

breccia is characteristically distributed.

It was reported that the analysis content of Cu, Mo, Pb and Zn were 0.003 % Cu, 0.003 % Mo, 0.002 % Pb and 0.003 % Zn.

[Features on SAR image] (SAR image unit: "Rashaant")

The prospect consists of dark and bright parts on the SAR image, which may reflect a landform composed of a ridge and a valley of the E-W system. The lineament of the E-W system has been extracted and has a good continuity.

[Geology and geological structure]

Nonsorted conglomerate, medium-grain sandstone, shale, dacite accompanied by gray magnetite and dacitic tuff, which indicated sedimentary structure having N70 to 80° E strike and 60 - 65° SE dip, were distributed.

[Mineral showing and alteration]

Silicification and sericitization could be recognized in dacite and tuff. And weak dissemination of pyrite was found. The alteration zone continued in N75° E trend. In the silicified tuff, quartz vein with large expansion, contraction and a low continuity of maximum 80 cm wide was distributed. Also, the tuff was accompanied by cataclasite which was caused by faulting and platy silicified rock.

[Laboratory test]

Chemical assay was conducted on quartz veins (M99NK021M and NK022M), hydrothermal breccia (M99NK023R), silicified rock (M99MZ006R and MZ007R), a float of quartz vein (M99RK003R), and silicified dacitic tuff breccia (M99RK004R). The results were <0.005 g/t Au (below detection limits), <0.2 - 1.0 g/t Ag, <1 - 20 ppm Cu, 4 - 702 ppm Pb, 4 - 148 ppm Zn. The powdery X-ray diffraction test shown that silicified rock (M99MZ006R) with dissemination of pyritic contained quartz, albite, potassium feldspar.

[Evaluation]

Although a dominant hydrothermal activity controlled by faulting could be recognized, no mineral showing was discovered in the field survey. Since the assay of gold was not conducted in the preceding survey, the existence of gold mineralization has been expected. However, it is concluded that no further survey is required for this prospect because the content of gold in silicified rock and quartz veins was below detection limits.

3.2.6 Altgana gol district

(1) Outline of the district

Figure II-3-13 shows the geology of Altgana gol district, and Figure II-3-14 shows the location of sampling points in the district.

LEGEND

 Survey region








 Survey point

 Contour line

 River


 Lake

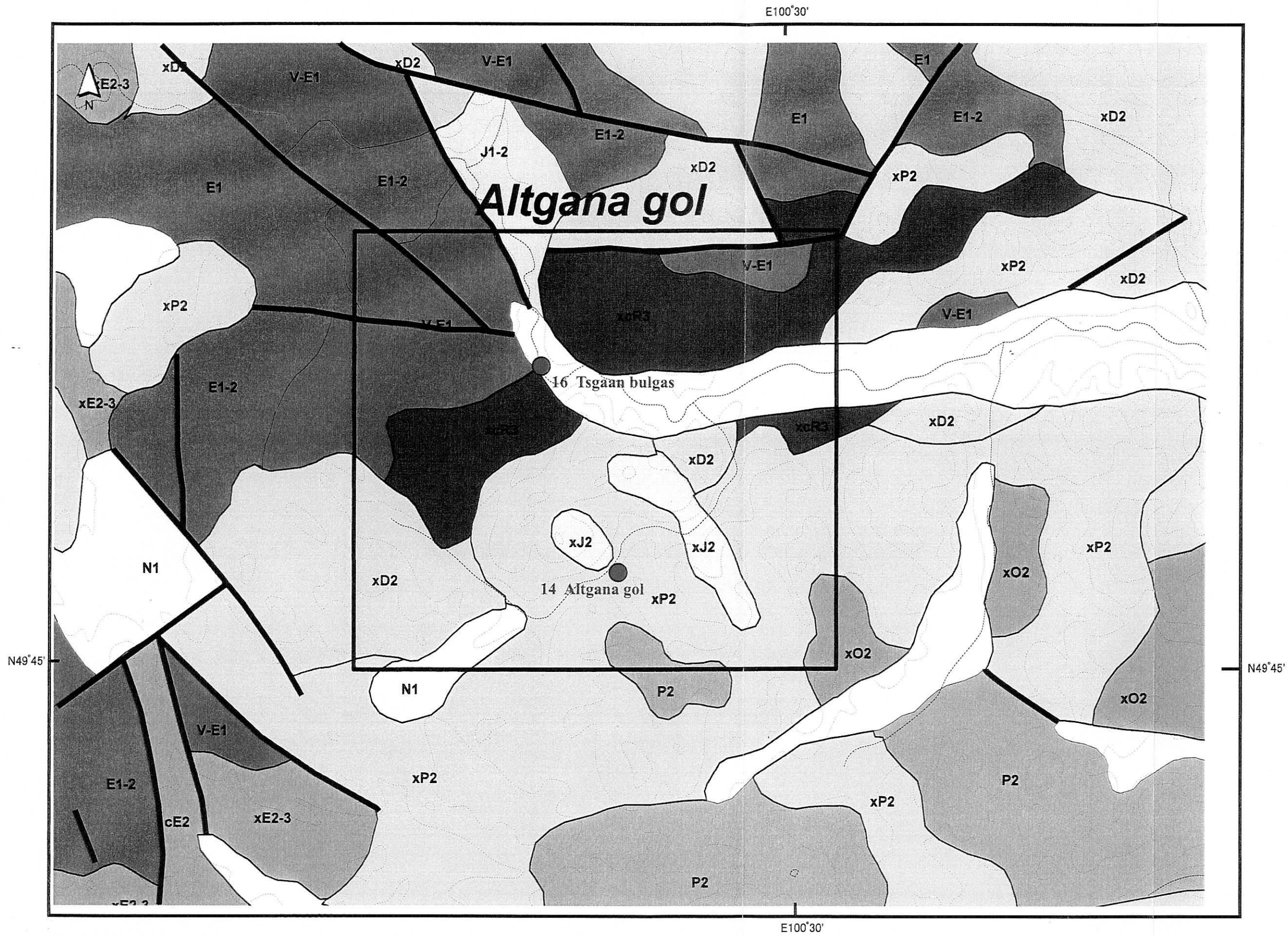
Sedimentary and volcanic rocks

-  Quaternary
-  Tertiary
-  Jurassic-Cretaceous
-  Permian-Triassic
-  Silurian-Carboniferous
-  Cambrian-Ordovician
-  Precambrian

Plutonic rocks

-  Triassic-Jurassic
-  Permian
-  Devonian-Carboniferous
-  Cambrian-Ordovician
-  Precambrian

