Gossan) |  | - |  |  |  |  |  |  |  | (0) | - |  |  |  |  | - |  |  |  |  |  |  |  |  |  |  |  |  |


$\begin{array}{ll}\text { Symbols: } & \text { O; abundant, } \mathrm{O} \text {; common, } 0 \text {; rare, }\end{array}$
Appendix 4. Megascopic observation of panning samples


| (2) |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Amount |  | Minerals |  |  |  |  |  |  |
| No. | Sample No. | Locality | Description | Raw material (l) | Heavy mineral (g) | $\cdots \mathrm{cs}$ | sh | gt | il | mag | Zr | radio |
| 23 | AO-23 | Huai Sa Ngin (X28, Y18) | Pegmatite | $\therefore 10$ | $<1$ | $\therefore 0$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | 0 | * |
| 24 | $\mathrm{AO}-24$ | Huai Sa Ngin (X29, Y17.5) | Pegmatite | - 100 | $<1$ |  |  | $\bigcirc$ |  |  | $\bigcirc$ | - |
| 25 | $\mathrm{AO}-25$ | Huai Sa Ngin (X22, Y17) | Stream sediment | 20 | $<1$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  | - | $\bigcirc$ | - |
| 26 | AO-26 | Huai Sa Ngin (X22, Y15.5) | Stream sediment | 10 | 3 | (0) | $\bigcirc$ | $\bigcirc$ |  | - | - | - |
| 27 | AO-27 | Huai Sa Ngin (X23, Y16) | Stream sediment | 10 | 4 | (0) | - | $\bigcirc$ |  |  | - | $\bigcirc$ |
| 28. | AO-28 | Huai Sa Ngin (X23, Y16.5) | Stream sediment | 60 | 6 | (0) | $\bigcirc$ | 0 |  | $\bigcirc$ |  | 0 |
| 29 | AO-29 | Huai Sa Ngin (X28, Y18) | Stream sediment | 10 | 2 | - | 0 | 0 |  | 0 |  | - |
| 30 | AO-30 | Huai Sa Ngin (X29, Y18.5) | Stream sediment | 30 | $<1$ | 0 |  | (0) |  |  | (0) | 0 |
| 31 | AO-31 | Huai Sa Ngin (X31, Y19) | Stream sediment | 100 | 22 | (0) | - | $\bigcirc$ | $\cdot$ | - | $\bigcirc$ | $\bigcirc$ |
| 32 | AO-32 | Huai $\mathrm{Sa} \mathrm{Ng} \ln (\mathrm{X} 36, \mathrm{Y} 18.5)$ | Stream sediment | 10 | $<1$ |  |  |  |  | 0 |  |  |
| 33 | AO-33 | Huai Sa Ngin (X40, Y17.5) | Stream sediment | 10 | 4 | 0 |  | $\bigcirc$ |  | - | $\bigcirc$ | - |
| 34 | AO-34 | Huai Sa Ngin (X40, Y17.5) | Stream sediment | 30 | $<1$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\cdots$ |  | 0 | * |
| 35 | AO-35 | Huai Sa Ngin (X41, Y19) | Stream sediment | 30 | $<1$ |  | . | $\bigcirc$ |  |  | 0 |  |
| 36 | AO-36 | Huai Sa Ngin (X43, Y14.5) | Stream sediment | 30 | 3 | $\bigcirc$ | $\therefore 0$ | $\bigcirc$ |  |  | $\bigcirc$ | - |
| 37 | AO-37 | Huai Sa Ngin (X44, X17.5) | Stream sediment | 30 | 3 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  | - | - | 0 |
| 38 | AO-38 | Huai Sa Ngin (X46, Y17.5) | Stream sediment | 30 | - 13 | $\bigcirc$ | $\bigcirc$ | 0 |  | * | 0. | $\bigcirc$ |
| 39 | AO-39 | Huai Sa Ngin (X48, Y17) | Stream sediment | 30 | $<1$ | $\bigcirc$ | 0 | (0) |  | - | $\bigcirc$ | - |
| 40 | AO-40 | Huai Sa Ngin (X48, Y17) | Stream sediment | 30 | 6 | $\bigcirc$ | - | (0) |  | $\bullet$ | $\bigcirc$ | $\bigcirc$ |
| 41 | AO-41 | Huai Sa Ngin (X48, Y15) | Stream sediment | 30 | - 2 | $\bigcirc$ |  | (0) |  |  | $\bigcirc$ | $\bullet$ |
| 42 | AO-42 | Huai Sa Ngin (X50, Y17.5) | Stream sediment | 30 | <1 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  | - | O | - |
| 43 | AO-43 | Branch of Huai U tum (X6, Y5) | Pegmatite | 30 | 10 | $\begin{aligned} & \text { cs } \\ & \text { ct } \\ & \hline \end{aligned}$ |  | $\bigcirc$ |  | - |  | - |
| 44 | AO-44 | Branch of Huai U tum (X7, Y4.5) | Stream sediment | 60 | 6 | (0) |  | $\bigcirc$ |  | - | $\bigcirc$ | 0 |
| 45 | AO-45 | Branch of Huai U tum (X7,Y2) | Stream sediment | - 30 | - 8 | $\bigcirc$ | - | $\bigcirc$ |  | - |  | - |


| (3) |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No. | Sample No. | Locality | Description | Amount |  | Minerals |  |  |  |  |  |  |
|  |  |  |  | Raw material ( $\ell$ ) | Heavy mineral (g) | $\because \mathrm{cs}$ | sh | gt | il | mag | 2r | radio |
| 46 | AO-46 | Branch of Huai U tum (X9, Y6.5) | Stream sediment | 20 | 8 | (0) | - | $\bigcirc$ |  |  |  | $\bigcirc$ |
| 47 | AO-47 | Branch of Huai U tum (X9, Y6.5) | Stream sediment | 10 | 4 |  |  |  |  | - | - | $\bullet$ ? |
| 48 | AG-48 | Branch of Huai U tum (X9, Y6.5) | Stream sediment | 30 | 14 | $\bigcirc$ | - | $\bigcirc$ |  |  | $\bigcirc$ | - |
| 49 | AO-49 | Branch of Huai U tum (X8, Y6) | Stream sediment | 10 | 8 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0? |  | - | $\bullet$ ? |
| 50 | AO-50 | Branch of Huai U tum (X8,Y6) | Stream sediment | 30 | 42 | 0 | - | 0 | o? |  | - | $\bigcirc$ |
| 51 | AO-51 | Branch of Huai $U$ tum (X8, Y5.5) | Stream sediment | 30 | 4 | 0 | \% | 0 | 0 ? | - | $\bigcirc$ | - |
| 52 | AO-52 | Branch of Huai U tum (X8,Y5) | Stream sediment | 30 | 10 | $\bigcirc$ | $\bigcirc$ | (0) |  |  | $\bigcirc$ | 0 |
| 53 | AO-53 | Branch of Huai U tum (X8, Y4.5) | Stream sediment | 100 | 58 | $\bigcirc$ | $\bigcirc$ | 0 |  |  | $\bigcirc$ | (0) |
| 54 | AO-54 | Branch of Huai $U$ tum (X8, Y3) | Stream sediment | 30 | 5 | $\bigcirc$ | - | (0) |  |  | - | $\bigcirc$ |
| 55 | AO-55 | Branch of Huai U tum (X8, Y2) | Stream sediment | 30 | 30 | 0 | - | $\bigcirc$ |  |  | $\bigcirc$ | 0 |
| 56 | AO-56 | Branch of Huai $U$ tum (X8, Y1.5) | Stream sediment | 50 | 6 | $\bigcirc$ | - | $\bigcirc$ |  |  | $\bigcirc$ | (0) |
| 57 | AO-57 | Branch of Huai U tum (X8, Y1.5) | Stream sediment | 40 | 32 | (0) | - | 0 |  | $\bullet$ | $\bigcirc$ | (o) |
| 58 | AO-58 | Branch of Huai U tum (X9, Y1.5) | Stream sediment | 20 | 2 | $\bigcirc$ |  | $\bigcirc$ |  |  | . | - |
| 59 | AO-59 | Branch of Huai U tum ( $\mathrm{X} 8, \mathrm{Y} 0$ ) | Stream sediment | 10 | 4 | - |  |  |  |  |  | - |
| 60 | AO-60 | Branch of Huai U tum (X33, Y9) | Pegmatite | 20 | <1 |  |  | (0) |  | $\bigcirc$ |  | $\bigcirc$ |
| 61 | AO-61 | Branch of Huai U tum (X22, Y4) | Stream sediment | 50 | 4 |  | - | $\bigcirc$ | O? | $\bigcirc$ |  | $\bigcirc$ |
| 62 | AO-62 | Branch of Huai U tum (X22, Y4.5) | Stream sediment | 50 | 4 | - | $\bigcirc$ | $\bigcirc$ |  | (0) | - | - |
| 63 | AO-63 | Branch of Huai U tum (X24, Y7) | Stream sediment | 30 | <1 | $\bullet$ ? | - | - | - | $\bigcirc$ |  | - |
| 64 | AO-64 | Branch of Huai U tum (X26, Y8.5) | Stream sediment | 50 | 3 | $\bigcirc$ | - | $\bigcirc$ |  | $\bullet$ | - | - |
| 65 | AO-65 | Branch of Huai U tum (X37, Y10.5) | Stream sediment | 40 | 8 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 ? |  | $\bullet$ | - |
| 66 | AO-66 | Branch of Huai U tum (X37, Y10) | Stream sediment | 40 | 8 | $\bigcirc$ | 0 | 0 | -? |  | $\bigcirc$ | $\bigcirc$ |
| 67 | AO-67 | Branch of Huai U tum (X44, Y8) | Stream sediment | 30 | 4 | $\bigcirc$ | - | - | $0 ?$ | - | $\bullet$ | - |
| 68 | AO-68 | Branch of Huai U tum (X44, Y8.5) | Stream sediment | 50 | $<1$ | - | - | - | O? |  |  |  |


|  |  |  |  | - Amo | ount | Minerals |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No. | No. | Locality | Description | Raw material ( $\ell$ ) | Heavy mineral (g) | cs | sh | gt | il | mag | $z r$ | radio |
| 69 | AO-69 | Branch of Huai U tum (X46, Y8.5) | Stream sediment | - 30 | $<1$ | $\bigcirc$ | 0 | $\bigcirc$ | $0 ?$ |  | $\bullet$ |  |
| 70 | AO-70 | Branch of Huai U tum (X47, Y9.5) | Stream sediment | 70 | 4 | (0) | $\bigcirc$ | $\therefore 0$ | 0? |  | $\mathrm{mz} \circ$ | $\bullet$ |
| 71 | $\mathrm{CO}-1$ | Nam Mae Hong (C1-34) | Stream sediment | 50 | $<1$ | (0) | $\bigcirc$ |  | - | $\bigcirc$ | 0 | - |
| 72 | $\mathrm{CO}-2$ | Nam Mae Hong (C5-34) | Stream sediment | 50 | 2 |  | 0 | $\ldots$ | - | $\bigcirc$ | $\bigcirc$ | - |
| 73 | CO-3 | Nam Mae Hong (C7-26) | Stream sediment | - 30 | $<1$ |  | $\because$ |  | -? |  | $\bigcirc$ | - ? |
| 74 | $\mathrm{CO}-4$ | Nam Mae Hong (C20-9) | Stream sediment | - 100 | $\because 10$ | $\bullet$ | $\bigcirc$ |  | $\bigcirc$ | - |  | 0 |
| 75 | $\mathrm{CO}-5$ | Nam Mae Hong (C21-7) | Stream sediment | 100 | $\therefore 6$ | $\bigcirc$ |  |  | 0 | - | $\bigcirc$ |  |
| 76 | $\mathrm{CO}-6$ | Nam Mae Hong (C22-6) | Stream sediment | 100 | 3 | - | . |  | $\bigcirc$ | - | - | - |
| 77 | CO-7 | Nam Mae Hong (C26-8) | Stream sediment | 100 | 5 | $\bigcirc$ |  | . | $\bigcirc$ | - | . . |  |
| 78 | $\mathrm{CO}-8$ | Nam Mae Hong (C28-4) | Stream sediment | 50 | 5 | $\bigcirc$ |  |  | 0 |  | $\bigcirc$ | $\bullet$ |
| 79 | CO- 9 | Nam Mae Hong (C33-4) | Stream sediment | - 50 | 10 | $\bigcirc$ |  |  | $\bigcirc$ | - |  |  |
| 80. | $\mathrm{CO}-10$ | Nam Mae Hong (C36-2) | Stream sediment | 50 | 12 | $\bigcirc$ | . | ; | 0 |  | $\bigcirc$ | $\bigcirc$ |
| 81 | $\mathrm{CO}-11$ | Nam Mae Hong (C41-3) | Stream sediment | 100 | 12 | (0) | $\bigcirc$ |  | $\bigcirc$ | - | O\% | - |
| 82 | CO-12 | Nam Mae Hong (C44-1) | Stream sediment | 50 | 14 | $\bigcirc$ | $\bigcirc$ |  | $\bigcirc$ | - | - | $\bullet$ |
| 83 | CO-13 | Nam Mae Hong (C49-1) | Stream sediment | 100 | 2 | $\bigcirc$ | - |  | $\bigcirc$ | - | . | - |
| 84 | $\mathrm{CO}-14$ | Branch of Nam Mae Hong (C11-37) | Stream sediment | 30 | $<1$ |  |  |  | O? | - | $\bigcirc$ | - |
| 85 | CO-15 | Branch of Nam Mae Hong (C5-37) | Stream sediment | 30 | $<1$ | -? | $\bigcirc$ | * | - | $\bigcirc$ | $\bigcirc$ | - |
| 86 | CO-16 | Branch of Nam Mae Hong (C5-33) | Stream sediment | 30 | $<1$ |  | $\bigcirc$ |  | - | - |  | - |
| 87. | $\mathrm{CO}-17$ | Branch of Nam Mae Hong (C9-33) | Stream sediment | - 30 | $<1$ | - | 0 |  | - | $\bigcirc$ | $\bigcirc$ | $?$ |
| 88 | CO-18 | Branch of Nam Mae Hong (C24-37) | Stream sediment | 50 | 3 | $\bigcirc$ | - | $\mathrm{mz} \bigcirc$ | 0 | - | 0 | $\bigcirc$ |
| 89 | CO-19 | Branch of Nam Mae Hong (C24-24) | Stream sediment | 70 | 250 | $\bigcirc$ | $\bigcirc$ |  | (0) | - | $\bigcirc$ | $\bigcirc$ |
| 90 | CO-20 | Branch of Nam Mae Hong (C27-14) | Stream sediment | . 30 | 6 | $\bigcirc$ | $\bigcirc$ |  | O? | 0 | $\bigcirc$ | - |
| 91 | CO-21 | Branch of Nam Mae Hong (C31-37) | Stream sediment | 30 | $<1$ | . | $\bigcirc$ |  | - | $\bigcirc$ | $\bigcirc$ | . |


| No. | Sample No. | Locality | Description | Amount |  | Minerals |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Raw material ( $\ell$ | Heavy mineral (g) | CS | sh | gt | il | mag | zr | radio |
| 92 | $\mathrm{CO}-22$ | Branch of Nam Mae Hong (C31-35) | Stream sediment | 30 | 6 |  |  |  | - | $\bigcirc$ | © |  |
| 93 | CO-23 | Branch of Nam Mae Hong (C30-28) | Stream sediment | 30 | 2 |  |  |  | O? | . | $\bigcirc$ | - |
| 94 | $\mathrm{CO}-24$ | Branch of Nam Mae Hong (C30-28) | Stream sediment | 30 | 6 |  | -? |  | 0 | - | © | - |
| 95 | CO-25 | Branch of Nam Mae Hong (C39-33) | Stream sediment | 30 | <1 | - | - |  | O? | - | $\bigcirc$ | - |
| 96 | CO-26 | Branch of Nam Mae Hong (C40-33) | Stream sediment | 30 | $<1$ | $\bigcirc$ | $\bigcirc$ |  |  | 0 | $\bigcirc$ |  |
| 97 | CO-27 | Branch of Nam Mae Hong (C43-9) | Stream sediment | 20 | 225 | $\bigcirc$ | - | wf |  | 0 | py © |  |
| 98 | CO-28 | Branch of Nam Mae Hong (C49-30) | Stream sediment | 10 | $<1$ | -? | $\bigcirc$ |  | 0 | - | - |  |
| 99 | CO-29 | Branch of Nam Mae Hong ( $46-25$ ) | Stream sediment | 10 | 6 | $\bigcirc$ | $\bigcirc$ |  | 0 | - | © | - |
| 100 | CO-100 | Branch of Nam Mae Hong ( $\mathrm{Cl} 1-7$ ) | Stream sediment | 50 | <1 | - | $\bigcirc$ |  |  | $\bigcirc$ | 0 | - |
| 101 | CO-101 | Branch of Nam Mae Hong (C11-8) | Stream sediment | 30 | 2 |  |  |  | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  |
| 102 | $\mathrm{CO}-32$ | Branch of Nam Mae Hong (C21-13) | Two mica granite | 30 | <1 |  |  |  | 0? |  |  | - |
| 103 | CO-33 | Branch of Nam Mae Hong (C26-13) | Two mica granite | 50 | <1 | -? | $\bullet ?$ |  | - | - |  |  |

Abbreviations: cs; cassiterite, sh ; scheelite, gt ; garnet, il ; ilmenite, mag ; magnetite, zr;zircon, mz;monazite, ct;columbite-tantalite, py ; pyrite, wf; wolframite, radio; radioactivity
Symbols; © abundant, $\bigcirc$;common, 0 ;rare •; trace

Appendix 5 Chemical analyses of geochemical samples (Area A)
****** Chemical analyses of geochemical samples (area A) *****


