REPUBLIC OF COLOMBIA

REPORT ON GEOLOGICAL SURVEY OF PIEDRANCHA AREA

PHASE Ⅲ

MARCH 1983

JAPAN INTERNATIONAL COOPERATION AGENCY

METAL MINING AGENCY OF JAPAN

PREFACE

In response to the requirements of the Government of the Republic of Colombia, the Japanese Government has decided to perform collaborative mineral exploration in Piedrancha area located in the southwestern part of the country and has entrusted its performance to the Japan International Cooperation Agency, who has decided to entrust that performance to the Metal Mining Agency of Japan because the subjects of this investigation belongs to a special field of the geological and mineral resources survey.

This investigation was started in 1980 as the first phase. For the third phase plan, the Metal Mining Agency of Japan organized an investigating mission of seven persons to dispatch it to the site from June 14, 1982 to December 12, 1982.

The investigation on the site was completed on schedule by the cooperation of agencies relative to the government of the Republic of Colombia, especially Instituto Nacional de Investigaciones Geologico-Mineras.

This report has collected and arranged the results of the investigation in the third phase to make a part of the final report.

Finally we express our heartiful thanks for the cooperation of the agencies relative to the Government of the Republic of Colombia, and also to the Ministry of Foreign Affairs, Ministry of International Trade and Industry, the Japanese Embassy in Colombia, and all personnel of the companies concerned in the performance of this investigation.

February, 1983

Keisuke Arita
President
Japan International Cooperation Agency

Masayuki Nishiie
President
Metal Mining Agency of Japan

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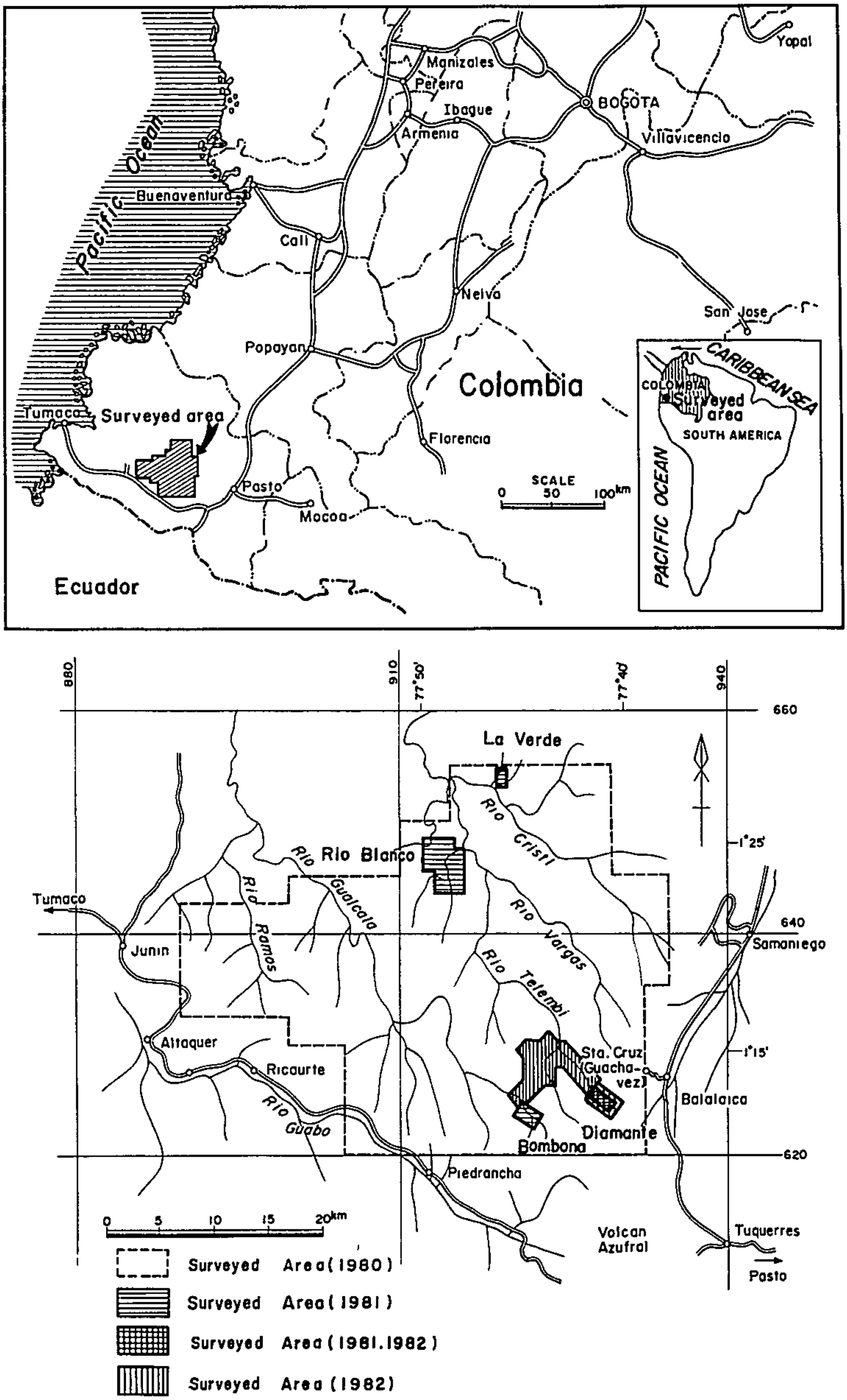