 Fault



5 0 5 10 Kilometers

Fig. II-3-13 Geological map of Altgana gol region

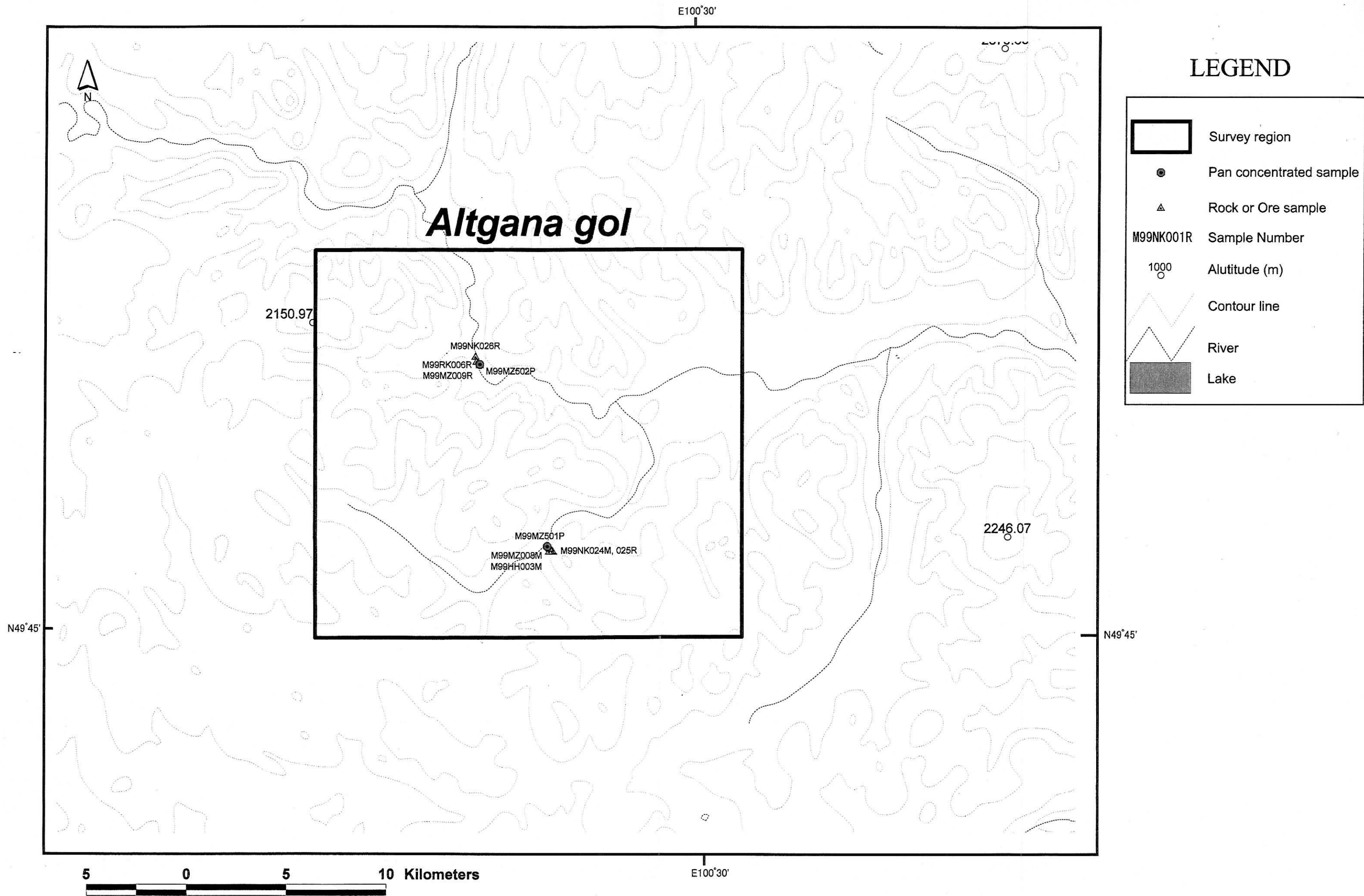


Fig. II-3-14 Sample locations of Altgana gol region

(a) Location

The Altgana gol district is situated in Khuvsgul Province, and is 20 km long from east to west and 20 km wide from north to south around 100° 10' east longitude and 49° 45' north latitude. It is approximately 30 km northeast of Murun city, a prefectural capital.

(b) Topography and vegetation

This district is in a mountainous region of the northern Mongolia with steep ups and downs, which is 2,000 m above sea level. The lowlands near a river form a narrow steppe. Conifers grow in the mountainous region.

(c) Infrastructure and access

Murun is the largest city next to Ulaanbaatar and Saihan and has a population of 50,000. Relatively well-appointed hotels for tourists are available. There is also a regular flight service from Ulaanbaatar. Since the survey district is located in the mountainous region, the road from Murun to it is in bad condition.

(d) Outline of geology and deposit

The geology corresponds to the Drkhat Unite of Sengor et al. (1996). Acidic plutonic rocks of Riphean age, Cambrian to Devonian age, and the Permian period intrude. Also, although ultrabasic rock, among the ophiolite member of Riphean to Cambrian age, is distributed, a linear distribution suggesting a suture zone is not shown. The Altgana Gol prospect, where molybdenum showing in acidic plutonic rock is expected, is known. Tsagaan Burgas is also known as a point where the existence of chromium and nickel deposits in ultrabasic rock is expected. In addition, this district corresponds to the interdistrict of the NW-SE system fault group and the NE-SW system fault.

(e) Reasons for selection

As described above, acidic plutonic intrusive rock accompanied by mineral showing is dominant. Also, this is an interdistrict of fault groups of two trends. For these reasons, the Altgana gol district was selected as a survey district in order to study room for future prospecting as well as to discover some mineralization.

(2) Survey results

(a) Altgana gol (Mineral occurrence No. 14)

[Typical longitude and latitude]

49° 50' 58.5" north latitude, 100° 24' 12.9" east longitude

[Topography and vegetation]

Although the Altgana gol prospect is in a relatively undulating mountainous region, the lowland along the river is grassland. At the top of the mountain, conifers grow.

[Access]

This prospect is situated approximately 30 km northeast of Murun. It is located on the right bank of the Altabanag gol River. It takes about an hour from that city by car. The prospect is accessible by car.

[Preceding survey]

Geological survey on a scale of 1:50,000 was conducted in 1985. A porphyry molybdenum deposit was expected because a mineral showing of molybdenum was discovered at that moment. According to the data supplied by the Mongol side, a mineralization 850 m long and 550 m wide was found and the grade of molybdenum was 0.006 - 0.035 % in major mineral showings. Trenching was conducted in four places, and a hole was drilled. The drilling advance was 40.8 m length and the grade of molybdenum was 0.003 - 0.02 %.

[Features on SAR image] (SAR image unit: "Rashaant")

The prospect shows a bright gray to dark gray tone on the SAR image. It shows a relatively high resistance. The drainage system density is medium, indicating a roundish drainage pattern.

[Geology and geological structure]

Aplitic granite intruded leucocratic granite of early Permian age.

[Mineral showing and alteration]

Quartz veins accompanied by molybdenite developed in aplitic granite.

[Laboratory test]

Chemical assay was conducted on quartz vein samples (M99HH003, M99MZ008 and M99RK005). As the results, 320, 12 and 431 ppm Mo were obtained.

The microscopic observation revealed that rock sample M99NK025 (aplitic granite) consisted of quartz, potassium feldspar, plagioclase, muscovite and opaque minerals.

The oxygen isotope ratio and the homogenization temperature and salinity of fluid inclusions were measured on quartz vein sample (M99MZ008M). These measurements are added to the appendix at the end of this report. The oxygen isotope ratio of the quartz in M99MZ008M ranges from +7.6 ‰ to +8.4 ‰ and the homogenization temperature of the fluid inclusion ranges between 142 °C and 206 °C. The oxygen isotope ratio of water which is in equilibrium with quartz calculated from the oxygen isotopic fractionation coefficient (Matsuhisa et al., 1979) between quartz and water at 183 °C, the mean value, ranges from -5.2 ‰ to -4.4 ‰ (Appendix Table A-25). The oxygen isotope ratio of meteoric water, which has generally a small value, ranges from -15 ‰ to -5 ‰ in Japan, Korean Peninsula, and the northeast of China (Mizota and Kusakabe, 1994). Based on the data on the Tsookher mert prospect described later, the oxygen isotope ratio of meteoric water during mineralization may be about -11 ‰. That of magmatic water ranges between +6 ‰ and +9 ‰ (Taylor, 1974), which indicates a high value. The value obtained in this survey, -5.2 ‰ to -4.4 ‰, suggests two possibilities; the water involved in the formation of the quartz vein is a mixture of meteoric water and magmatic water, and although the water originated from meteoric water, it

shifted to a high value because a sufficient isotope exchange with a rock having a high oxygen isotopic ratio occurred. In order to study these two possibilities, it is necessary to pay attention to the salt concentration of the fluid inclusion. A mean value of the salt concentration is 9.34%, a relatively high value. Since the host rock of a quartz vein consists of granites, it may be a magmatic component. Consequently, the oxygen isotope ratio of water probably shows a mixture of magmatic water and meteoric water. In this case, although the magmatic component contributed to the hydrothermal process that formed the quartz vein, chemical analysis revealed that gold and copper were below detection limits. This fact suggests that the mineralizing ability of the hydrothermal fluid in this prospect was low.

[Evaluation]

According to the content obtained so far, the grade of molybdenum was low and gold and copper were below detection limits and little alteration was recognized in field survey. Therefore, it is concluded that there is no need to go ahead with the prospecting plan.

(b) Tsgaan bulgas (Mineral occurrence No. 16)

[Typical longitude and latitude]

49° 56' 02.6" north latitude, 100° 20' 59.9" east longitude

[Topography and vegetation]

The Tsgaan bulgas prospect is in a mountainous region. Short grass and trees grow. A river runs through this prospect.

[Access]

This prospect is situated 34 km northeast of Murun. It takes about two hours by car from Murun. It is possible to go near the prospect by car.

[Preceding survey]

Geological survey on a scale of 1:200,000 (Report No. 1725) and 1:50,000 (Report No. 3649) and geophysical survey (Report No. 3598) were conducted. No geochemical prospecting has been carried out. It was reported that mineralization zone was 1,200m length and 500 m width, and assay results were 0.6 % Ni, 1.0 % Cr. Also, geochemical anomaly of Cu, Pb and Zn was known.

[Features on SAR image] (SAR image unit: "Moron")

When seen at a regional range, this prospect is included in an area where a bright gray response, characteristic of a mountainous region north of the Selenge River, is dominant. When seen at a local range, it is situated in an oval dark gray to dark color response (which may be a depression) surrounded by a bright gray response (mountainous area). In this dark gray to dark color response, a clear lineament of the N-S system (which may be a swamp) develops and at the same time a bright gray response of the E-W system can also be seen. This response of the E-W system continues to the dark color lineament (which may be a swamp line) in the bright gray response on the west side.