X 2 Y 3.5




| No. | Sample No. | Nb ppin | Ta $p p^{m}$ | Sn P14 | $\begin{gathered} W \\ \text { ppr } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |
| 421 | X 13 Y 8.5 | 20 | 5 | 44 | 15 |
| 422 | $\times 13 \times 9.0$ | 24 | 10 | 47 | 28 |
| 423 | $X 13$ Y 9.5 | 24 | 10 | 43 | 22 |
| 424 | X 13 Y 10.0 | 18 | 6 | 32 | 14 |
| 425 | X 13 Y 10.5 | 18 | 5 | 25 | 14 |
| 426 | X 13 Y11.0 | 16 | 2 | 22. | 11 |
| 427 | X 13 Y 11.5 | 19 | 4 | 33 | 18 |
| 428 | X 13 Y 12.0 | 24 | 7 | 35 | 21 |
| 429 | X 13 Y 12.5 | 26 | 9 | 41 | 15 |
| 430 | X 13 Y13.0 | 20 | 6 | 36 | 19 |
| 431. | $X 13 \quad 113.5$ | 17 | 4 | 31 | 16 |
| 432 | X 13 Y 14.0 | 19 | 5 | 34 | 15 |
| 433 | $X 13$ Y14.5 | 14 | 3 | 23 | 10 |
| 434 | X 13 Y 15.0 | 19 | 5 | 27 | 14 |
| 435 | X 14 Y 0.0 | 14 | 3 | 27. | 13 |
| 436 | X 14 Y 0.5 | 15 | 3 | 26 | 9 |
| 437 | X 14 Y 1.0 | 24 | 8 | 33 | 12 |
| 438 | X 14 Y 1.5 | 25 | 5 | 38 | 14 |
| 439 | X 14Y 2.0 | 34. | 23 | 53 | 13 |
| 440 | X $14 . Y 2.5$ | 21 | 10 | 27 | 11 |
| 441 | $X 14 Y 3,0$ | 20 | 4 | 34 | 14 |
| 442 | $X 14 \mathrm{Y} 3.5$ | 20 | 4 | 33 | 15 |
| 443 | X 14 Y 4.0 | 20 | 7 | 30 | 13 |
| 444 | X 14 Y 4.5 | 19 | 6 | 36 | 13 |
| 445 | $X 14 \mathrm{Y} 5.0$ | 18 | 5 | 33 | 14 |
| 446 | X 14 Y 5,5 | 15 | 6 | 47 | 17 |
| 447 | X 14 Y 6.0 | 27 | 9 | 46 | 77 |
| 448 | X.14.Y6.5 | 28 | 8 | 41 | 77 |
| 149 | X 14 Y 7.0 | 26 | 8 | 44 | 57 |
| 450 | X 14 Y 7.5 | 18 | 5 | 38 | 38 |
| 451 | X 14 Y 8.0 | 28 | 10 | 36 | 66 |
| 452 | X 14 Y 8.5 | 19 | 6 | 36 | 24 |
| 453 | X 14 Y 9.0 | 21 | 7 | 43 | 20 |
| 454 | X .14 Y 9.5 | 25 | 9 | 44 | 44 |
| 455 | $X 14 \times 10.0$ | 24 | 8 | 53 | 49 |
| 456 | X 14.Y10.5 | 20 | 11 | 39 | 25 |
| 457 | X 14 Y11.0 | 20 | 3 | 25 | 13 |
| 458 | X 14 Y 11.5 | 19 | 3 | 31 | 15 |
| 459 | X 14 Y 12.0 | 19 | 4 | 28 | 13 |
| 460 | X 14 Y12.5 | 22 | 7 | 27 | 16 |
| 461 | X 14 Y 13.0 | 22 | 4 | 32 | 16 |
| 462 | X 14 Y13.5 | 20. | 5 | 40 | 19 |
| 463 | X 14 Y 14.0 | 21 | 6 | 42 | 18 |
| 164 | X 14 Y 14.5 | 21. | 5 | 31 | 12 |
| 465 | X 14 Y 15.0 | 19 | 4 | 30. | 10 |
| 466 | X 15 Y 0.0 | 24 | 5 | 45 | 11 |
| 167 | $X 15$ Y 0.5 | 23 | 5 | 52 | 9 |
| 468 | X 15 Y 1.0 | 23 | 4 | 34 | 25 |
| 469. | X 15 Y 1.5 | 31 | 15 | 35 | 13 |
| 470 | X 15 Y 2.0 | 22 | 4 | 23 | 13 |
| 471 | $X 15 Y 2.5$ | 14 | 3 | 38 | 10 |
| 472 | X 15 Y 3.0 | 32 | 11 | 30 | 16 |
| 173 | X 15 Y 3.5 | 21 | 5 | 26 | 10 |
| 474 | X 15 Y 4.0 | 25 | 5 | 27 | 17 |
| 475 | $X 15 Y 4.5$ | 19 | 3 | 37 | 13 |
| 476 | X $15 \times 5.0$ | 22 | 4 | 33 | 13 |
| 477 | X 15 Y 5.5 | 17 | 3 | 33 | 20 |
| 478 | X 15 Y 6.0 | 23 | 6 | 37 | 72 |
| 479 | X $15 \mathrm{Y} 6,5$ | 18 | 5 | 51 | 11 |
| 480 : | X 15 Y 7.0 | 16 | 4 | 42 | 17 |
| 481. | X 15 Y 7.5 | 19 | 8 | 48 | 12 |
| 482 | X 15 Y 8.0 | 26 | 9 | 75 | 19 |
| 483 | X 15 Y 8.5 | 17 | 6 | 43 | 10 |
| 484 | X 15 Y 9.0 | 22 | 11 | 49 | 15 |
| 485 | X 15 Y 9.5 | 25 | 12 | 67 | 63 |
| 486 | X 15 Y 10.0 | 48 | 35 | 73 | 53 |
| 487 | X 15 Y10.5 | 20 | 7 | 42 | 16 |
| 488 | X 15 Y 11.0 | 15 | 4 | 26 | 14 |
| 489 | X 15 Y 11.5 | 16 | 4 | 35 | 15 |
| 490 | X 15 Y 12.0 | 15 | 3 | 30 | 18 |



A-12




770 X 24 Y12.5


| No. | Sample No. | Nb pm | Ta рри | Sn ppan | $\underset{(W \times i n}{W}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 841 | X 26 Y17.0 | 19 | 3 | 25 | 7 |
| 842 | X 26 Y17.5 | 28 | 5 | 26 | 9 |
| 843 | X 26 Y 18.0 | 25 | 4 | 26 | 12 |
| 844 | $X 26$ Y18.6 | 29 | 6 | 37. | 12 |
| 845 | X 26 Y19,0 | 27 | 5 | 32 | 9 |
| 846 | X 26 Y19.5 | 24 | 4 | 24 | 12 |
| 847 | X 26 Y20.0 | 27 | 4 | 28 | 11 |
| 848 | X $27 \times 5.0$ | 22 | 13 | 40 | 15 |
| 849 | X 27.Y5.5 | 33 | 13. | 57. | 19 |
| 850 | X 27 Y 6.0 | 30 | 14 | 55 | 17 |
| 851 | $X 27 Y 6.5$ | 19 | 3 | 29 | 22 |
| 852 | X 27 Y 7.0 | 23 | 3 | 30. | 17 |
| 853 | X 27 Y 7.5 | 19 | 3 | 26 | 25 |
| 854 | X 27 Y 8.0 | 20 | 3 | 39 | 26 |
| 855 | X 27 Y 8.5 | 20 | 8 | 30 | 13 |
| 856 | X 27 Y 9.0 | 22 | 7 | 42 | 19 |
| 857 | X 27 Y 9.5 | 19 | 4 | 14 | 45 |
| 858 | X 27 Y10.0 | 28 | 5 | 28 | 28 |
| 859 | X 27 Y 10.5 | 24 | 3 | 24 | 25 |
| 860 | X 27 Y11.0 | 17 | 5 | 34. | 20 |
| 861 | X 27 Y11.5 | 21 | 4 | 26 | 13 |
| 862 | X 27 Y 12.0 | 27 | 5 | 28 | 15 |
| 863 | X 27 Y12.5 | 25 | 5 | 28 | 22 |
| 864 | X 27 Y 13.0 | 29 | 5 | 33 | 35 |
| 865 | X 27 Y13.5 | 26 | 5 | 32 | 21 |
| 866 | X 27 Y 14.0 | 21 | 4 | 26 | 24 |
| 867 | X 27 Y 14.5 | 21 | 5 | 27 | 23 |
| 868 | X 27 Y15.0 | 22 | 5 | 31 | 23 |
| 869 | X 27 Y15.5 | 27 | 5 | 34 | 22 |
| 870 | X 27 Y 16.0 | 29 | 7. | 63 | 25 |
| 871 | X 27 Y 16.5 | 24 | 5 | 23 | 11 |
| 872 | X $27 . \mathrm{Y} 17.0$ | 24 | 1 | 23 | 12 |
| 873 | X 27 Y 17.5 | 32 | 5 | 24 | 14 |
| 874 | X 27 Y 18.0 | 27 | 5 | 27 | 12 |
| 875 | X 27 Y18.5 | 37 | 9 | 34 | 12 |
| 876 | X 27 Y19.0 | 26 | 7 | 25 | 12 |
| 877 | X 27 Y19.5 | 32 | 6 | 27 | 10 |
| 878 | X 27 Y20.0 | 28 | 5 | 28 | 13 |
| 879 | X 28 Y 5.0 | 17. | 3 | 30 | 19 |
| 880 | X 28 Y 5.5 | 32 | 23 | 54 | 25 |
| 881 | X $28 . \mathrm{Y} 6.0$ | 21 | 4 | 34 | 22 |
| 882 | X 28 Y 6.5 | 20 | 5 | 33 | 22 |
| 883 | X 28 Y 7.0 | 18 | 4 | 32 | 16 |
| 884 | X 28 Y 7.5 | 12 | 4 | 24 | 17 |
| 885 | X 28 Y 8.0 | 23 | 5 | 29 | 30 |
| 886 | X 28 Y 8.5 | 23 | 10 | 44 | 24 |
| 887 | X 28 Y 9.0 | 18 | 6 | 42 | 17 |
| 888 | X 28 Y 9.5 | 26 | 8 | 49 | 64 |
| 889 | X 28 Y10.0 | 17 | 5 | 31 | 29 |
| 890 | X 28 Y10.5 | 18 | 8 | 44 | 28 |
| 891 | X 28 Y11.0 | 27 | 7. | 31 | 26 |
| 892 | X 28 Y11.5 | 24 | 6 | 32 | 26 |
| 893 | X 28 Y12.0 | 25 | 4 | 26 | 30 |
| 894 | X 28 Y12.5 | 24 | 5 | 26 | 33 |
| 895 | X 28 Y 13.0 | 28 | 7 | 35 | 44 |
| 896 | X 28 Y13.5 | 24 | 5 | 30 | 28 |
| 897 | $X 28 \mathrm{Y} 14.0$ | 25 | 5 | 27 | 20 |
| 898 | X 28 Y14.5 | 28 | 5 | 32 | 18 |
| 899 | X 28 Y15.0 | 29 | 11. | 35 | 18 |
| 900 | X 28 Y15.5 | 27 | 7 | 35 | 17 |
| 901 | X 28 Y16.0 | 29 | 11 | 37 | 13 |
| 902 | X 28 Y16.5 | 26 | 5 | 45 | 14 |
| 903 | X 28 Y 17.0 | 19 | 3 | 24 | 9 |
| 904 | X 28 Y17.5 | 24 | 4 | 20 | 13 |
| 905 | X 28 Y18.0 | 36 | 7 | 29 | 15 |
| 906 | X 28 Y 18.5 | 34 | 5 | 23 | 16 |
| 907 | X 28 Y19.0 | 28 | 5 | 31 | 16 |
| 908 | X 28 Y19.5 | 34 | 8 | 39 | 13 |
| 909 | X 28 Y20.0 | 30 | 4 | 27 | 11 |
| 910 | X 29 Y 5.0 | 18 | 5 | 28 | 16 |


| No. | Sumple No. | Nb ppin | Ta ppin | Sn ppen | W <br> ypun |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 911. | X 29 Y 6.5 | 34 | 38 | 60 | 20 |
| 912 | X 29 Y 6.0 | 26 | 8 | 48 | 20 |
| 913 | X 29 Y 6.5 | 25 | 11 | 48 | 15 |
| 914 | X 29.170 | 22 | 5 | 32 | 17 |
| 915 | X 29 Y 7.5 | 20 | 4 | 35 | 22 |
| 916 | X 29 Y 8.0 | 31 | 21 | 39 | 28 |
| 917 | X 29 Y 8.5 | 21 | 9 | 35 | 25 |
| 918 | X 29 Y 9.0 | 28 | 10 | 44 | 16 |
| 919 | X 29 Y 9.5 | 33 | 9 | 49 | 24 |
| 920 | X 29 Y 10.0 | 25 | 8 | 42 | 36 |
| 921 | X 29 Y10.5 | 26 | 7 | 34 | 18 |
| 922 | X 29 Y11.0 | 39 | 16 | 38 | 21 |
| 923 | X 29 Y11.5 | 35 | 9 | 34 | 18 |
| 924 | X 29 Y 12.0 | 27 | 9 | 31 | 33 |
| 925 | X 29 Y 12.5 | 30 | 6 | 29 | 22 |
| 926 | X 29 Y13.0 | 27. | 7 | 32 | 18 |
| 927 | X 29 Y13.5 | 22 | 4 | 29 | 17 |
| 928 | X 29 Y 14.0 | 28 | 5 | 28 | 16 |
| 929 | X 29 Y14.5 | 33 | 12 | 35 | 42 |
| 930 | X 29 Y 15.0 | 42 | 17 | 43 | 30 |
| 931 | X 29 Y15.5 | 28 | 11 | 38 | 17 |
| 932 | X 29 Y 16.0 | 25 | 5 | 31 | 14 |
| 933 | X 29 Y 16.5 | 27 | 8 | 34 | 12 |
| 934 | X 29 Y 17.0 | 25 | 8 | 30 | 10 |
| 935 | X 29 Y 17.5 | 27 | 5 | 29 | 11 |
| 936 | X 29 Y18.0 | 25 | 5 | 28 | 12 |
| 937 | X 29 Y18.5 | 30 | 7 | 26 | 15 |
| 938 | X 29 Y 19.0 | 25 | 5 | 25 | 14 |
| 939 | X 29 Y 19.5 | 25 | 4 | 31 | 13 |
| 940 | X 29 Y 20.0 | 29 | 6 | 36 | 18 |
| 941 | X 30 Y 5.0 | 15 | 3 | 30 | 7 |
| 942 | X 30 Y 5.5 | 26. | 7 | 32 | 12 |
| 943 | $X 30 Y 6.0$ | 18 | 2 | 25 | 10 |
| 944 | X 30 Y 6.5 | 25 | 9 | 47 | 16 |
| 945 | X 30 Y 7.0 | 24 | 6 | 39 | 13 |
| 946 | X 30 Y 7.5 | 25 | 5 | 36 | 16 |
| 947 | X 30 Y 8,0 | 29 | 8 | 41 | 18 |
| 948 | X $30 . \mathrm{Y} 8.5$ | 19 | 4 | 32 | 16 |
| 949 | X 30.Y 9.0 | 23 | 5 | 32 | 15 |
| 950 | X 30 Y 9.5 | 19 | 4 | 29 | 17 |
| 951 | X 30 Y 10.0 | 23 | 6 | 29 | 12 |
| 952 | X 30 Y 10.5 | 27 | 7 | 30 | 23 |
| 953 | X 30 Y11.0 | 30 | 6 | 36 | 44 |
| 954 | X 30 Y 11.5 | 29 | 5 | 37 | 38 |
| 955 | X 30 Y 12.0 | 27 | 11 | 37 | 49 |
| 956 | $X 30 \mathrm{Yl2.5}$ | 32 | 18 | 39 | 23 |
| 957 | $X 30 \mathrm{Y} 13.0$ | 23 | 16 | 33 | 22 |
| 958 | X 30 Y13.5 | 26 | 8 | 36 | 18 |
| 959 | X 30 Y14.0 | 26 | 9 | 32 | 24 |
| 960 | X 30 Y 14.5 | 23 | 3 | 33 | 21 |
| 961 | $X 30$ Y15.0 | 34 | 6 | 36 | 25 |
| 962 | X 30 Y15.5 | 37 | 16 | 40 | 20 |
| 963 | X. 30 Y16.0 | 31 | 9 | 56 | 33 |
| 964 | X 30 Y16.5 | 30 | 16 | 50 | 24 |
| 965 | X 30 Y 17.0 | 27 | 4 | 30 | 15 |
| 966 | X $30 . Y 17.5$ | 28 | 4 | 24 | 11 |
| 967 | X $30 \times 18.0$ | 20 | 3 | 18 | 11 |
| 968 | X 30 Y18.5 | 41 | 23 | 52 | 18 |
| 969 | X 30 Y19.0 | 28 | 4 | 26 | 11 |
| 970 | X 30 Y19.5 | 28 | 4 | 25 | 15 |
| 971 | X 30 Y20.0 | 23 | 4 | 33 | 9 |
| 972 | $X 31$ Y 5.0 | 24 | 4 | 37 | 17 |
| 973 | X 31 Y 5.5 | 28. | 4 | 31 | 14. |
| 974 | X 31 Y 6.0 | 15 | 2 | 20 | 16 |
| 975 | X 31 Y 6.5 | 27 | 4 | 35 | 9 |
| 976 | X 31 Y 7.0 | 24 | 4 | 34 | 16 |
| 977 | $X 31 \mathrm{Y} 7.5$ | 27 | 5 | 35 | 12 |
| 978 | X 31 Y 8.0 | 28 | 6 | 40 | 12 |
| 979 | X 31 Y 8.5 | 23 | 5 | 36 | 9 |
| 980 | X 31 Y 9.0 | 20 | 5 | 32 | 14 |


****** Chemical analyses of gecohenical samples (area A) *****


| No. | Sample No, | Nb ppon | Ta ppx | Sn <br> pron | $\begin{aligned} & \mathrm{W} \\ & \mathrm{pp} \mathrm{~m} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |



| No. | Sample No. | N, <br> pmi | Ta ppxa | Sn ppan | $\underset{\text { pprin }}{\text { W }}$ | No. | Smple No. | Nb ppin | Ta рри | Sn <br> ppm | $\begin{gathered} \mathrm{W} \\ \mathrm{ppm} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1401 | X 44 Y18.0 | 26 | 14 | 53 | 36 | 1471 | $\times 47$ Y 6.5 | 22 | 3 | 24 | 12 |
| 1402 | X 44 Y18.5 | 21 | 6 | 41 | 21 | 1472 | $\times 47 \mathrm{Y} 7.0$ | 17 | 3 | 16 | 10 |
| 1403 | X 44 Y 19.0 | 31 | 8 | 48 | 28 | 1473 | X 47 Y 7.5 | 17 | 2 | 21 | 17 |
| 1404 | $\times 44$ Y19.5 | 35 | 16 | 56 | 34 | 1474 | X $47 \times 8.0$ | 17 | 2 | 24 | 17 |
| 1405 | X 14 Y20.0 | 31 | 8 | 53 | 29 | 1475 | $\times 47$ Y 8.5 | 17 | 4 | 20 | 15 |
| 1406 | X 45 Y 5.0 | 16 | 2 | 25 | 13 | 1476 | X 47 Y 9.0 | 25 | 6 | 38 | 16 |
| 1407 | X $45 \times 5.5$ | 15 | 2 | 24 | 10 | 1477 | X 47 Y 9.5 | 18 | 3 | 29 | 10 |
| 1408 | X 45 Y 6.0 | 14 | 2 | 20 | 12 | 1478 | X 47 Y 10.0 | 18 | 3 | 27 | 10 |
| 1409 | $\times 15$ Y 6.5 | 16 | 2 | 23 | 12 | 1479 | X $47 \times 10.5$ | 20 | 3 | 30 | 15 |
| 1410 | X 45 Y 7.0 | 23 | 3 | 29 | 14 | 1480 | $\times 47 \mathrm{Y} 11.0$ | 18 | 2 | 49 | 33 |
| 1411 | X 45 Y 7.5 | 24 | 3 | 24 | 20 | 1481 | $\times 47 \mathrm{Y} 11.5$ | 20 | 3 | 29 | 9 |
| 1412 | X 45 Y 8.0 | 21 | , | 30 | 20 | 1482 | $X 47$ Y12.0 | 20 | 3 | 27 | 14 |
| 1413 | X 45 Y 8.5 | 20 | 3 | 29 | 9 | 1483 | X 47 Y12.5 | 15 | 3 | 36 | 14 |
| 1414 | $\times 45 \times 9.0$ | 19 | 8 | 32 | 13 | 1484 | X 47 Y 13.0 | 25 | 3 | 42 | 16 |
| 1415 | X 45 Y 9.5 | 17 | 8 | 38 | 17 | 1485 | X 47 Y13.5 | 23 | 4 | 33 | 22 |
| 1416 | X 45 Y10.0 | 12 | 6 | 31 | 16 | 1486 | X 47 Y14.0 | 27 | 5 | 34 | 24 |
| 1417 | X 45 Y 10.5 | 16 | 6 | 35 | 38 | 1487 | X 47 Y 14.5 | 21 | 3 | 31 | 12 |
| 1418 | X 45 Y 11.0 | 12 | 5 | 39 | 21 | 1488 | $X 47 \mathrm{Y} 15.0$ | 21 | 3 | 52 | 28 |
| 1419 | X 45 Y 11.5 | 16 | 11 | 48 | 21 | 1489 | X 47 Y 15.5 | 24 | 5 | 38 | 13 |
| 1420 | X 45 Y12.0 | 22 | . | 36 | 23 | 1490 | X 47 Y 16.0 | 31 | 11 | 41 | 18 |
| 1421 | X 45 Y 12.5 | 22 | 4 | 39 | 29 | 1491 | X 17 Y16.5 | 27 | 5 | 58 | 26 |
| 1422 | X 45 Y 13.0 | 23 | 10 | 53 | 29 | 1492 | X 47 Y 17.0 | 22 | 4 | 53 | 28 |
| 1423 | X 45 Y13.5 | 18 | 20 | 38 | 17 | 1493 | X 47 Y17.5 | 30 | 13 | 49 | 25 |
| 1424 | $\times 45 \times 14.0$ | 21 | 4 | 39 | 22 | 1494 | $\times 47$ Y18.0 | 26 | 8 | 49 | 14 |
| 1425 | X 45 Y 14.5 | 20 | 3 | 45 | $=27$ | 1495 | X 47 Y 18.5 | 30 | 12 | 50 | 12 |
| 1426 | $X 45$ Y 15.0 | 14. | 6 | 37 | 21 | 1496 | X 47 Y 19.0 | 27 | 5 | 41 | 13 |
| 1427 | X 45 y 15.5 | 17 | 2 | 26 | 17 | 1497 | X 47 Y19.5 | 23 | 5 | 37 | 20 |
| 1428 | X 45 Y16.0 | 19 | 3 | 30 | 14 | 1498 | X 47 Y 20.0 | 28 | 5 | 54 | 31 |
| 1429 | X 45.Y16.5 | 19 | 3 | 33 | 16 | 1499 | X 48 Y 5.0 | 19 | 3 | 33 | 16 |
| 1430 | X 45 Y17.0 | 16 | 2 | 35 | 47 | 1500 | X 48 Y 5.5 | 20 | 3 | 29 | 13 |
| 1431 | X 45 Y 17.5 | 31 | 9 | 46 | 22 | 1501 | X 48 Y 6.0 | 22 | 4 | 31 | 14 |
| 1432 | X 45 Y 18.0 | 27 | 7 | 41 | 17 | 1502 | X 48 Y 6.5 | 19 | 3 | 24 | 11 |
| 1433 | X. 45 Y18.5 | 26 | 4 | 39 | 25 | 1503 | X 48 Y 7.0 | 15 | 3 | 27 | 8 |
| 1434 | X 45 Y19.0 | 77 | 32 | 76 | 46 | 1504 | X 48 Y 7.5 | 20 | 3 | 24 | 11 |
| 1435 | X 45 Y19.5 | 21. | 3 | 46 | 23 | 1505 | X 48 Y 8.0 | 33 | 5 | 30 | 15 |
| 1436 | X 45 Y 20.0 | 26 | 5 | 61 | 28 | 1506 | X 48 Y 8.5 | 21 | 2 | 35 | 11 |
| 1437. | X 46 Y 5.0 | 15 | 2 | 22 | 11 | 1507 | X 48 Y 9.0 | 22 | 5 | 29 | 16 |
| 1438 | X 46 Y 5.5 | 16 | 2 | 20. | 11 | 1508 | X 48 Y 9.5 | 19 | 4 | 31 | 15 |
| 1439 | X 46 Y 6.0 | 21. | 3 | 22 | 8 | 1509 | X 48 Y10.0 | 18 | 8 | 48 | 28 |
| 1440 | $X 46$ Y 6.5 | 17 | 2 | 21 | 13 | 1510 | X $48 . Y 10.5$ | 21 | 4 | 38 | 17 |
| 1441 | X 46 Y 7.0 | 19 | 3 | 24 | 12 | 1511 | X 48 Y 11.0 | 19 | 5 | 49 | 15 |
| 1442 | X 46 Y 7.5 | 16 | 2 | 20 | 13 | 1512 | X 48 Y11.5 | 19 | 6 | 39 | 18 |
| 1443 | X 46 Y 8.0 | 19 | 3 | 27 | 19 | 1513 | X .48 Y 12.0 | 22 | 16 | 38 | 19 |
| 1444 | X 46 Y 8.5 | 20 | 3 | 33 | 22 | 1514 | X 48 Y12.5 | 23 | 14 | 55 | 17 |
| 1445 | X 46 Y 9.0 | 26 | 3 | 31 | 21 | 1515 | X 48 Y 13.0 | 25 | 12 | 55 | 20 |
| 1446 | X 46 Y 9.5 | 18 | 2 | 23 | 9 | 1516 | X 48 Y 13.5 | 28 | 11 | 53 | 16 |
| 1447 | X 46 Y10.0 | 22 | 23 | 42 | 10 | 1517 | X 48 Y 14.0 | 29 | 8 | 47 | 12 |
| 1418 | X 46 Y10.5 | 16 | 2 | 34 | 17 | 1518 | X 48 Y 14.5 | 29 | 5 | 41 | 13 |
| 1449 | X 46 Y 11.0 | 18 | 2 | 27 | 16 | 1519 | X 48 Y 15.0 | 29 | 13 | 65 | 17 |
| 1450 | X 46 Y 11.5 | 21 | 2 | 25 | 11 | 1520 | X 48 Y 15.5 | 44 | 25 | 70 | 20 |
| 1451 | X 46 Y12.0 | 18 | 3 | 20 | 9 | 1521 | X 48 Y16.0 | 26 | 10 | 46 | 11 |
| 1452 | X 46 Y12. 5 | 20 | 3 | 28 | 13 | 1522 | X 48 Y 16.5 | 20 | 3 | 34. | 16 |
| 1453 | X 46 Y 13.0 | 18 | 4 | 29 | 15 | 1523 | X 48 Y17.0 | 31 | 8 | 59 | 12 |
| 1454 | X 46 Y 13.5 | 20 | 3 | 30 | 17 | 1524 | X 48 Y 17.5 | 23 | 4 | 37 | 13 |
| 1455 | X 46 Y 14.0 | 16 | 5 | 22 | 8 | 1525 | X 48 Y 18.0 | 23 | 6 | 35 | 14 |
| 1456 | X 46 Y14.5 | 24. | 3 | 29 | 18 | 1526 | X 48 Y 18.5 | 27 | 13 | 54 | 17 |
| 1457 | X. 46 Y 15.0 | 20. | 5 | 34 | 47 | 1527 | X 48 Y19.0 | 26 | 4 | 33 | 10 |
| 1458 | $\times 46$ Y15.5 | 28 | 9 | 34 | 24 | 1528 | X 48 Y 19.5 | 27 | 9 | 49 | 24 |
| 1459 | X 46 Y16.0 | 20 | 4 | 36 | 20 | 1529 | $X 48 \mathrm{Y} 20.0$ | 25 | 6 | 40 | 19 |
| 1460 | X 46 Y 16.5 | 21 | 3 | 27 | 12 | 1530 | X 49 Y 5.0 | 16 | 2 | 26 | 11 |
| 1461 | X 46 Y17.0 | 15 | 3 | 47 | 29 | 1531 | X 49 Y 5.5 | 23 | 3 | 29 | 28 |
| 1462 | X 46 Y17. 5 | 21 | 3 | 34 | 14 | 1532 | X 49 Y 6.0 | 21 | 3 | 31 | 17 |
| 1463 | X 46 Y 18.0 | 31 | 8 | 42 | 26 | 1533 | X 49 Y 6.5 | 21 | 3 | 43 | 17 |
| 1464 | $X 46 \mathrm{Y} 18.5$ | 19 | 3 | 39 | 34 | 1534 | X 49 Y 7.0 | 21 | 2 | 28 | 14 |
| 1465 | X 46 Y 19.0 | 27 | 7 | 37. | 23 | 1535 | X 49 Y 7.5 | 22 | 4 | 38 | 14 |
| 1466 | X 46 Y19.5 | 25 | 10 | 40 | 14 | 1536 | X 49 Y 8.0 | 19 | 3 | 37 | 11 |
| 1467 | X 46 Y20.0 | 27. | 8 | 40 | 13 | 1537 | X 49 Y 8.5 | 19 | 3 | 34 | 11 |
| 1468 | X 47 Y 5.0 | 21 | 3 | 27 | 11 | 1538 | X 49 Y 9.0 | 25 | 4 | 39 | 12 |
| 1469 | X 47 Y 5.5 | 20 | 3 | 24 | 10 | 1539 | X 49 Y 9.5 | 23 | 4 | 31 | 14 |
| 1470 | X 47 Y 6.0 | 16 | 2 | 19 | 11 | 1540 | X 49 Y 10.0 | 16 | 3 | 22 | 8 |


| No. | Sample No. | Nb ppon | Ta ppm | Sn ppm | N |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1541 | X 49 Y 10.5 | 22 | 3 | 37. | 11 |
| 1542 | X 49 Y11.0 | 23 | 13 | 52 | 11 |
| 1543 | X 49 Y11. 5 | 19 | 3 | 31. | 15 |
| 1544 | X $49 \times 12.0$ | 17 | 3 | 20 | 22 |
| 1545 | $X 49$ Y12.5 | 22 | 3 | 31 | 11 |
| 1546 | X 49 Y13.0 | 19 | 3 | 35 | 8 |
| 1547 | X 49 Y 13.5 | 20 | 2 | 30 | 8 |
| 1548 | $\times 49$ Y14.0 | 17 | 2 | 27 | 8 |
| 1549 | $\times 49$ Y14.5 | 19 | 3 | 24 | 8 |
| 1550 | X 49 Y 15.0 | 21 | 13 | 36 | 14 |
| 1551 | X 49 Y 15.5 | 18 | 4 | 43 | 23 |
| 1552 | X 19 Y16.0 | 21 | 5 | 32 | 17 |
| 1553 | X 49 Y16.5 | 24 | 7 | 37 | 13 |
| 1554 | X 49 Y17.0 | 28 | 4 | 45 | 16 |
| 1555 | X 49 Y17.5 | 25 | 4 | 39 | 12 |
| 1556 | X 49 Y18.0 | 23 | 5 | 46 | 12 |
| 1557 | X 49 Y18.5 | 22 | 4 | 46 | 11 |
| 1558 | X 49 Y19.0 | 21 |  | 37 | 15 |
| 1559 | X 49 Y19.5 | 30 | 7 | 59 | 17 |
| 1560 | X 49 Y20.0 | 28 | 6 | 50 | 16 |
| 1561 | X 50 Y 5.0 | 17 | 2 | 26 | 18 |
| 1562 | X 50 Y 5.5 | 14 | 2 | 20 | 18 |
| 1563 | X 50 Y 6.0 | -18 | 2 | 21 | 18 |
| 1564 | X 50 Y 6.5 | 17 | 3 | 26 | 17 |
| 1565 | $\times 50$ Y 7.0 | 16 | 3 | 28 | 9 |
| 1566 | X 50 Y 7.5 | 16 | 3 | 37 | 12 |
| 1567 | X 50 Y 8.0 | 16 | 2 | 38 | 11 |
| 1568 | X 50 Y 8.5 | 15 | 4 | 49 | 13 |
| 1569 | X 50 Y 9.0 | 20 | 3 | 32 | 11 |
| 1570 | X 50 Y 9.5 | 18 | 2 | 31. | 8 |
| 1571 | $X 50 Y 10.0$ | 15 | 3 | 35 | 23 |
| 1572 | $\mathrm{X} 50 Y 10.5$ | 26 | 4 | 29 | 15 |
| 1573 | X 50 Y 11.0 | 19 | 2 | 36 | 11 |
| 1571 | X 50 Y11.5 | 23 | 3 | 44 | 14 |
| 1575 | X 50 Y12.0 | 19 | 3 | 25 | 10 |
| 1576 | X 50 Y12.5 | 26 | 3 | 32 | 8 |
| 1577 | $X 50 \mathrm{Y} 13.0$ | 20 | 3 | 27 | 11 |
| 1578 | X 50 Y 13.5 | 19 | 3 | 30 | 20 |
| 1579 | X 50 Y 14.0 | 28 | 8 | 35 | 9 |
| 1580 | X 50 Y14.5 | 22 | 9 | 32 | 12 |
| 1581 | X 60 Y 15.0 | 23 | 3 | 24 | 19 |
| 1582 | X 50 Y 15.5 | 15 | 3 | 29 | 13 |
| 1583 | X 50 Y16.0 | 21 | 3 | 30 | 14 |
| 1584 | X 50 Y16.5 | 21 | 4 | 36 | 12 |
| 1585 | X 50 Y 17.0 | 22 | 3 | 39 | 12 |
| 1586 | X 50 Y 17.5 | 22 | 4 | 25 | 11 |
| 1587 | X 50 Y18.0 | 24 | 4 | 22 | 18 |
| 1588 | X 50 Y18.5 | 26 | 4 | 27. | 19 |
| 1589 | X 50 Y19.0 | 25 | 4 | 30 | 11 |
| 1590 | X 50 Y19.5 | 25 | 4 | 22 | 10 |
| 1591 | X 50 Y20.0 | 28 | 6 | 29 | 12 |



Appendix 6 : Relative frequency and cumulative frequency histogram (Area A) (1)

SONヨnOヨys ヨAlIV7ヨy

Appendix 7 Relative frequency and cumulative frequency histogram（Area A）（2）







Appendix 12. Chemical analyses of geochemical samples (Area C)
****** Chemical analyses of geochemical samples (area C) *****

| No. | Sumple No. | $\begin{aligned} & \mathrm{Nb} \\ & \mathrm{pqm} \end{aligned}$ | Ta ppm | Sn ppn | $\begin{gathered} \mathrm{W} \\ \mathrm{p} p \mathrm{pm} \end{gathered}$ | No. | Sample No. | Nb ppm | Ta ppin | Sn ppa | $\begin{gathered} \mathrm{W} \\ \text { pp } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | C 1-1 | 14 | 1 | 5 | 6 | 71 | C 3-1 | 29 | 2 | 7 | 5 |
| 2 | c1-2 | 27 | 2 | 7 | G | 72 | C 3-2 | 26 | 2 | 8 | 5 |
| 3 | C1-3 | 23 | 2 | 6 | 6 | 73 | C 3-3 | 27 | 3 | 7 | 6 |
| 4 | C 1-4 | 21 | 2 | 7 | 8 | 74 | C 3-4 | 25 | 2 | 8 | 6 |
| 5 | C1-5 | 21 | 2 | 6 | 8 | 75 | C $3-5$ | 23 | 2 | 6 | 6 |
| 6 | C 1-6 | 25 | 3 | 9 | 11 | 76 | C 3-6 | 20 | 2 | 8 | 6 |
| 7 | C1-7 | 23 | 3 | 9 | 10 | 77 | C 3-7 | 21 | 3 | 8 | 9 |
| 8 | C 1-8 | 30 | 8 | 66 | 150 | 78 | C 3-8 | 27 | 5 | 39 | 45 |
| 9 | C $1-9$ | 29 | 7 | 72 | 220 | 79 | C 3 - 9 | 29 | 7 | 62 | 74 |
| 10 | c 1-10 | 24 | 7 | 86 | 130 | 80 | C 3-10 | 25 | 4 | 28 | 91 |
| 11 | C1-11 | 28 | 7 | 80 | 130 | 81 | C 3-11 | 24 | 3 | 30 | 36 |
| 12 | C 1-12 | 25 | 7 | 72 | 97 | 82 | c 3-12 | 24 | 3 | 11 | 12 |
| 13 | C 1-13 | 28 | 8 | 180 | 120 | 83 | C 3-13 | 28 | 7 | 73 | 19 |
| 14 | C 1-14 | 32 | 9 | 83 | 30 | 84 | C 3-14 | 29 | 8 | 83 | 15 |
| 15 | C1-15 | 29 | 9 | 71 | 18 | 85 | C 3-15 | 26 | 8 | 94 | 19 |
| 16 | C 1-16 | 26 | 7 | 85 | 22 | 86 | C. 3-16 | 17 | 6 | 48 | 3 |
| 17 | C 1-17 | 30 | 9 | 120 | 22 | 87 | C 3-17 | 33 | 10 | 77 | 36 |
| 18 | C. 1-18 | 37 | 10 | 79 | 34 | 88 | C 3-18 | 30 | 10 | 68 | 66 |
| 19 | C 1-19 | 32 | 9 | 73 | 23 | 89 | C 3-19 | 26 | 8 | 44 | 21 |
| 20 | C 1-20 | 26 | 8 | 49 | 62 | 90 | C 3-20 | 34 | 10 | 80 | 33 |
| 21 | C 1-21 | 31 | 9 | 78 | 36 | 91 | C 3-21 | 33 | 9 | 78 | 36 |
| 22 | C 1-22 | 32 | 9 | 71 | 30 | 92 | C 3-22 | 32 | 8 | 62 | 30 |
| 23 | C 1-23 | 33 | 8 | 69 | 25 | 93 | C 3-23 | 33 | 10 | 76 | 28 |
| 24 | C 1-24 | 32 | 8 | 73 | 25 | 94 | C 3-24 | 33 | 10 | 74 | 18 |
| 25 | C 1-25 | 30 | 7 | 61 | 23 | 95 | C 3-25 | 30 | 7 | 64 | 26 |
| 26 | c 1-26 | 28 | 8 | 67 | 22 | 96 | C. 3-26 | 33 | 9 | 76 | 33 |
| 27 | C 1-27 | 30 | 7 | 66 | 25 | 97 | C 3-27 | 42 | 13 | 96 | 45 |
| 28 | C 1-28 | 25 | 6 | 54 | 21 | 98 | c 3-28 | 34 | 11 | 96 | 310 |
| 29 | C 1-29 | 29 | 7 | 57 | 50 | 99 | c 3-29 | 40 | 12 | 88 | 71 |
| 30 | C 1-30 | 25 | 6 | 47 | 37 | 100 | C 3-30 | 32 | 10 | 66 | 46 |
| 31. | C 1-31 | 25 | 6 | 31 | 35 | 101 | C 3-31 | 29 | 8 | 56 | 41 |
| 32 | c 1-32 | 20 | 4 | 25 | 54 | 102 | c 3-32 | 23 | 6 | 34 | 52 |
| 33 | C 1-33 | 20 | 4 | 26 | 55 | 103 | C 3-33 | 23 | 6 | 35 | 110 |
| 34 | C 1-34 | 28 | 5 | 27 | 33 | 104 | C 3-34 | 12 | 3 | 79 | 170 |
| 35 | C 1-35 | 28 | 5 | 29 | 41 | 105 | C 3-35 | 18 | 5 | 110 | 130 |
| 36 | c 1-37 | 16 | 2 | 1100 | 1400 | 106 | C 3-36 | 24 | 7 | 150 | 86 |
| 37 | C 2-1 | 28 | 2 | 8 | 9 | 107 | C 3-37 | 20 | 6 | 1100 | 350 |
| 38 | c 2-2 | 25 | 3 | 8 | 6 | 108 | C $4-1$ | 24 | 3 | 7 | 6 |
| 39 | C 2-3 | 25 | 3 | 6 | 5 | 109 | C 4-2 | 27 | 3 | 7 | 3 |
| 40 | C 2-4 | 23 | 2 | 6 | 6 | 110 | C 4-3 | 24 | 3 | 7 | 4 |
| 41 | C 2-5 | 23 | 2 | 8 | 6 | 111 | C 4-4 | 25 | 3 | 7 | 5 |
| 42 | c $2-6$ | 22 | 3 | 9 | 8 | 112 | C 4-5 | 25 | 3 | 8 | 6 |
| 43 | C 2-7 | 22 | 3 | 15 | 27 | 113 | C 4-6 | 24 | 3 | 9 | 7 |
| 44 | C 2-8 | 26 | 6 | 69 | 160 | 114 | C 4-7 | 21 | 2 | 8 | 6 |
| 45 | C 2-9 | 26 | 6 | 100 | 400 | 115 | C 4-8 | 23 | 3 | 9 | 10 |
| 46 | C 2-10 | 28 | 11 | 160 | 300 | 116 | C 4-9 | 26 | 3 | 11 | 10 |
| 47 | C 2-11 | 27 | 6 | 110 | 770 | 117 | C 4-10 | 26 | 2 | 9 | 9 |
| 48 | c 2-12 | 26 | 8 | 67 | 180 | 118 | C 4-11 | 29 | 3 | 11 | 11 |
| 49 | C 2-13 | 26 | 5 | 50 | 90 | 119 | c 4-12 | 30 | 4 | 18 | 20 |
| 50 | C 2-14 | 23 | 7 | 79 | 14 | 120 | C 4-13 | 28 | 7 | 78 | 39 |
| 51 | C 2-15 | 24 | 8 | 58 | 15 | 121 | C 4-14 | 14 | 2 | 70 | 12 |
| 52 | C 2-16 | 25 | 7 | 78 | 12 | 122 | c 4-15 | 35 | 11 | 88 | 13 |
| 53 | c 2-17 | 27 | 8 | 67 | 10 | 123 | C 4-16 | 35 | 11 | 70 | 14 |
| 54 | C 2-18 | 32 | 10 | 77 | 23 | 124 | C 4-17 | 36 | 10 | 86 | 46 |
| 55 | C 2-19 | 29 | 8 | 67 | 24 | 125 | C 4-18 | 39 | 12 | 87. | 43 |
| 56 | C 2-20 | 27 | 8 | 55 | 22 | 126 | C 4-19 | 34 | 9 | 76 | 38 |
| 57 | c 2-21 | 29 | 8 | 60 | 28 | 127 | C 4-20 | 34 | 10 | 85 | 23 |
| 58 | c 2-22 | 34 | 9 | 71 | 28 | 128 | C 4-21 | 35 | 10 | 75 | 24 |
| 59 | C 2-23 | 39 | 11 | 69 | 28 | 129 | C 4-22 | 30 | 9 | 69 | 23 |
| 60 | c 2-24 | 31 | 9 | 71 | 25 | 130 | C. $4-23$ | 28 | 9 | 68 | 20 |
| 61 | C 2-25 | 33 | 9 | 79 | 27 | 131 | C 4-24 | 32 | 10 | 80 | 26 |
| 62 | c 2-26 | 29 | 8 | 67 | 25 | 132 | C 4-25 | 32 | 9 | 70 | 35 |
| 63 | c 2-27 | 31 | 8 | 63 | 41 | 133 | C 4-26 | 30 | 9 | 70 | 26 |
| 64 | C 2-28 | 37 | 10 | 79 | 53 | 134 | C 4-27 | 36 | 10 | 76 | 37 |
| 65 | C 2-29 | 37 | 11 | 110 | 46 | 135 | C 4-28 | 25 | 8 | 48 | 36 |
| 66 | C 2-30 | 35 | 10 | 79 | 54 | 136 | C 4-29 | 25 | 6 | 38 | 28 |
| 67 | C 2-31. | 35 | 9 | 110 | 89 | 137 | C 4-30 | 26 | 8 | 48 | 32 |
| 68 | C 2-32 | 32 | 9 | 91 | 82 | 138 | C. 4-31 | 22 | 6 | 34 | 69 |
| 69 | C.2-33 | 14 | 4 | 27 | 66 | 139 | C 4-32 | 13 | 3 | 42 | 130 |
| 70 | C 2-37 | 12 | 3 | 2200 | 990 | 140 | C 4-33 | 14 | 3 | 36 | 190 |


