REPORT

ON

THE COOPERATIVE MINERAL EXPLORATION

IN

SHEBENIK AREA, THE REPUBLIC OF ALBANIA

PHASE Ⅲ

MARCH 1999

JAPAN INTERNATIONAL COOPERATION AGENCY

METAL MINING AGENCY OF JAPAN

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PREFACE

In response to the request of the Government of the Republic of Albania, the Japanese Government decided to conduct a Mineral Exploration in Shebenik Area Project and entrusted the survey to the Japan International Agency (JICA) and the Metal Mining Agency of Japan (MMAJ).

The JICA and MMAJ sent to the Republic of Albania a survey team consisting of two geologists from August 24 to September 23 in 1998 and from March 6 to March 20 in 1999.

The team conducted a field survey in the Shebenik Area and completed it in cooperation with the Ministry of Public Economy and Privatisation, and the Albanian Geological Survey.

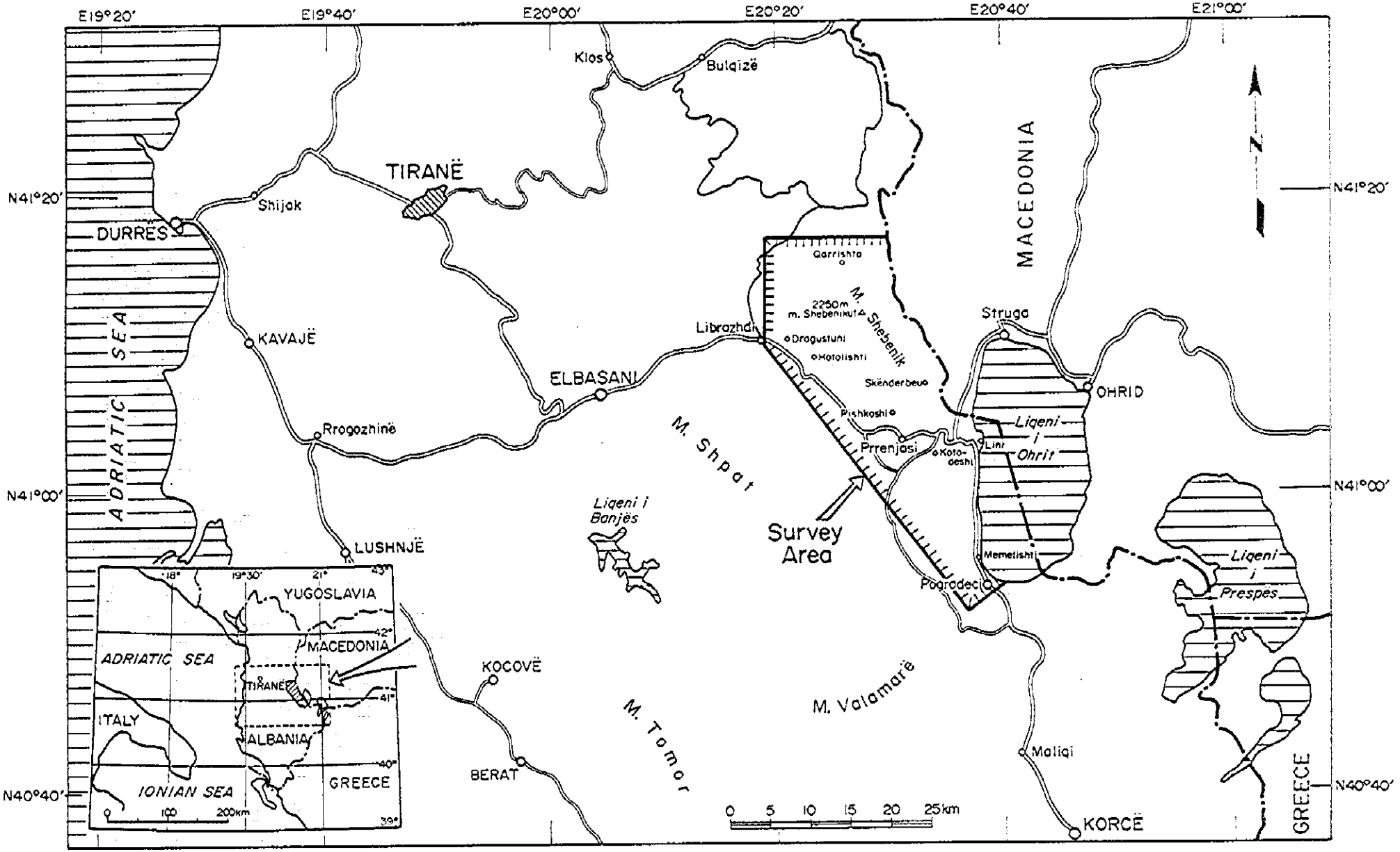
We hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

We wish to express our deep appreciation to the officials concerned of the Government of the Republic of Albania for their close cooperation extended to the team.

March 1999

Kimio FUJITA
President
Japan International Cooperation Agency

Hiroaki HIYAMA
President
Metal Mining Agency of Japan



Location map of survey area

SUMMARY

This report has been prepared as the result of the Third Year Campaign of the Mineral Exploration Project for Shebenik Area, the Republic of Albania. The Survey Team was dispatched twice during the Campaign, in the periods from August to September, 1998 and of March, 1999.

The major component of the Third Year Campaign was drilling work. The drilling program had been prepared on the basis of the results of the First and Second Year Campaigns as well as the existing data obtained by the past Albanian activities. The drilling work was carried out for the six selected target areas, namely Ahu i Vetem, Lugu i Batres, Buzgare, Pishkash-5, Bregu i Pishes, and Hija e Zeze. The amount of drilling work was 15 holes with the total length of 1,405 m.

Each drill hole aimed at exploring either down-dip or strike extensions of the known chromitite ore bodies or surface indications. Of the 15 holes, 8 holes which were drilled in Ahu i Vetem, Lugu i Batres and Hija e Zeze, intersected chromitite. However, the rest of holes in Buzgare, Pishkash-5 and Bregu i Pishes failed to encounter any significant chromitite bodies.

All the five holes, drilled to the deep ore body of Ahu i Vetem, intersected chromitite at depth for appreciable length ranging from 1.75 to 4.60 m. However, the intersections mainly comprised banded or disseminated ores with average Cr_2O_3 grades at around 20 %, which were rather low for chromite ores. Two of the five holes also intersected the shallow ore body with thickness less than 0.05 m.

One of the two holes for the Lugu i Batres and both of the two holes for the Hija e Zeze intersected massive chrome ores with core lengths between 0.20 and 1.10 m. Although the intersections were rather short, their Cr_2O_3 grades were appreciably high at around 40 %.

Both hanging and foot walls of the chromitite layers are invariably composed of dunite forming envelopes for chromitite. The dunite envelopes vary in their thickness from place to place. Their thickness is, however, apparently greater for the low grade deep ore body of Ahu i Vetem, ranging from 10 to 60 m, than for the ore bodies of the other two target areas varying between one and three meters.

The rocks observed in drill cores are similar in every hole, comprising mainly hartzburgite and subordinate dunite often intruded by pyroxinite dykes. These ultra basic rocks are mostly serpentinized to variable degrees except for extremely fresh ones found at depth of Bregu i Pishes. Crushed or brecciated zones are developed in association with faults in some target areas.

EPMA analysis was carried out for samples systematically collected from drill

cores of two holes, one each for Ahu i Vetem and Hija e Zeze, both of which intersected chromitite bodies. Samples of dunite enveloping chromitite bodies indicated EPMA anomaly in V_2O_3--Cr #, while most harzburgite samples showed EPMA anomaly in Fe^{3+} # rather than in Cr #.

Based on the results of the Third Year Campaign, the following targets will be recommended for the follow-up exploration;

1) Hija e Zeze: the northern strike-extension and the upper and lower part of the ore body which has been intersected by the drill holes in the Current Project.
2) Ahu i Vetem: the north-northeastern extension of the deep ore body and the northwestern extension of the shallow ore body, both of which have been identified by the drill holes in the Current Project.

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PART I

PART I GENERAL

Chapter 1 Introduction

1-1 Background

This Project was implemented in Shebenik Area in the southeastern part of the Republic of Albania according to the 'Scope of Work' agreed upon between Japan International Cooperation Agency and Metal Mining Agency of Japan for Japanese Side, and Ministry of Mineral Resources and Energy and Albanian Geological Survey for Albanian Side, on July 5th, 1995.

In this year, the Third Year of the Project, drilling work was carried out for the six target areas in Central and Southern Shebenik and Northern Pogradec Districts selected on the basis of the result of the First and Second Year Campaigns.

1-2 Conclusion and Recommendation of the Second Year Campaign

1-2-1 Conclusion

The conclusions obtained from the Second Year Campaign are summarized as follows;

The Shebenik-Pogradec Ultrabasic Massif can be divided into the apparently lower massive dunite-harzburgite suite (MDHS) and the upper dunite-harzburgite suite with remarkable layering (DHSRL). Chromium deposits occur in the dunite rich zone within MDHS, where lenses of dunite are predominated.

In the target areas of Ahu i Vetem, Lugu i Batres, Gobille, Qafa e Dinarit and Buzgare many EPMA anomalies were recognized by the results of EPMA analysis for chromian spinel contained in surface rock and chromitite samples. The target areas of Ahu i Vetem and Lugu i Batres are considered to be most prospective among them.

According to the result of magnetic survey, chromitite and associated dunite appear to be related to magnetic lows, which may be caused by inversely magnetized rocks.

Holes drilled in Bregu i Pishes and Qarri i Zi intersected chromitite (samples collected in both areas during the First Year Campaign indicated EPMA anomalies). Drill core samples of these areas and Pishkash South showed Cr # $-V_2O_3$ anomalies in EPMA analysis.

1-2-2 Recommendation

Based on the above conclusions of the Second Year Campaign, the following 9

areas in 3 districts were selected for the drilling exploration targets in the Third Year Campaign;

* Northern Pogradec District (Bregu i Pishes, Hija e Zeze)

  Bregu i Pishes: the chromitite intersected by the drill holes, MJAS-1 and -2.

  Hija e Zeze: the massive chromitite encountered by the exploratory.

* Southern Shebenik District (Pishkash-5, Qarri i Zi)

  Pishkash-5: the northern extension of the fault-dislocated portion of the known ore body, where the continuation of a zone of EPMA anomaly had been projected and remained as a major exploration subject.

  Qarri i Zi: the drill holes, MJAS-8 and MJAS-9, had intersected chromitite and a number of EPMA anomalies had been also identified.

* Central Shebenik District (Ahu i Vetem, Gobille, Qafa e Dinarit, Buzgare, Lugu i Batres)

  EPMA anomalies had been identified in every target areas. There are a number of outcrops of massive ores and known ore deposits.

1-3 Overview of the Third Year Campaign

1-3-1 Exploration Work

Drilling survey was carried out in six target areas of Ahu i Vetem, Lugu i Batres, Buzgare, Pishkash-5, Bregu i Pishes and Hija e Zeze. The number of drill holes is 15 and the total length of holes is 1,405m. The location of the target areas is shown in Figure 1-1-1 and the geology of the entire Project Area is illustrated in Figure 1-1-2. The field operation of the Third Year comprises drilling work, the amount of which is tabulated in Table 1-1-1.

1-3-2 Objective of the Survey

The objective of drilling survey is to explore the strike-extension or the dip-extension of the known chrome ores and indications.

1-3-3 Members of the Survey Team

The members engaged in the Third Year Campaign are as follows.

(1) Japanese Side

Mr. Takumi ONUMA	(Sumiko Consultants Co., Ltd.; Geologist)
Mr. Norihiro NAGANO	(Sumiko Consultants Co., Ltd.; Geologist)
Mr. Atsushi NINOMIYA	(Sumiko Consultants Co., Ltd.; Geologist)

(2) Albanian Side

Dr. Prof. Mehmet ZACAJ	(Albanian Geological Survey; General Director)

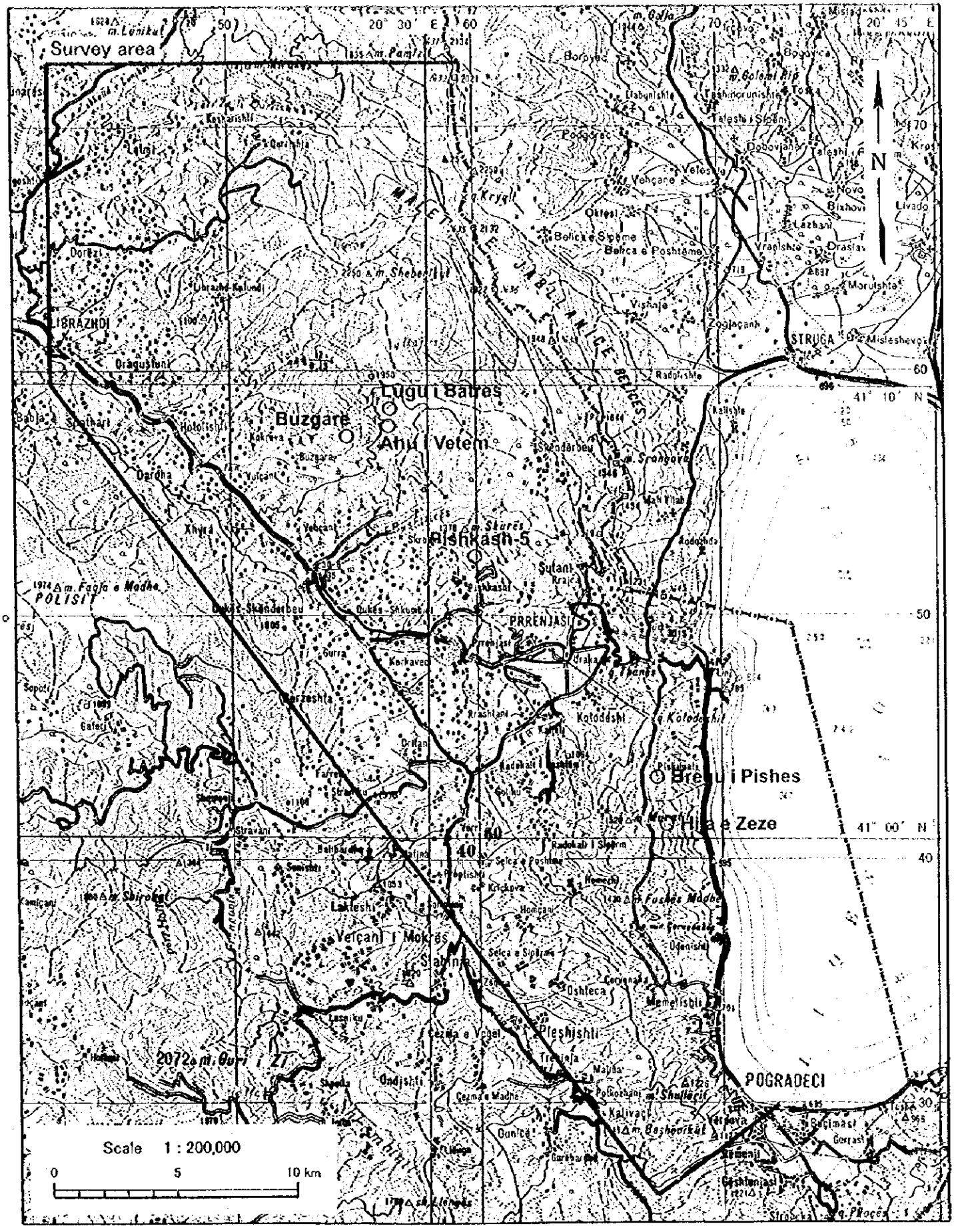


Figure 1-1-1 Location map of the survey area

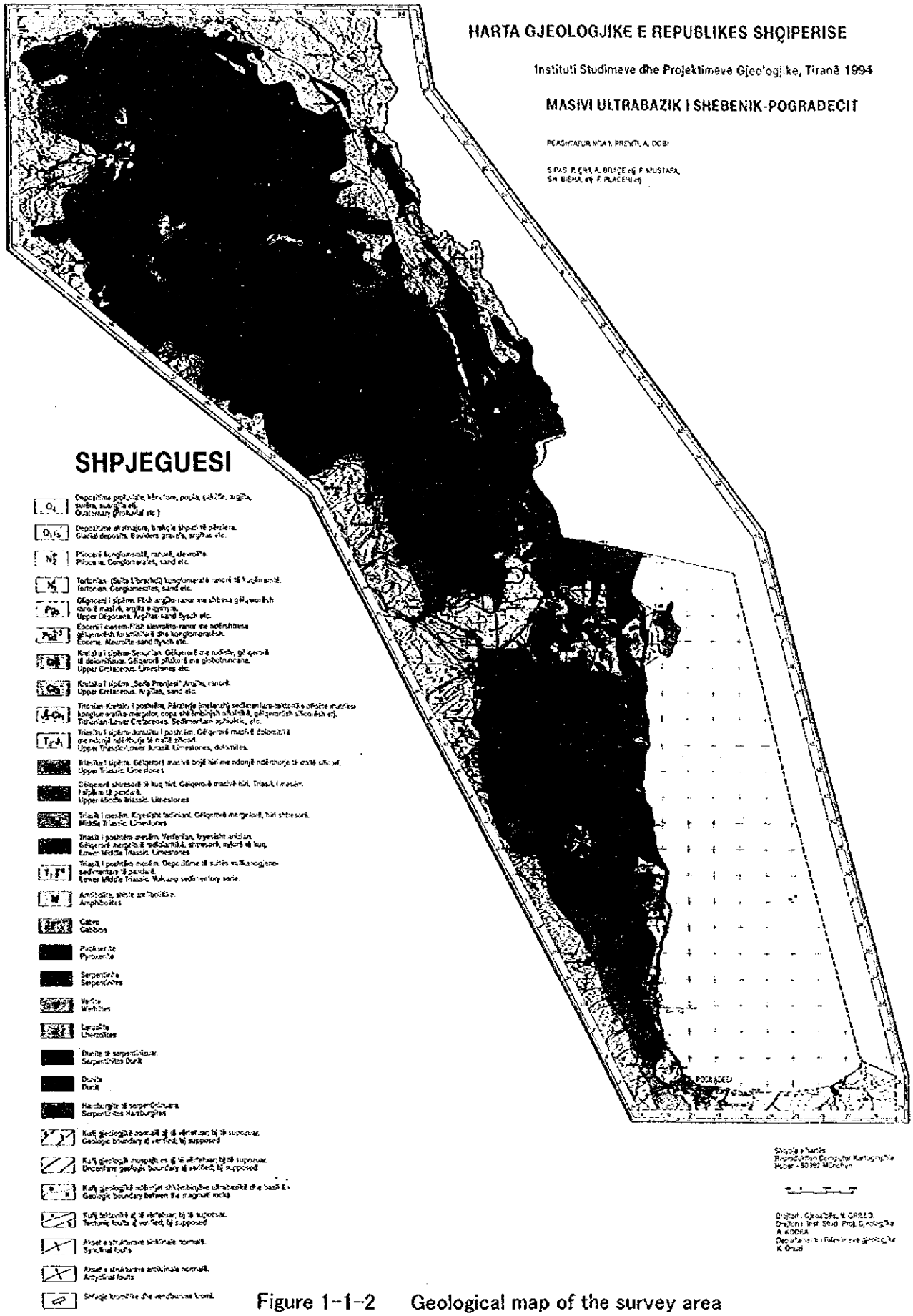
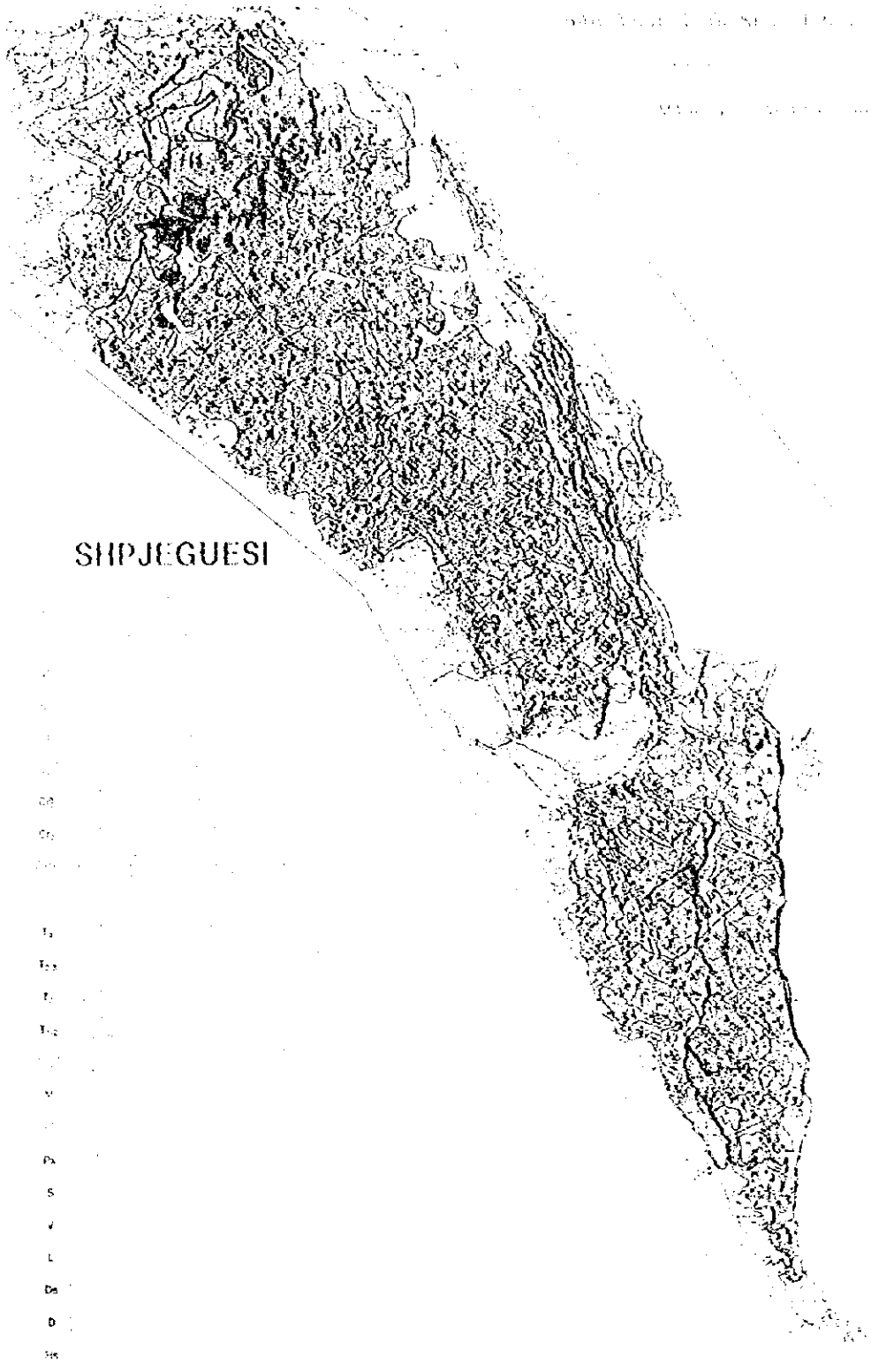