[Geology and geological structure]

This prospect is situated in the North Mongol Fold Belt and Khuvsgul Metalogenic Belt. Serpentine and carbonate rock of late Riphean to early Cambrian ages were distributed around this prospect.

[Mineral showing and alteration]

Weathering of Basalt has been remarkable. Weak chloritization and calcite veinlets occurred as alteration. No mineral showing was recognized.

[Laboratory test]

Chemical assay was conducted on ultrabasic rock (M99MZ009R) and basic tuff (M99RK006R). The results (M99MZ009R) were 1,985 ppm Ni and 1,395 ppm Cr, and those (M99RK006R) were 1,970 ppm Ni and 1,850 ppm Cr.

As microscopic observation, the modal composition of M99MZ009R was constituted from forsterite (80 %), enstatite (15 %), diopside (0.5 % or less) and chromite (0.5 %).

[Evaluation]

As ultrabasic rock, this prospect contains Ni and Cr on the average. Although weak anomaly of Cr which may be attributable to ultrabasic rock was recognized in pan concentrated stream sediment, no sign that leads to a deposit was discovered. In addition, judging from the description of the preceding survey, it is concluded that there is no need of any further prospecting.

3.2.7 Altgana gol NW district

(1) Outline of the district

Figure II-3-15 shows the geology of Altgana gol NW district, and Figure II-3-16 shows the location of sampling points in the district.

(a) Location

This district is situated on the south of Lake Khuvsgul, 60 km north of Murun, and is 30 km long from east to west and 20 km wide from north to south around 100° 5' east longitude and 50° 10' north latitude.

(b) Topography and vegetation

As for the topography, this district is in hilly to mountainous area having a summit which is 2,000 to 2,400 m high, except flat country (approximately 1,800 m above sea level) around the river of the N-S system flowing toward Lake Khuvsgul and its tributaries.

As for the vegetation, the low-lying area is a steppe where short grass grows while the highland country is woodland.

E100°15'

LEGEND

Survey region

Survey point

Contour line

River

Lake

Sedimentary and volcanic rocks

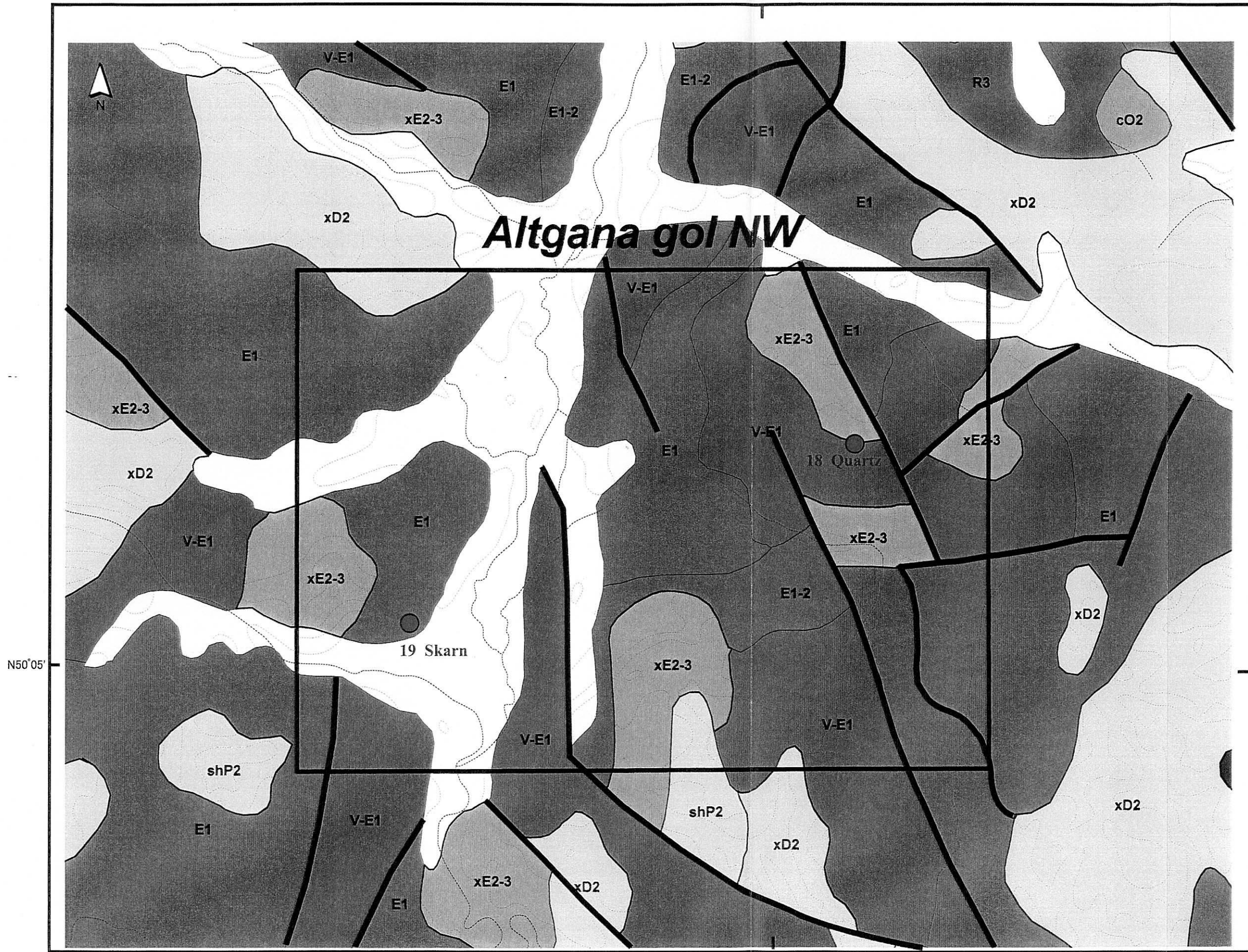
- Quaternary
- Tertiary
- Jurassic-Cretaceous
- Permian-Triassic
- Silurian-Carboniferous
- Cambrian-Ordovician
- Precambrian

Plutonic rocks

- Triassic-Jurassic
- Permian
- Devonian-Carboniferous
- Cambrian-Ordovician
- Precambrian

Fault

Altgana gol NW



N50°05'

N50°05'

E100°15'