| No, | Sample No. | Nb pm | Ta pran | Sn ppm | $\begin{gathered} \mathrm{W} \\ \text { ppxn } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 141 | C 4-34 | 15 | 5 | 130 | 320 |
| 142 | C 4-36 | 28 | 5 | 340 | 280 |
| 143 | C 4.36 | 26 | 7 | 780 | 590 |
| 144 | C 4-37 | 28 | 8 | 78 | 70 |
| 145 | C 5-1 | 26 | 3 | 8 | 6 |
| 146 | C 5-2 | 26 | 4 | 7 | 5 |
| 147 | C5-3 | 31 | 3 | 6 | 5 |
| 148 | C.5-4 | 31 | 3 | 8 | 6 |
| 149 | C 5- 5 | 25 | 3 | 8 | 7 |
| 150 | C5-6 | 25 | 3 | 8 | 6 |
| 151 | C5-7 | 24 | 3 | 7 | 9 |
| 152 | C 5-8 | 26 | 4 | 8 | 9 |
| 153 | C5-9 | 25 | 3 | 10 | 11 |
| 154 | C 5-10 | 27 | 3 | 12 | 12 |
| 155 | C 5-11 | 28 | 5 | 22 | 24 |
| 156 | C 5-12 | 22 | 7 | 74 | 13 |
| 157 | C 5-13 | 26 | 7 | 110 | 15 |
| 158 | C 5.14 | 28 | 8 | 78 | 25 |
| 159 | C 5-15 | 27 | 7 | 88 | 19 |
| 160 | C 5-16 | 32 | 10 | 150 | 32 |
| 161 | C 5-17 | 33 | 10 | 100 | 40 |
| 162 | C 5-18 | 38 | 11 | 110 | 40 |
| 163 | C 5-19 | 34 | 10 | 97 | 30 |
| 164 | C 5-20 | 30 | 8 | 74 | 30 |
| 165 | C 5-21 | 22 | 6 | 53 | 34 |
| 166 | C.5-22 | 26 | 7 | 66 | 36 |
| 167 | C $5-23$ | 32 | 9 | 78 | 36 |
| 168 | C 5-24 | 31 | 8 | 71 | 31 |
| 169 | C 5-25 | 30 | 8 | 75 | 47 |
| 170 | C 5-26 | 32 | 9 | 74 | 42 |
| 171 | C 5-27 | 31 | 9 | 63 | 41 |
| 172 | C 5-28 | 28 | 8 | 53 | 34 |
| 173 | C 5-29 | 27 | 7 | 48 | 57 |
| 174 | C5-30 | 22 | 6 | 39 | 76 |
| 175 | C 5-31 | 15 | 4 | 34 | 110 |
| 176 | C 5-32 | 17 | 4 | 58 | 260 |
| 177 | C 5-33 | 24 | 5 | 100 | 270 |
| 178 | C 5-34 | 12 | 3 | 29 | 98 |
| 179 | C 5-35 | 16 | 3 | 430 | 1600 |
| 180 | C 5-36 | 15 | 4 | 170 | 330 |
| 181 | C 5-37 | 25 | 7 | 140 | 190 |
| 182 | c 6-1 | 27 | 3 | 10 | 8 |
| 183 | C6-2 | 28 | 3 | 9 | 7 |
| 184 | C6-3 | 26 | 3 | 7 | 6 |
| 185 | C 6-4 | 26 | 2 | 9 | 10 |
| 186 | C6-5 | 23 | 3 | 6 | 5 |
| 187 | C6-6 | 22 | 3 | 7 | 8 |
| 188 | C $6-7$ | 23 | 2 | 7 | 10 |
| 189 | C6-8 | 24 | 2 | 9 | 10 |
| 190 | C6-9 | 26 | 2 | 9 | 12 |
| 191 | C 6-10 | 26 | 3 | 29 | 53 |
| 192 | C6-11 | 26 | 5 | 180 | 1200 |
| 193 | C6-12 | 29 | 8 | 86 | 56 |
| 194 | C 6-13 | 29 | 8 | 100 | 12 |
| 195 | C 6-14 | 35 | 10 | 85 | 24 |
| 196 | C 6-15 | 45 | 15 | 100 | 45 |
| 197 | C6-16 | 38 | 10 | 92 | 30 |
| 198 | C 6-17 | 32 | 9 | 80 | 35 |
| 199 | C6-18 | 31 | 9 | 110 | 46 |
| 200 | C 6-19 | 30 | 8 | 85 | 30 |
| 201 | C 6.- 20 | 34 | 9 | 82 | 50 |
| 202 | C 6-21 | 26 | 7 | 79 | 25 |
| 203 | C 6-22 | 20 | 5 | 55 | 47 |
| 204 | C 6-23 | 31 | 8 | 76 | 55 |
| 205 | C 6-24 | 29 | 7 | 73 | 40 |
| 206 | C 6-25 | 33 | 8 | 74 | 49 |
| 207 | C 6-26 | 30 | 8 | 67 | 41 |
| 208 | C 6-27 | 32 | 9 | 50 | 95 |
| 209 | C 6-28 | 23 | 6 | 45 | 120 |
| 210 | C 6-29 | 26 | 6 | 55 | 80 |

****** Chenical analyses of geochemical samples (area C) *****

| No, | Sample No. | Nb pprim | Ta ppa | Sn ppin | $\begin{gathered} \mathrm{W} \\ \mathrm{ppm} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |
| 282 | C 8-27 | 5 | 7 | 160 | 100 |
| 283 | C $8-28$ | 18 | 6 | 220 | 270 |
| 284 | C 8-29 | 17 | 6 | 340 | 370 |
| 285 | C 8-30 | 12 | 4 | 750 | 940 |
| 286 | C 8-31 | 23 | 7 | 130 | 110 |
| 287 | C 8-32 | 26 | 6 | 140 | 83 |
| 288 | C 8-33 | 25 | 6 | 71 | 53 |
| 289 | C 8-34 | 25 | 5 | 57 | 220 |
| 290 | c8-35 | 19 | 4 | 69 | 570 |
| 291 | C 8-36 | 23 | 4 | 44 | 100 |
| 292 | C 8-37 | 26 | 5 | 46 | 64 |
| 293 | C9-1 | 29 | 3 | 9 | 8 |
| 294 | C9-2 | 25 | 3 | 8 | 5 |
| 295 | C9-3 | 29 | 2 | 9 | 6 |
| 296 | C9-4 | 29 | 4 | 9 |  |
| 297 | C9-5 | 27 | 3 | 8 | 8 |
| 298 | C 9-6 | 27 | 3 | 7 | 5 |
| 299 | C 9-7 | 24 | 3 | 7 | 8 |
| 300 | C9-8 | 24 | 3 | 10 | 14 |
| 301 | C 9-9 | 28 | 8 | 100 | 41 |
| 302 | C9-10 | 26 | 8 | 120 | 25 |
| 303 | C9-11 | 25 | 9 | 150 | 13 |
| 304 | C 9-12 | 31 | 10 | 68 | 17 |
| 305 | C 9-13 | 30 | 8 | 73 | 18 |
| 306 | C 9-14 | 30 | 10 | 61 | 20 |
| 307 | C. 9-15 | 29 | 9 | 75 | 19 |
| 308 | C 9-16 | 26 | 8 | 65 | 17 |
| 309 | C 9-17 | 24 | 9 | 75 | 21 |
| 310 | C 9-18 | 22 | 7 | 72 | 21 |
| 311 | C 9-19 | 30 | 10 | 71 | 35 |
| 312 | C 9-20 | 24 | 7 | 59 | 36 |
| 313 | C 9-21 | 29 | 7 | 49 | 43 |
| 314 | C 9-22 | 29 | 8 | 51 | 43 |
| 315 | C 9-23 | 28 | 9 | 52 | 46 |
| 316 | C 9-24 | 25 | 6 | 43 | 54 |
| 317 | C 9-25 | 20 | 6 | 47 | 40 |
| 318 | C 9-26 | 20 | 6 | 98 | 78 |
| 319 | C 9-27 | 13 | 3 | 57 | 75 |
| 320 | C 9-28 | 18 | 5 | 690 | 600 |
| 321 | C 9-29 | 16 | 5 | 1700 | 390 |
| 322 | C 9-30 | 22 | 3 | 690 | 320 |
| 323 | C 9-31 | 20 | 5 | 310 | 200 |
| 324 | C 9-32 | 28 | 7 | 150 | 97 |
| 325 | C $9-33$ | 28 | 6 | 80 | 78 |
| 326 | C 9-34 | 24 | 5 | 52 | 160 |
| 327 | C 9-35 | 20 | 4 | 59 | 140 |
| 328 | C 9-36 | 27 | 4 | 40 | 100 |
| 329 | C 9-37 | 24 | 3 | 36 | 68 |
| 330 | C10-1 | 27 | 2 | 8 | 9 |
| 331 | C10-2 | 27 | 2 | 9 | 6 |
| 332 | C10-3 | 33 | 3 | 10 | 7 |
| 333 | Cl0-4 | 29 | 2 | 6 | 5 |
| 334 | C10-5 | 29 | 2 | 6 | 6 |
| 335 | C10-6 | 28 | 2 | 9 | 6 |
| 336 | C10- ? | 26 | 3 | 10 | 8 |
| 337 | C10-8 | 27 | 4 | 32 | 71 |
| 338 | C10-9 | 29 | 8 | 100 | 30 |
| 339 | C10-10 | 32 | 8 | 110 | 31 |
| 340 | C10-11 | 32 | 8 | 89 | 17 |
| 341. | C10-12 | 36 | 9 | 87 | 20 |
| 342 | C10-13 | 41 | 11 | 92 | 40 |
| 343 | C10-14 | 37 | 9 | 88 | 32 |
| 344 | C10-15 | 34 | 9 | 82 | 19 |
| 345 | C10-16 | 30 | 8 | 75 | 30 |
| 346 | C10-17 | 36 | 8 | 85 | 31 |
| 347 | C10-18 | 37 | 9 | 85 | 43 |
| 348 | C10-19 | 33 | 7 | 64 | 34 |
| 349 | C10-20 | 35 | 7 | 66 | 27 |
| 350 | C10-21 | 29 | 6 | 45 | 25 |


| No. | Sample No. | Nb <br> ppin | Ta ppa | Sn ppon | $\underset{p p: n}{W}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 351 | C10 -- 22 | 28 | 4 | 29 | 21 |
| 352 | C10-23 | 32 | 8 | 160 | 110 |
| 353 | C10-24 | 32 | 8 | 100 | 100 |
| 354 | C10-25 | 32 | 8 | 78 | 71 |
| 355 | C10-26 | 26 | 7 | 51 | 59 |
| 356 | C10-27 | 28 | 8 | 72 | 39 |
| 357 | C10-28 | 31 | 8 | 160 | 79 |
| 358 | C10-29 | 30 | 9 | 130 | 76 |
| 359 | C10-30 | 23 | 6 | 270 | 300 |
| 360 | c10-31 | 26 | 6 | 380 | 430 |
| 361 | C10-32 | 31 | 7 | 300 | 190 |
| 362 | C10-33 | 28 | 6 | 160 | 130 |
| 363 | C10-34 | 24 | 5 | 47 | 50 |
| 364 | c10 ~ 35 | 20 | 4 | 50 | 52 |
| 365 | C10-36 | 28 | 7 | 39 | 35 |
| 366 | C10 - 37 | 25 | 4 | 43 | 35 |
| 367 | C11-1 | 27 | 2 | 8 | 6 |
| 368 | C11-2 | 25 | 2 | 7 | 6 |
| 369 | C11-3 | 28 | 3 | 11 | 7 |
| 370 | C11-4 | 26 | 3 | 12 | 7 |
| 371 | C11-5 | 27 | 3 | 12 | 7 |
| 372 | C11- 6 | 28 | 6 | 57 | 17 |
| 373 | C11-7 | 28 | 7 | 73 | 15 |
| 374 | C11 - 8 | 30 | 10 | 56 | 17 |
| 375 | C11 - 9 | 31 | 9 | 61 | 25 |
| 376. | C11-10 | 25 | 8 | 59 | 18 |
| 377 | C11-11 | 32 | 10 | 75 | 33 |
| 378 | C11-12 | 32 | 10 | 82 | 66 |
| 379 | C11-13 | 34 | 10 | 85 | 48 |
| 380 | C11-14 | 35 | 10 | 79 | 36 |
| 381 | C11-15 | 34 | 9 | 86 | 32 |
| 382 | C11-16 | 32 | 8 | 67 | 28 |
| 383 | C11-17 | 21 | 3 | 24 | 20 |
| 384 | 011-18 | 29 | 6 | 44 | 56 |
| 385 | C11-19 | 28 | 7 | 41 | 52 |
| 386 | C11-20 | 31 | 8 | 48 | 44 |
| 387 | C11-21 | 33 | 7 | 53 | 41 |
| 388 | C11-22 | 31 | 8 | 54 | 48 |
| 389 | C11-23 | 29 | 7 | 49 | 33 |
| 390 | C11-24 | 29 | 6 | 43 | 46 |
| 391 | C11-25 | 27 | 7 | 60 | 61 |
| 392 | C11-26 | 31 | 9 | 140 | 130 |
| 393 | C11-27 | 39 | 11 | 89 | 61 |
| 394 | C11-28 | 34 | 11 | 79 | 38 |
| 395 | C11-29 | 34 | 8 | 75 | 38 |
| 396 | C11-30 | 33 | 9 | 73 | 39 |
| 397 | c11-31 | 23 | 5 | 490 | 410 |
| 398 | C11-32 | 20 | 5 | 320 | 250 |
| 399 | C11-33 | 27 | 4 | 47 | 24 |
| 400 | C11-34 | 27 | 5 | 43 | 25 |
| 401 | C11-35 | 27 | 4 | 40 | 20 |
| 402 | C11-36 | 27 | 5 | 39 | 21 |
| 403 | C11-37 | 25 | 4 | 40 | 19 |
| 404 | C12-1 | 26 | 2 | 8 | 6 |
| 405 | C12-2 | 28 | 2 | 21 | 28 |
| 406 | c12-3 | 36 | 8 | 63 | 21 |
| 407 | c12-4 | 25 | 6 | 63 | 14 |
| 408 | 612 - 5 | 31 | 9 | 62 | 17 |
| 409 | C12-6 | 27 | 7 | 68 | 20 |
| 410 | C12-7 | 42 | 12 | 90 | 36 |
| 411 | $\mathrm{Cl2}-8$ | 36 | 10 | 83 | 43 |
| 412 | C12-9 | 40 | 12 | 85 | 38 |
| 413 | c12-10 | 36 | 10 | 86 | 32 |
| 414 | c12-11 | 29 | 9 | 77 | 26 |
| 416 | c12-12 | 41 | 12 | 88 | 49 |
| 416 | C12-13 | 32 | 8 | 74 | 44 |
| 417. | C12-14 | 36 | 9 | 72 | 48 |
| 418 | C12-15 | 30 | 8 | 76 | 73 |
| 419 | c12-16 | 29 | 8 | 54 | 38 |
| 420 | c12-17 | 32 | 8 | 45 | 41 |