Figure 1-1-2 Geological map of the survey area


SHPJEGUESI

Dr. Prof. Irakli PREMTI (Albanian Geological Survey; Vice Director)
Dr. Kristaq DHIMA (Institute of Geological Research; Geologist)
Mr. Kujtim KOCI (Institute of Geological Research; Geologist)
Mr. Lufti MUSTAFA (Albanian Geological Survey)
Mr. Murat LEKA (Albanian Geological Survey)

(3) Technical Supervision and Instruction

Mr. Takashi KAMIKI (Metal Mining Agency of Japan)
Mr. Takeshi HARADA (Metal Mining Agency of Japan)
Mr. Taro KAMIYA (Metal Mining Agency of Japan)

Table 1-1-1 Amount of drilling exploration

Area	Drill hole	Length	Dip	Direction
Ahu i Vetem	MJAS-23	140m	-71°	S78° W
	MJAS-24	130m	-73°	N78° E
	MJAS-25	130m	-61°	N78° E
	MJAS-26	130m	-59°	N78° E
	MJAS-27	150m	-74°	N78° E
Lugu i Batres	MJAS-28	60m	-40°	N16° E
	MJAS-29	70m	-50°	N16° E
Buzgare	MJAS-30	40m	-40°	N45° E
	MJAS-31	50m	-40°	N45° E
Pishkash-5	MJAS-32	125m	-60°	S80° W
	MJAS-33	110m	-68°	S80° W
Bregu i Pishes	MJAS-34	80m	-40°	S60° W
	MJAS-35	80m	-43°	S60° W
Hija e Zeze	MJAS-36	50m	-40°	S60° W
	MJAS-37	60m	-40°	S60° W
Total	15 holes	1,405m		

1-3-4 Duration of Field Operation

The field operation was carried out in two separate occasions during the Japanese fiscal year of 1998; the first operation in the period from 24th of August to 23rd of September, 1998 and the second operation in the period between 6th and 20th of March, 1999. The laboratory tests and report preparation were made in the periods between the two operations and from 21st to 26th of March, 1999.

Chapter 2 Geography of the Project Area

2-1 Location (ref. Figure 1-1-1)

The Shebenik Area is located in the mountainous region in the southeastern part of the Republic of Albania, bounded to the east by the international border with Macedonia and by the coast of Ohrit Lake. In the Area, high mountains, such as Mt. Shebenik with its peak elevation of 2262m, are aligned in the direction of NNW-SSE and are called Shebenik Mountain Range as a whole. The Mountain Range is separated into the Shebenik Mountains in the northern half and the Pogradec Mountains in the southern half. The cities of Librazhd at the northern end and Pogradec at the southern end of the Area are the centers of transportation, communication and industry in the general region.

The six target areas, where the drilling work was carried out, are Lugu i Batres, Ahu i Vetem, Buzgare, Pshkash-5, Bregu i Pishes and Hija e Zeze, from north to south, of which the former four are located in the Shebenik Mountains and the latter two in the Pogradec Mountains.

The Lugu i Batres is situated at an elevation of about 1780m near the center of the of the Shebenik Mountains, in the lineal distances of approximately 33km and 14 km to the north northwest of Pogradec City and to the east of Librazhd City respectively. The Ahu i Vetem, at an elevation of about 1700m, and the Buzgare, at an elevation of about 1190m, are located 0.6km to the south of and 2.1km to the southwest of Lugu i Batres respectively. The district including these three areas is named the Central Shebenik in this report.

The Pishkash-5 is situated at an elevation of about 1200m in the southern part of the Shebenik Mountains, approximately 25km to the north northwest of Pogradec City, and belongs to the Southern Shebenik District.

The Bregu i Pishes is situated at an elevation of about 1140m on the eastern slope of the northern part of the Pogradec Mountains facing Ohrit Lake, approximately 14km north northwest of Pogradec City. The Hija e Zeze is at an elevation of 1180m, approximately 2km south of the Bregu i Pishes. The district including these two areas is called the Northern Pogradec in this report.

The Pogradec City, at an elevation of 700m beside the southern coast of Ohrit Lake, is a small town with a population of about 10,000 and a popular summer resort crowded with a large number of tourists to enjoy swimming in the lake. The domestic telecommunication is generally poor in Albania, which leads to mobile phones coming into wide use. It is possible to make domestic and international phone calls using mobile phones from Pogradec via stations located in Macedonia. Since an international

trunk call circuit was installed in 1999, it is now possible to make an international call from Pogradec using an ordinary phone. A number of private-owned accommodations are available in Pogradec, but all of them are very small. The large hotel, formerly owned by the Government, were destroyed on the occasion of the riot in 1997, and is not in operation at the present time.

2-2 Access

Pogradec, one of the major cities in the Shebenik Area, is located in the direct distance of approximately 80km to the southeast of Tirana, the Capital of Albania and can be reached by a paved national trunk road. The national road runs through the major industrial cities of Elbasan, Librazhd and Perrenjas, and leads to the international borders to Macedonia and Greece. It takes 3 to 4 hours to drive from Tirana to Pogradec.

The Central and Southern Shebenik Districts are situated in mountainous areas with elevations ranging between 1000 and 2000m, and are accessible from the above mentioned national trunk road using forestry paths passable only by 4-wheel drives. One of the forestry paths, starting from the village of Xhyra (at an elevation of 370m) on the national trunk road, leads to the vicinity of Ahu i Vetem (at an elevation of 1700m) and Lugu i Batres (at an elevation of 1780m), via a water reservoir (at an elevation of 1190m) where a forestry path leading to Buzgare (at an elevation of 1190m) branches off. These paths were poorly maintained with road surfaces and side-slopes being washed away or collapsed at a number of localities. The sections, introducing to the path from the national trunk road, between Ahu i Vetem and Lugu i Batres and of the last several hundreds meters to Buzgare, were impassable at the time of commencement of the Third Year Campaign. Accordingly, it was required to repair the entire sections of the paths and to construct access trails to drilling sites. In spite of the repair and construction, it often became very difficult to drive through these paths and trails under wet weather. The driving to Lugu i Batres and Buzgare requires about 2hours and 1.5hours respectively from the entrance village of Xhyra. Meanwhile, it takes approximately 1.5hours to drive from Pogradec to Xhyra along the national road.

A mine access road is available to the vicinity of the Pishkash-5 exploration site and is passed by lorries. Construction of an access trail to drilling sites for the last several hundred meter section were required. It takes approximately 1hour from Pogradec to the entrance of the mine access road (at an elevation of 500m) and then further half an hour to Pishkash-5 (at an elevation of 1200m).

An unpaved road runs through the Pogradec Mountains parallel to the national

road along the shore of Ohrit Lake, from Qafe Thane where the national road crossing the range, to Memelishti to the north of Pogradec. Existing paths off this road were repaired as access to Bregu i Pishes and Hija e Zeze and further access trails to drilling sites were newly constructed. It takes about 1 hour to drive from Pogradec to Bregu i Pishes or Hija e Zeze via Qafe Thane.

2-3 Geology

The Shebenik-Pogradec Ultrabasic Massif in the survey area is composed of ultrabasic rocks such as harzburgite, dunite, pyroxinite and so on. Almost of them are serpentinized. The general structure of ultrabasic rocks has the direction from NW-SE to NNW-SSE.

Chromium ore deposit as exploration target is a podiform type deposit whose mother rock is harzburgite. Chromitite, in which chromian spinel highly concentrate, shows many occurrences such as massive, nodular, banded, disseminated and etc. Chromitite is always enclosed in dunite and its structure is concordant with the structure of the ultrabasic rock.

Chapter 3 Conclusion and Recommendation

3-1 Conclusion

3-1-1 Result of Drilling Exploration

(1) Ahu i Vetem

There are two ore bodies, the shallow and the deep ore bodies, in this target area. The drilling exploration was carried out in order to investigate the northern extensions of both ore bodies and comprised a total of 5 holes (MJAS-23 through MJAS-27). All the drill holes intersected the deep ore body, while only two holes (MJAS-25 and MJAS-26) encountered the shallow ore body.

The deep ore body is rather thick within a very thick dunite envelope and consists of disseminated or banded chromitite ores with relatively low Cr_2O_3 grade. The shallow ore body is thin within a thin dunite envelope and consists mainly of massive chromitite ores with high Cr_2O_3 grade. The configurations of both ore bodies are conformable with the layering structures of their host ultrabasic rocks, which are oblique to each other trending in the NNE-SSW direction in the vicinity of the deep ore body and in the NW-SE direction in the vicinity of the shallow ore body. The latter trend is harmonious with the regional structure of the Shebenik ultrabasic massif.

The deep ore body is estimated to have a size of more than 200m in length and more than 70m in width with the average thickness of 2m and the average grade of 20% Cr_2O_3. It may be expected that the ore body continues laterally further to the north-northeast and also to the down-dip, because all the five holes have intersected chromitite with thickness exceeding 2m. Although the ore grade is generally low, this ore body will be a significant target for the future exploration because it has a sizable dimension and contains high grade portions partly.

The shallow ore body is estimated to have a size of more than 80m in length and more than 30m in width with the average thickness of 0.8m and the average grade of 40% Cr_2O_3. The lateral and down-dip continuity of this ore body may be doubtful, because only two holes have intersected a part of the down-dip extension in the north-northeastern part. However, the strike extension to the north-northwest has been unexplored and remains as a future exploration target.

(2) Lugu i Batres

The two holes, MJAS-28 and MJAS-29, were drilled to explore the down-dip extension of the known ore body in its central to western part. Although MJAS-28 intersected massive chromitite ores for a core length of 0.3m with Cr_2O_3 grade of 39.75%, MJAS-29 failed to intersect any chromitite.

The ore body strikes in the E-W to WNW-ESE direction with steep to moderate dip to the south and plunges to the WNW direction. The size of the ore body is rather small and estimated at about 80m in length and more than 20m in width with thickness ranging between 0.1 and 2m and with the average grade of about 40% Cr_2O_3.

No exploration result to date indicates the eastern and down-dip extensions of this ore body. In addition, MJAS-29 has not intersected any chromitite at the depth in the westernmost part. Accordingly, it is considered that the size of the ore body will be limited.

(3) Buzgare

The two holes, MJAS-30 and MJAS-31, were drilled to identify the down-dip and northwestern extensions of the known ore body, and both failed to intersect any chromitite.

The ore body may have been offset for a considerable distance at depth by a fault which dips with a gentle angle and has a thick crushed zone. Judging from the ragged topography in this area, it appears impractical to carry out drilling exploration looking for the offset part of the ore body.

(4) Pishkash-5

The two holes, MJAS-32 and MJAS-33, were drilled to identify the northern extension of the known ore body, and both failed to intersect any chromitite.

The ore body, striking in the NNW-SSE direction, must have been dislocated for a distance of several tens of meters by a fault running parallel to its strike. A number of drill holes have been put down in this target area and have failed to identify the offset portion of the ore body, which suggests that the dislocation may be considerably great beyond estimation.

(5) Bregu i Pishes

The two holes, MJAS-34 and MJAS-35, were drilled to explore the northwestern extension of the known ore body, and both failed to intersect any chromitite.

It is estimated that a number of faulted segments of the ore body are arranged an echelon westwards according to the exploration result to date. The reason why the two holes failed to intersect the ore body may be that one or more faults have dislocated the ore body for a great distance beyond estimation or that the extension of the ore body is limited. Follow-up exploration may be recommended to the west and at the depth of the two holes.

(6) Hija e Zeze

The two holes, MJAS-36 and MJAS-37, were drilled to explore the north northwestern extension of the known ore body identified by the past exploration, and both intersected chromitite comprising massive ores with thickness of 1.1m and Cr_2O_3

grade of 36.41% in the former hole and with thickness of 0.2m and Cr_2O_3 grade of 41.62% in the latter.

The ore body, as a whole, has an average thickness of 1m for a dimension of more than 100m in strike length and 20m in down-dip length with an average grade of 42% Cr_2O_3.

The drilling exploration of the current program is the first instance carried out for this target ore body and has successfully confirmed its continuations, which is still open to the north-northwest, being step-faulted by a number of cross-cutting faults. The target for the follow-up exploration will be the down-dip and north-northwestern extension of the mineralization identified by the two drill holes put down in the current program.

3-1-2 EPMA Analysis

An EPMA analysis was made for chromian spinel contained in the drill core samples systematically collected from MJAS-26 in Ahu i Vetem and from MJAS-36 in Hija e Zeze. The former drill hole intersected a sizable ore body with a relatively low Cr_2O_3 grade, and the latter, a relatively small ore body with a high Cr_2O_3 grade. The two groups of the samples are different from each other in some of mineralization characteristics but have common features in EPMA anomaly in various indices according to the result of EPMA analysis. Dunite containing chromitite has some kinds of EPMA anomalies and another dunite and hartzburgite have a few EPMA anomalies.

Hereinafter, Cr # =Cr/(Cr+Al), Mg # =Mg/(Mg+Fe^{2+}), and Fe^{3+} # =Fe^{3+}/(Cr+Al+Fe^{3+}). EPMA anomaly in this project is defined as follows; Cr # indicates from 0.4 to 0.6, TiO_2 wt% is not less than 0.05, and Fe^{3+}# is not less than 0.015 in harzburgite; Fe^{3+}# in dunite is not less than 0.030; Cr # is not less than 0.7 and V_2O_3 wt% is not more than 0.2 in dunite and harzburgite.

The V_2O_3 wt% of chromian spinel in dunite close to chromitite is apparently lower than that in dunite apart from chromitite, being nearly equal to that in chromitite. The low Vanadium dunite shows EPMA anomaly in V_2O_3−Cr # and is higher in TiO_2 wt% and lower in Mg # than the high Vanadium dunite.

Almost all harzburgite samples indicate EPMA anomaly in Fe^{3+} # but tend to decrease the value of Fe^{3+} # (or become less anomalous) with increasing distance from chromitite. No harzburgite sample indicates EPMA anomaly in Cr # with the value less than 0.6.

In general, the chemical composition of chromian spinel in chromitite is similar to that in the dunite close to the chromitite, which may suggest that the chromitite and the dunite have formed coevally under the same physico-chemical conditions. In some

cases, however, chromian spinel contained in a single dunite envelope indicates different chemical compositions in accordance with distance from chromitite.

The result of the EPMA analysis for the drill core samples in the current Project has identified that chromium mineralization is associated with the dunite containing chromian spinel with V_2O_3 wt % lower than 0.150, and with harzburgite containing chromian spinel with the value of Fe^{3+} # higher than 0.020. Therefore, the chemical composition of chromian spinel contained will be effective to assess ultrabasics with respect to their potential for chromium mineralization.

The Cr # of chromian spinel in harzburgite indicates from 0.60 to 0.40 near the large scale chrome ore deposit of podiform type. The Cr # of chromian spinel in harzburgite in MJAS-26 and MJAS-36 is generally high and ranges from 0.66 to 0.79. Therefore, in both target areas of Ahu i Vetem and Hija e Zeze the possibility to locate large scale ore deposit comparable to those of the Bulqiza Mines appears to be rather limited based on the result of the EPMA analysis to date.

3-1-3 Consideration

EPMA anomalies of V_2O_3 − Cr # and Fe^{3+} # remarkably observed indicate the existence of the interactive reaction between melt and wall rock (harzburgite) which is an important phenomenon on the forming process of the podiform type chrome deposit. Especially in Ahu i Vetem near MJAS-26, the massive dunite suite is widely distributed and the dunite confirmed by drilling survey is thick and large, therefore the potentiality of chrome ore deposit in this target area is estimated to be high. The possibility, however, to occur the large scale ore deposit is low in this target area, because the large ore deposit accompanied by high Cr # harzburgite as existing in the area is rare.

3-2 Recommendations for Future

As the result of the Third Year Campaign of the Project, the following recommendations will be made for exploration targets to be followed up in a subsequent stage;

1) Drilling Exploration in Hija e Zeze

- Down-dip Continuation of the Ore Body identified by the Holes, MJAS-36 and MJAS-37
- The Northern Strike-extension of the Same Ore Body

2) Drilling Exploration in Ahu i Vetem

- North Northeastern Extension of the Deep Ore Body (further to the north and the northeast of the hole, MJAS-27)
- Northwestern Extension of the Shallow Ore Body (further to the west and the northwest of the hole, MJAS-27)

3) Drilling Exploration in Bregu i Pishes

- Lower Section of the Part explored by the Holes, MJAS-34 and MJAS-35
- Western Side of the Part explored by the Holes, MJAS-34 and MJAS-35

PART II

PART II DETAILED REPORT

Chapter 1 Contents of Drilling Exploration

1-1 Summary of Drilling Work

A total of 15 holes, MJAS-23 through MJAS-37, with a total length of 1,405m, were drilled in the 6 target areas during the Third Year Campaign, as shown in Figure 2-1-1 through Figure 2-1-3 and in Table 2-1-1. The 3 target areas, namely Ahu i Vetem, Lugu i Batres and Buzgare, are located in the central part of the Shebenik Ultrabasic Massif and Pishkash-5, in its southern part. The remaining 2 target areas, Bregu i Pishes and Hija e Zeze, are located in the northern part of the Pogradec Ultrabasic Massif.

The drilling work was carried out from the early October to the beginning of December.

The drilling aimed at exploring strike and down-dip extensions of known chromium ore bodies and surface indications. The result is summarized in Table 2-1-1. Eight holes drilled in Ahu i Vetem, Lugu i Batres and Hija e Zeze intersected chromitite. No chromitite was encountered in holes drilled in Buzgare, Pishkash-5 and Bregu i Pishes.

Core samples from each drill holes were submitted to laboratory tests such as microscopic observation, chemical analysis for Cr_2O_3 and EPMA analysis.

1-2 Drilling Operation

The progress of drilling work is shown in Table 2-1-2 and its performance, in Table 2-1-3.

(1) Progress of Drilling Operation

The Japanese Survey Team was dispatched to the exploration site in the period between August 24th and September 23rd, 1998, for the first half of field work in the Third Year Campaign. During this period, surveying of drilling sites and hole collars, as well as geological verification of drilling sites were carried out. It had been intended to commence drilling work within this period. However, the commencement was postponed till October 15th,1998, due to delay in site/access preparation and access path repair and also the riot having occurred in the Capital City, Tirana on September 12th, 1998.