5 0 5 10 Kilometers

Fig. II-3-15 Geological map of Altgana gol NW region

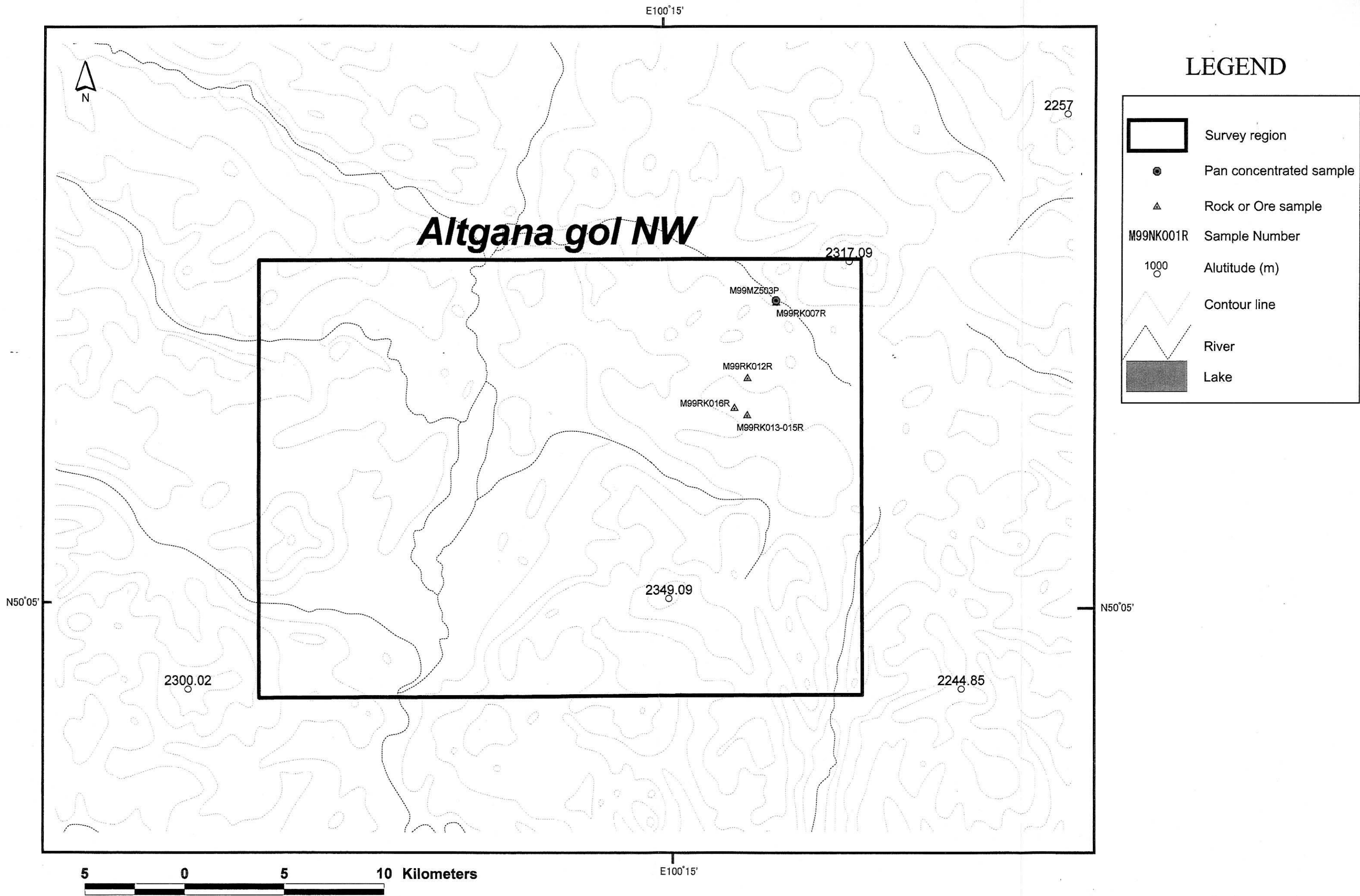


Fig. II-3-16 Sample locations of Altgana gol NW region

(c) Infrastructure and access

Although a north to south road connecting Moron to Hatgal (tourist resort) situated by Lake Khuvsgul has not been paved, it is a main road and relatively easy to drive down. Roads going east and west from there are in bad condition.

(d) Outline of geology and deposit

The SAR image reveals that the district is situated in a mountainous region north from Selenge River and a bright gray color is dominant. Lowlands (a dark color is dominant) with a certain width of the N-S system stretching southward from Lake Khuvsgul can be recognized. Valley of the E-W system or WWN-EES system cut a bright gray to gray block in the form of crossing it almost at right angles.

Granitic rocks of middle Devonian age and basic rocks of late Riphean to early Cambrian ages intruded a distribution area of sedimentary rocks (limestone, dolomite and sandstone) of Cambrian age. Diluvium was distributed in the basin of both the river on N-S system flowing toward Lake Khuvsgul and its tributaries. A fault (maximum 20 km) of the NW system and a fault (maximum 10 km) of the NE-SW system crossing this at right angles are dominant. Mineral showing of Ni and Cr that accompany basic rocks was described in the preceding survey.

(e) Reason for selection

This district was selected because mineral showing of Ni and Cr that accompany ultrabasic rock was described in the preceding geological survey on a scale of 1:50,000 in 1986.

(2) Survey results

(a) Quartz (Mineral occurrence No. 18)

[Typical longitude and latitude]

50° 14' 09.7" north latitude, 100° 16' 53.7" east longitude

[Topography and vegetation]

The ridges and swamps tend to stretch in the NW-SE trend. The neighborhood of the prospect consists of a hill where short grass grows, a swamp, and a low mountain where thin woods of conifers are distributed.

[Access]

The Quartz prospect is approximately 20 km away from Khatgal. It takes two hours to go near the prospect by car. An unpaved road runs to the prospect through a steppe. Rainfall makes the access difficult. It is possible to go near the prospect by car. It takes about 30 minutes to go to the prospect on foot.

[Preceding survey]

As the preceding survey, geological survey, trenching and sampling for assay were conducted from 1980 through 1982.

This prospect is situated in the North Mongolia Fault Zone. The mineralization is of a hydrothermal type and the mineralization is considered to have occurred in early Riphean age. In the prospect, shale of Riphean age, sedimentary rocks mainly composed of limestone of Cambrian age and intrusion of fine-grained diorite were distributed.

It was reported that silicification and sericitization were recognized and the alteration zone was 5.2 meter long and 1.5 meter wide. It was also reported that the content of Au and Ag were 7.6 g/t Au and 0.4 - 3.2 g/t Ag.

[Features on SAR image] (SAR image unit: "Hatgal")

This prospect is represented as a bright part on the SAR image. It is in a slightly steep mountainous region and is a little strong in resistance. The lineament has not been extracted.

[Geology and geological structure]

Limestone, meta - shale and green tuff recognized weak schistosity were distributed. The limestone was accompanied by nonsorted breccia. Also, float rocks of fine-grained diorite was recognized in investigated area.

[Mineral showing and alteration]

Two trenches were observed, and silicified limestone and quartz vein were recognized. The quartz vein was harmonious with schistosity of green schist that hosted green tuff, and showed colorless or white coarse grains. This may be a segregation during metamorphism. This quartz vein was accompanied by limonite and a small amount of molybdenite. The limestone had underwent silicification and turned into jasperoid. Quartz veinlets were recognized slightly in the form of network.

[Laboratory test]

Chemical assay was conducted on floats of quartz vein (M99RK007R and RK012R), a quartz vein in a trench (M99RK013R), a silicified limestone (M99RK014R), a green schist (M99RK015R), and a weakly silicified limestone (M99RK016R). The results were <0.005 g/t Au (below detection limits), <0.2 - 0.2 g/t Ag, <1 - 6 ppm Cu, <2 - 70 ppm Pb, <2 - 40 ppm Zn and 1 - 11 ppm As. The homogenized temperature of fluid inclusions in the quartz vein (M99RK013R) collected in a trench was 136 to 184 °C, and its salinity was maximum 0.88 wt%.

[Evaluation]

The preceding survey revealed that the grade of Au was 7.6 g/t. It was assumed that the mineralization may be of metamorphic type or carlin type. However, anomaly of As has not been recognized, the homogenized temperature of fluid inclusion was as low as 136 to 184 °C, the salinity, 0.88 wt%, was also low, and floats of diorite was recognized. For these reasons, there is a possibility that the mineralization may have been caused by hydrothermal activity in a shallow part, with

intrusive rock being heat source, originating from meteoric water. It is difficult to believe that prominent gold mineralization existed because every contents of gold was below detection limits. Consequently, it is concluded that there is no great necessity for any future prospecting.

(b) Skarn (Mineral occurrence No. 19)

[Typical longitude and latitude]

50° 09' 20.3" north latitude, 100° 00' 58.9" east longitude

[Topography and vegetation]

The Skarn prospect has a landform of plain and hill. It is in a steppe where only short grass grows.

[Access]

It is possible to go up north by an unpaved main road leading to Lake Khuvsgul from Murun and arrive near the site through a forked road.

[Preceding survey]

A skarn type copper mineralization was discovered through a geological survey on a scale of 1:50,000 carried out in 1982 and trenching was also conducted. It was reported that the copper and silver grades were 0.015 - 1.0 % Cu and 5 - 10 g/t Ag, respectively.

[Features on SAR image] (SAR image unit: “

This prospect is represented a gray to white tone on the SAR image. It has rolling undulations and is low in resistance. The development of the drainage system is low to medium, indicating a slightly parallel distribution.

[Geology and geological structure]

Crystalline limestone and marble of Vendian age was distributed.

[Mineral showing and alteration]

Although trenches and pit were recognized, skarnization reported in the preceding survey could not be discovered.

[Evaluation]

Neither mineralization nor skarnization was recognized. This prospect will not be a target area for future survey.