Fig. I-1 Location Map of the Surveyed Area

ABSTRACT

The third phase survey was carried out in and around the mining area of the Diamante Mine, which is auriferous polymetallic vein type ore deposit.

The main purpose of the survey was to obtain the information on the possibility of the existence of ore deposits, by clarifying the relation between the geological structure and the mineralization of the auriferous polymetallic ore deposits, and especially in the Diamante mining area, the survey was aimed to obtain some definite policy for further exploration of the possible ore deposits of the same type as those widely expected in this area, through the precise examination of the ore minerals, in addition to the comprehension of the actual continuity, ore grade and scale of the mineralized area, by carrying out diamond-drilling works in the mineralized zone where main vein type ore deposits are distributed in the Diamante mining area.

The contents of the survey works conducted were geological survey, geochemical exploration and diamond drilling. The geological survey was carried out by mapping along the main river and the main road, describing the details in the route map of the scale of 1/2,000. The total area mapped was about 24 Km^2. The geochemical exploration was carried out by collecting soil samples at the points every 25 meters along the survey lines, which was established with the interval of 125 to 250 meters across the line in the direction of the extension of main ore veins. The soil samples thus collected amounted to as many as 2,256. The diamond drilling was carried out in the mining area of the Diamante mine by locating the drill-holes with approximately 100 meters interval along the extension of the principal ore vein. The total length of the drill holes was 1,335.9 meters with 8 holes.

The principal items of information obtained through the surveys are as follows:

(1) The rocks distributed in the surveyed area are composed mainly of green volcanic rocks and granodiorite of the Miocene Epoch of Tertiary Period, intruding the former. The intrusive rocks are thought to be a composite intrusive mass, showing two ages of 20 and 6 million years.

(2) The mineralization is represented by the auriferous poly-metallic fissure-filling type ore deposits contained in the above-mentioned wall rocks.

(3) The mineralized zones are oriented in the direction of NW-SE and are located in parallel three rows with approximate 3 kilometers interval.

(4) Each of the mineralized zones has width of several hundred meters, in which several ore veins are found usually. The width of each ore vein is generally under 1 meter and the vein of the largest width ever found in the survey areas is the one in the central part of the main ore vein of the Diamante mining area, which is as wide as 5.6 meters. The lateral extension of the most enriched part of the mineralization is estimated to be 150 to 200 meters, and the depth of this part to be approximately 200 meters. The principal ore minerals composing the ore veins are arsenopyrite and sphalerite. The main gold-silver mineral is electrum. The crystallization of the electrum is thought to have been at the final stage of the crystallization of arsenopyrite. There is a tendency that the gold grade is high in such parts where arsenopyrites are found fairly concentrated.

(5) As the results of the geochemical exploration conducted, 20 geochemical anomalies have been extracted. The areas represented by the anomalies include every indication of the mineralization represented by the known mineral outcrops and old working tunnels. The distribution of

the anomalies and that of the indications of mineralization are thought to have some intimate relation. Accordingly, it is expected that there would be some fair potentiality of ore deposits in the anomalies where no indication of mineralization has been found yet. Through the realization of this fact, it is thought that further exploration would be warranted in such areas represented by the geochemical anomalies even if no indications have been found at the moment.

According to the above-mentioned results of the surveys in this third phase, the following further investigations would be recommended to be carried out for future perspectives of the mineral exploration in this area.

(1) Investigation by diamond drilling in the area including the lateral extension and the depth of the known ore deposits as Marina, Desquite, Bombona and so on.

(2) Exploration of the depth of the very positive anomalies selected by the geochemical exploration conducted in this third phase by such method as trenching and diamond drilling.

(3) Preliminary feasibility studies for the development of the main mineralized zone in the Diamante mining area, including the study of the minerals and the concentration tests.