The mobilization of drilling equipment was often suspended due to extremely

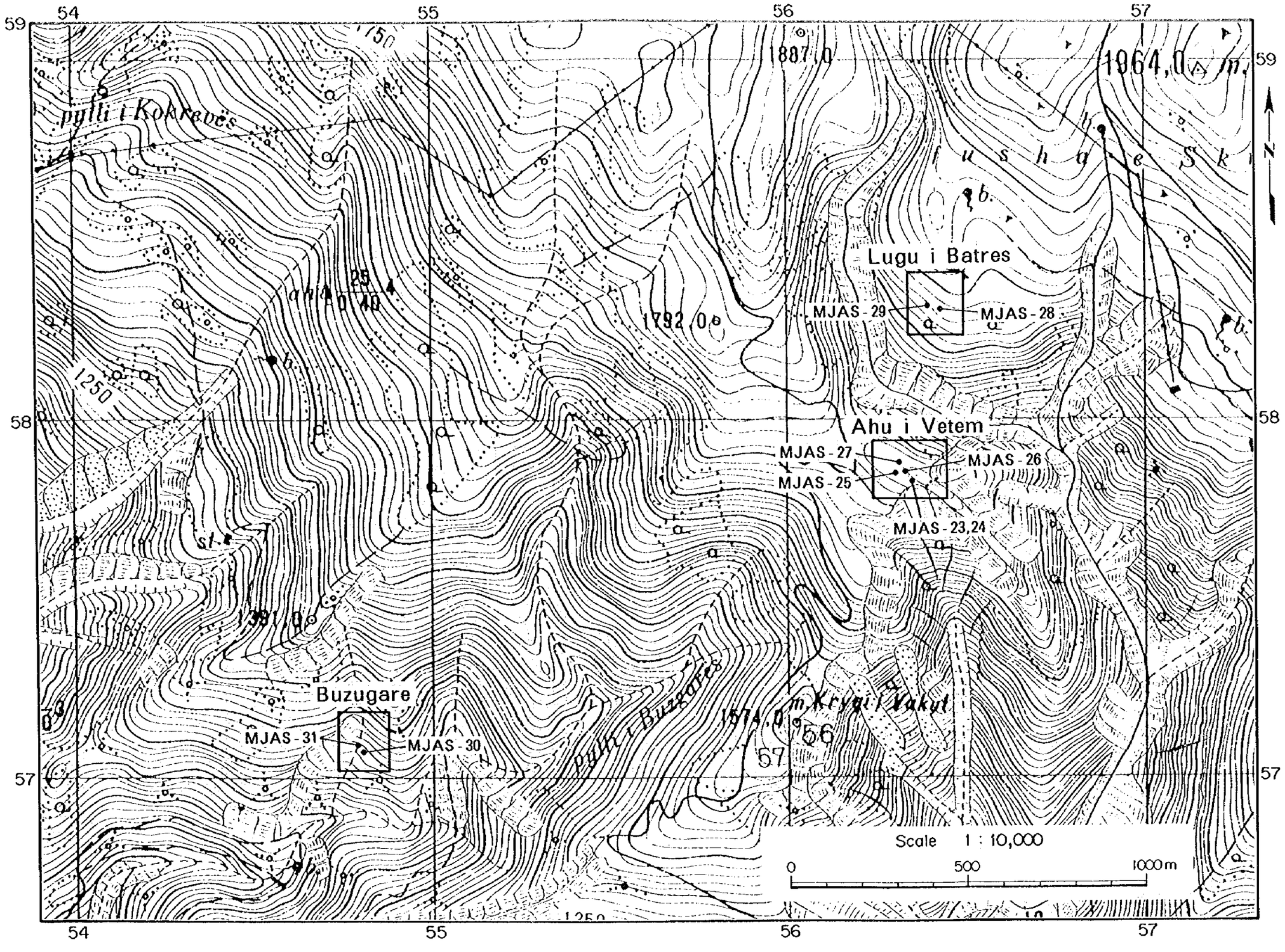


Figure 2-1-1 Location map of drilling survey in Central Shebenik District

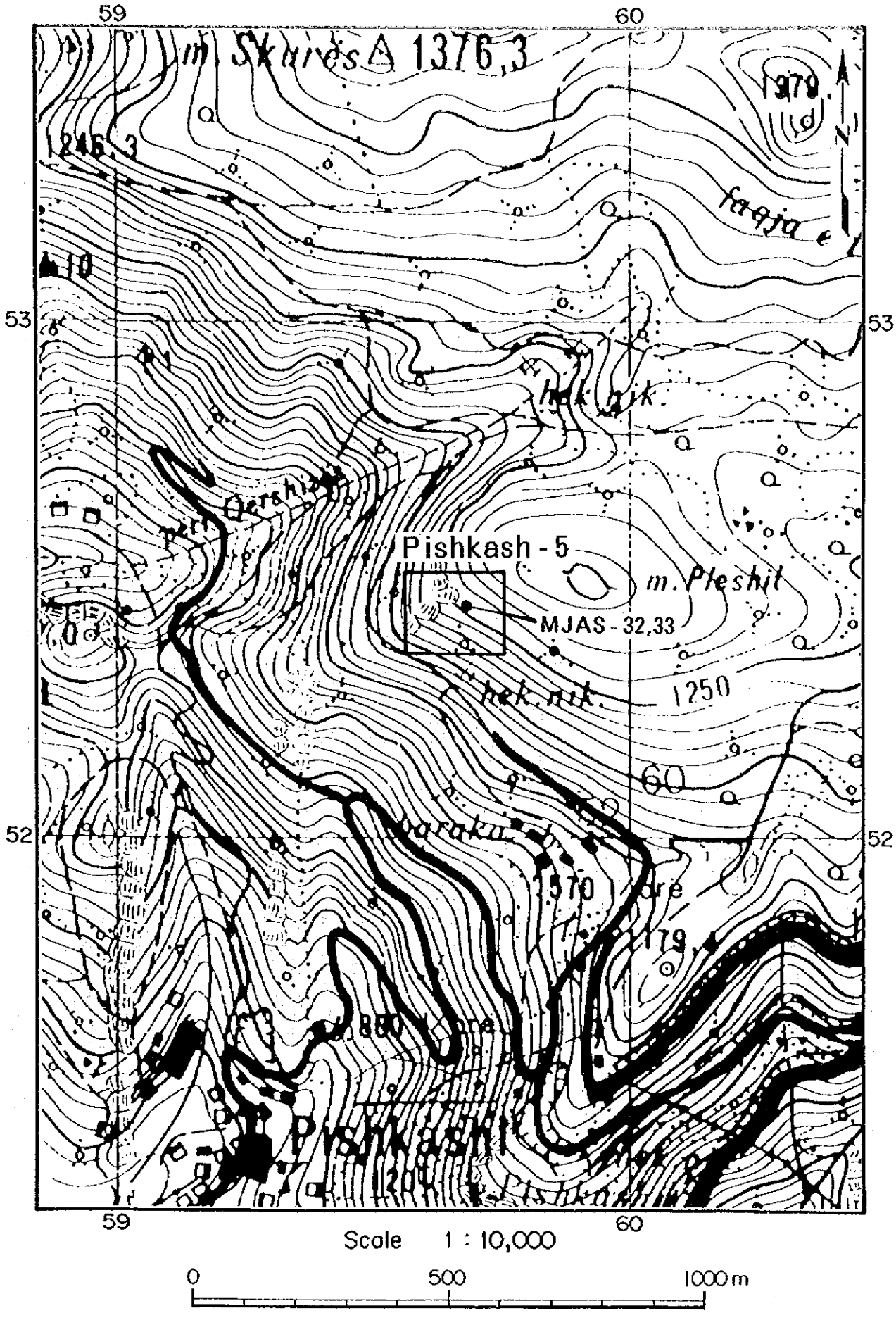


Figure 2-1-2 Location map of drilling survey in Southern Shebenik District

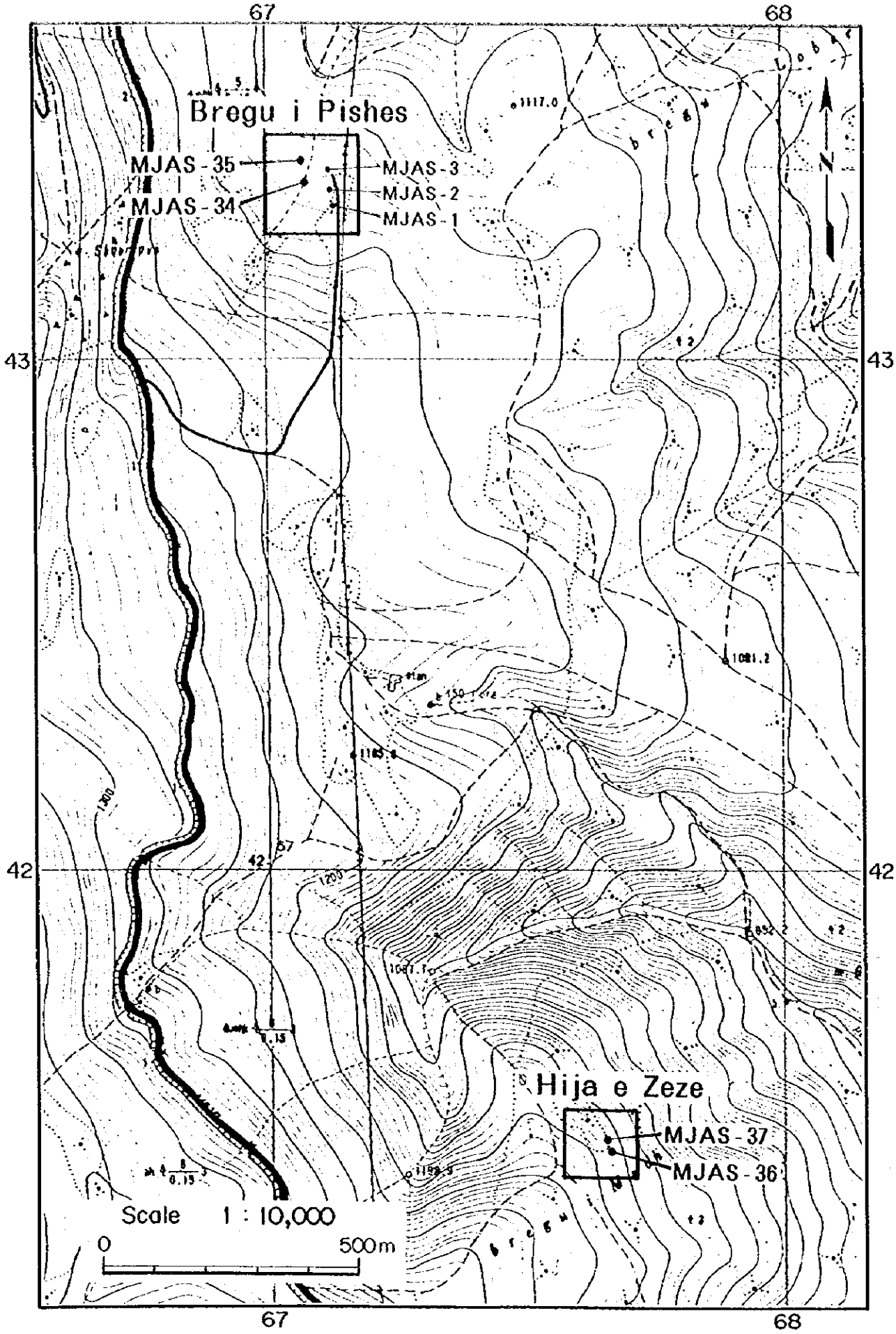


Figure 2-1-3 Location map of drilling survey in Northern Pogradec District

Table 2-1-1 Results of drilling exploration

Area	Drilling hole No.	Coordinates X	Coordinates Y	Elevation (m)	Depth (m)	Inclination	Direction	Depth of chromitite Top (m)	Depth of chromitite Bottom (m)	Thickness (m)	Ore type	Cr_2O_3 (%)	Core recovery (%)
Ahu i Vetem	MJAS-23	57,824.16	56,350.25	1,717.15	140	-71°	S78° W	119.30	122.05	2.75	disseminated ~banded	26.10	96.8
	MJAS-24	57,824.16	56,350.25	1,717.15	130	-73°	N78° E	100.20	102.95	2.75	disseminated ~banded	15.39	97.7
	MJAS-25	57,847.17	56,306.94	1,718.25	130	-61°	N78° E	4.90	4.91	0.01	banded	—	98.5
								113.90	115.65	1.75	disseminated ~banded	18.40	
	MJAS-26	57,853.11	56,327.78	1,711.85	130	-59°	N78° E	10.85	10.90	0.05	massive	35.41	97.7
								113.90	118.50	4.60	disseminated ~banded	17.42	
	MJAS-27	57,878.45	56,314.37	1,718.51	150	-74°	N78° E	116.85	118.83	1.98	disseminated ~banded	21.51	96.7
Lugu i Batres	MJAS-28	58,292.63	56,435.11	1,781.57	60	-40°	N16° E	9.50	9.80	0.30	massive	39.75	96.7
	MJAS-29	58,301.84	56,395.93	1,776.68	70	-50°	N16° E			—		—	95.0
Buzgare	MJAS-30	57,074.24	54,799.44	1,190.30	40	-40°	N45° E			—		—	97.5
	MJAS-31	57,093.04	54,788.73	1,187.21	50	-40°	N45° E			—		—	92.0
Pishkash-5	MJAS-32	52,446.34	59,680.67	1,243.50	125	-60°	S80° W			—		—	97.6
	MJAS-33	52,446.34	59,680.67	1,243.50	110	-68°	S80° W			—		—	99.0
Bregu i Pishes	MJAS-34	43,344.10	67,079.83	1,139.25	80	-40°	S60° W			—		—	84.1
	MJAS-35	43,386.83	67,070.70	1,137.72	80	-43°	S60° W			—		—	71.1
Hija e Zeze	MJAS-36	41,451.43	67,663.52	1,182.94	50	-40°	S60° W	43.00	44.10	1.10	massive	36.41	95.3
	MJAS-37	41,474.24	67,651.39	1,185.64	60	-40°	S60° W	41.50	41.70	0.20	massive	41.62	92.0

Table 2-1-2 Schedule of drilling works .

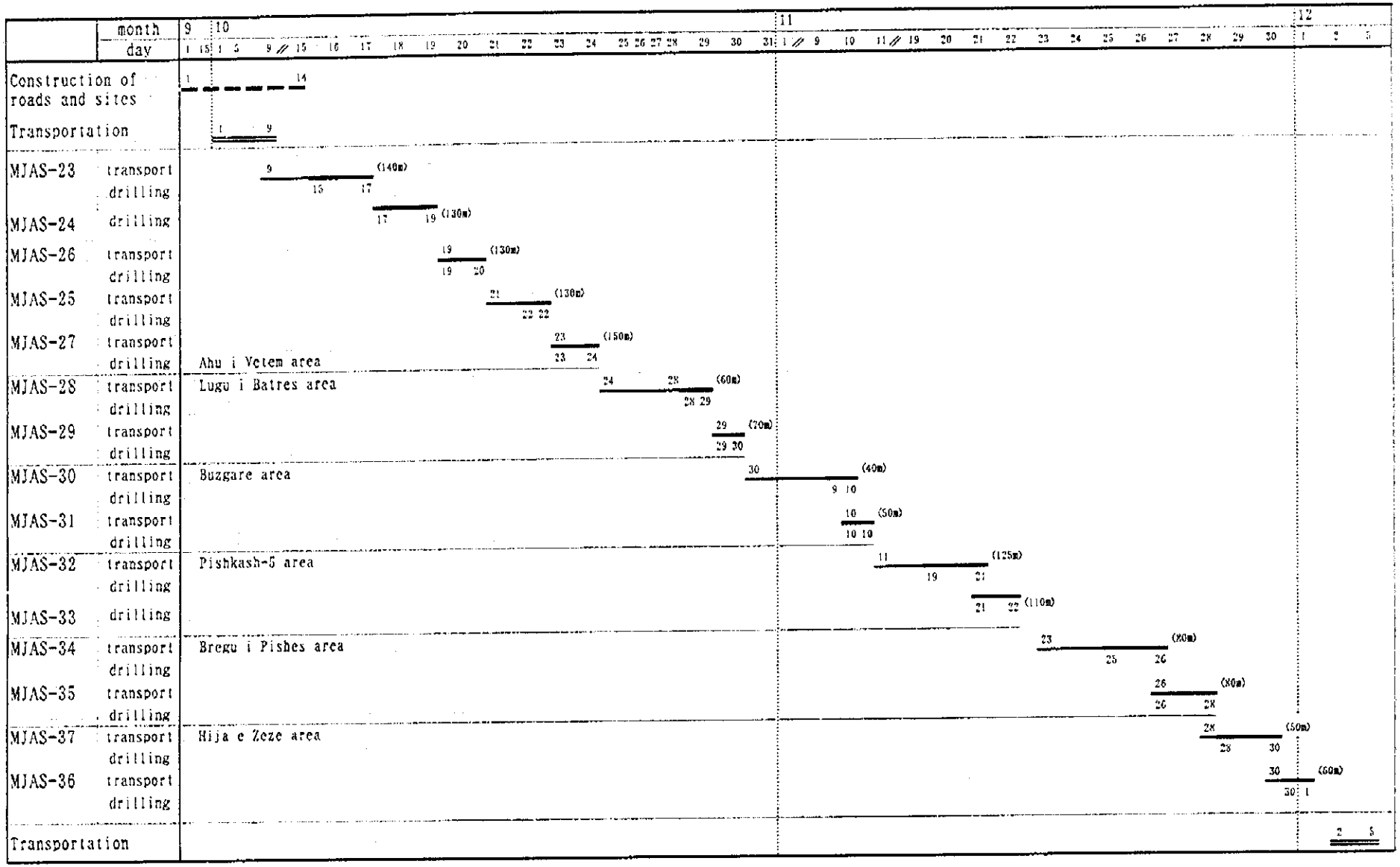


Table 2-1-3 Contents of drilling works

No. of hole		MJAS-23	MJAS-24	MJAS-25	MJAS-26	MJAS-27	MJAS-28	MJAS-29	MJAS-30	MJAS-31	MJAS-32	MJAS-33	MJAS-34	MJAS-35	MJAS-36	MJAS-37	Total
Depth	m	140	130	130	130	150	60	70	40	50	125	110	80	80	50	60	1,405
Core length	m	135.5	127.0	127.0	128.0	145.0	58.0	66.5	39.0	46.0	122.0	109.0	67.3	57.2	46.0	57.2	1,330.7
Core recovery	%	96.8	97.7	97.7	98.5	96.7	96.7	95.0	97.5	92.0	97.6	99.1	84.1	71.5	92.0	95.3	94.7
Diameter		NQ	NQ	HQ+NQ	HQ+NQ	HQ+NQ	HQ+NQ	HQ+NQ	HQ+NQ	HQ+NQ	NQ	HQ+NQ	NQ	NQ	NQ	NQ	
Date of start		15-Oct	17-Oct	22-Oct	19-Oct	23-Oct	28-Oct	29-Oct	9-Nov	10-Nov	19-Nov	21-Nov	25-Nov	26-Nov	30-Nov	28-Nov	
Date of finish		17-Oct	19-Oct	22-Oct	20-Oct	24-Oct	29-Oct	30-Oct	10-Nov	10-Nov	21-Nov	22-Nov	26-Nov	28-Nov	1-Dec	30-Nov	
Total work	day	8.5	2.0	2.0	1.5	1.5	5.0	1.0	10.5	1.0	10.0	1.5	4.0	1.8	2.0	1.2	53.5
Transportion	day	3.5	0.0	1.0	0.2	0.2	2.5	0.2	2.5	0.2	3.5	0.2	1.0	0.2	0.2	0.2	15.6
Operation	day	2.0	2.0	1.0	1.3	1.3	1.0	0.8	1.0	0.8	2.0	1.3	2.0	1.6	1.8	1.0	20.9
Others	day	3.0	0.0	0.0	0.0	0.0	1.5	0.0	7.0	0.0	4.5	0.0	1.0	0.0	0.0	0.0	17.0
Drilling rate	m/day	70.0	65.0	130.0	100.0	115.4	60.0	87.5	40.0	62.5	62.5	84.6	40.0	50.0	27.8	60.0	67.2

Table 2-1-4 Consumable materials used for the drilling survey

No. of hole		MJAS-23	MJAS-24	MJAS-25	MJAS-26	MJAS-27	MJAS-28	MJAS-29	MJAS-30	MJAS-31	MJAS-32	MJAS-33	MJAS-34	MJAS-35	MJAS-36	MJAS-37	Total
NQ D-bit	pcs.	1	1	2	2	2	1	1	0	1	1	2	1	1	0	1	17
NQ D-reamer	pcs.	1	0	1	1	1	1	1	1	0	0	1	0	1	0	1	10
core lifter	pcs.			2				2			1				1		6
core box	pcs.	38	31	33	32	38	15	17	10	12	28	27	14	11	10	12	328
diesel	l	200	160	160	200	160	100	90	30	40	190	140	70	160	80	60	1,540
motor oil	l				20			20			20				10		70
poly drill	l	80	80	80	80	40	60	20	20	20	140	40	100	100	40	20	920
grease	kg	10	10		10			10			20			20			80

difficult road conditions caused by frequent rainfalls, waiting for weather recovery and road repairing. In addition, unusual snowfalls in mid-November onward often required snow-removal, which made equipment mobilization further difficult. In spite of the adverse weather conditions as above, the drilling operation progressed satisfactorily and, as a result, completed the entire work in the early part of December. The site-supervision of the drilling work was done by the Albanian Counterpart.