3.2.8 Khokhoo district

(1) Outline of the district

Figure II-3-17 shows the geology of Khokhoo district, and Figure II-3-18 shows the location of

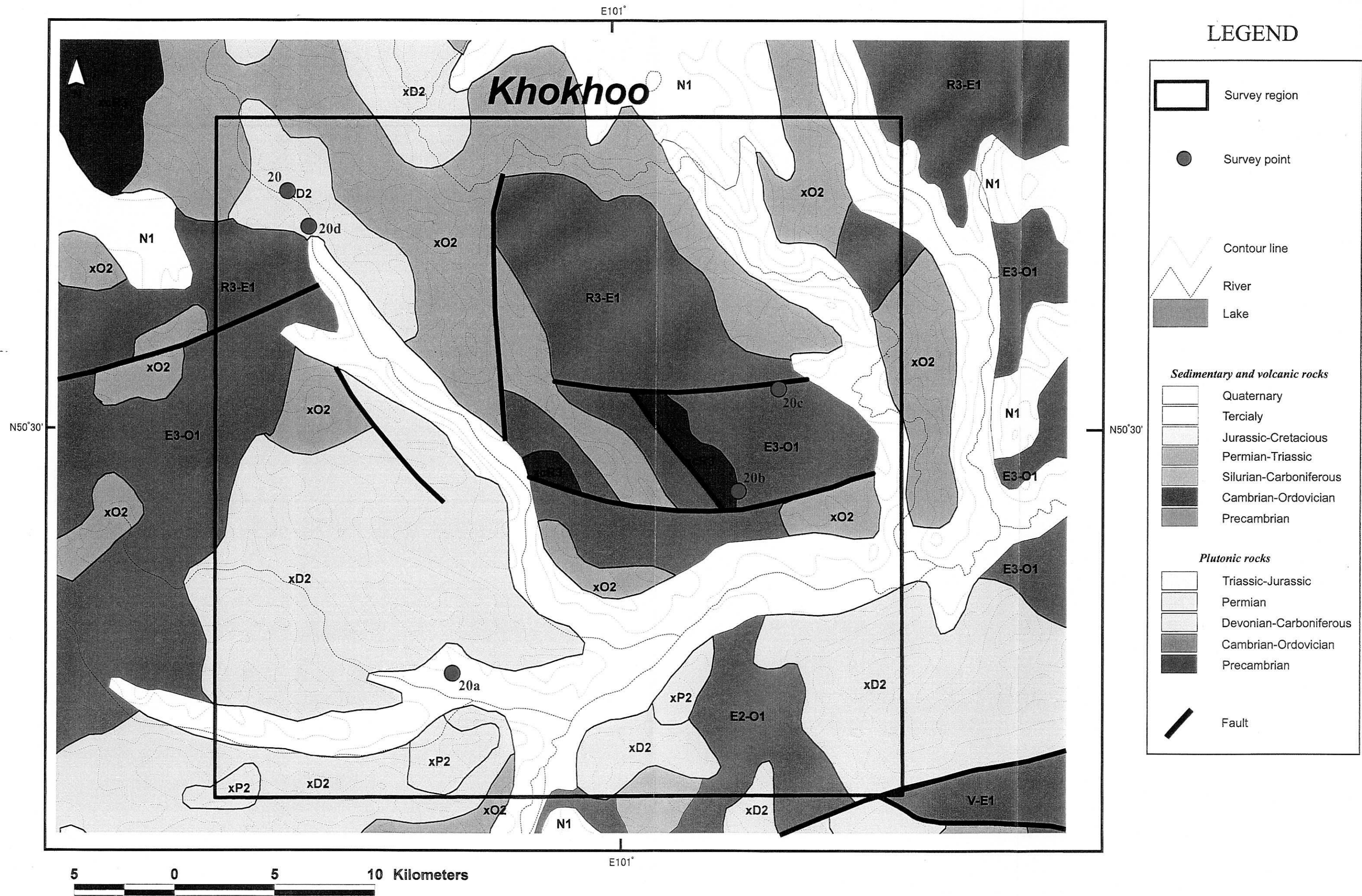


Fig. II-3-17 Geological map of Khokhoo region

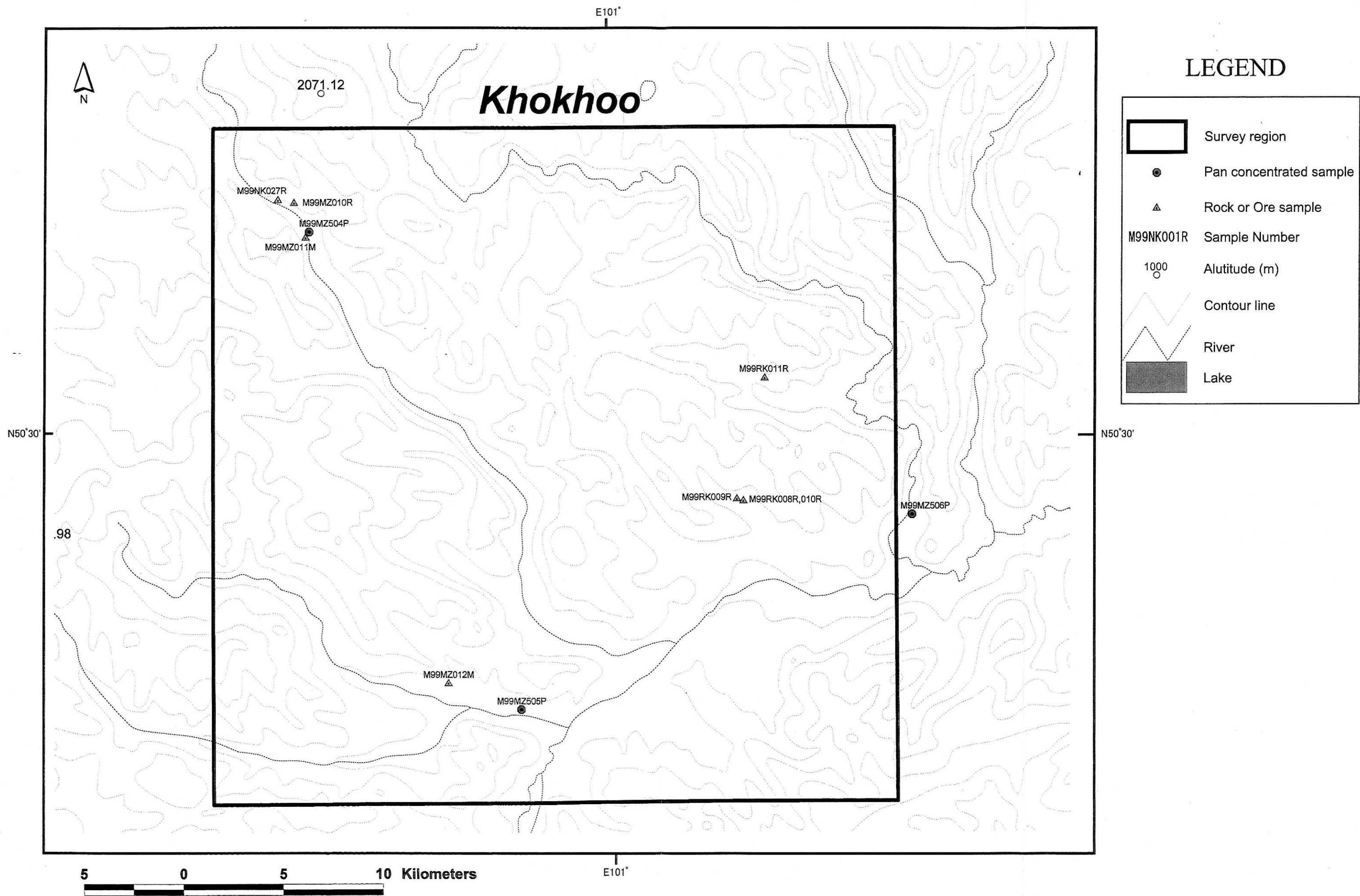


Fig. II-3-18 Sample locations of Khokhoo region

sampling points in the district.

(a) Location

Khokhoo district is located to the north to northeast of the central part of the survey area and to the southeast of Lake Khuvsgul in a range of 40 km (E-W) × 40 km (N-S) centering around 101° east longitude and 50° 35′ north latitude. It is approximately 50 km as the crow flies to the east of a town of Khatgal along the southern shore of Lake Khuvsgul, where tourists often visit in summer. The towns called Chandmani under and Tsagaan uur are located in and near the survey area respectively.

(b) Topography and vegetation

The geomorphology there consist of a slightly steep ridge and a valley and 1,500 to 2,000 m above the sea level. There is a river in the center of the survey area, whose main course runs in the E-W trend, the ridge and valley lines are developed in N-S, NW-SE, and NE-SW trends. Stream lines are well developed in arborescent. As for vegetation, low trees and grasses grow only beside a low valley, and all the ridges are covered with sparse conifer forests.

(c) Infrastructures and access

Towns of Chandmani under and Tsagaan uur are located in and near the survey area respectively. Although power supply is available there, no facilities such as hospitals are established, the general infrastructure is not sufficiently established. The survey area is relatively steep with sparse conifer forests on the ridge. Stream lines are well developed with abundant amount of water. However, since bridges are scarcely built on the river, access by car is difficult. At the time of this survey, the bridge on the street eastward from the town of Tsagaan uur was unusable since its girders had been washed away because of swollen water. In the east of Lake Khuvsgul, it was extremely difficult to move by car.

(d) Outline of geology and deposit

Sandstone, conglomerate, quartzite and limestone of Riphean to Cambrian ages, and ultrabasic rocks of Riphean age, and granitic rocks of Devonian age, and granite, tonalite and granodiorite of Ordovician age were distributed.