| No. | Samile No. | Nb ppa | Ta ppin | Sn ppin | $\underset{\mathrm{ppm}}{\mathrm{~W}}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 421. | C12-18 | 33 | 9 | 39 | 51 |
| 422 | C12-19 | 32 | 8 | 45 | 52 |
| 423 | C12-20 | 34 | 9 | 48 | 43 |
| 424 | C12-21 | 35 | 9 | 64 | 39 |
| 425 | C12-22 | 28 | 7 | 56 | 27 |
| 426 | Cl2-23 | 28 | 7 | 55 | 32 |
| 427 | C12-24 | 30 | 8 | 52 | 53 |
| 428 | C12-25 | 33 | 12 | 310 | 410 |
| 429 | C12-26 | 29 | 10 | 230 | 210 |
| 430 | C12-27 | 24 | 6 | 980 | 500 |
| 431 | C12-28 | 35 | 11 | 270 | 150 |
| 432 | C12-29 | 33 | 10 | 170 | 83 |
| 433 | C12-30 | 30 | 8 | 94 | 25 |
| 434 | C12-31 | 24 | 5 | 170 | 98 |
| 435 | C12-32 | 26 | 5 | 140 | 89 |
| 436 | C12-33 | 25 | 6 | 46 | 27 |
| 437 | C12-34 | 25 | 5 | 51 | 23 |
| 138 | C12-35 | 27 | 5 | 44 | 21 |
| 439 | C12-36 | 26 | 5 | 35 | 20 |
| 440 | C12-37 | 28 | 5 | 33 | 28 |
| 441 | C13-1 | 29 | 3 | 8 | 6 |
| 442 | C13-2 | 28 | 3 | 9 | 8 |
| 443 | C13-3 | 28 | 3 | 12 | 9 |
| 444 | C13-4 | 30 | 7 | 60 | 26 |
| 445 | C13-5 | 31 | 10 | 80 | 26 |
| 146 | C13-6 | 38 | 10 | 70 | 31 |
| 447 | C13-7 | 34 | 9 | 81 | 22 |
| 448 | C13-8 | 41 | 10 | 89 | 33 |
| 449 | C13-9 | 34 | 9 | 83 | 51 |
| 450 | C13-10 | 33 | 8 | 68 | 36 |
| 451 | C13-11 | 38 | 10 | 82 | 47 |
| 452 | C13-12 | 41 | 13 | 88 | 47 |
| 453 | C13-13 | 29 | 8 | 83 | 27 |
| 454 | C13-14 | 37 | 10 | 100 | 37 |
| 455 | C13-15 | 31 | 9 | 71 | 25 |
| 456 | C13-16 | 31 | 8 | 59 | 30 |
| 457 | C13-17 | 27 | 7 | 60 | 25 |
| 458 | C13-18 | 35 | 10 | 66 | 35 |
| 459 | C13-19 | 34 | 8 | 60 | 50 |
| 460 | C13-20 | 31. | 7 | 60 | 36 |
| 461 | C13-21 | 33 | 9 | 85 | 32 |
| 462 | C13-22 | 31 | 9 | 74 | 29 |
| 463 | C13-23 | 30 | 8 | 88 | 38 |
| 464 | C13-24 | 21 | 4 | 36 | 22 |
| 465 | C13-25 | 37 | 11 | 170 | 85 |
| 466 | C13-26 | 33 | 11 | 340 | 250 |
| 467 | C13-27 | 20 | 3 | 710 | 280 |
| 468 | C13-28 | 23 | 4 | 630 | 690 |
| 469 | C13-29 | 26 | 3 | . 320 | 290 |
| 470 | C13-30 | 22 | 4 | 230 | 430 |
| 471 | C13-31 | 27 | 5 | 63 | 21 |
| 472 | C13-32 | 28 | 4 | 71 | 35 |
| 473 | C13-33 | 28 | 4 | 90 | 44 |
| 474 | C13 - 34 | 25 | 4 | 49 | 23 |
| 475 | C13-35 | 27 | 5 | 45 | 21 |
| 476 | C13-36 | 26 | 4 | 39 | 21 |
| 477 | C13-37 | 23 | 5 | 36 | 32 |
| 478 | C14 - 1 | 30 | 3 | 9 | 6 |
| 479 | C14-2 | 28 | 4 | 9 | 7 |
| 480 | C14 - 3 | 25 | 3 | 9 | 7 |
| 481 | C14-4 | 27 | 3 | 19 | 27 |
| 482 | C14-5 | 34 | 10 | 77 | 17 |
| 483 | C14-6 | 39 | 10 | 83 | 25 |
| 484 | C14-7 | 36 | 9 | 82 | 31 |
| 485 | C14-8 | 35 | 10 | 91 | 41 |
| 486 | C14-9 | 38 | 12 | 97 | 35 |
| 487 | C14-10 | 32 | 9 | 80 | 26 |
| 488 | C14-11 | 35 | 10 | 88 | 47 |
| 489 | C14-12 | 38 | 12 | 91 | 43 |
| 490 | C14-13 | 39 | 10 | 87 | 36 |



| No. | Sample No, | Nb ppin | Ta ppm | Sn ppin | $\begin{gathered} W \\ p l \times n \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 561 | C16-10 | 28 | 8 | 68 | 54 |
| 562 | C16-11 | 35 | 12 | 90 | 31 |
| 563 | C16-12 | 37 | 11 | 100 | 33 |
| 564 | C16-13 | 29 | 8 | 120 | 32 |
| 565 | C16-14 | 28 | 8 | 73 | 31 |
| 566 | C16-15 | 27 | 8 | 70 | 19 |
| 567 | C16-16 | 36 | 10 | 85 | 33 |
| 568 | C16-17 | 31 | 9 | 76 | 28 |
| 569 | C16-18 | 26 | 7 | 52 | 29 |
| 570 | C16-19 | 32 | 10 | 66 | 29 |
| 571 | C16-20 | 33 | 9 | 69 | 50 |
| 572 | C16-21 | 31 | 9 | 95 | 19 |
| 573 | C16-22 | 31 | 11 | 420 | 200 |
| 574 | C16-23 | 35 | 11 | 240 | 73 |
| 575 | C16-24 | 29 | 9 | 1200 | 280 |
| 576 | C16-25 | 36 | 9 | 400 | 290 |
| - 577 | C16-26 | 38 | 12 | 450 | 400 |
| 578 | C16 - 27 | 29 | 7 | 950 | 230 |
| 579 | C16-28 | 29 | 4 | 720 | 99 |
| 580 | C16-29 | 28 | 4 | 320 | 58 |
| 581 | C16-30 | 21 | 2 | 240 | 76 |
| 582 | C16-31 | 21 | 3 | 69 | 46 |
| 583 | C16-32 | 30 | 5 | 44 | 19 |
| 584 | C16-33 | 28 | 4 | 43 | 21 |
| 585 | C16-34 | 29 | 4 | 42 | 21 |
| 586 | C16-35 | 25 | 4 | 33 | 18 |
| 587 | C16-36 | 24 | 4 | 24 | 20 |
| 588 | C16-37 | 21 | 3 | 21 | 22 |
| 589 | C17-1 | 28 | 2 | 9 | 6 |
| 590 | C17-2 | 28 | 8 | 63 | 32 |
| 591 | C17-3 | 26 | 3 | 12 | 10 |
| 592 | C17-4 | 47 | 14 | 91 | 51 |
| 593 | C17 - 5 | 40 | 11 | 92 | 35 |
| 594 | C17-6 | 41 | 11 | 110 | 45 |
| 595 | C17 - 7 | 43 | 13 | 120 | 26 |
| 596 | C17-8 | 34 | 10 | 90 | 23 |
| 597 | C17 - 9 | 42 | 11 | 95 | 46 |
| 598 | C17-10 | 41 | 13 | 95 | 35 |
| 599 | C17-11 | 34 | 10 | 88 | 25 |
| 600 | C17-12 | 28 | 9 | 76 | 37 |
| 601 | C17-13 | 36 | 10 | 92 | 41 |
| 602 | C17-14 | 31 | 8 | 74 | 32 |
| 603 | C17-15 | 31 | 9 | 77 | 49 |
| 604 | C17-16 | 31 | 10 | 78 | 51 |
| 605 | C17-17 | 31 | 7 | 66 | 32 |
| 606 | C17-18 | 24 | 7 | 52 | 25 |
| 607 | C17-19 | 28 | 7 | 65 | 40 |
| 608 | C17-20 | 28 | 7 | 52 | 26 |
| 609 | C17-21 | 29 | 8 | 64 | 31 |
| 610 | C17-22 | 30 | 9 | 76 | 25 |
| 611 | c17-23 | 30 | 9 | 240 | 130 |
| 612 | C17-24 | 25 | 7 | 370 | 410 |
| 613. | C17-25 | 30 | 5 | 140 | 68 |
| 614 | C17-26 | 44 | 15 | 170 | 170 |
| 615 | C17-27 | 43 | 14 | 140 | 67 |
| 616 | c17-28 | 26 | 5 | 110 | 44 |
| 617 | C17-29 | 29 | 5 | 100 | 43 |
| 618 | C17-30 | 29 | 5 | 71 | 57 |
| 619 | C17 - 31 | 29 | 5 | 49 | 23 |
| 620 | C17-32 | 21 | 3 | 39 | 18 |
| 621. | C17-33 | 20 | 3 | 32 | 11 |
| 622 | C17-34 | 26 | 4 | 36 | 15 |
| 623 | C17-35 | 23 | 4 | 30 | 16 |
| 624 | C17-36 | 26 | 4 | 23 | 17 |
| 625 | C17-37 | 21 | 4 | 25 | 17 |
| 626 | C18 - 1 | 25 | 3 | 9 | 4 |
| 627 | C18-2 | 26 | 2 | 8 | 8 |
| 628 | C18 -- 3 | 25 | 3 | 13 | 9 |
| 629 | C18-4 | 37 | 10 | 94 | 25 |
| 630 | c18-5 | 37 | 11 | 100 | 24 |


| No. | Sample No. | Nb ppr | Ta pprn | Sn ppon | $\begin{gathered} \mathrm{W} \\ \text { ypar } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 631 | c18-6 | 35 | 10 | 110 | 21 |
| 632 | C18 - 7 | 25 | 4 | 34 | 61 |
| 633 | C18-8 | 40 | 13 | 100 | 43 |
| 634 | c18-9 | 38 | 13 | 89 | 51 |
| 635 | C18-10 | 32 | 10 | 130 | 49 |
| 636 | C18 - 11 | 41 | 11 | 100 | 49 |
| 637 | C18-12 | 33 | 9 | 86 | 38 |
| 638 | C18-13 | 25 | 5 | 51 | 23 |
| 639 | C18-14 | 29 | 8 | 78 | 28 |
| 640 | C18-15 | 33 | 9 | 87 | 29 |
| 641 | C18-16 | 29 | 7 | 69 | 24 |
| 642 | C18-17 | 29 | 6 | 65 | 29 |
| 643 | C18-18 | 28 | 8 | 76 | 32 |
| 644 | C18-19 | 33 | 10 | 91 | 35 |
| 645 | C18-20 | 33 | 10 | 100 | 99 |
| 646 | C18-21 | 28 | 8 | 76 | 52 |
| 647 | C18-22 | 25 | 8 | 54 | 16 |
| 648 | C18-23 | 23 | 8 | 72 | $\checkmark 25$ |
| 649 | C18-24 | 30 | 9 | 86 | 48 |
| 650 | C18-25 | 41 | 14 | 200 | 130 |
| 651 | C18-26 | 35 | 10 | 79 | 64 |
| 652 | c18-27 | 47 | 12 | 89 | 81 |
| 653 | C18 - 28 | 40 | 10 | 85 | 56 |
| 654 | C18-29 | 26 | 3 | 130 | 140 |
| 655. | C18-30 | 25 | 4 | 39 | 18 |
| 656 | c18-31 | 30 | 5 | 46 | 17 |
| 657 | C18-32 | 21 | 3 | 35 | 17 |
| 658 | C18-33 | 20 | 4 | 36 | 23 |
| 659 | C18-34 | 19 | 3 | 28 | 13 |
| 660 | C18-35 | 23 | 4 | 35 | 14 |
| 661 | C18 - 36 | 23 | 3 | 21 | 41 |
| 662 | C18-37 | 22 | 3 | 26 | 21 |
| 663 | C19-1 | 29 | 3 | 9 | 6 |
| 664 | C19 - 2 | 32 | 3 | 10 | 6 |
| 665 | C19 - 3 | 31 | 2 | 10 | 7 |
| 666 | C19-4 | 29 | 4 | 23 | 11 |
| 667. | C19-5 | 32 | 5 | 27 | 8 |
| 668 | C19 - . 6 | 36 | 10 | 93 | 21 |
| 669 | C19-7 | 39 | 12 | 110 | 23 |
| 670 | C19-8 | 34 | 10 | 89 | 25 |
| 671 | c19-9 | 30 | 10 | 78 | 31 |
| 672 | C19 - 10 | 32 | 10 | 82 | 24 |
| 673 | C19-11. | 43 | 11 | 95 | 44 |
| 674 | C19-12 | 31 | 9 | 86 | 33 |
| 675 | C19-13 | 34 | 9 | 83 | 29 |
| 676 | C19-14 | 30 | 9 | 71 | 26 |
| 677 | C19 - 15 | 28 | 9 | 71 | 22 |
| 678 | C19-16 | 31 | 10 | 81 | 39 |
| 679 | C19-17 | 35 | 10 | 88 | 40 |
| 680 | c19-18 | 33 | 9 | 150 | 67 |
| 681 | C19 - 19 | 44 | 16 | 360 | 100 |
| 682 | C19-20 | 33. | 11 | 150 | 78 |
| 683 | C19-21 | 28 | 9 | 77 | 22 |
| 684 | C19 - 22 | 28 | 9 | 81 | 24 |
| 685 | C19-23 | 29 | 10 | 72 | 44 |
| 686 | C19-24 | 35 | 10 | 150 | 110 |
| 687 | C19-25 | 24 | 4 | 490 | 890 |
| 688 | C19-26 | 46 | 13 | 120 | 79 |
| 689 | C19-27 | 35 | 7 | 190 | 100 |
| 690 | C19-28 | 32 | 5 | 210 | 270 |
| 691 | C19-29 | 24 | 4 | 46 | 21 |
| 692 | C19-30 | 29 | 4 | 42 | 20 |
| 693 | C19-31 | 27 | 5 | 43 | 15 |
| 694 | C19-32 | 23 | 5 | 37 | 14 |
| 695 | C19-33 | 21 | 4 | 28 | 21 |
| 696 | C19-34 | 17 | 2 | 22 | 23 |
| 697 | C19-35 | 20 | 3 | 26 | 29 |
| 698 | C19-36 | 21 | 4 | 25 | 10 |
| 699 | C19-37 | 24 | 4 | 30 | 12 |
| 700 | C20-8 | 38 | 10 | 100 | 43 |


| No. | Sample No. | Nb ppm | Ta ppm | Sn <br> pp*n | $\begin{gathered} W \\ p m m \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 701 | C20-9 | 35 | 12 | 97 | 46 |
| . 702 | C20 -. 10 | 35 | 10 | 93 | 41 |
| 703 | C20-11 | 38 | 11 | 85 | 34 |
| 704 | C20-12 | 36 | 10 | 89 | 29 |
| 705 | C20-13 | 40 | 13 | 100 | 31 |
| 706 | C20-14 | 41 | 13 | 91 | 47 |
| 707 | C20-15 | 30 | 9 | 56 | 35 |
| 708 | C20-16 | 25 | 9 | 72 | 22 |
| 709 | C20-17 | 38 | 13 | 95 | 40 |
| 710 | C20-18 | 30 | 10 | 96 | 61. |
| 711 | C20 - 19 | 44 | 17 | 480 | 270 |
| 712 | C20-20 | 26 | 10 | 220 | 840 |
| 713 | C20-21 | 31 | 12 | 140 | 310 |
| 714 | C20-22 | 30 | 12 | 91 | 46 |
| 715 | C20-23 | 36 | 12 | 270 | 220 |
| 716 | C20-24 | 45 | 17 | 340 | 180 |
| 717 | C20-25 | 31 | 9 | 830 | 390 |
| 718 | C20-26 | 30 | 7 | 420 | 200 |
| 719 | 620-27 | 36 | 9 | 150 | 73 |
| 720 | C20-28 | 25 | 4 | 49 | 25 |
| 721 | C20-29 | 28 | 5 | 44 | 16 |
| 722 | C20-30 | 27 | 5 | 38 | 15 |
| 723 | C20-31 | 29 | 5 | 39 | 13 |
| 724 | $\mathrm{C} 20-32$ | 27 | 5 | 35 | 13 |
| 725 | C20-33 | 28 | 4 | 34 | 12. |
| 726 | C20-34 | 22 | 4 | 28 | 17 |
| 727 | C20-35 | 27 | 4 | 24 | 19 |
| 728 | C20-36 | 26 | 3 | 20 | 40 |
| 729 | C20-37 | 24 | 4 | 33 | 11 |
| 730 | C21-9 | 42 | 13 | 100 | 45 |
| 731 | C21-10 | 27 | 9 | 69 | 23 |
| 732 | C21-11 | 29 | 9 | 75 | 21 |
| 733 | C21-12 | 37 | 12 | 85 | 30 |
| 731 | C21-13 | 30 | 9 | 74 | 26 |
| 735 | C21-14 | 36 | 10 | 80 | 31 |
| 736 | c21-15 | 26 | 7 | 61 | 30 |
| 737 | C21-16 | 31 | 9 | 61 | 30 |
| 738 | C21-17 | 27 | 8 | 140 | 150 |
| 739 | C21-18 | 37 | 11 | 240 | 280 |
| 740 | C21-19 | 30 | 10 | 110 | 240 |
| 741 | C21-20 | 30 | 11 | 140 | 150 |
| 742 | c21-21 | 35 | 11 | 140 | 89 |
| 743 | C21-22 | 53 | 18 | 140 | 140 |
| 744 | C21-23 | 36 | 9 | 610 | 310 |
| 745 | C21-24 | 44 | 12 | 290 | 340 |
| 746 | C21-25 | 33 | 6 | 200 | 130 |
| 747 | C21-26 | 29 | 4 | 470 | 210 |
| 748 | C21-27 | 27 | 6 | 1200 | 1200 |
| 749 | C21-28 | 27 | 5 | 59 | 47 |
| 750 | C21-29 | 27 | 4 | 37 | 17 |
| 751 | C21-30 | 30 | 5 | 37 | 32 |
| 752 | C21-31 | 30 | 5 | 42 | 17 |
| 753 | C21-32 | 30 | 5 | 33 | 12 |
| 754 | C21-33 | 29 | 4 | 33 | 12 |
| 755 | C21-34 | 27 | 4 | 32 | 21 |
| 756 | C21-35 | 24 | 4 | 27 | 14 |
| 757 | C21-36 | 26 | 4 | 30 | 18 |
| 758 | C21-37 | 20 | 3 | 17 | 40 |
| 759 | C22-9 | 40 | 12 | 100 | 37 |
| 760 | C22-10 | 47 | 14 | 100 | 53 |
| 761 | C22-11 | 44 | 11 | 100 | 54 |
| 762 | C22-12 | 44 | 13 | 120 | 57. |
| 763 | C22 - 13 | 41 | 12 | 110 | 30 |
| 764 | C22-14 | 38 | 13 | 100 | 30 |
| 765 | C22-15 | 38 | 12 | 110 | 26 |
| 766 | C22-16 | 36 | 12 | 84 | 48 |
| 767 | C22-17 | 39 | 12 | 90 | 41 |
| 768 | C22-18 | 38 | 12 | 92 | 33 |
| 769 | C22-19 | 36 | 12 | 110 | 60 |
| 770 | c22-20 | 44 | 17 | 130 | 43 |