It had been intended to dispatch the Japanese Survey Team for drill core observation and sampling immediately after the completion of the drilling operation. However, the Ministry of Foreign Affairs of Japan identified Albania as 'the country restricted for traveling' after the above mentioned riot, which made it impossible to send the Survey Team to Albania. Upon the restriction having been eased, the Survey Team was dispatched to Albania for implementing the later half of field work in the Third Year Campaign in the period between March 6th and 20th, 1999. During the period, the drill core observation and sampling were completed and the progress of the Project was reported to the Albanian Counterpart.

(2) Drilling Work and Team

The drilling work was contracted to ITNPM (Mining & Processing Technology Institute), an Albanian drilling contractor.

Only one drill rig was employed and operated on an 2-shift for 24 hours a day basis. The drilling team comprised two drilling engineers and two assistants. Several laborers were employed as necessary.

(3) Preparation and Maintenance of Drilling Sites and Access Roads

Prior to commencement of the drilling work, preparation of drilling sites and construction, repair and maintenance of access roads were carried out by Gjeoalba to whom the entire construction work was contracted. The procedure of the construction work was as follows;

- repairing the existing roads to Ahu i Vetem from the national road,
- preparing the drilling sites in Ahu i Vetem and constructing access roads to these drilling sites,
- repairing the existing roads to Lugu i Batres from Ahu i Vetem,
- preparing the drilling sites in Lugu I Batres and constructing access roads to these drilling sites,
- repairing the existing roads to Buzgare, branching off from the road to Ahu i Vetem,
- preparing the drilling sites in Buzgare and constructing access roads to these

drilling sites,

- repairing the existing roads to Pishkash-5 from the national road,
- preparing the drilling sites in Pishkash-5 and constructing access roads to these drilling sites,
- repairing the existing roads to Bregu i Pishes and Hija e Zeze from the national road,
- preparing the drilling sites in Bregu i Pishes and constructing access roads to these drilling sites and
- preparing the drilling sites in Hija e Zeze and constructing access roads to these drilling sites.

The existing roads from the national road to Ahu i Vetem, Lugu i Batres and Buzgare were in extremely poor conditions and were easily damaged by heavy rainfalls to the extent that they became impassable even by 4-wheel drives. These roads required occasional repair and maintenance due to frequent rainfalls since late September after the completion of drill-site preparation for Ahu i Vetem. In addition, unusually heavy snowfalls started in mid-November when the drilling operation was in progress in Pishkash-5 and required snow removals for demobilization of the Pishkash-5 operation and for mobilization and demobilization of the Hija e Zeze operation. Repairing work was also required for some drilling sites and access roads where surface soils and gravel were washed away due to heavy rain.

Two bulldozers were employed for construction, repair and maintenance work of roads and for drill-site preparation. Blasting work was required for preparation of some drill-sites, being located directly on rock outcrops, in Pishkash-5 and Hija e Zeze.

(4) Drill Rig, Spare Parts, Consumables and Drill-water Supply

The drill rig, accessories and vehicles used for the drilling work are as follows;

- Drill Rig and Accessories: JKS Boyles 37A Drill (Canada made, 100H.P., 1set)
  BP25 Triplex Hydraulic Pump (2sets)
  BP25 Triplex Diesel Pump (2sets)
- Vehicles for Equipment Transportation: DT75 Bulldozer (Albania made)
  Foreststreet Truck (China made)
  TETRA Truck (Czechoslovakia made)
  LIAZ Tractor
  (2 helicopters were used in some areas)
- Commuting Vehicle: Land Rover
  (Tractor was partly substituted when rainfalls)

Consumption statistics of consumables and drilling diamond bits are shown in

Table 2-1-4.

Drilling water was supplied from nearby rivers or streams for the Ahu i Vetem, Lugu i Batres, Buzgare and Pishkesh-5 operations. Drilling water for the Bregu i Pishes and Hija e Zeze operations was supplied from a pond located to the west across a ridge.

(5) Drilling Method

A wire-line drilling method was employed in order to recover as much as possible cores for the entire sections of drill holes. According to near-surface ground conditions, about a half number of the holes were drilled by HQ-coring for the several meter sections from collars and by NQ-coring for the deeper sections. Other holes were drilled all the way through by NQ-coring. The drilling performance of each hole is shown in Table2-1-3.

The core recovery of each hole was better than 90%, with most holes indicating those higher than 95%, except the holes drilled in Bregu i Pishes, which returned relatively low core recoveries due to highly crushed nature of ground by numerous faults and fractures.

(6) Drill Core Handling

Drill cores collected from each hole were installed in wooden core boxes and temporarily stored at drilling sites for photographing. The core boxes were then transported to the Gjeoalba's storage in Tirana.

In the later half of the Third Year Campaign, drill core observation and sampling were carried out in the storage. Core samples were then shipped to Japan for various laboratory tests. The drill cores, after the observation and sampling, are now kept in the storage.

Chapter 2 Results of Drilling Exploration

The geological plans, mineral occurrence maps and geological cross and longitudinal sections of the 6 target areas are shown in Figures 2-2-1 through 2-2-23. The columnar geological sections of the 15 drill holes are included in the Appendix 1 through 15. Chromitite intersections and their Cr_2O_3 grades are summarized in Table 2-2-1. The hole average grades, indicated in a left-side column in the Table, are estimated by averaging assay results (indicated in a center column) with weight of relevant assay run lengths. The result for each target area is described below.

2-1 Central Shebenik District

Three target areas, Ahu i Vetem, Lugu i Batres and Buzgare, are located in this District (Figure 2-1-1).

(1) Ahu i Vetem (Figures 2-2-1 through 2-2-3, Appendixes 1 through 5)

The drilling targets were the northern extensions of the shallow and deep ore bodies identified by surface outcrops and exploratory tunnels. The five holes, MJAS-23 through MJAS-27, were drilled.

The geology observed in each hole comprises dunite interlayered with harzburgite. A relatively thick dunite layer, ranging from about fifteen meters to several tens of meters in thickness, is intersected at the deep part and contain chromitite correlated deep ore body. In the shallower part, a dunite layer of several meters thick is intersected and contains thin chromitite correlated shallow ore body. In general, faults and fractured zones are highly developed in the deep part. The proportion of dunite to harzburgite is relatively large, including the thick dunite layer as above, in Ahu i Vetem in comparison with that in other target areas.

All the five holes encountered chromitite at the depths deeper than 100m from their collars. The ore body consists of disseminated and/or banded chromitite, which is similar in occurrence to the ore body identified by the exploratory tunnels. The ore body intersected by these drill holes can be correlated to the north northeastern extension of the deep ore body in the exploratory tunnels, judging from its mode of occurrence and the positions of intersections.

The intersections of dunite envelopes containing chromitite, and the Cr_2O_3 grade of chromitite are summarized as follows;

- MJAS-23: dunite from 118.3 to 131.0m (core length 12.7m)
  chromitite from 119.3 to 122.05m (core length 2.75m) with 26.10% Cr_2O_3
- MJAS-24: dunite from 59.3 to 118.4m (core length 59.1m)
  chromitite from 100.2 to 102.95m (core length 2.75m) with 15.39% Cr_2O_3

Table 2-2-1 Distribution and content of chromitite

Drilling hole No.	Depth	Type of ore	Thickness of chromitite	Cr_2O_3 (%)	Sample No.	Cr_2O_3 (%)	Depth of chromitite Top (m)	Depth of chromitite Bottom (m)	Thickness (m)	Core length (m)	Average Cr_2O_3 (%)
MJAS-23	140m	Disseminated ~banded	2.75m	26.10%	23-C-1	30.38	119.30	119.90	0.60	2.75	26.10
					23-C-2	16.07	119.90	120.55	0.65		
					23-C-3	24.10	120.55	121.60	1.05		
					23-C-4	39.53	121.60	122.05	0.45		
MJAS-24	130m	Disseminated ~banded	2.45m	15.39%	24-C-1	13.40	100.20	100.55	0.35	0.80	14.95
					24-C-2	16.16	100.55	101.00	0.45		
					24-C-3	16.66	101.30	101.85	0.55	1.65	15.61
					24-C-4	14.16	101.85	102.25	0.40		
					24-C-5	18.47	102.25	102.65	0.40		
					24-C-6	11.82	102.65	102.95	0.30		
MJAS-25	130m	Disseminated ~banded	1.60m	18.40%	25-C-1	8.64	113.90	114.20	0.30	1.10	19.39
					25-C-2	23.42	114.20	115.00	0.80		
					25-C-3	16.21	115.15	115.65	0.50	0.50	16.21
MJAS-26	130m	Massive	0.05m	35.41%	26-C-1	35.41	10.85	10.90	0.05	0.05	35.41
		Disseminated ~banded	4.60m	17.42%	26-C-2	18.78	113.90	114.80	0.90	4.60	17.42
					26-C-3	15.73	114.80	115.90	1.10		
					26-C-4	15.41	115.90	116.50	0.60		
					26-C-5	24.41	116.50	117.10	0.60		
					26-C-6	15.73	117.10	118.50	1.40		
MJAS-27	150m	Disseminated ~banded	1.98m	21.51%	27-C-1	24.01	116.85	117.65	0.80	1.98	21.51
					27-C-2	18.08	117.65	118.55	0.90		
					27-C-3	25.37	118.55	118.83	0.28		
MJAS-28	60m	Massive	0.30m	39.75%	28-C-1	39.75	9.50	9.80	0.30	0.30	39.75
MJAS-36	50m	Massive	1.10m	36.41%	36-C-1	26.94	43.00	43.40	0.40	1.10	36.41
					36-C-2	43.85	43.40	44.00	0.60		
					36-C-3	29.63	44.00	44.10	0.10		
MJAS-37	60m	Massive	0.20m	41.62%	37-C-1	41.62	41.50	41.70	0.20	0.20	41.62

- MJAS-25: dunite from108.3 to 130.0m (core length 21.7m+)
  chromitite from 113.9 to115.65m (core length1.75m) with 18.40% Cr_2O_3
- MJAS-26: dunite from 85.8 to 130.0m (core length 44.2m)
  chromitite from 113.9 to 118.5m (core length 1.98m) with 17.42% Cr_2O_3
- MJAS-27: dunite from 100.5 to 135.4m (core length 34.9m)
  chromitite from 116.85 to 118.83m (core length 1.98m) with 21.51% Cr_2O_3

It is observed in the holes MJAS-24 and MJAS-26 that faults cut across chromitite layers; in the former hole, the chromitite layer is bounded by the fault-crush zone to the foot-wall dunite, and in the latter, the chromitite layer includes a thin dunite layer.

The holes MJAS-25 and MJAS-26 has intersected thin layers of massive or banded chromitite in the shallow part. These chromitite layers can be correlated to the extension of the shallow ore body identified by surface outcrops. In the hole MJAS-25, a dunite envelope is encountered at the depth between 2.9 and 5.8m (core length 2.9m) containing a chromitite layer between 5.10 and 5.11m (core length 0.01m). In the hole MJAS-26, a dunite envelope is encountered at the depth between 10.80 and 10.95m (core length 0.15m) containing a chromitite layer between 10.85 and 10.90m (core length 0.05m) with 35.41% Cr_2O_3. As indicated by these holes, the shallow ore body is extremely thin in its thickness though high in chromium content. The other 3 holes, MJAS-23, MJAS-24 and MJAS-27, have failed to intersect the shallow ore deposit, which suggests that it strikes oblique to the deep ore body and is somewhat shifted to the west.

As above described, it has been confirmed that both the deep and shallow ore body extend northwards. The deep ore body is located at the elevation between 1640 and 1600m, striking in the NNE-SSW direction and dipping 40 to 50 degrees to west, and consists of disseminated or banded chromitite. Though its scale is relatively large with its thickness ranging between one and two meters, its chromium content is low, ranging from 14 to 26% Cr_2O_3. The shallow ore body, on the other hand, is located in the elevation between 1705 and 1695m, striking in the NNW-SSE direction and dipping 20 to 30 degrees to east, and consists of massive chromitite. Though its scale is small with its thickness by far less than 1m, its chromium content is high, ranging from 35 to 51% Cr_2O_3.

(2) Lugu i Batres (Figures 2-2-4 through 2-2-7, Appendixes 6 and 7)

The drilling target was the down-dip extension of the ore body identified by surface outcrops and exploratory pits. The two holes, MJAS-28 and MJAS-29, were drilled.

The geology observed in the holes comprises mainly harzburgite accompanying dunite layers with the thickness of several meters. Dunite-harzburgite alternation is observed in the shallower part of both holes. The proportion of dunite is larger in the hole, MJAS-28 than in MJAS-29. Faults and crushed zones are highly developed, particularly in association with chromitite layers in the shallow part of the hole, MJAS-28.

MJAS-28 has intersected chromitite but MJAS-29 has failed, which may suggest that the down-dip extension of the ore deposit is offset by a fault in its western part or thins out downwards. In MJAS-28, a dunite envelope is encountered at the depth between 9.25 and 10.3m (core length 1.05m) including a chromitite layer between 9.5 and 9.8m (core length 0.3m) with 39.75% Cr_2O_3. The ore body runs in the E-W or WNW-ESE direction and dips 40 to 70 degrees to south. It continues westwards, being offset by some small faults.

(3) Buzgare (Figures 2-2-8 through 2-2-11, Appendixes 8 and 9)

The drilling target was the down-dip and western extensions of the known ore body identified by exploratory tunnels. The ore body runs in the NW-SE direction and dips 50 to 80 degrees to south. The two holes, MJAS-30 and MJAS-31, were drilled.

In MJAS-30, the geology comprises only harzburgite and no dunite has been observed. Crushed zones are highly developed at the deep part. In MJAS-31, dunite is predominated in the shallower part and harzburgite, in the deeper part. Crushed zones are highly developed in the shallower part. MJAS-31 has intersected a relatively thick dunite layer at the depth between 3.0 and 19.6m and also three layers of dunite at depth with their thickness ranging from one to three meters. Since the geology of the two holes, in spite of their close location, differs significantly from each other. It may be suggested that a fault with a considerable dislocation exists between the holes or that the holes has been located in a part of complex and inhomogeneous lithofacies.

The two holes have failed to intersect chromitite. A thick crushed zone, which exists under the known ore body, may have dislocated its down-dip extension considerably. Since no dunite has been intersected by MJAS-30 which has passed through directly below the known ore body, it is unlikely that the ore body continues downwards in the same attitude as observed near surface.

Meanwhile, three samples collected from chromitite outcrops have indicated analytical results ranging from 44.79 to 48.08% Cr_2O_3 with an arithmetic mean of 46.89% Cr_2O_3.

2-2 Southern Shebenik District

This District includes Pishkash-5 (Figure 2-1-2).

(1) Pishkash-5 (Figures 2-2-12 through 2-2-15, Appendixes 10 and 11)

The drilling target was the northern extension of the fault-dislocated portion of the ore body which had been identified by exploratory tunnels. The two holes, MJAS-32 and MJAS-33, were drilled at the same location with different inclinations and lengths.

The geology of both holes comprises predominantly harzburgite with minor dunite, intruded by thin pyroxinite dikes of several to twenty centimeter thick. Faults and crushed zones are highly developed in the shallow part. Dunite layers are observed in the section from 80.4 to 80.7m of MJAS-32, and the sections from 34.2 to 34.3m, from 95.6 to 104.4m and from 106.2 to 107.8m of MJAS-33. No chromitite has been intersected by both holes, which may suggest that the ore body has been dislocated for a distance of more than several tens of meters by the fault running in the NNW-SSE direction parallel to the strike of the ore body. Judging from the minor occurrences of dunite, there will be little potential to encounter significant ore body in the vicinity of the two holes.

The known ore body strikes in the NW-SE or NNW-SSE direction and dips 50 to 80 degrees to east. The ore body is cut across by a number of normal faults striking in the NE-SW direction and steps up northwards.

2-3 Northern Pogradec District

Bregu i Pishes and Hija e Zeze are included in this District (Figure 2-1-3).

(1) Bregu i Pishes (Figures 2-2-16 through 2-2-19, Appendixes 12 and 13)

The drilling target was the northwestern extension of the ore body which had been identified by surface outcrops, exploratory pits and drilling carried out in the Second Year Campaign. The two holes, MJAS-34 and MJAS-35, were drilled.

The geology of the holes comprises mainly harzburgite accompanying dunite layers about one meter thick, with considerable development of faults and crushed zones. The rocks are generally subjected to intense serpentinization. Due to this nature of ground, the core recoveries of these holes are poor in comparison with those of the holes in other areas, with the RQD being very low.

The dunite proportion is relatively high in the shallower parts of both holes. The thickness of dunite layers generally ranges between 0.05 and 1.3m, with the thickest being the section between 17.2 and 23.0m of MJAS-34. Notable crushed zones are observed in the sections from 26.5 to 31.6m and from 44.9 to72.9m of MJAS-34, and in the sections from16.5 to 27.0m, from 49.4 to 53.95m and from 62.4 to 77.9m of MJAS-

35. The section between 73.3 and 80.0m (hole bottom) consists of fresh harzburgite subjected to minimal serpentinization. Such fresh harzburgite has been encountered in the bottom section of MJAS-2 drilled in the Second Year Campaign, below the highly crushed and serpentinized section. Judging from these geological features, it is considered that the entire zone above the fresh harzburgite, which is characterized by a number of crushed zones and ubiquitous serpentinization, may compose a part of a large scale geological structure. It is implied that this geological structure runs in the NNW-SSE direction and dips 30 to 50 degrees to northwest.

Neither of the two holes has intersected chromitite. The known ore body may have been dislocated westwards by the fault to a great extent beyond the anticipation or may abruptly thin out downwards.

The ore body strikes in the NW-SE direction and dips vertically or 80 degrees to east. Its faulted blocks are arranged en echelon.

(2) Hija e Zeze (Figures 2-2-20 through 2-2-23, Appendixes 14 and 15)

The drilling target was the north-northwestern extension of the ore body which had been identified by exploratory pits and tunnels. The two holes, MJAS-36 and MJAS-37, were drilled.

The geology of the holes comprises harzburgite accompanying dunite layers, one of which contains chromitite at the deep part. The dunite layers are dominant in the shallow parts (shallower than 15m) and the deep parts (deeper than 35m) in the two holes. The thickness of dunite layers ranges between 0.5 and 2.0m in general, with the thickest section between 37.0 and 39.5m (2.5m in core length) of MJAS-36. Serpentinization and development of crushed zones are common in both holes.

Both holes have intersected chromitite; in MJAS-36, the dunite envelope in the section between 42.3 and 45.4m (3.1m in core length) containing a massive chromitite layer between 43.0 and 44.1 (1.1m in core length) with 36.41% Cr_2O_3 and in MJAS-37, the dunite envelope in the section between 41.0 and 42.1m (1.1m in core length) containing a massive chromitite layer between 41.5 to 41.7m (0.2m in core length) with 41.62% Cr_2O_3.

The ore body strikes in the NW-SE or NNW-SSE direction and dips vertically or 80 degrees to east. It is cut across by some faults and extended in the NNW-SSE direction.