Known prospects of skarn type were shown in the limestone of the Proterozoic.

(e) Reasons for selection

Through analysis of SAR images, a circular structure having a diameter of 2 km was extracted from Proterozoic granite. Since this district was located at the place where lineaments of E-W and N-E systems crossed each other, development of fissure system was expected. Existence of a skarn prospect in limestone was shown as known prospect. In view of the granites distributed in a wide range, porphyry mineralization was presumed. Therefore, the district was selected as subject to the survey.

(2) Survey results

(a) Hurilt gol (Mineral occurrence No. 20)

[Typical latitude and longitude]

50° 38' 18.5" north latitude, 100° 46' 37.7" east longitude

[Topography and vegetation]

Topography and vegetation analyzed along the river formed a mountainous region of around 200 m in relative height. Conifers grow on the northern slope.

[Access]

The prospect is situated at about 50 km to the northeast of Khatagal at the southern end of Lake Khuvsgul. Access is given to go there from Khatagal southward by way of Darkhint.

[Preceding survey]

In 1941, when geological survey, trenching, and short drilling were conducted, quartz and carbonate veins were found in granitic rocks, accompanied by galena, chalcopyrite, chalcocite and pyrites. In addition, it was recorded that 0.16 - 0.72 % Cu, 0.29 - 0.97 % Zn and 1.58 - 5.04 % Pb were obtained as assay results.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

The color tone of SAR images is gray. The ridge looked round, and both drainage system density and resistivity are low. Lineament by the river in the NW-SE system is conspicuous.

[Geology and geological structure]

Granitic rocks were widely distributed in the prospect.

[Mineral showing and alteration]

Although floats of quartz vein were found, none of them accompanied mineralization.

[Laboratory test]

No laboratory test was conducted.

[Evaluation]

In this field survey, it was impossible to recognize the mineral showings found in 1941. Since such mineral showings were in a small scale, it is considered that they will not be worth prospecting in the future.

(b) 20a point

[Typical latitude and longitude]

50° 26' 13.9" north latitude, 100° 52' 50.3" east longitude

[Topography and vegetation]

This point is a plain and a hill. As to vegetation, a steppe where short grass grows is found dominant, and the upper part of the hill is covered with conifer forests. The low land along the Arigiyn gol river in the NE-SW trend was a swamp.

[Access]

Access is provided to the point by a drive on a vehicle on an unpaved road from Darhint, the nearest town.

[Preceding survey]

Trenching is conducted in the past, and traces remained there in length of 25 m and 5 m in the N-S trend.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

The color tone of the SAR image is light gray. Undulation is gentle, and resistivity is medium. Lineament in the N-E system is interpreted. Drainage system is developed to a medium extent and they are distributed almost in parallel.

[Geology and geological structure]

Granodiorite of Devonian age were distributed in a wide range.

[Mineral showing and alteration]

A line of quartz vein was distributed and its host rock was granodiorite. The quartz vein was at the strike of N50° W and the dip of vertical, and approximately 200 m in total length with its maximum width of 40 cm. The quartz vein was accompanied by galena, malachite, hematite and limonite. Limonitization occurred in the host rock beside the vein.

[Laboratory test]

Chemical assay of quartz vein (M99MZ012M) was conducted, the results were 1,135 ppm Cu, 5,210 ppm Pb, and 23.2 g/t Ag.

[Evaluation]

Mineral showing of base metal mainly consisting of lead was identified. With its low grade and small scale, it was not considered as promising. However, since mineralization of base metal was noted as in 20d prospect, potential of skarn type mineralization should be evaluated on the margin of granodiorite.

(c) 20b point

[Typical latitude and longitude]

50° 31' 06.3" north latitude, 101° 05' 23.0" east longitude

[Topography and vegetation]

A valley and ridge is identified to extend in the NW-SE system. Relatively tall grass grows beside the valley and on the low land, and forests of conifers alone are distributed on the ridge.

[Access]

The prospect is approximately 10 km away from the town of Chandmani under, and it takes approximately 45 minutes to go there by a car. Since there is an unpaved road along the swamp, access is provided to go there in a vehicle.

[Preceding survey]

No accurate record was reserved concerning preceding surveys.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

The SAR image shows a rather steep mountainous region in a bright tone. Resistivity is high and a drainage system is well developed. This prospect is located at the place where NW-SE system lineament and E-W system lineament are crossed each other.

[Geology and geological structure]

Sillimanite schists originating from mudstone or shale were distributed. Granite was identified in floats.

[Mineral showing and alteration]

White to milky-white quartz veins were identified in schist. Quartz vein was in harmony with a schistosity structure or indicated to cut schistosity in parts. The quartz vein was in a strike of N85° W, dip of 60° N. Its form was relatively irregular with its width of 10 to 100 cm indicating distinctive difference between its expanded and contracted parts. The quartz vein intermittently continued for 150 m or more in NW trend. No alteration was identified at the host rock beside the vein. Also, Greisenization was noted in granite floats.

[Laboratory test]

Chemical assay was conducted on quartz veins (M99RK008R, RK009R and RK010R). The results were <0.005 g/t Au (below the detection limit), <0.2 Ag (below the detection limit), 1 ppm Cu, 16 ppm Pb and 2 - 20 ppm Zn.

[Evaluation]

The quartz vein discovered was considered as segregation caused by metamorphism or occurred by hydrothermal activity related to granite intrusion. Both of them might possibly have become gold

deposits. However, it turned out barren quartz vein since the content of gold and silver were below detection limits. Therefore, further survey will not be necessary.

(d) 20c point

[Typical latitude and longitude]

50° 34' 25.4" north latitude, 101° 06' 18.6" east longitude

[Topography and vegetation]

A ridge and a valley are developed in NW-SE system. Sparse forests are distributed on the ridge. Beside the valley was a swamp where relatively tall grass was growing.

[Access]

This point is approximately 5 km from 20b point. Since a swamp is beside the valley and sparse forests are distributed on the ridge, access by a vehicle is impossible. It takes an hour and a half on foot from 20b prospect to the point.

[Preceding survey]

No preceding survey was conducted.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

The point is expressed as a bright portion on the SAR image. Resistivity is high and a drainage system is developed. A circular structure with a diameter of 4 km is extracted in the place where granitic rocks of the Proterozoic are distributed. Therefore, mineral showing accompanying granite stocks may exist there.

[Geology and geological structure]

Gneiss, granodiorite and granite were distributed in the investigated point, and pegmatite dyke on small scale intruded there. The dyke had the strike of N30° E and the dip of vertical.

[Mineral showing and alteration]

Greisenization was recognized. As alteration mineral, muscovite and biotite occurred in pegmatite dyke.

[Laboratory test]

Chemical assay and the microscopic observation were conducted on pegmatite dyke (M99RK011R). As the results, the contents were Au/Ag/Cu (below detection limits), 14 ppm Pb and 46 ppm Zn, and secondary biotite was revealed.

[Evaluation]

Through SAR image analysis this district was found to have features of a circular topography. Consequently, existence of intrusive rock was assumed and the intrusive rock was expected to be

related to mineralization. From the result of our field survey, the circular topography was considered to have been formed through erosion of gneiss, granite and granodiorite. Since no mineral showing was found, further survey will not be necessary.

(e) 20d point

[Typical latitude and longitude]

50° 39' 17.1" north latitude, 100° 45' 37.1" east longitude

[Topography and vegetation]

Dissecting is made along the river, and a mountainous region is formed in the relative height of around 200 m. Conifers grow on the northern slope.

[Access]

This point is located at about 50 km to the northeast of Hatagal, the southern end of Lake Khuvsogol. The point can be reached by going southward from Hatagal by way of Darhint. The point is located in the way to Hurill gol prospect.

[Preceding survey]

In 1980, a geological survey was conducted for uranium survey. A lot of trenches in N30° E trend (in the total length of 5 to 20 m) were excavated mainly.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

The SAR image shows color tone of bright gray. The point is a gentle slope with low resistivity. Drain system is developed poorly.

[Geology and geological structure]

Granitic rocks and andesite dyke were distributed.

[Mineral showing and alteration]

Some parts of granitic rock were greisenized extremely, accompanying malachite stains. No sulphide mineral was observed.

[Laboratory test]

Chemical assay of andesite that was stained with malachite (M99NK027M) and quartz vein (M99MZ011M) was conducted. Assay results of M99NK027M did not show remarkable geochemical anomaly. On the other hand, those of M99MZ011M were 7,950 ppm Cu, 11.1 % Pb and 44.2 g/t Ag.

[Evaluation]

Though mineralization of base metals was recognized in quartz vein, that was small scale and low grade. However, it is necessary to check the potential of mineralization on the margin of granodiorite

because same mineralization occurred in 20a point. Furthermore, it is considered that further prospecting will be necessary.