$770-\mathrm{C} 22-20$

| No. | Sample No. | Nb ppn | Ta ppin | Sn ppin | $\begin{gathered} \text { W } \\ \text { pprl } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 771 | C22-21 | 46 | 17 | 130 | 69 |
| 772 | C22 - 22 | 36 | 12 | 1300 | 260 |
| 773 | c22 - 23 | 26 | 7 | 2500 | 470 |
| 774 | C22-24 | 52 | 14 | 300 | 200 |
| 775 | C22-25 | 34 | 6 | 220 | 150 |
| 776 | C22-26 | 23 | 5 | 460 | 590 |
| 777 | C22-27 | 26 | 5 | 110 | 97 |
| 778 | C22-28 | 26 | 5 | 52 | 67. |
| 779 | C22-29 | 24 | 5 | 49 | 37 |
| 780 | C22-30 | 24 | 4 | 34 | 12 |
| 781 | C22-31 | 29 | 4 | 38 | 13 |
| 782 | C22-32 | 28 | 4 | 35 | 15 |
| 783 | C22-33 | 25 | 3 | 29 | 16 |
| 784 | C22-34 | 24 | 4 | 31 | 16 |
| 785 | C22-35 | 21 | 4 | 29 | 15 |
| 786 | C22-36 | 20 | 4 | 24 | 9 |
| 787 | C22-37 | 19 | 3 | 25 | 11 |
| 788 | C23-10 | 33 | 9 | 76 | 24 |
| 789 | c23-11 | 33 | 6 | 52 | 19 |
| 790 | C23-12 | 39 | 12 | 110 | 37 |
| 791 | C23-13 | 32 | 10 | 89 | 32 |
| 792 | C23-14 | 37 | 12 | $100^{\prime}$ | 28 |
| 793 | C23-15 | 43 | 15 | 110 | 27 |
| 794 | C23-16 | 44 | 16 | 110 | 44 |
| 795 | C23-17 | 40 | 14 | 100 | 38 |
| 796 | C23-18 | 35 | 12 | 110 | 41 |
| 797 | C23-19 | 40 | 10 | 280 | 1700 |
| 798 | C23-20 | 46 | 14 | 650 | 660 |
| 799 | C23-21 | 37 | 11 | 360 | 500 |
| 800 | C23-22 | 35 | 10 | 860 | 220 |
| 801 | C23-23 | 47 | 15 | 680 | 280 |
| 802 | C23-24 | 30 | 6 | 240 | 220 |
| 803 | C23-25 | 30 | 7 | 670 | 380 |
| 804 | C23-26 | 27 | 6 | 750 | 790 |
| 805 | C23-27 | 18 | 3 | 64 | 120 |
| 806 | C23 -. 28 | 22 | 5 | 31 | 81 |
| 807 | C23-29 | 24 | 4 | 34 | 18 |
| 808 | $\mathrm{C} 23-30$ | 28 | 4 | $34^{*}$ | 13 |
| 809 | C23-31 | 29 | 4 | 33 | 16 |
| 810 | c23-32 | 26 | 4 | 31 | 12 |
| 811 | C23-33 | 26 | 4 | 27 | 18 |
| 812 | C23-34 | 22 | 4 | 22 | 21 |
| 813 | C23-35 | 23 | 4 | 25 | 27 |
| 814 | C23-36 | 21 | 4 | 32 | 18 |
| 815 | C23-37 | 27 | 5 | 22 | 12 |
| 816 | C24-11 | 52 | 20 | 100 | 54 |
| 817 | C24-12 | 41 | 13 | 110 | 36 |
| 818 | C24-13 | 41 | 12 | 110 | 32 |
| 819 | C24-14 | 40 | 13 | 110 | 30 |
| 820 | C24-15 | 39 | 15 | 97 | 48 |
| 821 | C24-16 | 49 | 18 | 120 | 68 |
| 822 | C24-17 | 39 | 15 | 110 | 23 |
| 823 | C24-18 | 36 | 12 | 130 | 45 |
| 824 | C24-19 | 48 | 14 | 690 | 460 |
| 825 | C24-20 | 43 | 11 | 320 | 200 |
| 826 | C24-21 | 37 | 8 | 300 | 130 |
| 827 | C24-22 | 65 | 20 | 650 | 120 |
| 828 | C24-23 | 34 | 9 | 700 | 220 |
| 829 | c24-24 | 21 | 4 | 1600 | 250 |
| 830 | C24-25 | 23 | 3 | 1800 | 420 |
| 831 | C24-26 | 21 | 4 | 93 | 250 |
| 832 | c24-27 | 24 | 4 | 30 | 23 |
| 833 | C24-28 | 21 | 4 | 29 | 16 |
| 834 | C24-29 | 24 | 5 | 31 | 14 |
| 835 | C24-30 | 24 | 4 | 34 | 15 |
| 836 | C24-31 | 23 | 4 | 37 | 13 |
| 837. | C24-32 | 28 | 5 | 35 | 12 |
| 838 | C24-33 | 20 | 3 | 27 | 41 |
| 839 | C24-34 | 22 | 3 | 28 | 18 |
| 840 | C24-35 | 21 | 3 | 28 | 12 |

****** Chemical analyses of geochemical samples (arca C) *****

| No. | Sample No. | Nb mpm | Ja prn | Sn ppn | $\begin{gathered} W \\ \text { pron } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 841 | C24-36 | 17 | 3 | 32 | 9 |
| 842 | C24-37 | 26 | 4 | 25 | 16 |
| 843 | C25-11 | 29 | 6 | 78 | 81 |
| 844 | C25-12 | 46 | 13 | 130 | 36 |
| 845 | C25-13 | 45 | 14 | 110 | 42 |
| 846 | $\mathrm{C} 25-14$ | 41 | 13 | 130 | 27 |
| 847 | C25-15 | 43 | 14 | 140 | 29 |
| 848 | C25 - 16 | 40 | 12 | 110 | 23 |
| 849 | C25-17 | 33 | 10 | 90 | 40 |
| 850 | C25-18 | 34 | 13 | 130 | 52 |
| 851 | C25-19 | 49 | 19 | 240 | 110 |
| 852 | C25-20 | 41 | 11 | 500 | 610 |
| 853 | C25-21 | 31 | 8 | 620 | 190 |
| 854 | c25-22 | 38 | 11 | 250 | 150 |
| 855 | $\mathrm{C} 25-23$ | 26 | 5 | 530 | 660 |
| 856 | C25-24 | 28 | 4 | 730 | 280 |
| 857 | C25-25 | 23 | 5 | 490 | 920 |
| 858 | C25-26 | 23 | 4 | 64 | 280 |
| 859 | C25-27 | 26 | 4 | 42 | 190 |
| 860 | C25-28 | 23 | 5 | 40 | 22 |
| 861 | C25-29 | 23 | 4 | 27 | 12 |
| 862 | C25-30 | 22 | 4 | 30 | 14 |
| 863 | C25-31 | 31 | 5 | 44 | 18 |
| 864 | C25-32 | 24 | 4 | 29 | 11 |
| 865 | C25-33 | 20 | 4 | 29 | 21 |
| 866 | C25-34 | 24 | 4 | 33 | 19 |
| 867 | C25-35 | 16 | 3 | 23 | 10 |
| 868 | C25-36 | 17 | 3 | 21 | 11 |
| 869 | C25-37 | 26 | 4 | 22 | 18 |
| 870 | C26 - 1 | 33 | 2 | 8 | 5 |
| 871 | C26-2 | 36 | 4 | 10 | 7 |
| 872 | C26-3 | 34 | 4 | 10 | 7 |
| 873 | C26-4 | 33 | 3 | 10 | 7 |
| 874 | C26-5 | 34 | 4 | 10 | 7 |
| 875 | $\mathrm{C} 26-13$ | 42 | 13 | 100 | 28 |
| 876 | c26-14 | 39 | 13 | 100 | 26 |
| 877 | C26-15 | 37 | 12 | 100 | 30 |
| 878 | C26-16 | 36 | 12 | 89 | 26 |
| 879 | C26-17 | 32 | 11 | 81 | 47 |
| 880 | C26-18 | 37 | 13 | 120 | 79 |
| 881 | C26 -- 19 | 37 | 11 | 790 | 930 |
| 882 | C26-20 | 41 | 12 | 1300 | 370 |
| 883 | C26-21 | 38 | 14 | 300 | 190 |
| 884 | C26-22 | 31 | 6 | 57 | 79 |
| 885 | C26-23 | 30 | 4 | 81 | 150 |
| 886 | c26-24 | 26 | 5 | 760 | 4000 |
| 887 | C26-25 | 27 | 5 | 27 | 18 |
| 888 | C26-26 | 21 | 3 | 49 | 210 |
| 889 | C26-27 | 26 | 4 | 37 | 41 |
| 890 | C26-28 | 25 | 4 | 28 | 110 |
| 891 | C26-29 | 22 | 3 | 25 | 160 |
| 892 | C26-30 | 24 | 4 | 29 | 59 |
| 893 | C26-31 | 26 | 4 | 29 | 440 |
| 894 | c26-32 | . 19 | 2 | 24 | 950 |
| 895 | C26-33 | 25 | 4 | 35 | 21 |
| . 896 | C26-34 | 24 | 4 | 30 | 14 |
| 897 | C26-35 | 26 | 4 | 29 | 9 |
| 898 | C26-36 | 25 | 5 | 26 | 13 |
| 899 | C26-37 | 28 | 4 | 23 | 13 |
| 900 | C27-1 | 37 | 4 | 11 | 7 |
| 901 . | C27-2 | 37 | 3 | 12 | 8 |
| 902 | C27-3 | 35 | 3 | 11 | 6 |
| 903 | C27-12 | 42 | 11 | 96 | 40 |
| 904 | C27-13 | 36 | 11 | 79 | 34 |
| 905 | C27-14 | 40 | 11 | 97 | 31 |
| 906 | C27-15 | 41 | 14 | 92 | 37 |
| 907 | C27-16 | 26 | 8 | 74 | 17 |
| 908 | C27-17 | 25 | 9 | 62 | 22 |
| 909 | C27-18 | 63 | 17 | 220 | 280 |
| 910 | C27-19 | 29 | 5 | 600 | 260 |


| No, | Sample No. | Nb pan | Ta ppn | Sn ppm | $\begin{aligned} & \text { N } \\ & \text { ppin } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 911 | C27-20 | 31 | 6 | 180 | 210 |
| 912 | C27-21 | 29 | 4 | 51 | 97 |
| 913 | C27-22 | 30 | 5 | 86 | 110 |
| 914 | C27-23 | 24 | 5 | 58 | 110 |
| 915 | C27-24 | 27 | 5 | 42 | 180 |
| 916 | C27-25 | 24 | 4 | 33 | 46 |
| 917 | C27-26 | 31 | 5 | 35 | 27 |
| 918 | C27 - 27 | 25 | 4 | 30 | 16 |
| 919 | C27-28 | 28 | 4 | 31 | 12 |
| 920 | C27-29 | 24 | 4 | 32 | 13 |
| 921 | C27-30 | 21 | 3 | 26 | 14 |
| 922 | C27 - 31 | 24 | 4 | 35 | 91 |
| 923 | C27-32 | 26 | 5 | 41 | 40 |
| 924 | C27-33 | 19 | 3 | 23 | 10 |
| 925 | C27-34 | 26 | 4 | 36 | 16 |
| 926 | C27-35 | 26 | 4 | 26 | 13 |
| 927 | C27-36 | 30 | 4 | 25 | 15 |
| 928 | C27-37 | 29 | 4 | 23 | 13 |
| 929 | C28-4 | 34 | 3 | 10 | 8 |
| 930 | C28-5 | 31 | 3 | 10 | 7 |
| 931 | C28-12 | 43 | 14 | 82 | 32 |
| 932 | C28-13 | 30 | 9 | 84 | 34 |
| 933 | C28-14 | 48 | 17. | 120 | 48 |
| 934 | C28 -15 | 49 | 15 | 140 | 55 |
| 935 | C28-16 | 27 | 11 | 66 | 11 |
| 936 | C28-17 | 39 | 12 | 100 | 28 |
| 937 | C28-18 | 33 | 11 | 99 | 240 |
| 938 | C28-19 | 31 | 3 | 24 | 71 |
| 939 | C28-20 | 35 | 9 | 80 | 36 |
| 940 | C28-21 | 23 | 3 | 22 | 31 |
| 941 | C28-22 | 29 | 4 | 39 | 110 |
| 942 | C28-23 | 26 | 5 | 66 | 310 |
| 943 | C28-24 | 25 | 5 | 49 | 260 |
| 944 | C28-25 | 39 | 6 | 45 | 22 |
| 945 | C28-26 | 37 | 6 | 42 | 15 |
| 946 | C28-27 | 30 | 4 | 38 | 18 |
| 947 | C28-28 | 28 | 4 | 40 | 14 |
| 948 | C28-29 | 30 | 4 | 41 | 13 |
| 949 | C28-30 | 33 | 6 | 51 | 18 |
| 950. | C28-31 | 21 | 3 | 28 | 60 |
| 951 | C28-32 | 28 | 5 | 32 | 16 |
| 952 | C28-33 | 22 | 3 | 33 | 12 |
| 953 | C28-34 | 25 | 4 | 29 | 13 |
| 954 | C28-35 | 29 | 4 | 26 | 19 |
| 955 | C28-36 | 33 | 5 | 28 | 19 |
| 956 | C28-37 | 29 | 4 | 26 | 18 |
| 957 | C29 - 1 | 54 | 17 | 130 | 71 |
| 958 | C29 - 2 | 35 | 5 | 12 | 9 |
| 959 | c29-3 | 36 | 4 | 13 | 9 |
| 960 | C29-4 | 36 | 3 | 13 | 10 |
| 961 | C29-12 | 62 | 20 | 130 | 53 |
| 962 | $\mathrm{C} 29-13$ | 52 | 16 | 140 | 56 |
| 963 | C29-14 | 73 | 19 | 210 | 100 |
| 964 | C29-15 | 53 | 10 | 140 | 190 |
| 965 | C29-16 | 61 | 15 | 150 | 130 |
| 966 | $\mathrm{C} 29-17$ | 68 | 22 | 230 | 310 |
| 967 | C29-18 | 37 | 7 | 70 | 69 |
| 968 | C29-19 | 24 | 3 | 20 | 20 |
| 969 | C29-20 | 44 | 10 | 94 | 53 |
| 970 | C29-21 | 34 | 5 | 35 | 44 |
| 971 | C29-22 | 32 | 3 | 35 | 72 |
| 972 | C29 - 23 | 33 | 5 | 51 | 160 |
| 973 | C29 - 24 | 25 | 5 | 59 | 470 |
| 974 | c29-25 | 25 | 4 | 39 | 66 |
| 975 | C29 - 26 | 32 | 5 | 37 | 16 |
| 976 | C29-27 | 26 | 4 | 30 | 16 |
| 977 | C29-28 | 26 | 4 | 37. | 15 |
| 978 | C29-29 | 27 | 4 | 35 | 12 |
| 979 | C29 - 30 | 28 | 4 | 34 | 18 |
| 980 | C29 - 3 I | 18 | 3 | 21 | 35 |

****** Chemical analyses of geochemical samples (area C) *****

| No. | Sample No. | Nb pprn | Ta ppm | Sn ppn | $\begin{gathered} W \\ \text { Wpxn } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 981 | C29 - 32 | 30 | 4 | 35 | 11 |
| 982 | c29-33 | 30 | 4 | 31 | 16 |
| 983 | C29 - 34 | 29 | 4 | 30 | 11 |
| 984 | C29-35 | 26 | 3 | 21 | 10 |
| 985 | C29-36 | 33 | 4 | 30 | 11 |
| 986 | C29 - 37 | 33 | 4 | 27. | 14 |
| 987 | C30 - 1 | 33 | 5 | 12 | 7 |
| 988 | C30-2 | 32 | 3 | 11 | 7 |
| 989 | C30-3 | 32 | 4 | 11 | 7 |
| 990 | C30-4 | 34 | 3 | 10 | 8 |
| 991 | C30-8 | 47 | 13 | 97 | 77 |
| 992 | C30 - 9 | 51 | 16 | 110 | 74 |
| 993 | C30 - 10 | 62 | 20 | 170 | 100 |
| 994 | C30-11 | 60 | 19 | 250 | 210 |
| 995 | C30-12 | 50 | 15 | 100 | 38 |
| 996 | C30-13 | 56 | 17 | 130 | 57 |
| 997 | C30 -14 | 69 | 21 | 130 | 110 |
| 998 | C30-15 | 48 | 11 | 150 | 100 |
| 999 | 630-16 | 63 | 20 | 120 | 73 |
| 1000 | C30-17 | 57 | 14 | 170 | 150 |
| 1001 | C30-18 | 37 | 8 | 63 | 66 |
| 1002 | C30-19 | 30 | 5 | 36 | 41 |
| 1003 | C30-20 | 39 | 6 | 41 | 45 |
| 1004 | C30-21 | 34 | 5 | 36 | 43 |
| 1005 | c30-22 | 32 | 4 | 36 | 43 |
| 1006 | C30-23 | 33 | 6 | 55 | 88 |
| 1007 | C30-24 | 26 | 3 | 23 | 26 |
| 1008 | C30-25 | 24 | 4 | 30 | 16 |
| 1009 | C30-26 | 24 | 4 | 33 | 21 |
| 1010 | C30-27 | 27. | 4 | 30 | 17 |
| 1011 | C30-28 | 27 | 4 | 31 | 15 |
| 1012 | C30-29 | 24 | 4 | 27 | 11 |
| 1013 | C30-30 | 17 | 3 | 25 | 14 |
| 1014 | C30-31 | 24 | 4 | 31 | 14 |
| 1015 | C30-32 | 29 | 5 | 32 | 10 |
| 1016 | C30-33 | 32 | 5 | 35 | 12 |
| 1017 | C30-34 | 28 | 5 | 30 | 10 |
| 1018 | C30-35 | 28 | 4 | 27 | 11 |
| 1019 | C30-36 | 29 | 4 | 23 | 11 |
| 1020 | C30-37 | 28 | 3 | 27 | 18 |
| 1021 | C31-1 | 30 | 3 | 9 | 5 |
| 1022 | C31-2 | 28 | 3 | 8 | 6 |
| 1023 | C31-3 | 28 | 4 | 10 | 6 |
| 1024 | C31-4 | 27 | 3 | 10 | 7 |
| 1025 | C31 - 5 | 24 | 3 | 8 | 5 |
| 1026 | C31-8 | 55 | 19 | 99 | 61 |
| 1027 | C31-9 | 59 | 21 | 110 | 66 |
| 1028 | C31-10 | 49 | 17 | 110 | 99 |
| 1029 | C31-11 | 58 | 18 | 220 | 200 |
| 1030 | C31-12 | 61 | 19 | 130 | 150 |
| 1031 | C31-13 | 56 | 15 | 100 | 60 |
| 1032 | C31-14 | 71 | 20 | 130 | 73 |
| 1033 | C31-15 | 46 | 12 | 85 | 63 |
| 1034 | C31-16 | 60 | 22 | 63 | 17 |
| 1035 | C31-20 | 28 | 4 | 33 | 29 |
| 1036 | C31-21 | 30 | 5 | 38 | 40 |
| 1037 | C31-24 | 25 | 4 | 35 | 32 |
| 1038 | C31 - 25 | 27 | 4 | 35 | 35 |
| 1039 | C31-26 | 27 | 5 | 41 | 23 |
| 1040 | C31-27 | 28 | 5 | 47 | 16 |
| 1041 | C31-28 | 26 | 3 | 32 | 14 |
| 1042 | C31-29 | 24 | 4 | 28 | 11 |
| 1043 | C31-30 | 22 | 4 | 27 | 14 |
| 1044 | C31-31 | 25 | 4 | 35 | 11 |
| 1045 | C31-32 | 28 | 5 | 32 | 11 |
| 1046 | C31-33 | 25 | . 4 | 32 | 9 |
| 1047 | C31-34 | 29 | 4 | 25 | 13 |
| 1048 | C31-35 | 23 | 4 | 27 | 10 |
| 1049 | C31 -36 | 25 | 3 | 19 | 19 |
| 1050 | C31-37 | 34 | 5 | 23 | 23 |