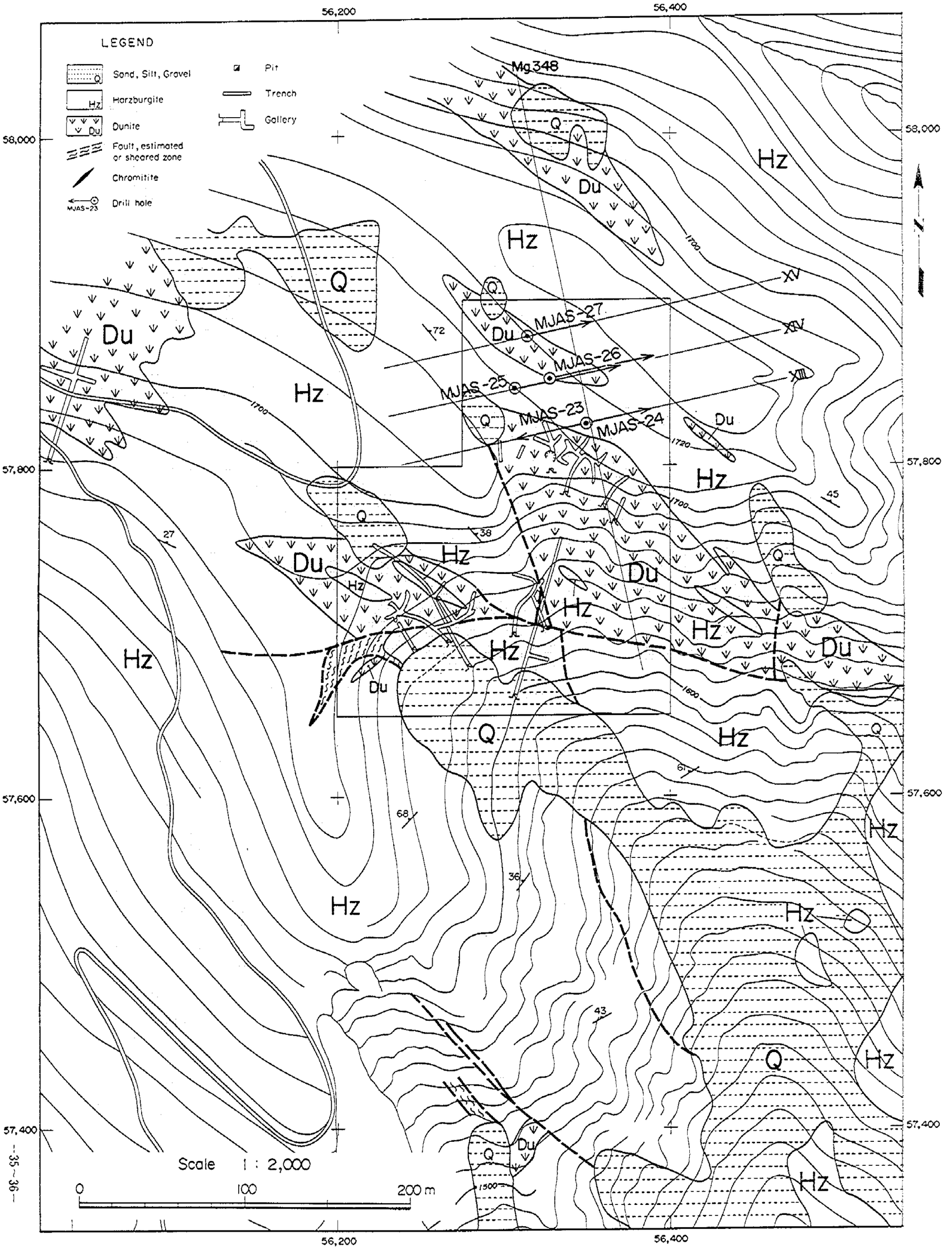


Figure 2-2-1 Location map of drilling sites in Ahu i Vetem

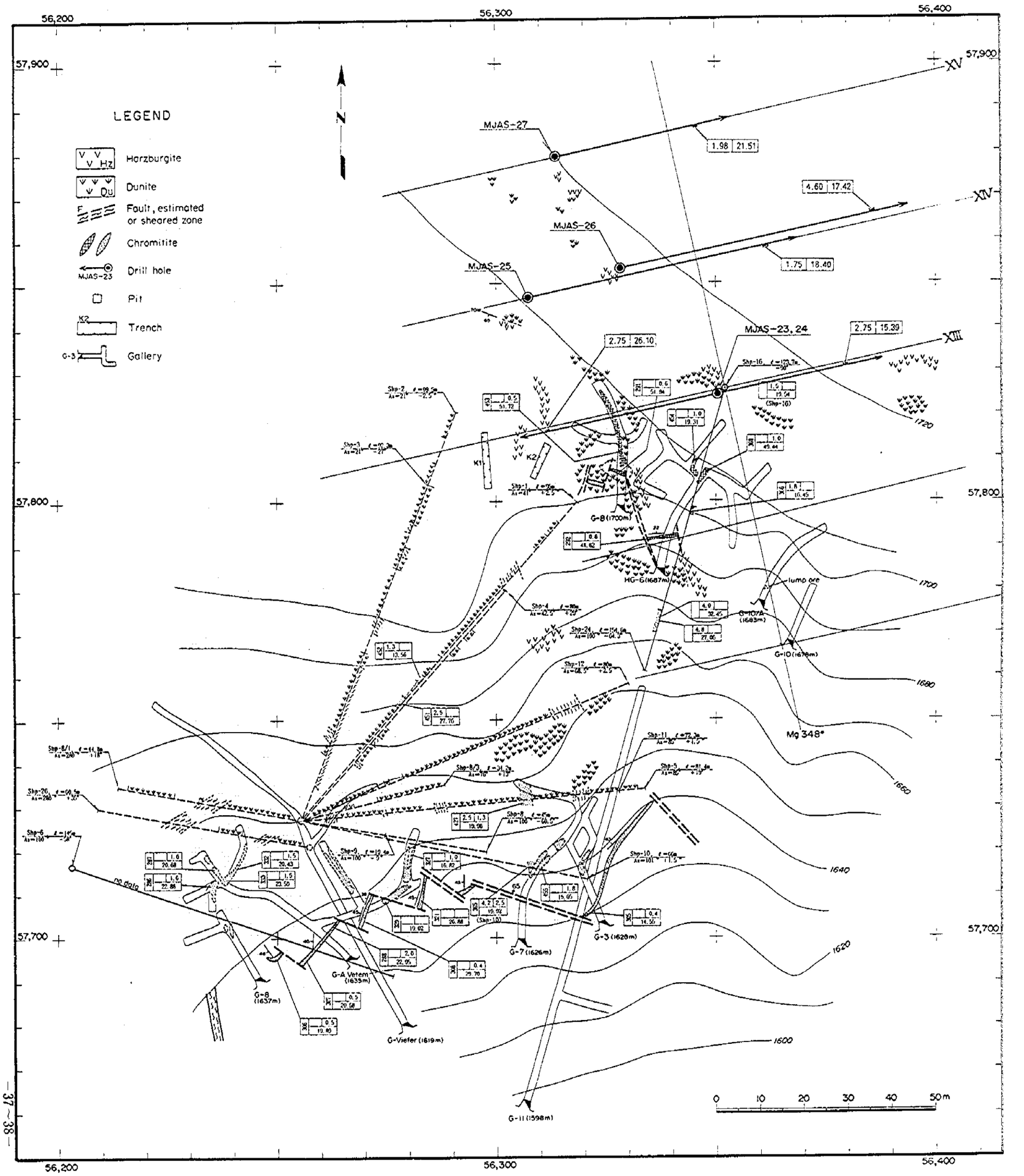
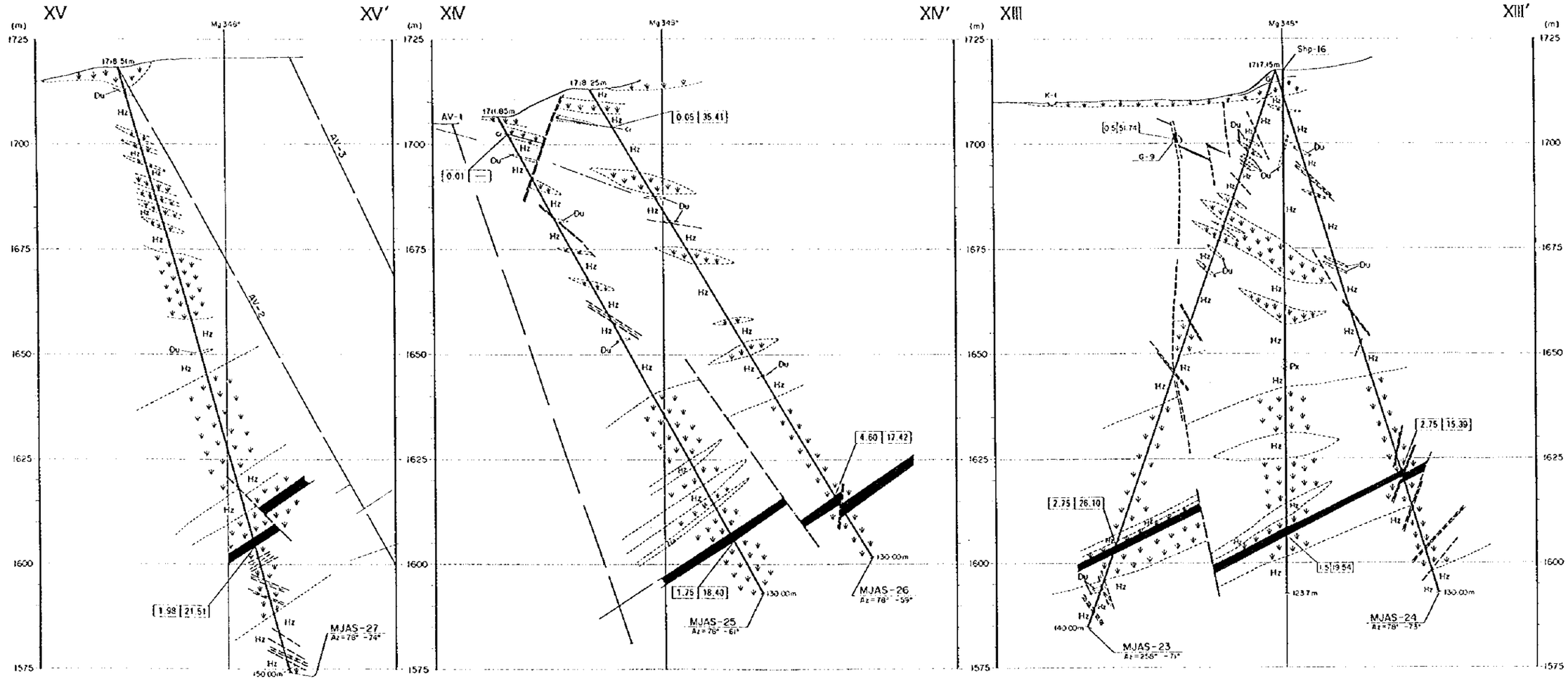


Figure 2-2-2 Geological fact map in Ahu i Vetem



LEGEND

- Sand, Silt, Gravel
- Hz(F) Harzburgite (fresh)
- Du Dunite
- Px Pyroxenite
- Fault, estimated or sheared zone
- Chromitite
- P Pit
- K Trench
- Gallery