3.2.9 South Camp district

(1) Outline of the district

Figure II-3-19 shows the geology of South Camp district, and Figure II-3-20 shows the location of sampling points in the district.

(a) Location

This district is located in Khuvsgul province constitutes a zone 130 km to the east-northeast of Murun city including Erdrnbulgan in a range of 20 km (E-W) × 25 km (N-S) centering around 101° 35' east longitude and 50° north latitude.

(b) Topography and vegetation

The district is in the mountainous area in the northern part of Mongolia, and its height above the sea level is of 2,000 m class. The district consists of a low land in the periphery of the river which is a vast steppe and a steep mountainous region where conifers grow.

(c) Infrastructure and access

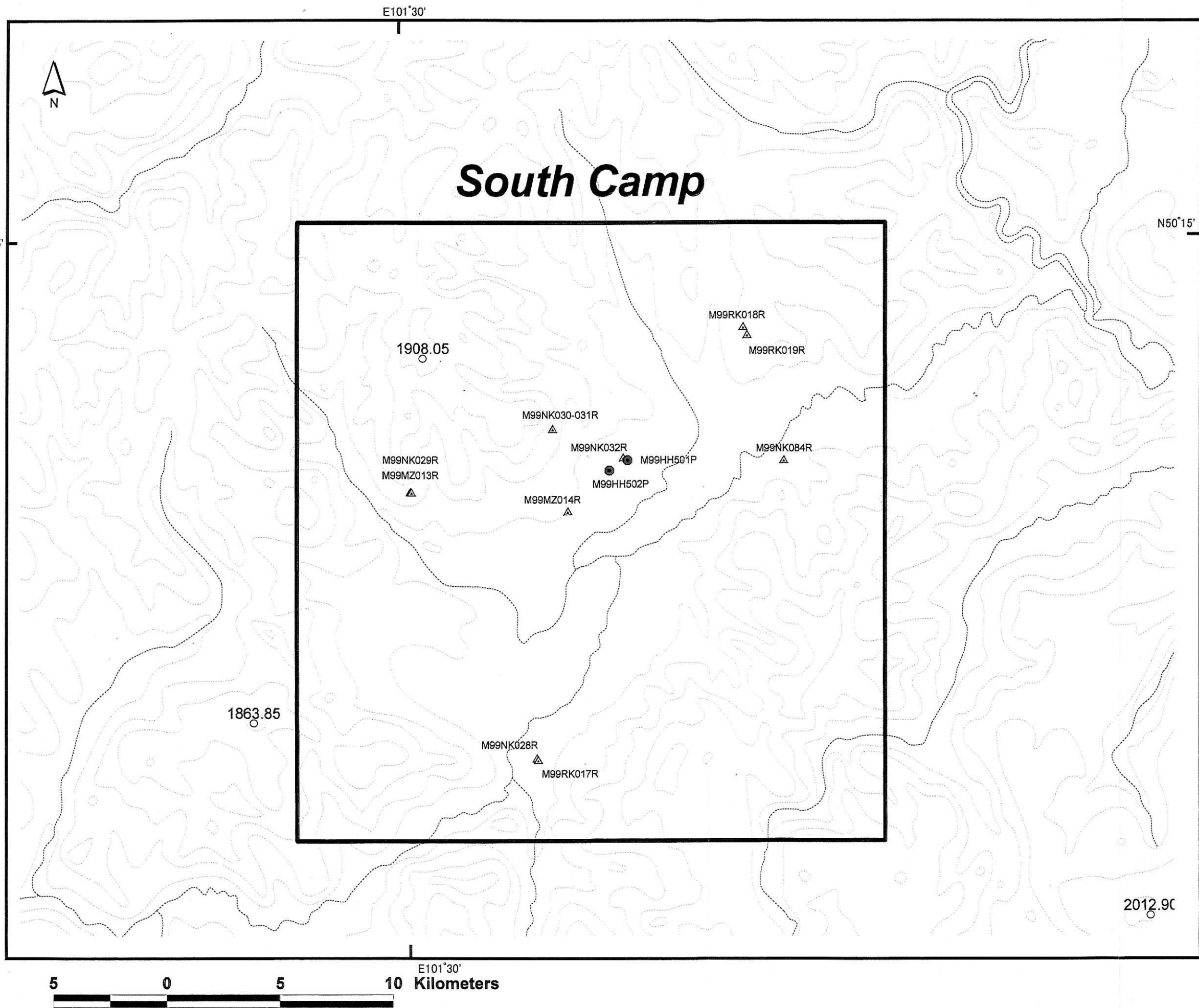
Erdrnbulgan, which is the center of the district, constitutes a city area with population of several thousand people. Erdrnbulgan is situated approximately 140 km of Murun city. It is possible to go there approximately 90 km north direction from Tarianan on the way of a main road from Bulgan to Murun.

(d) Outlines of geology and deposits

The geological unit of this district corresponds to Dzhida Unite by Sengor et al. (1996). Sandstone, shale, conglomerate and basaltic pyroclastic rocks of Riphean to Vendian ages, and ultrabasic rocks as ophiolite member of Riphean to Cambrian ages, and undivided acidic plutonic intrusions of the Paleozoic were distributed. And Molasse sediments of Jurassic age covered them.

(e) Reason for selection

In view of a lot of alluvial gold discovered through a recent survey conducted in Mongolia, and the known listvenite accompanying ultrabasic rocks and auriferous quartz vein, whose gold mineralization was expected, the aim of the survey was determined to acquire the above features and to examine whether further prospecting would be necessary or not.



LEGEND

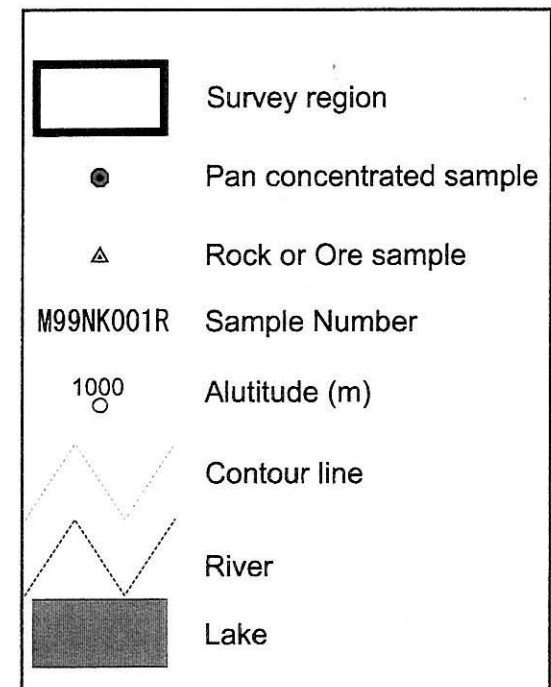


Fig. II-3-20 Sample locations of South Camp region

(2) Survey results

(a) 25a point

[Typical latitude and longitude]

50° 06′ 23.3″ north latitude, 101° 36′ 06.8″ east longitude

[Topography and vegetation]

As for the topography, this point consists of the bank of a river of around 10 m in width which constitutes a steep cliff. Sparse forests of conifers were distributed in the vicinity and there was a lodge for tourists near the prospect.

[Access]

It takes about 30 minutes by driving in a vehicle to the prospect from a nearby city of Erdenbulgan. An easy access is available without any bad road involved.

[Preceding survey]

As sedimentary rocks, Volcati sediments consisting of limestone, conglomerate and schist of early Cambrian age, and red clay which is considered to be of the Paleozoic were distributed. As intrusive rocks, diorite and granodiorite of late Cambrian age, granite and trachite of middle Devonian age were distributed. Further, gabbro of early Riphean age, andesite and basalt of Permian age, auriferous conglomerate of early Cretaceous age, and basalt of Tertiary age were identified in the district surveyed.

This prospect is located to the west of Tavt Prospect and is controlled by Ekin gol Fault System in the NE-SW system. Zieal Metallogenic Belt is considered to be located to the south of deep fault in the E-W system, and Khuvsgul Metallogenic Belt, to its north. As to mineral showing, quartz vein was recognized in the sediments of early Cambrian age and its grade was reported as 0.2 g/t Au. Also, gold grains were identified in the conglomerate of early Cretaceous age. In the place where ultrabasic rocks were distributed, existence of Pt may be expected.

[Features on SAR image] (SAR image unit: “Erdenbulgan”)

This point is expressed as a dark tone on the SAR image, constituting a low mountainous land or a plain land. Resistivity is relatively low and lineament in NEE-SEE system is extracted in the north and southwestern parts of the survey district.