| No. | Sample No. | Nb ppan | Ta ppn | Sn ppon | $\begin{aligned} & \mathrm{N} \\ & \mathrm{ppm} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1051 | C32-1 | 29 | 1 | 9 | 6 |
| 1052 | C32-2 | 31 | 3 | 9 | 6 |
| 1053 | C32 - 3 | 29 | 3 | 9 | 5 |
| 1054 | C32-4 | 26 | 2 | 8 | 4 |
| 1055 | C32-5 | 27 | 3 | 9 | 7 |
| 1056 | C32-11 | 30 | 5 | 33 | 22 |
| 1057 | C32-12 | 41 | 13 | 140 | 82 |
| 1058 | C32-13 | 59 | 17 | 160 | 170 |
| 1059 | C32-14 | 45 | 13 | 180 | 250 |
| 1060 | C32-15 | 41 | 9 | 93 | 91 |
| 1061 | C32-16 | 39 | 6 | 47 | 45 |
| 1062 | C32-17 | 36 | 5 | 34 | 30 |
| 1063 | c32-18 | 33 | 5 | 29 | 27 |
| 1064 | C32-20 | 29 | 5 | 24 | 23 |
| 1065 | C32-21 | 30 | 6 | 130 | 650 |
| 1066 | C32-22 | 32 | 7 | 190 | 1100 |
| 1067 | C32-23 | 33 | 9 | 220 | 2200 |
| 1068 | c32-24 | 27 | 5 | 38 | 48 |
| 1069 | C32-25 | 25 | 4 | 34 | 16 |
| 1070 | C32-26 | 24 | 4 | 36 | 16 |
| 1071 | C32-27 | 29 | 5 | 39 | 17 |
| 1072 | C32-28 | 31 | 5 | 38 | 16 |
| 1073 | C32-29 | 22 | 5 | 32 | 15 |
| 1074 | C32-30 | 28 | 4 | 29 | 12 |
| 1075 | C32-31 | 28 | 5 | 32 | 12 |
| 1076 | C32-32 | 30 | 5 | 27 | 12 |
| 1077 | C32-33 | 25 | 4 | 24 | 7 |
| 1078 | C32-34 | 29 | 5 | 27 | 8 |
| 1079 | C32-35 | 31 | 4 | 22 | 10 |
| 1080 | C32-36 | 30 | 4 | 26 | 12 |
| 1081 | C32-37 | 28 | 4 | 24 | 16 |
| 1082 | C33-10 | 65 | 22 | 230 | 1700 |
| 1083 | C33-11 | 36 | 12 | 60 | 32 |
| 1084 | C33-12 | 35 | 11 | 74 | 26 |
| 1085 | C33-13 | 41 | 7 | 59 | 48 |
| 1086 | C33-18 | 31 | 5 | 48 | 90 |
| 1087 | c33-19 | 37 | 6 | 55 | 65 |
| 1088 | C32-20 | 31 | 5 | 54 | 73 |
| 1089 | C33-21 | 26 | 5 | 110 | 380 |
| 1090 | C33-22 | 41 | 7 | 1500 | 3600 |
| 1091 | C33-23 | 30 | 6 | 54 | 100 |
| 1092 | c33-24 | 28 | 4 | 36 | 78 |
| 1093 | C33 - 25 | 25 | 4 | 33 | 14 |
| 1094 | C33 - 26 | 25 | 4 | 32 | 11 |
| 1095 | c33-27 | 22 | 4 | 31 | 14 |
| 1096 | C33-28 | 21 | 4 | 31 | 16 |
| 1097 | C33-29 | 20 | 4 | 34 | 13 |
| 1098 | C33-30 | 26 | 5 | 28 | 11 |
| 1099 | C33-31 | 23 | 5 | 34 | 13 |
| 1100 | C33-32 | 27 | 4 | 28 | 9 |
| 1101 | C33-33 | 28 | 4 | 24 | 13 |
| 1102 | C33-34 | 25 | 3 | 26 | 9 |
| 1103 | C33-35 | 28 | 4 | 26 | 10 |
| 1104 | C33 - 36 | 34 | 5 | 22 | 7 |
| 1105 | C33-37 | 30 | 4 | 24 | 12 |
| 1106 | C34-10 | 45 | 14 | 57 | 42 |
| 1107 | C34-11 | 47 | 16 | 69 | 32 |
| 1108 | C34-12 | 44 | 13 | 64 | 34 |
| 1109 | C34-13 | 85 | 20 | 130 | 110 |
| 1110 | C34-17 | 32 | 5 | 46 | 55 |
| 1111 | C34-18 | 28 | 4 | 45 | 67 |
| 1112 | C34-19 | 36 | 7 | 62 | 48 |
| 1113 | C34 - 20 | 26 | 5 | 48 | 58 |
| 1114 | C34-21 | 23 | 5 | 45 | 23 |
| 1115 | C34-22 | 24 | 6 | 53 | 36 |
| 1116 | C34-23 | 22 | 4 | 45 | 50 |
| 1117 | C34-24 | 26 | 4 | 32 | 30 |
| 1118 | C34-25 | 29 | 4 | 40 | 20 |
| 1119 | C34-26 | 23 | 3 | 39 | 21 |
| 1120 | C34-27 | 21 | 3 | 28 | 10 |


| No. | Sample No. | Nb ppla | Ta ppm | Sn ppm | $\begin{gathered} W \\ \text { Ppon } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1121 | 634-28 | 23 | 3 | 29 | 12 |
| 1122 | C34-29 | 14 | 3 | 26 | 11 |
| 1123 | C34-30 | 24 | 4 | 39 | 15 |
| 1124 | C34-31 | 24 | 4 | 31 | 12 |
| 1125 | C34-32 | 27 | 5 | 35 | 13 |
| 1126 | C34 - 33 | 31 | 4 | 29 | 13 |
| 1127 | C34-34 | 32 | 5 | 28 | 13 |
| 1128 | C34-35 | 32 | 5 | 27 | 14 |
| 1129 | C34-36 | 31 | 4 | 23 | 16 |
| 1130 | C34-37 | 27 | 5 | 24 | 14 |
| 1131 | C35 - 10 | 47 | 15 | 120 | 52 |
| 1132 | C35-11 | 42 | 14 | 95 | 43 |
| 1133 | C35-12 | 38 | 13 | 100 | 33 |
| 1134 | C35 - 13 | 60 | 21 | 150 | 46 |
| 1135 | C35-16 | 24 | 4 | 38 | 45 |
| 1136 | C35-17 | 35 | 8 | 39 | 49 |
| 1137 | C35-18 | 29 | 5 | 51 | 55 |
| 1138 | C35-19 | 29 | 6 | 85 | 35 |
| 1139 | C35-20 | 24 | 4 | 43 | 29 |
| 1140 | C35-21 | 27 | 5 | 50 | 57. |
| 1141 | C35-22 | 32 | 7 | 58 | 59 |
| 1142 | C35 - 23 | 27 | 5 | 41 | 33 |
| 1143 | C35-24 | 27 | 4 | 38 | 41 |
| 1144 | C35-25 | 28 | 4 | 42 | 110 |
| 1145 | C35-26 | 30 | 5 | 41 | 32 |
| 1146 | C35-27 | 23 | 3 | 34 | 10 |
| 1147 | C35-28 | 22 | 4 | 31 | 11 |
| 1148 | C35-29 | 21 | 4 | 34 | 16 |
| 1149 | C35-30 | 21 | 4 | 32 | 10 |
| 1150 | C35-31 | 25 | 5 | 36 | 14 |
| 1151 | C35-32 | 23 | 4 | 24 | 12 |
| 1152 | C35-33 | 26 | 4 | 29 | 9 |
| 1153 | C35-34 | 20 | 3 | 27 | 12 |
| 1154 | C35-35 | 29 | 4 | 22 | 11 |
| 1155 | C35-36 | 28 | 4 | 25 | 15 |
| 1156 | C35-37 | 27 | 4 | 22 | 15 |
| 1157 | C36-8 | 44 | 13 | 90 | 42 |
| 1158 | C36-9 | 43 | 12 | 88 | 39 |
| 1159 | C36-10 | 45 | 14 | 100 | 40 |
| 1160 | C36 - 11 | 46 | 15 | 120. | 53 |
| 1161 | C36-12 | 39 | 14 | 110 | 44 |
| 1162 | C36-13 | 36 | 11 | 86 | 31 |
| 1163 | C36-18 | 28 | 5 | 31 | 43 |
| 1164 | C36-19 | 27 | 5 | 44 | 50 |
| 1165 | C36-20 | 27 | 6 | 46 | 26 |
| 1166 | C36-21 | 16 | 4 | 35 | 28 |
| 1167 | C36-22 | 21 | 4 | 50 | 43 |
| 1168 | C36-23 | 25 | 4 | 34 | 32 |
| 1169 | C36-24 | 23 | 4 | 33 | 26 |
| 1170 | C36-25 | 24 | 4 | 38 | 35 |
| 1171 | C36-26 | 23 | 3 | 35 | 80 |
| 1172 | c36-27. | 24 | 3 | 34 | 53 |
| 1173 | C36-28 | 24 | 4 | 32 | 18 |
| 1174 | C36-29 | 21 | 4 | 30 | 12 |
| 1175 | C36-30 | 16 | 4 | 29 | 10 |
| 1176 | C36-31 | 22 | 5 | 35 | 11 |
| 1177 | C36-32 | 34 | 6 | 49 | 13 |
| 1178 | C36-33 | 34 | 5 | 33 | 15 |
| 1179 | C36-34 | 31 | 4 | 27 | 8 |
| 1180 | C36-35 | 31 | 5 | 24 | 10 |
| 1181 | C36-36 | 31 | 4 | 29 | 24 |
| 1182 | C36 - 37 | 26 | 3 | 24 | 15 |
| 1183 | C37-7 | 41 | 11 | 86 | 36 |
| 1184 | C37-8 | 52 | 17 | 110 | 38 |
| 1185 | C37 - 9 | 50 | 16 | 110 | 47 |
| 1186 | C37-10 | 62 | 22 | 130 | 63 |
| 1187 | C37-11 | 55 | 21 | 140 | 43 |
| 1188 | C37-12 | 46 | 15 | 110 | 33 |
| 1189 | C37-13 | 21 | 8 | 65 | 41 |
| 1190 | C37-18 | 32 | 6 | 200 | 620 |

A-35

| No. | Sample No. | Nb pran | Ta popin | Sn ppin | $\begin{gathered} \mathrm{W} \\ \mathrm{ppm} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1261 | C39-31 | 26 | 5 | 31 | 12 |
| 1262 | c39-32 | 27 | 3 | 21 | 16 |
| 1263 | C39-33 | 26 | 4 | 23 | 11 |
| 1264 | C39 - 34 | 27 | 4 | 22 | 16 |
| 1265 | C39-35 | 33 | 4 | 31 | 17 |
| 1266 | C39-36 | 31 | 4 | 23 | 22 |
| 1267 | C39-37 | 33 | 4 | 26 | 16 |
| 1268 | C40-6 | 72 | 23 | 130 | 60 |
| 1269 | $\mathrm{C} 40-7$ | 72 | 29 | 160 | 65 |
| 1270 | C40 - 8 | 57 | 19 | 120 | 56 |
| 1271 | C40-9 | 70 | 25 | 160 | 67 |
| 1272 | C40-10 | 53 | 18 | 110 | 60 |
| 1273 | C40-11 | 69 | - 22 | 130 | 75 |
| 1274 | C40-12 | 59 | 23 | 130 | 61 |
| 1275 | C40 - 13 | 68 | 18 | 120 | 74 |
| 1276 | C40-14 | 56 | 14 | 80 | 64 |
| 1277 | C40-18 | 27 | 4 | 25 | 18 |
| 1278 | C40-19 | 26 | 6 | 40 | 39 |
| 1279 | C40-20 | 21 | 4 | 34 | 19 |
| 1280 | C40-21 | 18 | 4 | 37 | 13 |
| 1281 | C40-22 | 23 | 4 | 35 | 15 |
| 1282 | C40-23 | 26 | 4 | 36 | 63 |
| 1283 | C40-24 | 35 | 12 | 95 | 24 |
| 1284 | C40-25 | 30 | 7 | 39 | 85 |
| 1285 | C40-26 | 24 | 3 | 20 | 14 |
| 1286 | C40-27 | 30 | 5 | 33 | 26 |
| 1287 | C40-28 | 23 | 4 | 32 | 16 |
| 1288 | C40-29 | 27 | 4 | 23 | 16 |
| 1289 | C40-30 | 31 | 5 | 28 | 13 |
| 1290 | C40-31 | 31 | 5 | 29 | 13 |
| 1291 | C40-32 | 29 | 4 | 24 | 15 |
| 1292 | C40-33 | 30 | 4 | 23 | 14 |
| 1293 | C40-34 | 31 | 4 | 24 | 16 |
| 1294 | C40-35 | 31 | 4 | 22 | 13 |
| 1295 | C40-36 | 33 | 4 | 22 | 18 |
| 1296 | C40-37 | 32 | 4 | 23 | 14 |
| 1297 | C4i - 5 | 71 | 23 | 120 | 62 |
| 1298 | C41-6 | 91 | 28 | 150 | 81 |
| 1299 | C41-7 | 110 | 32 | 170 | 97 |
| 1300 | $\mathrm{C41} \rightarrow 8$ | 80 | 29 | 180 | 79 |
| 1301 | C41-9 | 68 | 26 | 170 | 59 |
| 1302 | C41-10 | 95 | 31 | 160 | 100 |
| 1303 | C41-11 | 63 | 20 | 170 | 220 |
| 1304 | C41-12 | 39 | 9 | 53. | 32 |
| 1305 | C41-13 | 47 | 13 | 67 | 59 |
| 1306 | C41-14 | 40 | 7 | 39 | 30 |
| 1307 | Cd1-17 | 65 | 19 | 120 | 140 |
| 1308 | C41-18 | 32 | 7 | 48 | 34 |
| 1309 | C41-19 | 28 | 6 | 42 | 30 |
| 1310 | C4t-20 | 25 | 3 | 23 | 18 |
| 1311 | C41-21 | 27 | 5 | 40 | 29 |
| 1312 | C41-22 | 25 | 5 | 39 | 39 |
| 1313 | C41-23 | 22 | 4 | 37 | 59 |
| 1314 | C41-24 | 31 | 6 | 41 | 55 |
| 1315 | C41-25 | 30 | 5 | 36 | 18 |
| 1316 | C41-26 | 27 | 5 | 30 | 120 |
| 1317 | C41-27 | 21 | 4 | 36 | 21 |
| 1318 | C41-28 | 23 | 4 | 32 | 35 |
| 1319 | C41-29 | 26 | 5 | 40 | 22 |
| 1320 | C41-30 | 27 | 5 | 31 | 13 |
| 1321 | C41-31 | 35 | 6 | 30 | 16 |
| 1322 | C41-32 | 29 | 5 | 29 | 16 |
| 1323 | C41-33 | 34 | 5 | 26 | 16 |
| 1324 | C41-34 | 36 | 5 | 29 | 11 |
| 1325 | C41-35 | 28 | 4 | 24 | 14 |
| 1326 | C41-36 | 29 | 5 | 21 | 9 |
| 1327 | C41-37 | 35 | 5 | 30 | 19 |
| 1328 | C42-6 | 73 | 23 | 140 | 57 |
| 1329 | Cd2 - 7 | 87 | 28 | 180 | 73 |
| 1330 | C42-8 | 61. | 25 | 160 | 63 |


| No. | Sample No. |  | Ta pp\# | Sn pprn | $\begin{gathered} \mathrm{W} \\ \mathrm{pp} \times \mathrm{m} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1331 | C42-9 | 64 | 25 | 180 | 64 |
| 1332 | C42-10 | 88 | 24 | 150 | 120 |
| 1333 | C42-11 | 36 | 6 | 54 | 75 |
| 1334 | C42-12 | 43 | 9 | 55 | 55 |
| 1335 | C42-13 | 42 | 10 | 69 | 52 |
| 1336 | C42-14 | 35 | 6 | 51 | 62 |
| 1337 | C42 - 15 | 33 | 8 | 63 | 35 |
| 1338 | C42-16 | 38 | 10 | 71 | 34 |
| 1339 | C42-17 | 37 | 10 | 71 | 32 |
| 1340 | C42-18 | 34 | 8 | 55 | 38 |
| 1341 | C42-19 | 27 | 5 | 41 | 32 |
| 1342 | C42-20 | 18 | 4 | 31 | 15 |
| 1343 | C42-21 | 21 | 4 | 34 | 23 |
| 1344 | C42-22 | 21 | 4 | 32 | 18 |
| 1345 | C42-23 | 24 | 3 | 30 | 24 |
| 1346 | C42-24 | 25 | 4 | 37 | 21 |
| 1347. | C42-25 | 20 | 3 | 23 | 40 |
| 1348 | C42-26 | 25 | 4 | 29 | 30 |
| 1349 | C42-27 | 25 | 5 | 35 | 18 |
| 1350 | C42-28 | 25 | 4 | 30 | 14 |
| 1351 | C42-29 | 25 | 4 | 31 | 15 |
| 1352 | c42-30 | 26 | 4 | 26 | 14 |
| 1353 | C42-31 | 25 | 4 | 24 | 10 |
| 1354 | C42-32 | 25 | 3 | 23 | 9 |
| 1355 | C42-33 | 24 | 4 | 25 | 17 |
| 1356 | C42-34 | 39 | 5 | 29 | 16 |
| 1357 | C42-35 | 39 | 5 | 31 | 15 |
| 1358 | C42-36 | 28 | 4 | 23 | 17 |
| 1359 | $\mathrm{C} 42-37$ | 32 | 4 | 21 | 22 |
| 1360 | $\mathrm{C43}-6$ | 32 | 6 | 38 | 62 |
| 1361 | C43-7 | 33 | 7 | 52 | 230 |
| 1362 | C43-8 | 38 | 11 | 170 | 1200 |
| 1363 | C43 - 9 | 55 | 17 | 130 | 85 |
| 1364 | C43-10 | 48 | 12 | 140 | 500 |
| 1365 | C43-11 | 45 | 9 | 73 | 120 |
| 1366 | C43-12 | 47 | 9 | 110 | 770 |
| 1367 | C43-14 | 32 | 5 | 54 | 58 |
| 1368. | C43-15 | 27 | 5 | 33 | 27 |
| 1369 | C43-16 | 29 | 7 | 65 | 19 |
| 1370 | C43-17 | 32 | 8 | 68 | 18 |
| 1371 | C43-18 | 30 | 7 | 55 | 22 |
| 1372 | C43-19 | 23 | 4 | 35 | 20 |
| 1373 | C43-20 | 26 | 5 | 39 | 27 |
| 1374 | C43-21 | 23 | 4 | 40 | 16 |
| 1375 | C43-22 | 26 | 4 | 49 | 32 |
| 1376 | C43-23 | 21 | 4 | 36 | 20 |
| 1377 | C43-24 | 26 | 4 | 32 | 17 |
| 1378 | C43-25 | 27 | 4 | 35 | 22 |
| 1379 | C43-26 | 28 | 6 | 41 | 17 |
| 1380 | C43-27 | 22 | 3 | 21 | 34 |
| 1381 | C43-28 | 27 | 4 | 29 | 13 |
| 1382 | C43-29 | 26 | 4 | 25 | 10 |
| 1383 | C43-30 | 19 | 3 | 27 | 10 |
| 1384 | C43-31 | 23 | 3 | 28 | 10 |
| 1385 | C43-32 | 28 | 4 | 22 | 14 |
| 1386 | C43-33 | 30 | 4 | 19 | 14 |
| 1387 | C43-34 | 22 | 3 | 21 | 23 |
| 1388 | C43-35 | 30 | 4 | 21 | 21 |
| 1389 | C43-36 | 28 | 4 | 21 | 13 |
| 1390 | C43-37 | 22 | 3 | 24 | 8 |
| 1391 | C44-6 | 38 | 6 | 29 | 29 |
| 1392 | C44-7 | 42 | 8 | 41 | 41 |
| 1393 | C44-8 | 41 | 8 | 49 | 100 |
| 1394 | c44-9 | 40 | 6 | 36 | 79 |
| 1395 | C44-10 | 49 | 9 | 62 | 310 |
| 1396 | C44-11 | 40 | 9 | 69 | 79 |
| 1397 | C44-12 | 34 | 5 | 33 | 45 |
| 1398 | C44-15 | 28 | 4 | 29 | 34 |
| 1399 | C44-16 | 30 | 6 | 40 | 22 |
| 1400 | C44-17 | 25 | 5 | 32 | 21 |