Figure 2-2-3 Cross section in Ahu i Vetem

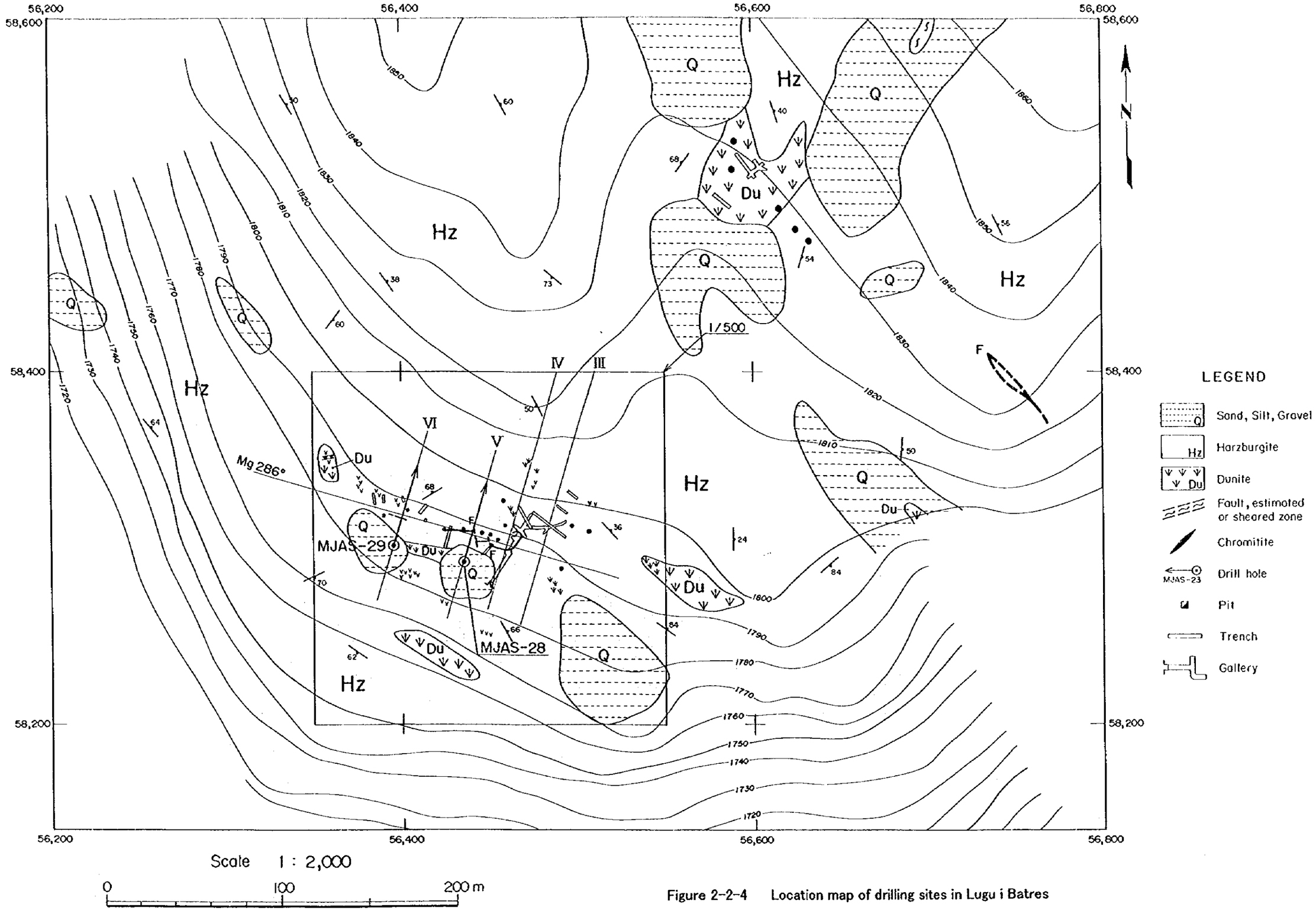


Figure 2-2-4 Location map of drilling sites in Lugu i Batres

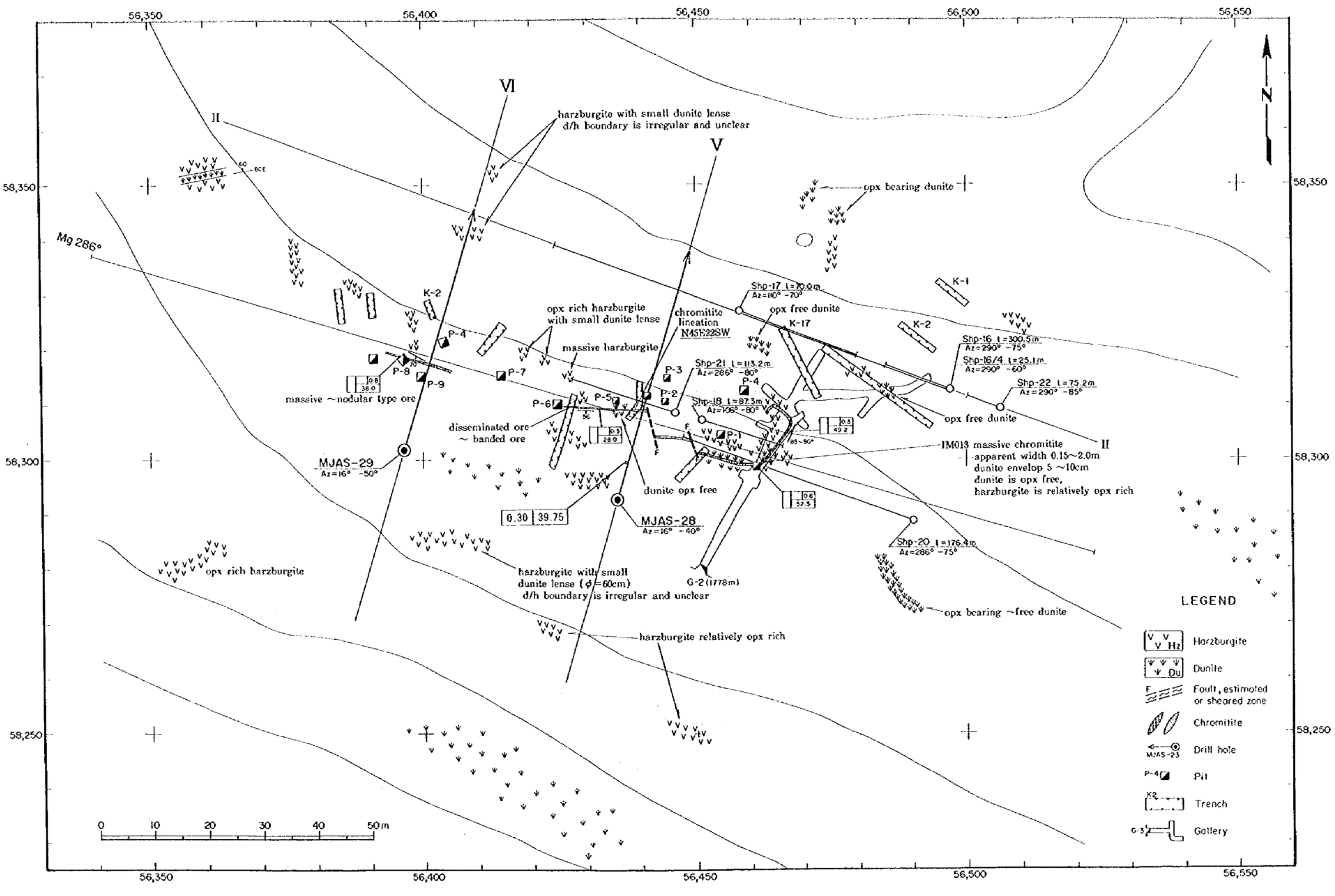


Figure 2-2-5 Geological fact map in Lugu i Batres

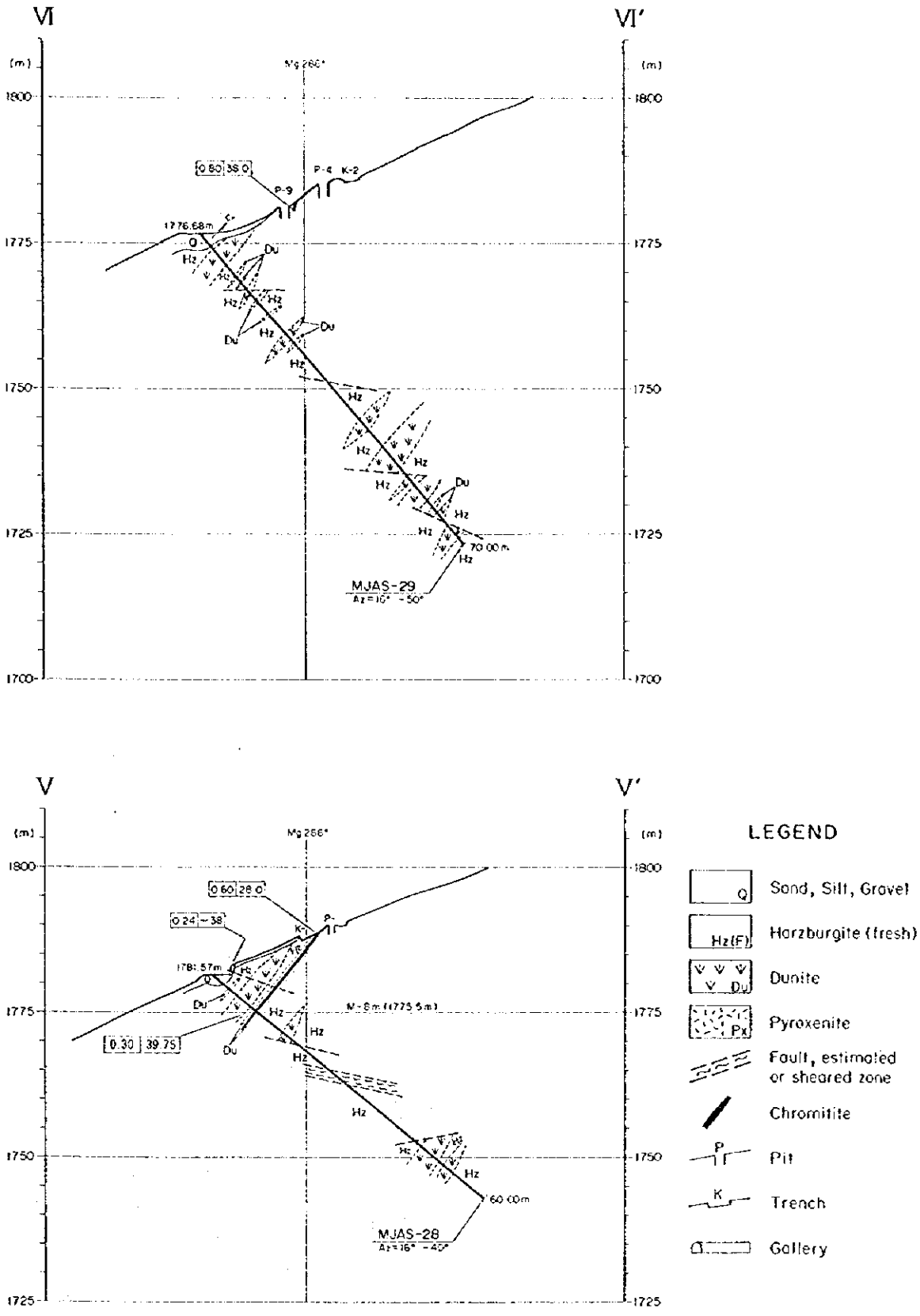
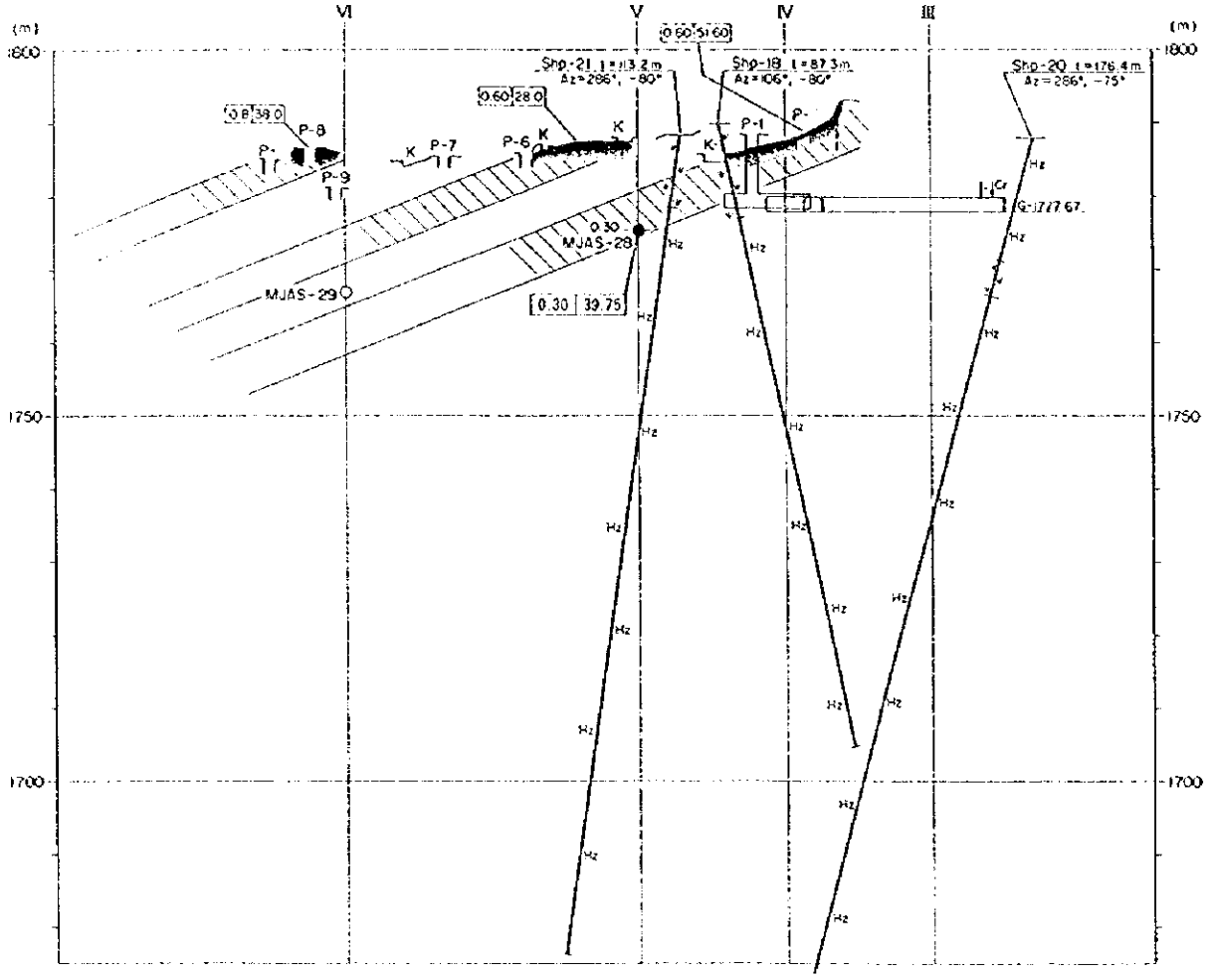


Figure 2-2-6 Cross section in Lugu i Batres



LEGEND

- Chromitite
- Expected mineralized zone of chromitite
- Fault, estimated or sheared zone
- O_8 Vertical projection of chromitite and it's profile number
- P Pit
- K Trench
- Gallery