[Geology and geological structure]

Granite in medium grains were distributed (Tes Complex) and sedimentary rocks such as limestone were distributed in the vicinity (Burgaltai Series).

[Mineral showing and alteration]

Quartz veins were identified as a network in rather porphyritic granite. In the zone where the network was identified was in the scale of about 30 m extent and its maximum width was

approximately 2 m. The quartz vein accompanied a small amount of limonite.

[Laboratory test]

The microscopic observation and modal analysis were conducted on granite as a host rock (M99NK028R). Chemical assay was conducted on quartz vein (M99RK017R), and the results were 0.035 g/t Au, 1.0g/t Ag, 28ppm Pb and 4ppm Zn.

[Evaluation]

The assay results obtained by a team in charge of geological mapping of quartz vein was 0.01 g/t Au. Similarly, as a result of the survey of this time, the content of Au was 0.035 g/t. Gold mineralization associated with granitic intrusion was identified through the survey. However, in view of the fact that the grade was not high and that the network scale was small, successive survey on this prospect was determined unnecessary.

(b) 25b point

[Typical latitude and longitude]

50° 12′ 45.5″ north latitude, 101° 31′ 29.3″ east longitude

[Topography and vegetation]

The point constitutes a hill with vegetation of a steppe and only short grass growing.

[Access]

Access is provided to reach the point by driving in a vehicle on an unpaved road from the nearest town of Erdenbulgan.

[Preceding survey]

As a national undertaking, geological survey on a scale of 1:50,000 has been conducted on 6 sites from 1998. The survey is contracted by a geological consultant firm located in Darkhan city, and a trench of approximately 80 m long has been excavated. The grade of gold obtained on the channel sampling in interval of 5 m was reported to be 0.1 g/t.

[Features on SAR image] (SAR image unit: “Erdenbulgan”)

The tone of the SAR image is bright gray, and undulations are gentle with low resistivity. The drainage system has been developed only to a low degree, indicating a radial distribution.

[Geology and geological structure]

Dark gray phyllite considered to be of lower Cambrian age were distributed accompanying greenish tuff lithofacies in parts. The phyllite had the strike of N80° E and the dip of 40° S, and slightly folded. The rocks near the prospect were under mylonitization, and its strike and dip was N50° E and vertical. Small-scaled granite dyke were accompanied. As a result of the above geological survey, existence of a fault in the WNW-ESE system was assumed.

[Mineral showing and alteration]

Although it was impossible to directly find outcrops, existence of quartz vein was identified in the rock fragments used to refill the trench. The quartz vein was 2 cm wide, crossing almost the foliation of the host rock. The host rock was white with foliation developed and suffered hydrothermal alteration.

[Laboratory test]

Chemical assay of rock sample (M99MZ013) containing quartz vein was conducted. The results were <0.005 g/t Au (below the detection limit), 0.2 g/t Ag.

[Evaluation]

Since the both Au grades were low as obtained in the preceding survey and the survey of this time, the point cannot be subject to further surveys.

(c) 25c point

[Typical latitude and longitude]

50° 12' 17.2" north latitude, 101° 37' 16.3" east longitude

[Topography and vegetation]

Gentle hills constitute a steppe. Outcrops are scattered in some parts.

[Access]

It takes 20 minutes' drive to reach the point from Erdrnbulgan.

[Preceding survey]

Geological survey has been conducted from 1998 on the scale of 1:50,000.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

This point is represented gray tone on the SAR image. With low resistivity, topography was almost flat. Sparse drainage systems are developed.

[Geology and geological structure]

Ultrabasic rock as an ophiolite member of Riphean to Cambrian ages including harzburgite with diameter of approximately 2 km and dunite in massive in part.

[Mineral showing and alteration]

Most of ultrabasic rocks were serpentized, and pseudomorph of orthopyroxene were sometimes found.

[Laboratory test]

No conspicuous anomaly was detected with respect to the values of Cr, Ni and Pt as an analysis result of sample (M99MZ014R; harzburgite). Also, EPMA analysis was conducted because of checking the potential of cromite deposit (Appendix Figure A-1, Table A-21).

[Evaluation]

Since it was impossible to acquire distribution of dunite as the host rock of chromite deposit on field survey, the point cannot be subject to further survey.

(d) 25d point

[Typical latitude and longitude]

50° 14' 13.8" north latitude, 101° 36' 46.4" east longitude

[Topography and vegetation]

This point is mountainous area with sparse forests and steppe

[Access]

This point is located at 12 km to the northeast of the city area of the nearest town Erdenbulgan. The point can be reached by about 20 minutes' drive in a vehicle from that city and then about 40 minutes' walk from the mountain foot.

[Preceding survey]

Geological survey has been conducted as a national enterprise on the scale of 1:50,000 contracted by a geological consultant firm in Darhan city. At present, a detailed survey in geological mapping including trenching was conducted where existence of gold and rare earth deposit was expected.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

The color tone of this point is gray on the SAR image. With low resistivity, topography is almost flat. Sparse drainage system is developed.

[Geology and geological structure]

Pelitic - psammitic schists of Vendian to early Cambrian ages and ultrabasic rocks were distributed.

[Mineral showing and alteration]

Listovenized ultrabasic rock (silicified and carbonatized serpentine) were distributed near the border between the ultrabasic rock and schist. Two trenches of approximately 25 m length at N40° W and N70° W had been excavated in the manner as crossing the border. Basalt in a width of 10 cm and dolerite dyke had been intruded into these ultrabasic rock.

[Laboratory test]

As the microscopic observation, the rock sample (M99NK030R) was found to consist of talc and calcite, indicating that serpentine had been carbonatized. Rock sample (M99NK031R) was found to consist of sericite, quartz and calcite, but not containing talc. According to the results of chemical analysis of the sample, Au and Ag were below or almost below detection limits and gold mineralization would not be expectable. Although being found intensely carbonatized, M99NK030R showed the content of 1,420 ppm Cr and 2,240 ppm Ni, while M99NK031R showed the content of 892 ppm Cr and 1,445 ppm Ni.

[Evaluation]

The typical gold grade was recorded as 10 g/t in listvenite existing to the southwest of Tsugaan uul. As far as the listvenite from this point was concerned, it was considered that the extent of alteration was weak compared with the typical listvenitization, and gold mineralization was not recognized. Furthermore, the point cannot be subject to further survey.

(e) 25e point

[Typical latitude and longitude]

50° 16' 33.2" north latitude, 101° 44' 13.6" east longitude

[Topography and vegetation]

The point consists of a ridge and a swamp in the E-W system. Sparse forests are distributed beside the valley and on the ridge.

[Access]

It takes about 45 minutes by vehicle from the nearby town of Erdenbulgan to the beside prospect, and then about a half an hour on foot to the prospect.

[Preceding survey]

Geological survey were conducted in 1998.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

The point is expressed as dark gray tone in the SAR image, with low resistivity. The point is found to constitute a mountainous low land or a plain land.

[Geology and geological structure]

Gray and fine-grained sandstone and psammitic to pelitic schist were distributed, which is considered to be of early Cambrian age.

[Mineral showing and alteration]

Existence of colorless to white quartz vein and in rather coarse-grained calcite vein was identified in sandstone and schist.

[Laboratory test]

Chemical assay was conducted on quartz vein (M99RK018R, RK019R), and the results were Au/Ag (below detection limits), 8 - 14 ppm Cu, <2 - 4 ppm Pb and <2 - 4 ppm Zn.

[Evaluation]

Further survey will be unnecessary since no mineral showing, hydrothermal alteration and sulfide mineral were identified, and the content of gold in quartz vein was below the detection limit.

(f) 25f point

[Typical latitude and longitude]

50° 13' 31.6" north latitude, 101° 39' 22.3" east longitude

[Topography and vegetation]

The point is found to consist of gentle hills and steppes

[Access]

The point is located approximately 12 km northeast from the nearest town of Erdenbulgan. Access to the point is available by car.

[Preceding survey]

Trenching was conducted as a part of geological survey in 1998, and existence of placer gold was identified.

[Features on SAR image] (SAR image unit: "Erdenbulgan")

Dark color tone is given in the SAR image, with extremely low resistivity and sparse development of drainage system.

[Geology and geological structure]

In view of lake sediments of Cretaceous age developed around the point, existence of placer gold deposit may be expected in Alluvium covering the lake sediments. Detrital deposit was unconsolidated pebbles in sand to cobble size consisting of granodiorite, diorite, gabbro, basalt, andesite, quartzite, sandstone, etc.

[Mineral showing and alteration]

As a result of the survey conducted on the side of Mongolia, placer gold has apparently been discovered in the entire area.

[Laboratory test]

No anomaly in gold was detected in the sample (M99NK032R) from sand of swamp.