| No. | Sample No. | N) Ppin | Ta ppm | Sn ppin | N ppon | No. | Sunple No. | Nb ppin | Ta ppm | Sn ppin | $\begin{gathered} \mathrm{W} \\ \mathrm{ppm} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1401 | C44-18 | 23 | 5 | 38 | 28 | 1471 | C46-32 | 32 | 1 | 23 | 25 |
| 1402 | C44 - 19 | 18 | 1 | 32 | 26 | 1472 | C46-33 | 31 | 3 | 23 | 18 |
| 1403 | C44-20 | 19 | 1 | 26 | 20 | 1473 | C46-34 | 27 | 3 | 18 | 18 |
| 1404 | C44-21 | 20 | 4 | 37 | 26 | 1474 | C46-35 | 28 | 3 | 20 | 26 |
| 1405 | C44-22 | 23 | 4 | 29 | 37 | 1475 | C46-36 | 27 | 4 | 23 | 18 |
| 1406 | C44-23 | 23 | 4 | 31 | 28 | 1476 | C46-37 | 30 | 4 | 25 | 12 |
| 1407 | C44-24 | 21 | 4 | 28 | 40 | 1477 | C47-3 | 33 | 5 | 25 | 20 |
| 1408 | C44-25 | 21 | 4 | 30 | 230 | 1478 | C47-4 | 29 | 4 | 22 | 17 |
| 1409 | C.14-26 | 25 | 6 | 36 | 17 | 1479 | C47-5 | 30 | 4 | 37 | 16 |
| 1410 | C44 - 27 | 21 | 5 | 29 | 14 | 1480 | C47-6 | 35 | 5 | 32 | 18 |
| 1411 | C44-28 | 22 | 4 | 26 | 14 | 1481 | C47-7 | 37. | 3 | 22 | 16 |
| 1412 | C44-29 | 27 | 5 | 30 | 15 | 1482 | C47-8 | 30 | 4 | 23 | 19 |
| 1413 | C44-30 | 23 | 5 | 37 | 18 | 1483 | C47-9 | 36 | 5 | 28 | 25 |
| 1414 | C14-31 | 23 | 5 | 33 | 13 | 1484 | C47-10 | 33 | 4 | 31 | 46 |
| 1415 | C44-32 | 20 | 3 | 23 | 9 | 1485 | C47-11 | 38 | 5 | 29 | 26 |
| 1416 | C44-33 | 24 | 3 | 19 | 24 | 1486 | C47-12 | 83 | 16 | 83 | 77 |
| 1117 | C44-34 | 28 | 3 | 23 | 19 | 1487 | C47-13 | 31 | 7 | 51 | 29 |
| 1418 | C44-35 | 27 | 3 | 16 | - 15 | 1488 | C47-14 | 28 | 7 | 59 | 23 |
| 1419 | C44-36 | 29 | 4 | 20 | 16 | 1489 | C47-15 | 25 | 6 | 45 | 19 |
| 1420 | C44-37 | 28 | 3 | 22 | 13 | 1490 | C47-16 | 26 | 5 | 38 | 42 |
| 1421 | C45-11 | 32 | 4 | 32 | 47 | 1491 | C47-17 | 26 | 5 | 44 | 21 |
| 1422 | C45-12 | 28 | 4 | 23 | 25 | 1492 | C47-18 | 29 | 6 | 51 | 22 |
| 1423 | C45-13 | 30 | 4 | 23 | 21 | 1493 | C47-19 | 26 | 5 | 45 | 33 |
| 1424 | CA5-14 | 33 | 8 | 59 | 73 | 1494 | c47-20 | 20 | 4 | 29 | 22 |
| 1425 | C45-15 | 27 | 5 | 46 | 24 | 1495 | C47-21 | 18 | 4 | 34 | 20 |
| 1426 | 645-16 | 24 | 4 | 39 | 74 | 1496 | C47-22 | 24 | 5 | 31 | 15 |
| 1427 | C15 - 17 | 29 | 5 | 38 | 23 | 1497 | C47-23 | 27 | 6 | 30 | 20 |
| 1428 | C45-18 | 27 | 3 | 22 | 23 | 1498 | C47-24 | 30 | 4 | 22 | 19 |
| 1429 | C45-19 | 25 | 3 | 19 | 16 | 1499 | C47-25 | 26 | 3 | 26 | 15 |
| 1430 | C45-21 | 29 | 4 | 26 | 16 | 1500 | C47-26 | 24 | 3 | 18 | 14 |
| 1431 | C45-22 | 21 | 5 | 28 | 12 | 1501 | C47-27 | 28 | 4 | 21 | 12 |
| 1432 | C45-23 | 22 | 2 | 18 | 14 | 1502 | C47-28 | 22 | 3 | 15 | 14 |
| 1433 | C45-24 | 20 | 3 | 26 | 9 | 1503 | C47-29 | 26 | 3 | 16 | 10 |
| 1434 | C45-25 | 19 | 4 | 24 | 14 | 1504 | C47-30 | 30 | 4 | 21 | 11 |
| 1435 | C45 - 26 | 17 | 3 | 19 | 15 | 1505 | C47-31 | 28 | 4 | 19 | 9 |
| 1436 | C45-27 | 27 | 4 | 20 | 23 | 1506 | C47-32 | 30 | 4 | 20 | 29 |
| 1437 | C45-28 | 24 | 3 | 20 | 25 | 1507 | C47-33 | 33 | 4 | 23 | 36 |
| 1438 | C45-29 | 31 | 4 | 24 | 19 | 1508 | C47-34 | 35 | 5 | 27 | 22 |
| 1439 | C45-30 | 31 | 4 | 25 | 19 | 1509 | C47-35 | 33 | 4 | 19 | 15 |
| 1440 | C45-31 | 29 | 4 | 19 | 16 | 1510 | C47-36 | 36 | 5 | 26 | 15 |
| 1441 | C45-32 | 29 | 3 | 17 | 14 | 1511 | C47-37 | 37 | 6 | 22 | 17 |
| 1442 | C45-33 | 32 | 4 | 20 | 17 | 1512 | C48 - 2 | 31 | 4 | 22 | 17 |
| 1443 | C45-34 | 30 | 4 | 18 | 13 | 1513 | C48-3 | 33 | 4 | 24 | 18 |
| 1444 | C45-35 | 27 | 3 | 19 | 17 | 1514 | C48-4 | 33 | 4 | 24 | 20 |
| 1445 | CA5-36 | 28 | 4 | 22 | 29 | 1515 | C48-5 | 29 | 4 | 22 | 19 |
| 1416 | C45 - 37 | 33 | 4 | 29 | 11 | 1516 | C48-6 | 15 | 2 | 16 | 7 |
| 1447 | C46-3 | 36 | 4 | 27 | 20 | 1517 | C48-7 | 30 | 4 | 22 | 20 |
| 1448 | C46-4 | 37 | 4 | 26 | 19 | 1518 | C48-8 | 27 | 3 | 19 | 19 |
| 1449 | C46-5 | 34 | 4 | 33 | 22 | 1519 | C48 - 3 | 32 | 4 | 25 | 28 |
| 1450 | c46-6 | 25 | 2 | 17 | 25 | 1520 | C48-10 | 33 | 5 | 25 | 25 |
| 1451 | C46-7 | 29 | 3 | 20 | 32 | 1521 | C48-11 | 36 | 5 | 29 | 33 |
| 1462 | C46-8 | 33 | 4 | 34 | 39 | 1522 | C48-12 | 33 | 5 | 24 | 87 |
| 1453 | C46-14 | 29 | 6 | 53 | 20 | 1523 | C48-13 | 31 | 7 | 52 | 26 |
| 1454 | C46-15 | 14 | 3 | 34 | 37. | 1524 | C48-14 | 30 | 8 | 57 | 34 |
| 1455 | C46-16 | 28 | 4 | 35 | 19 | 1525 | C48-15 | 27 | 6 | 41 | 21 |
| 1456 | C46-17 | 27 | 4 | 41 | 31 | 1526 | C48-16 | 26 | 5 | 37 | 21 |
| 1457 | C86-18 | 25 | 4 | 36 | 27 | 1527 | C48-17 | 18 | 3 | 59 | 14 |
| 1458 | C46-19 | 27 | 4 | 38 | 25 | 1528 | c48-18 | 23 | 4 | 34 | 17 |
| 1459 | C46-20 | 28 | 4 | 37 | 26 | 1529 | C48-19 | 17 | 4 | 33 | 14 |
| 1460 | C46-21 | 24 | 4 | 32 | 19 | 1530 | C48-20 | 13 | 2 | 15 | 15 |
| 1461 | C46-22 | 25 | 3 | 22 | 13 | 1531 | C48-21 | 18 | 4 | 30 | 18 |
| 1462 | C46-23 | 29 | 4 | 25 | 27 | 1532 | C48-22 | 23 | 4 | 28 | 12 |
| 1463 | C46-24 | 27 | 3 | 27 | 20 | 1533 | C48-23 | 24 | 2 | 18 | 11 |
| 1464 | C46-25 | 23 | 5 | 83 | 290 | 1534 | C48-24 | 30 | 4 | 26 | 8 |
| 1465 | C46-26 | 22 | 3 | 24 | 24 | 1535 | C48-25 | 27 | 3 | 21 | 7 |
| 1466 | C46-27 | 29 | 3 | 24 | 17 | 1536 | C48-26 | 34 | 4 | 20 | 13 |
| 1467 | C46-28 | 26 | 3 | 21 | 21 | 1637 | C48-27 | 28 | 3 | 24 | 17 |
| 1468 | C46-29 | 32 | 4 | 22 | 12 | 1538 | C48-28 | 32 | 5 | 19 | 12 |
| 1469 | C46-30 | 33 | 4 | 29 | 27 | 1539 | C48-29 | 23 | 4 | 18 | 13 |
| 1470 | C16-31 | 28 | 4 | 19 | 12 | 1540 | C18-30 | 23 | 3 | 17 | 11 |


| No. | Sanple No, | Nb ppm | Ta ppon | Sn <br> ppin | $\begin{gathered} W \\ \mathrm{ppm} \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1541 | C48-31 | 34 | 5 | 27 | 44 |
| 1542 | C48-32 | 33 | 5 | 21 | 13 |
| 1543 | C48-33 | 25 | 3 | 21 | 33 |
| 1544 | c48-34 | 33 | 4 | 26 | 18 |
| 1545 | $\mathrm{C} 48-35$ | 34 | 5 | 33 | 34 |
| 1546 | C48 - 36 | 29 | 4 | 23 | 11 |
| 1647 | C48-37 | 31 | 5 | 27 | 11 |
| 1548 | C49 - 1 | 28 | 4 | 20 | 14 |
| 1549 | C49 - 2 | 25 | 4 | 19 | 12 |
| 1550 | C49 - 3 | 26 | 4 | 25 | 13 |
| 1551 | C49 - 4 | 24 | 4 | 25 | 14 |
| 1552 | C49-5 | 27 | 3 | 23 | 21 |
| 1553 | C49-6 | 27 | 3 | 19 | 14 |
| 1554 | C49-7 | 33 | 4 | 23 | 17 |
| 1555 | C49 - 8 | 24 | 4 | 17 | 16 |
| 1556 | C49-9 | 28 | 4 | 29 | 34 |
| 155 ? | C49 - 10 | 41 | 6 | 34 | 43 |
| 1558 | C49-11 | 37 | 6 | 39 | 77 |
| 1559 | C49-12 | 27 | 6 | 73 | 170 |
| 1560 | C49-13 | 28 | 7 | 44 | 33 |
| 1561 | C49-14 | 28 | 5 | 37 | 32 |
| 1562 | c49-15 | 25 | 4 | 37 | 33 |
| 1563 | C49-16 | 28 | 5 | 43 | 36 |
| 1564 | C49-17 | 32 | 5 | 42 | 18 |
| 1565 | C49-18 | 21 | 4 | 37 | 25 |
| 1566 | C49-19 | 16 | 3 | 30 | 9 |
| 1567 | C49-20 | 18 | 4 | 32 | 11 |
| 1568 | C49-21 | 20 | 4 | 28 | 10 |
| 1569 | C49-22 | 23 | 3 | 22 | 9 |
| 1570 | C49-23 | 28 | 4 | 23 | 7 |
| 1571 | C4F-24 | 27 | 4 | 19 | 8 |
| 1572 | C49-25 | 26 | 3 | 15 | 10 |
| 1573 | C49-26 | 36 | 5 | 21 | 15 |
| 1574 | C49-27 | 42 | 6 | 24 | 13 |
| 1575 | C49-28 | 35 | 5 | 23 | 16 |
| 1576 | C49-29 | 34 | 4 | 21 | 17 |
| 1577 | C19-30 | 31 | 1 | 19 | 17 |
| 1578 | C49-31 | 27 | 4 | 16 | 14 |
| 1579 | C49-32 | 36 | 5 | 30 | 16 |
| 1580 | C49-33 | 24 | 4 | 16 | 11 |
| 1581 | C49-34 | 24 | 3 | 16 | 14 |
| 1582 | C49 - 35 | 20 | 3 | 16 | 160 |
| 1583 | C49-36 | 30 | 4 | 21 | 12 |
| 1584 | C49-37 | 28 | 4 | 23 | 73 |
| 1585 | C50-1 | 30 | 3 | 29 | 18 |
| 1586 | C50-2 | 31 | 3 | 35 | 49 |
| 1587 | C50-3 | 31 | 4 | 44 | 18 |
| 1588 | C50 - 4 | 30 | 3 | 40 | 15 |
| 1589 | C50-5 | 27 | 4 | 41 | 11 |
| 1590 | C50-6 | 28 | 4 | 22 | 22 |
| 1591 | C50 - ? | 29 | 5 | 25 | . 25 |
| 1592 | C50-8 | 29 | 4 | 22 | 18 |
| 1593 | C50-9 | 26 | 3 | 19 | 18 |
| 1594 | C50-10 | 38 | 5 | 32 | 38 |
| 1595 | C50-11 | 34 | 6 | 34 | 110 |
| 1596 | C50-12 | 27 | 6 | 77 | 430 |
| 1597 | C50-13 | 32 | 8 | 54 | 29 |
| 1598 | C50-14 | 28 | 7 | 55 | 19 |
| 1599 | C50-15 | 21 | 4 | 38 | 54 |
| 1600 | C50-16 | 23 | 4 | 39 | 39 |
| 1601 | C50-17 | 29 | 6 | 63 | 49 |
| 1602 | c50-18 | 21 | 6 | 64 | 64 |
| 1603 | C50-19 | 22 | 7 | 50 | 9 |
| 1604 | C50-20 | 20 | 5 | 37 | 18 |
| 1605 | C50-21 | 16 | 4 | 24 | 6 |
| 1606 | C50-22 | 20 | 4 | 30 | 6 |
| 1607 | c50-23 | 18 | 3 | 18 | 7 |
| 1608 | C50-24 | 28 | 4 | 16 | 10 |
| 1609 | C50-25 | 24 | 3 | 13 | 8 |
| 1610 | C50-26 | 33 | 6 | 21 | 16 |


| No. | Sample No. | Nb <br> ppan | Ta ppia | Sn <br> ppm | $\begin{gathered} W \\ p p x \pi \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1611 | C50-27 | 31. | 5 | 81 | 18 |
| 1612 | C50-28 | 32 | 5 | 24 | 16 |
| 1613 | c50-29 | 35 | 5 | 20 | 11 |
| 1614 | C50-30 | 33 | 4 | 23 | 29 |
| 1616 | C50-31 | 29 | 4 | 21 | 50 |
| 1616 | C50 -- 32 | 20 | 3 | 12 | 18 |
| 1617 | C50-33 | 32 | 4 | 19 | 18 |
| 1618 | C50-34 | 33 | 5 | 21 | 19 |
| 1619 | C50 - 35 | 29 | 4 | 21 | 35 |
| 1620 | C50-36 | 26 | 3 | 18 | 26 |
| 1621 | C50-37 | 30 | 4 | 22 | 27 |
| 1622 | C51-1 | 19 | 2 | 8 | 5 |
| 1623 | C51-2 | 31 | 4 | 44 | 12 |
| 1624 | C51-3 | 29 | 3 | 30 | 11 |
| 1625 | C51-4 | 28 | 4 | 34 | 14 |
| 1626 | C51-5 | 28 | 3 | 20 | 17 |
| 1627 | 651-6 | 23 | 2 | 14 | 13 |
| 1628 | C51-7 | 24 | 3 | 14 | 34 |
| 1629 | C51-8 | 32 | 4 | 23 | 32 |
| 1630 | C51-9 | 34 | 4 | 30 | 34 |
| 1631 | C51-10 | 34 | 4 | 29 | 24 |
| 1632 | c51-11 | 36 | 4 | 26 | 28 |
| 1633 | C51-12 | 27 | 3 | 20 | 23 |
| 1634 | c51-13 | 30 | 7 | 47 | 24 |
| 1635 | C51-14 | 34 | 8 | 55 | 32 |
| 1636 | C51-15 | 29 | 6 | 49 | 34 |
| 1637 | C51-16 | 19 | 4 | 31 | 85 |
| 1638 | C51-17 | 24 | 7 | 33 | 15 |
| 1639 | C51 - 18 | 30 | 6 | 36 | 25 |
| 1640 | C51-19 | 31 | 7 | 47 | 20 |
| 1641 | C51-20 | 26 | 6 | 34 | 19 |
| 1642 | C51-21 | 27 | 5 | 35 | 14 |
| 1643 | C51.-22 | 31 | 5 | 32 | 13 |
| 1644 | C51-23 | 33 | 5 | 29 | 20 |
| 1645 | C51-24 | 25 | 3 | 18 | 10 |
| 1646 | C51-25 | 34 | 5 | 22 | 10 |
| 1647 | C51-26 | 35 | 5 | 21 | 9 |
| 1648 | C51-27 | 37 | 4 | 19 | 8 |
| 1649 | C51-28 | 41 | 5 | 25 | 13 |
| 1650 | C51-29 | 35 | 4 | 26 | 17 |
| 1651 | C51-30 | 25 | 4 | 17 | 8 |
| 1652 | C51-31 | 37 | 5 | 27 | 69 |
| 1653 | C51-32 | 26 | 3 | 16 | 31 |
| 1654 | C51-33 | 38 | 5 | 24 | 50 |
| 1655 | C51-34 | 33 | 4 | 22 | 25 |
| 1656 | C51-35 | 30 | 4 | 19 | 24 |
| 1657 | C51 - 36 | 33 | 4 | 21 | 28 |
| 1658 | C51-37 | 35 | 4 | 18 | 130 |





Appendix 16. Relative frequency and cumulative frequency histogram