Figure 2-2-7 Longitudinal section in Lugu i Batres

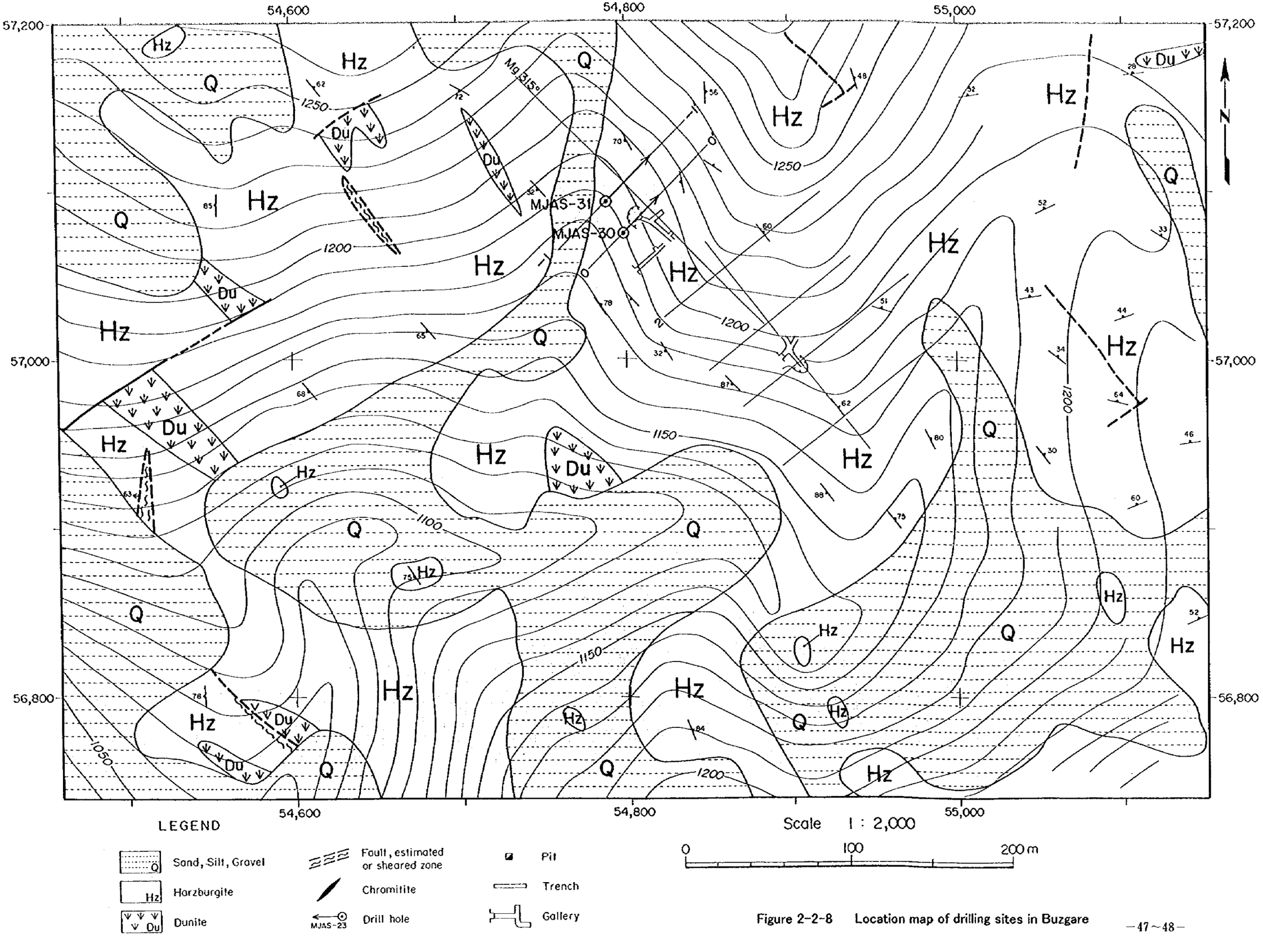


Figure 2-2-8 Location map of drilling sites in Buzgare

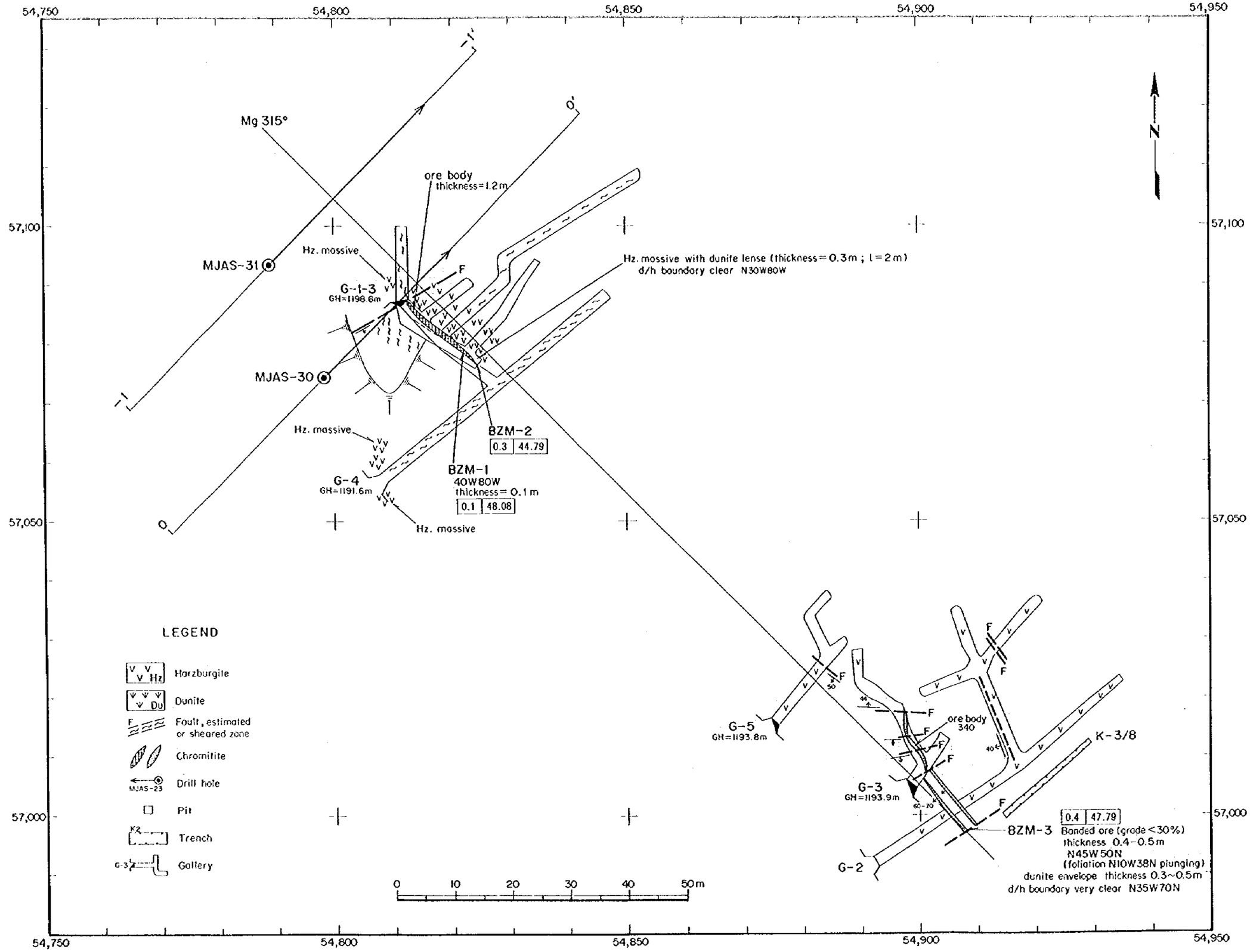


Figure 2-2-9 Geological fact map in Buzgare

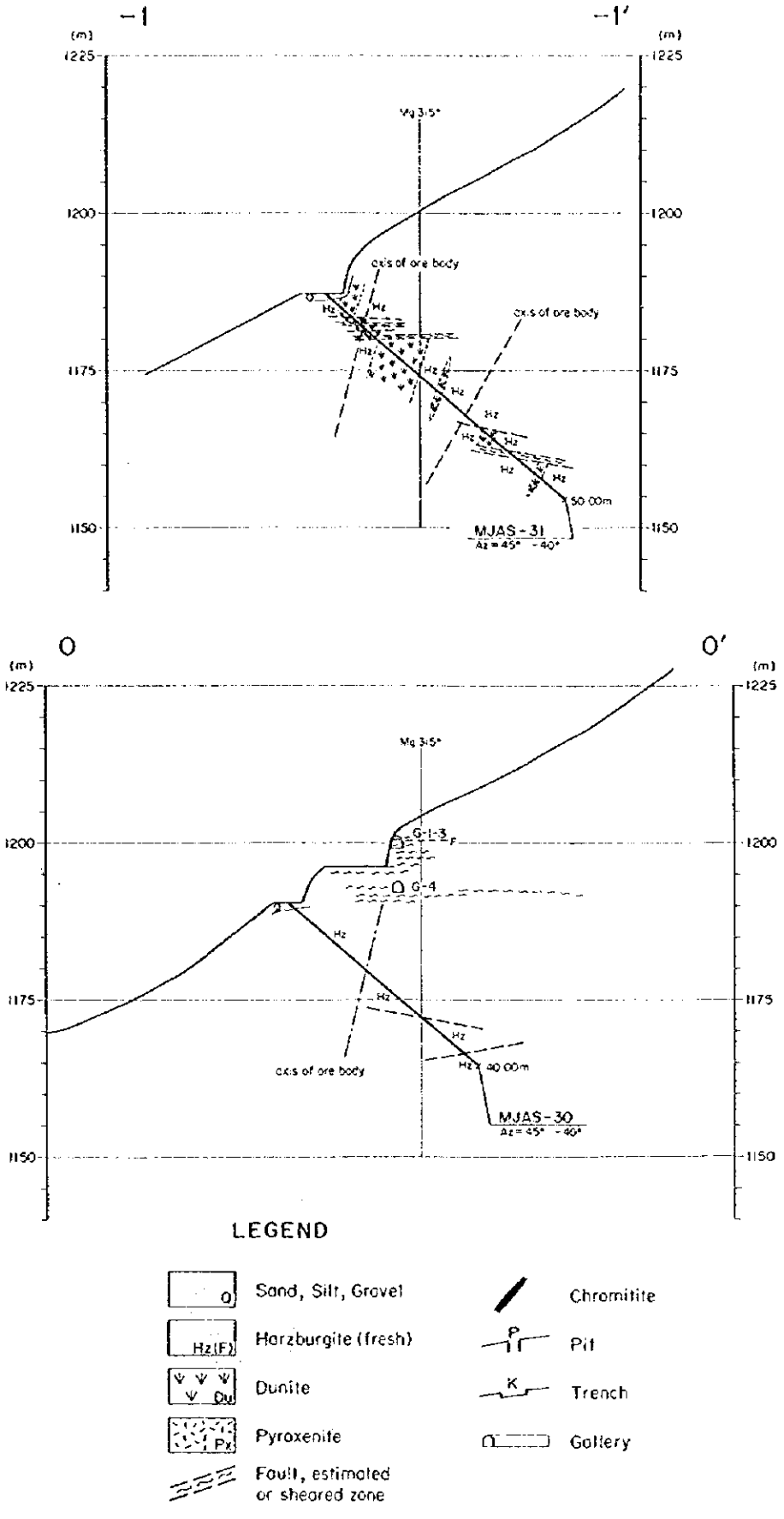


Figure 2-2-10 Cross section in Buzgare

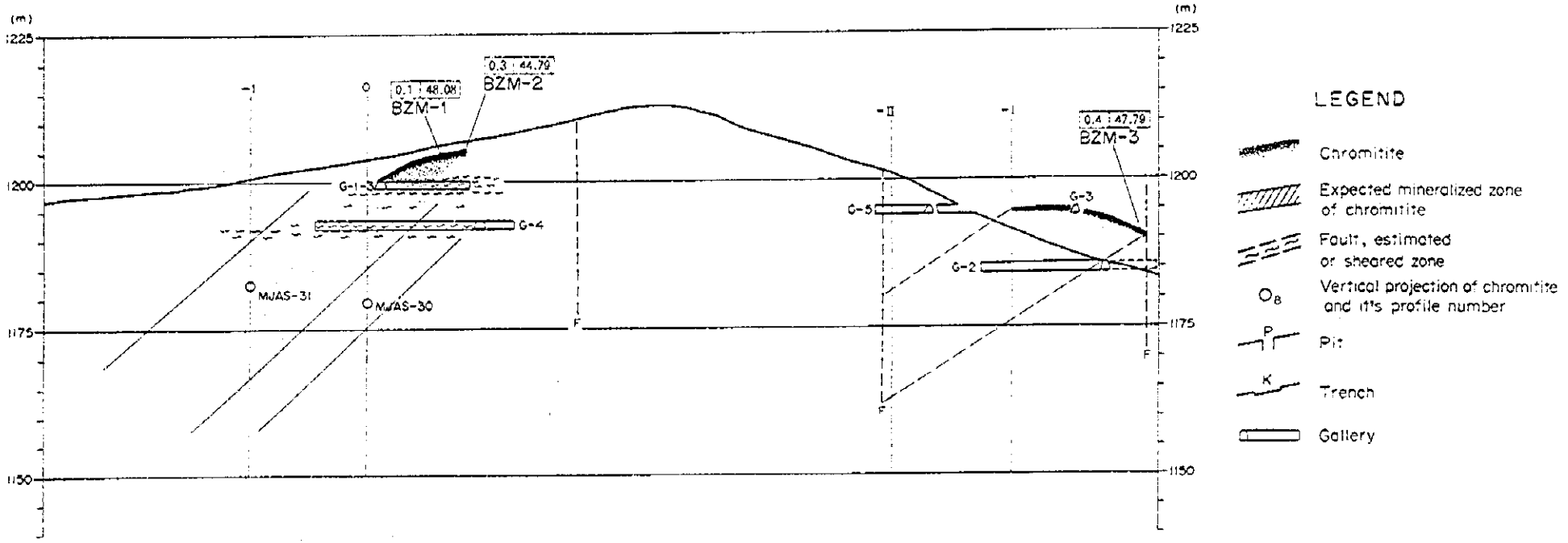


Figure 2-2-11 Longitudinal section in Buzgare

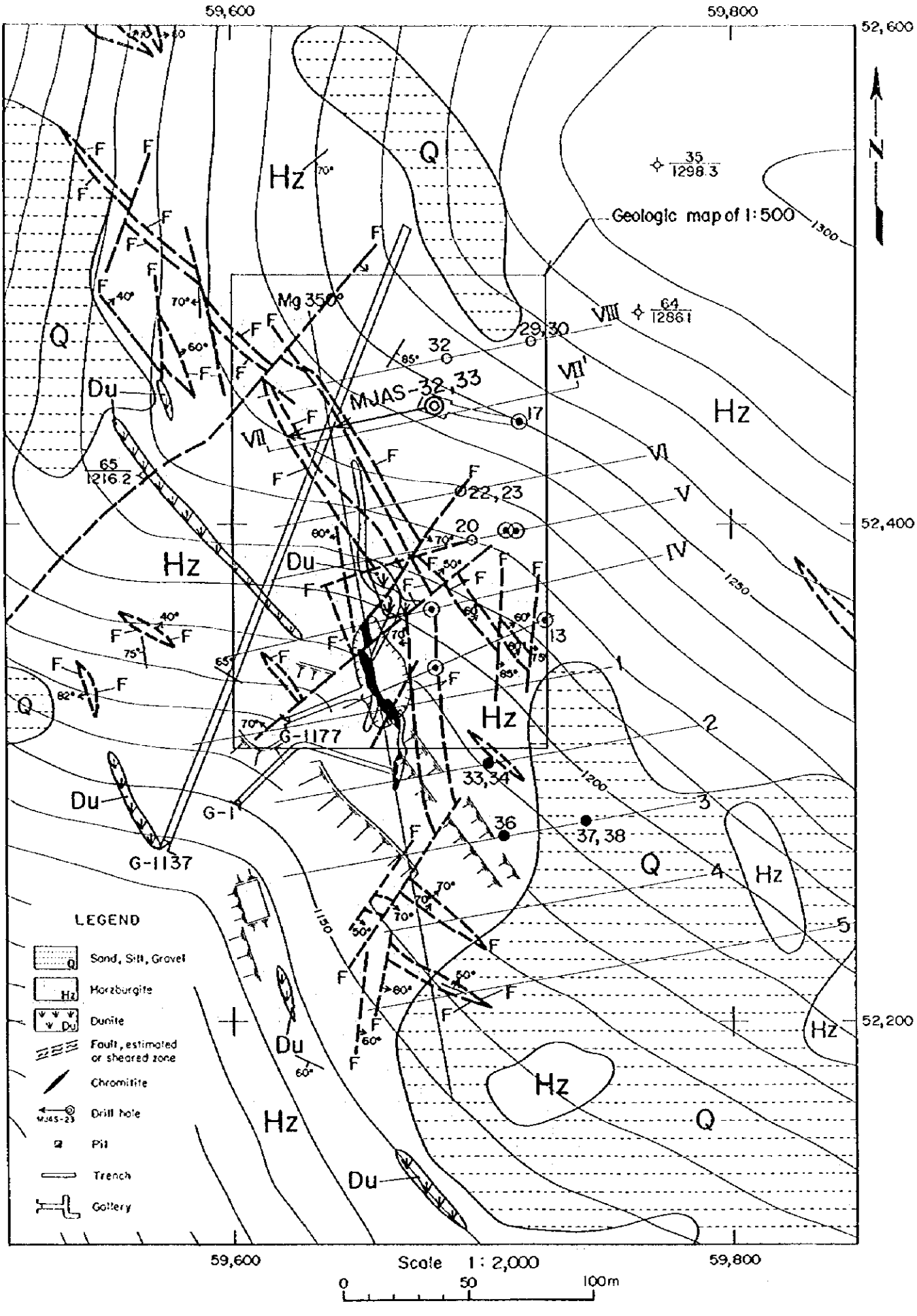


Figure 2-2-12 Location map of drilling sites in Pishkash-5

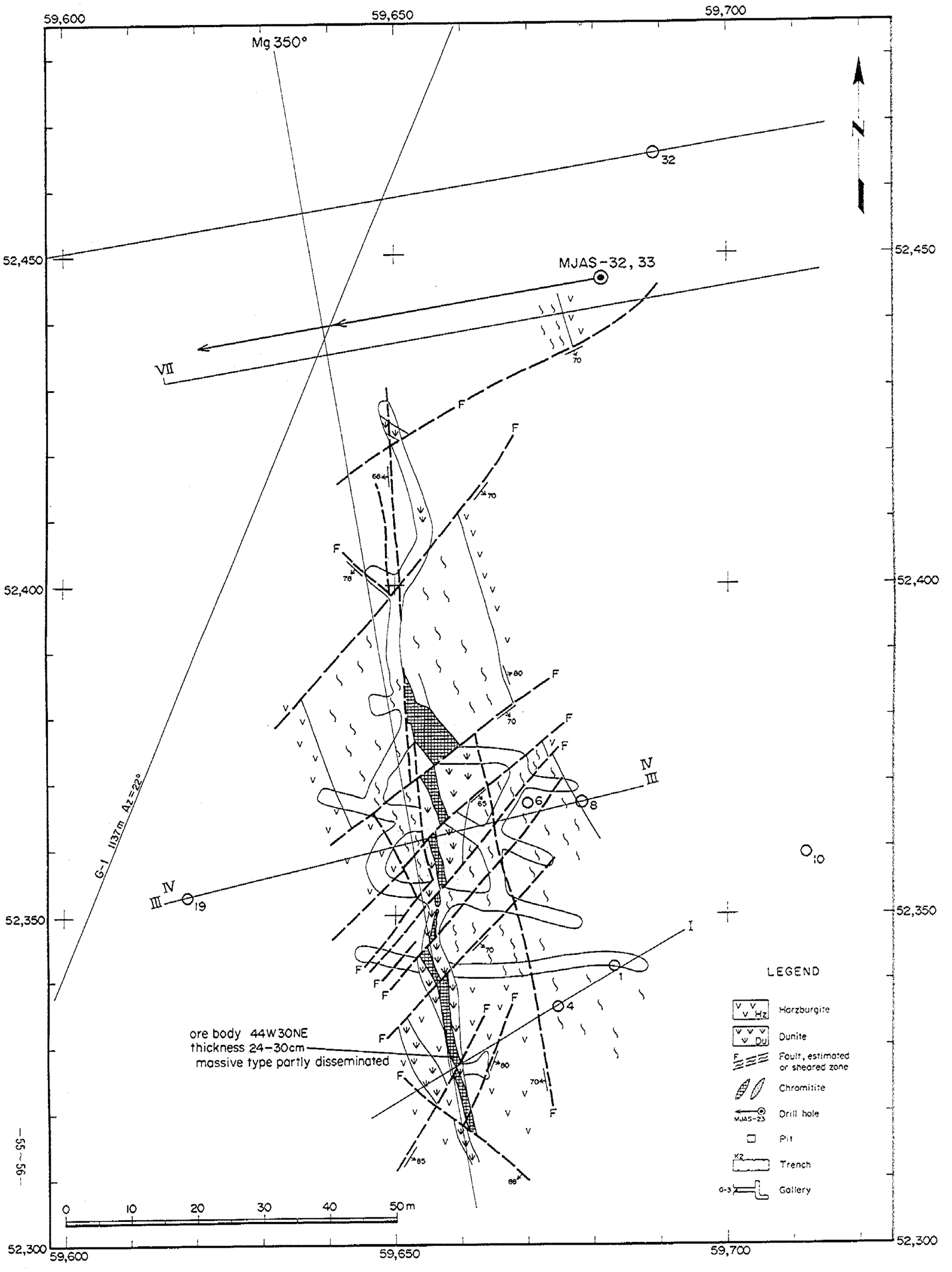


Figure 2-2-13 Geological fact map in Pishkash-5

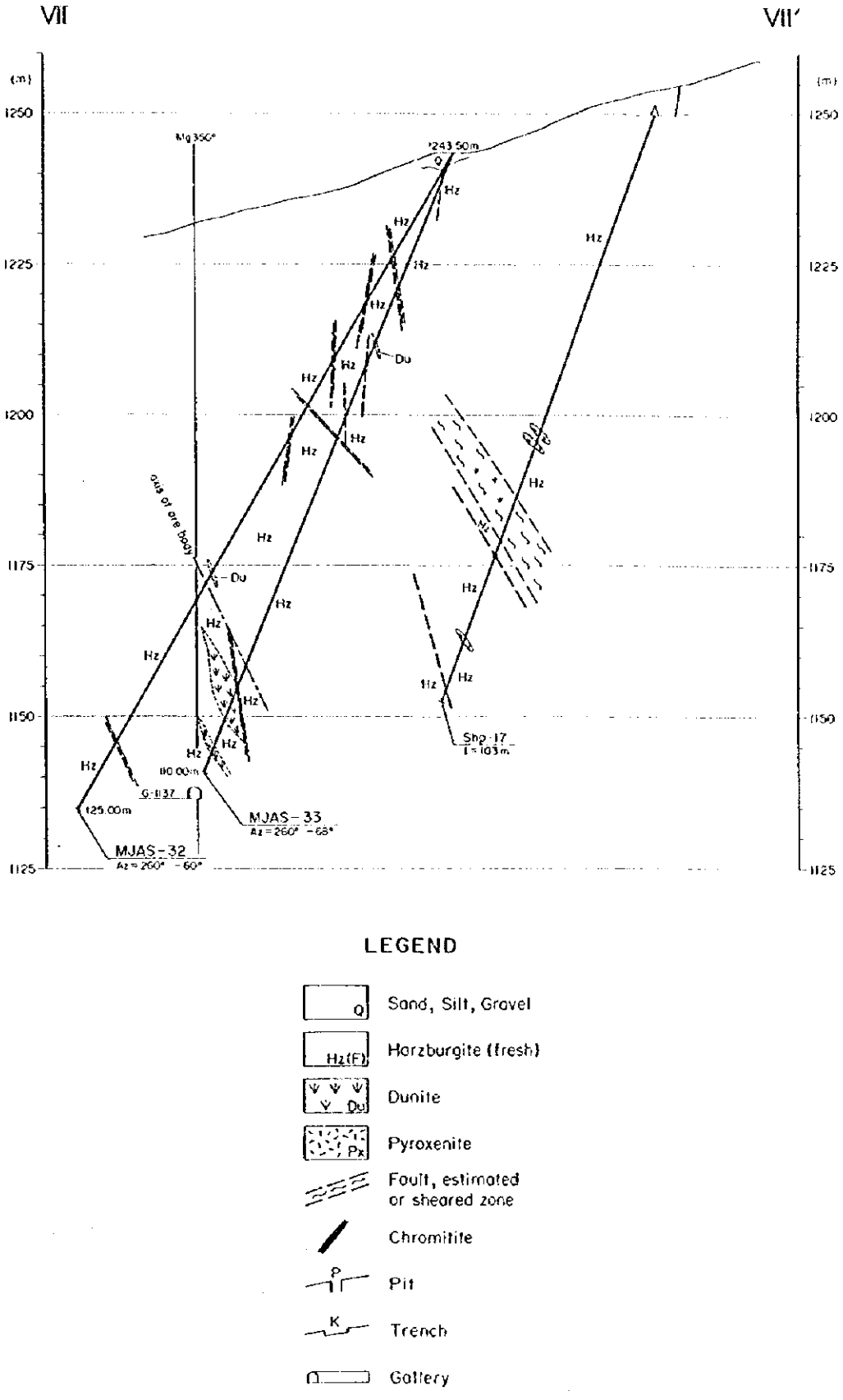


Figure 2-2-14 Cross section in Pishkash-5

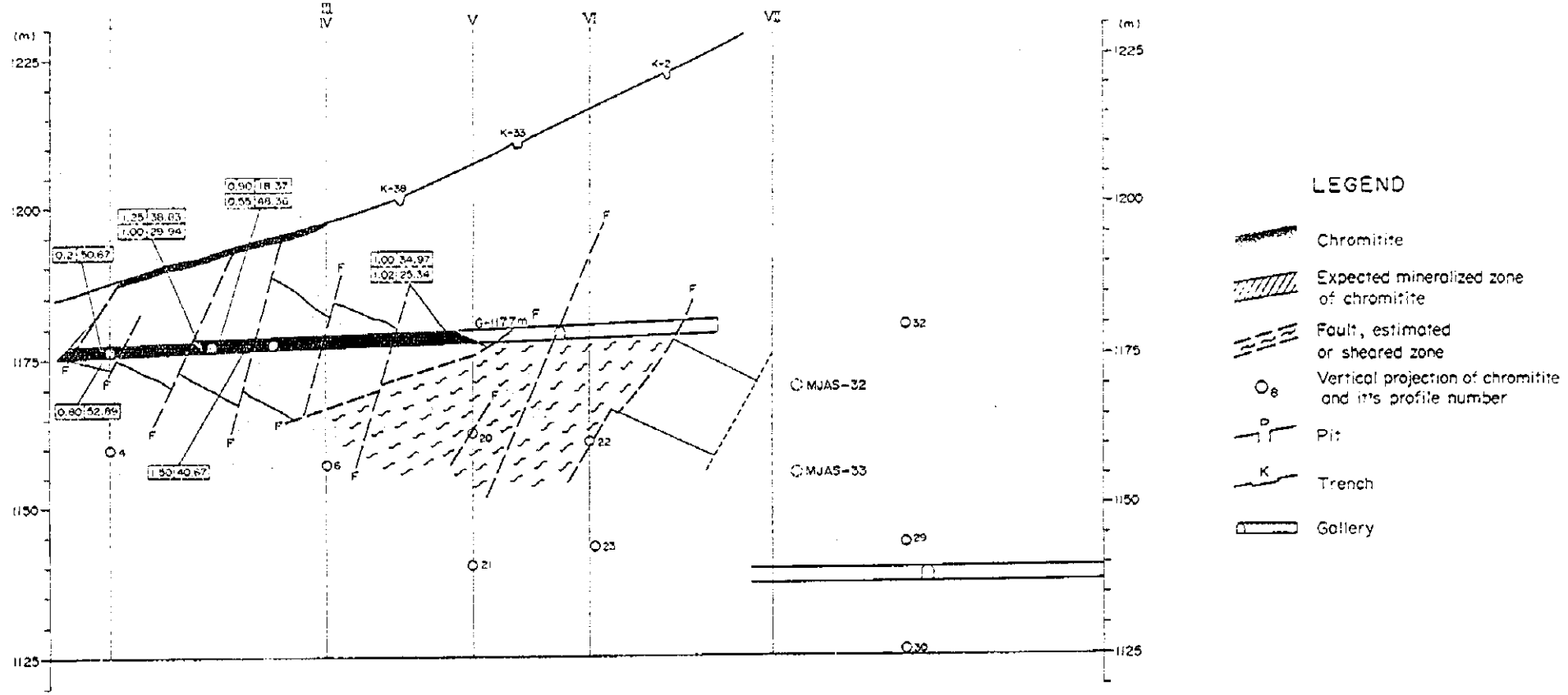


Figure 2-2-15 Longitudinal section in Pishkash-5

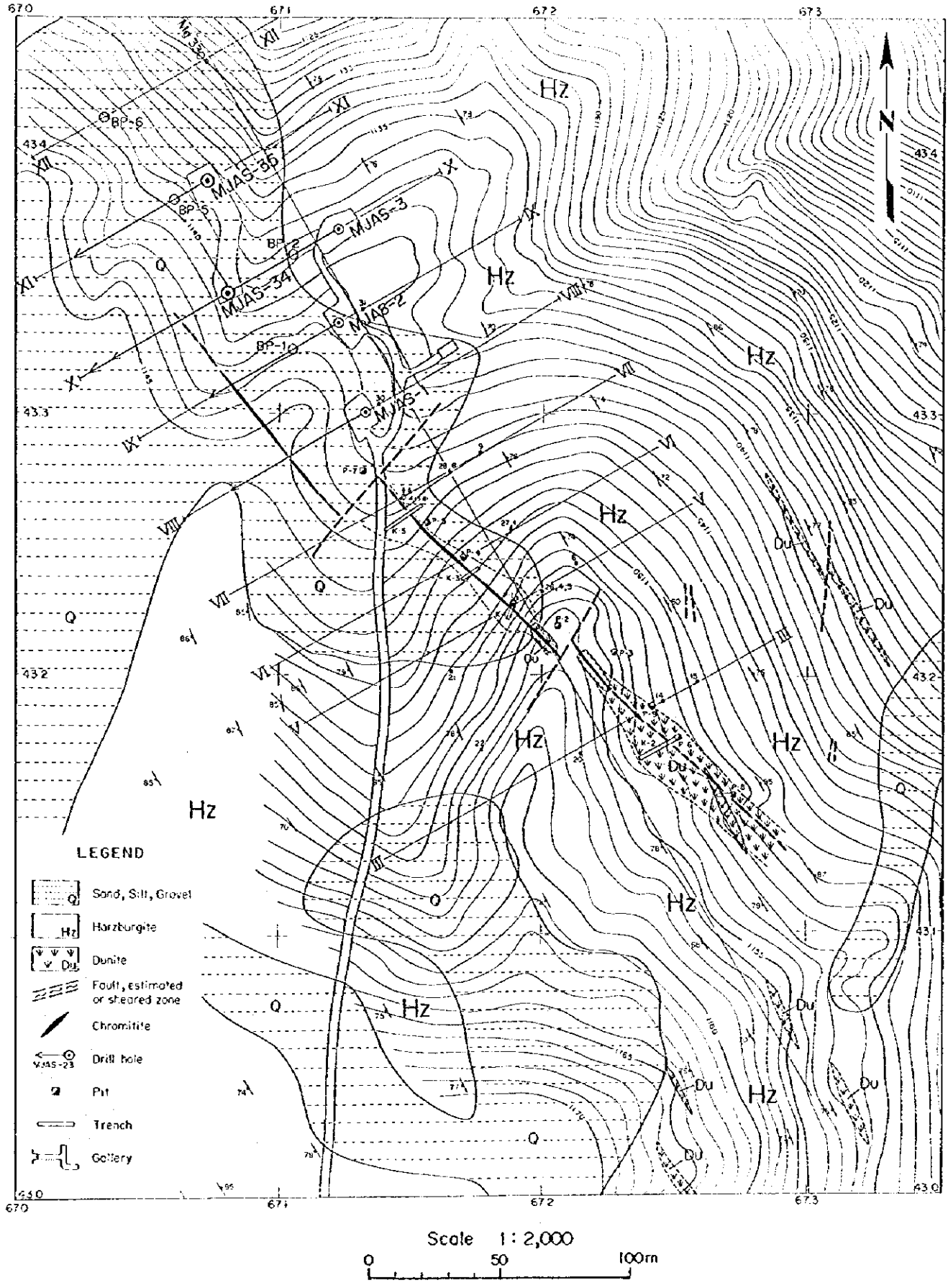


Figure 2-2-16 Location map of drilling sites in Bregu i Pishes

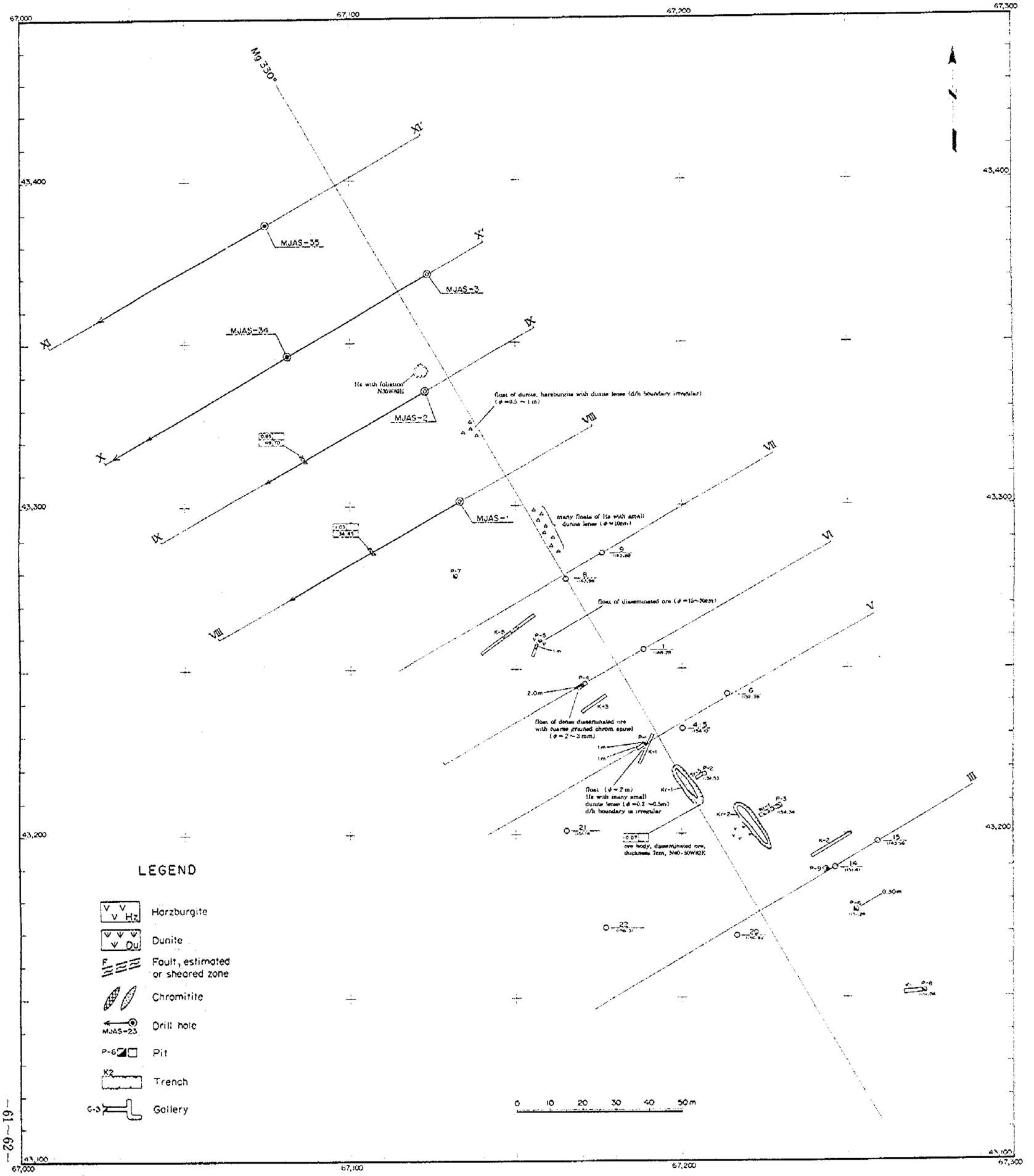


Figure 2-2-17 Geological fact map in Bregu i Pishes

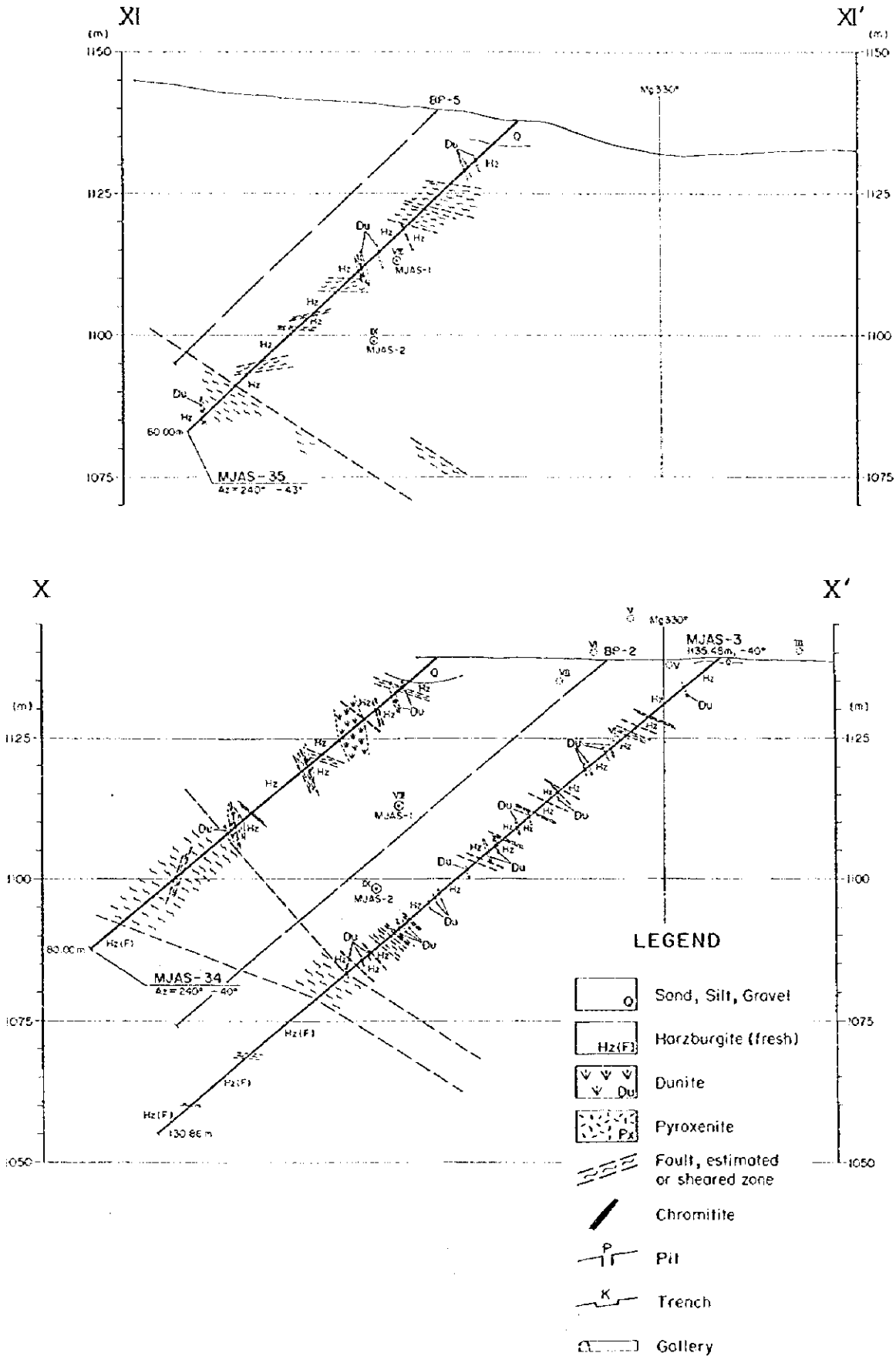
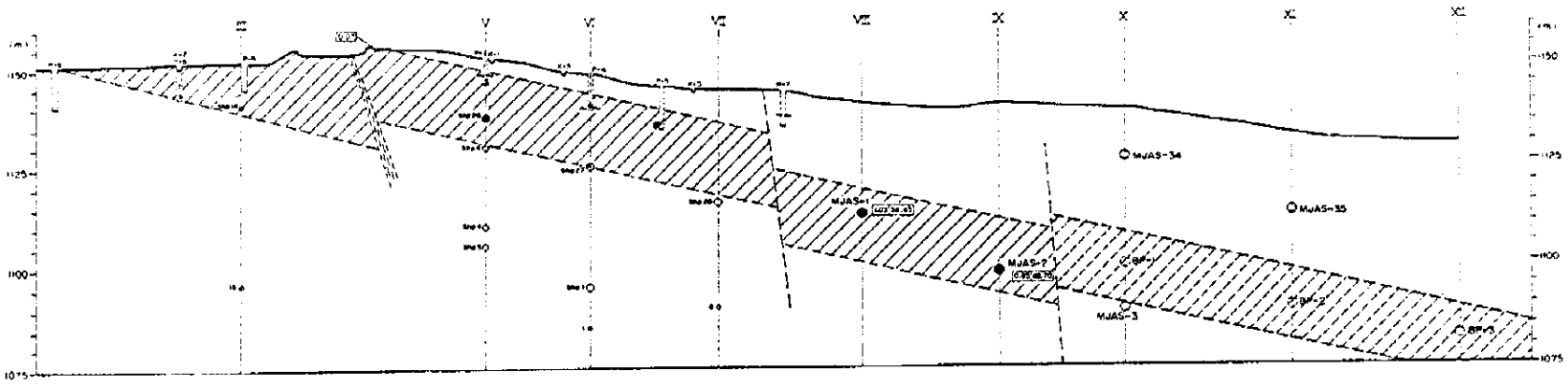


Figure 2-2-18 Cross section in Bregu i Pishes



LEGEND

- Chromitite
- Expected mineralized zone of chromitite
- Fault, estimated or sheared zone
- O_8 Vertical projection of chromitite and it's profile number
- P Pit
- K Trench
- Gallery

Figure 2-2-19 Longitudinal section in Bregu i Pishes

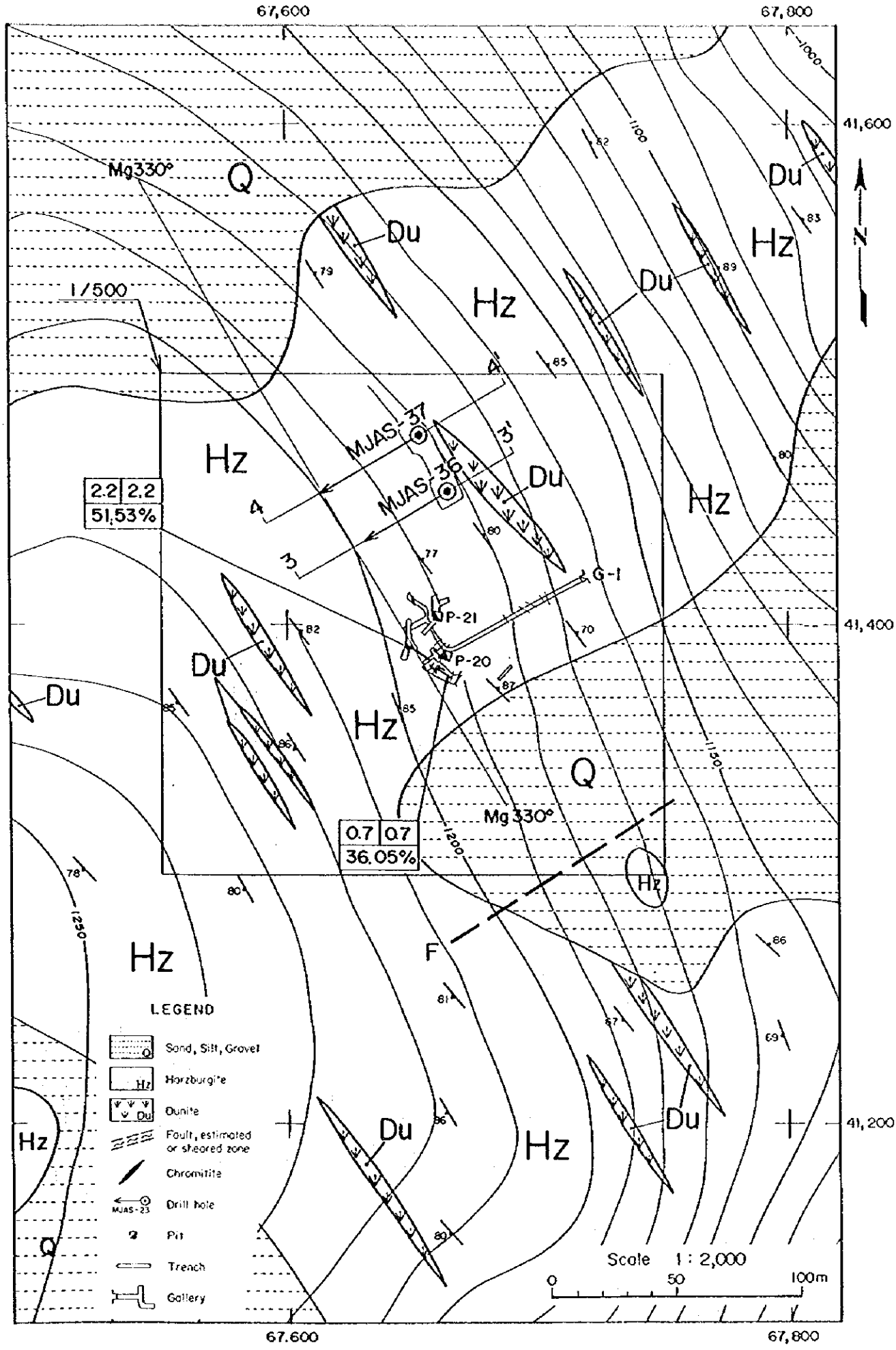


Figure 2-2-20 Location map of drilling sites in Hija e Zeze

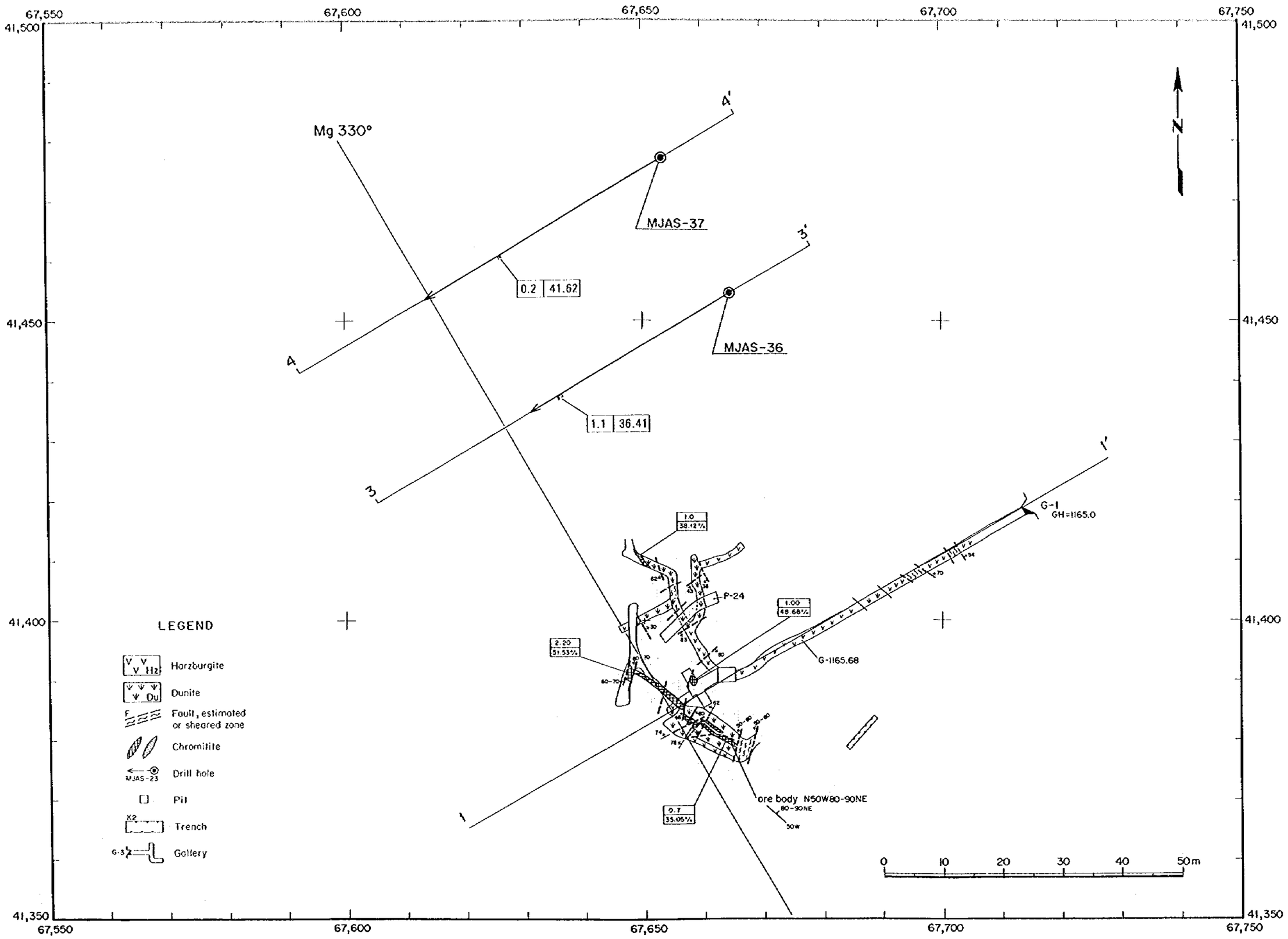
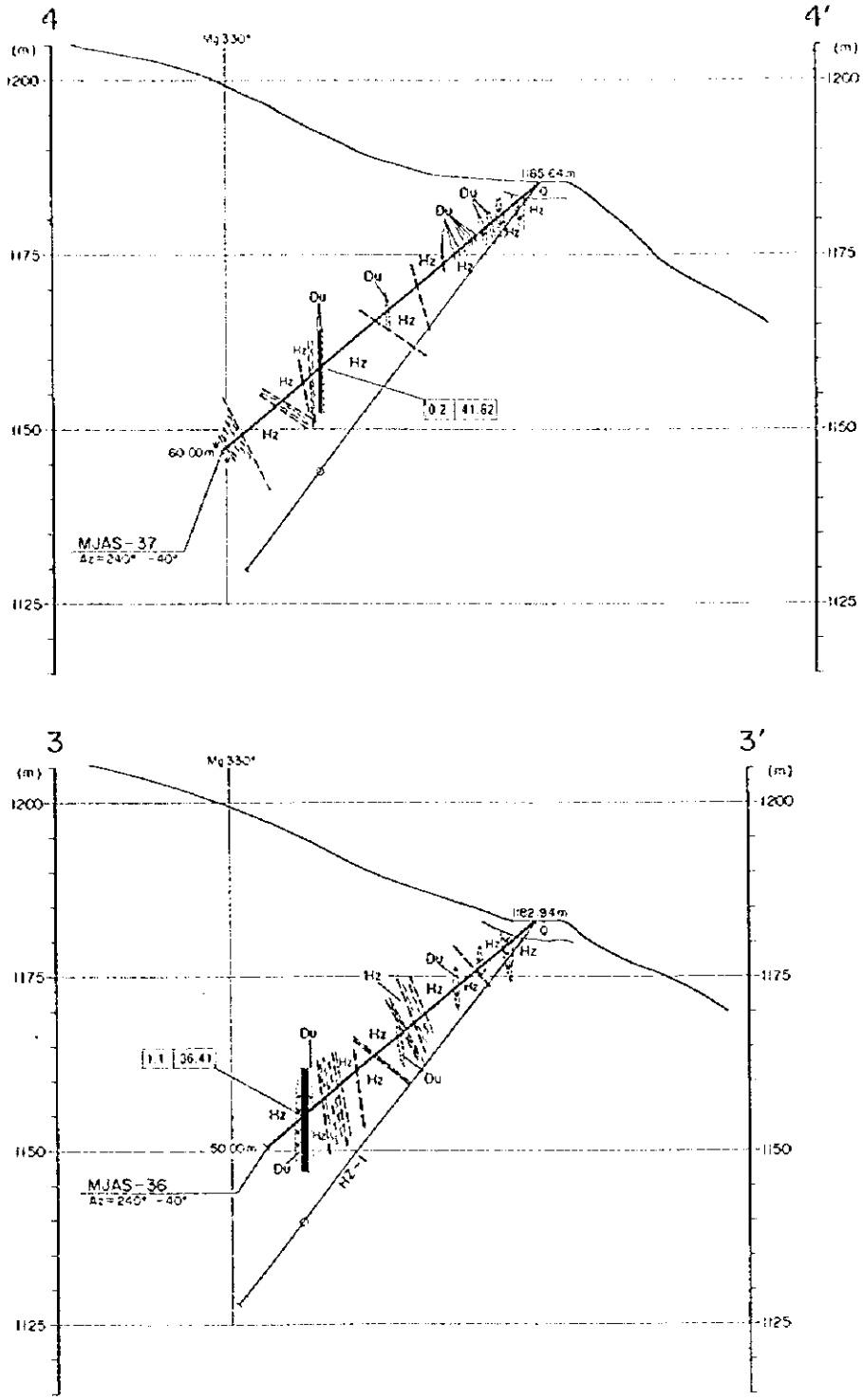


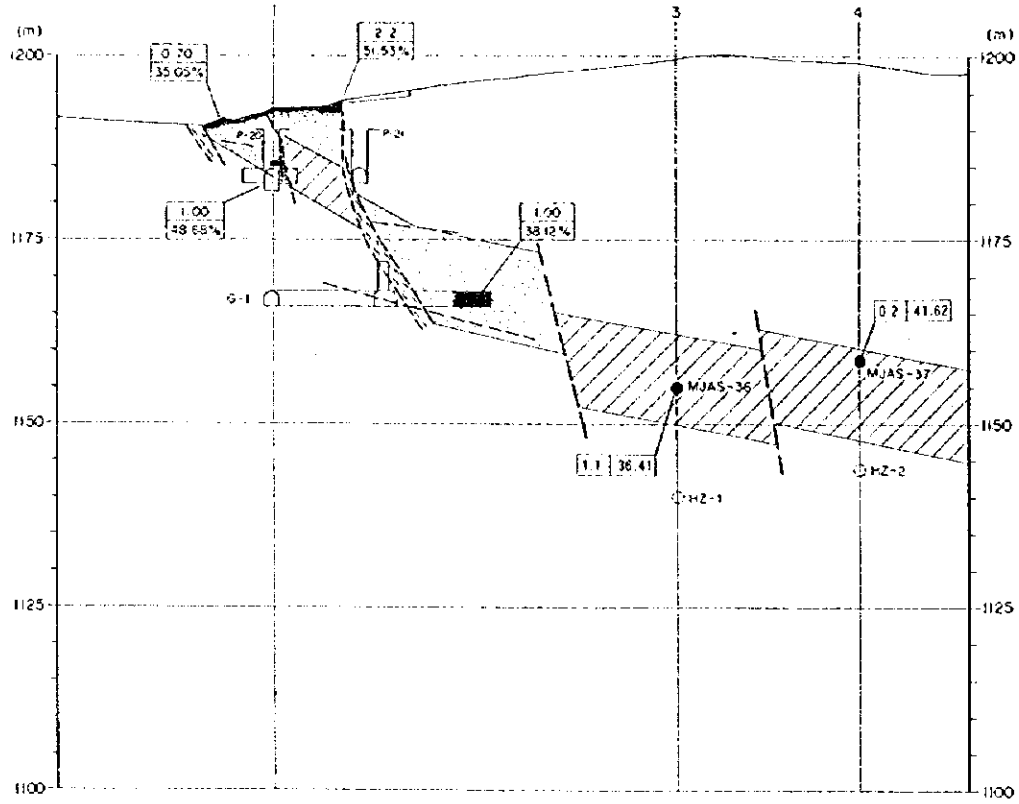
Figure 2-2-21 Geological fact map in Hija e Zeze



LEGEND

- Q — Sand, Silt, Gravel
- Hz(F) — Harzburgite (fresh)
- Du — Dunite
- Px — Pyroxenite
- Fault, estimated or sheared zone
- Chromitite
- P — Pit
- K — Trench
- Gallery

Figure 2-2-22 Cross section in Hija e Zeze



LEGEND

- Chromitite
- Expected mineralized zone of chromitite
- Fault, estimated or sheared zone
- O_e Vertical projection of chromitite and it's profile number
- P Pit
- K Trench
- Gallery

Figure 2-2-23 Longitudinal section in Hija e Zeze