INTRODUCTION

INTRODUCTION

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CHAPTER 1. PURPOSE AND OUTLINE OF THE SURVEYS

1-1 Outline of the Survey Works

The main purpose of the survey works carried out in the first phase were the comprehension of the regional geological structure and the extraction of the favorable areas for the mineralization through the geochemical survey by collecting samples of stream sediment. As the results of the survey works five areas with indications of porphyry copper type mineralization associated with the acidic igneous rocks and two areas showing indications of auriferous mineralization have been extracted. Gold ore deposits were found to be divided into two types. The one is milky white quartz vein type and the other is polymetallic vein type abound with sulphide minerals. It has also been clarified that the latter has potentiality of mineralization at the depth, warranting further exploration.

The survey works in the second phase are composed of detailed geological survey accompanied with geochemical exploration for soil in the two favorable areas of La Verde and Rio Blanco selected from the potential areas with indications of porphyry copper type mineralization, in addition to detailed geological survey and geochemical exploration for the investigation of extension of the mineral outcrops in the areas of Diamante and Bombona, where auriferous polymetallic vein type ore deposits are distributed. Also diamond drilling works were carried out in the second phase program in the Diamante mining area.

As the results of these survey works, it has become evident that the mineralized zone is extended with fairly good grade in the area of the Diamante ore deposit as was expected, and that the area of northern extension of the mineralized zone in Bombona and the area including Paraiso area, northeast to it, are quite favorable for the emplacement of the auriferous ore deposits, left for further exploration. Also a significant information has been obtained as for the soil geochemical exploration that this method is very useful for the extraction of the favorable areas with mineral indication, especially when zinc and arsenic are used for the indicative elements.

In the areas of La Verde and Rio Blanco, alteration zone showing zonal distribution of prophyry copper type and the possibility of emplacement of copper mineralization with the grade of some 0.2 to 0.5% were found through the surveys but no direct mineral indication was discovered, warranting further exploration for higher grade ore deposits.

Therefore, in the third phase of the survey program, geological survey and geochemical exploration in the Diamante-Paraiso-Bombona area and diamond drilling in the area including Diamante ore deposit were to be continued.

1-2 Purpose of the Survey Works

The main purpose of the survey works is to clarify the relation between the geological structure and the zone of the mineralization as well as the characteristics of the mineralization, in order to obtain useful direction for further exploration and development of mines in the whole areas in future.

Also, in the works of the diamond drilling in the area including the Diamante ore deposit, the drill holes were programmed to be located in a way to obtain informations of the points with approximately 100 meters interval laterally, which have made it possible to check swell and pinch of the veins, to know variation of intensity of the mineralization and thus to elucidate the feature of the mineralization. These informations would help to proceed further exploration and to study development of the area in future.

CHAPTER 2. OUTLINE OF THE ACTUAL SURVEY WORKS

2-1 Area and Term of the Survey Works

The survey area is located in the central part of the Narino Department, which occupies the southwestern part of the Republic of Colombia. The area is situated on the western slope of precipitous mountains of the Cordillera Occidental, which runs north to south in the western part of this Republic.

The survey area in this third phase of the program is a triangled area formed by linking Diamante, Paraiso and Bombona, in the southeastern part of the whole project area of 1,000 Km^2. It belongs to the Municipalities of Sta. Cruz and Piedrancha, Nariño Department, and the total area is approximately 24 Km^2.

The temperature is rather low, because the southern areas of Diamante and Bombona are situated at the altitude of 2,500 to 3,000 meters above sea level and the northern Paraiso area is also located approximately at as high altitude as 2,000 meters above sea level. However, generally they have pretty heavy rainfall and the dry season is only in the period between May and September. Access is hard as there is only horse path in the area, although vehicle road is available up to Guachavez. Therefore, a new road was constructed to the Diamante mine for the transportation of various machines in this phase of the survey program.

The actual works of the geological survey and the geochemical exploration were carried out during the period of 74 days between June 14th and August 26th in 1982, by 6 geologists, 4 from Japan and the other 2 from the Republic.

The diamond drilling was carried out in the mineralized zone including the main Diamante veins, succeeding the second phase of the survey program.

The total length of the drill holes is 1,335.9 meters with 8 holes. In this third phase, a new road for vehicles was constructed for the transportation according to the program, instead of helicopters. The actual works of the diamond drilling was carried out during the period of 152 days between July 5th and December 3rd, by 4 engineers sent from Japan. The schedule of the survey works is shown as following table.

ITINERARY

No.	Date	Day	Geological Survey Itinerary	Geological Survey Survey Contents	Drilling Survey Itinerary	Drilling Survey Survey Contents
1	6/14	M	Tokyo	Travel		
2	15	T	→ Bogota			
3	16	W	Japanese Embassy JICA INGEOMINAS	Courtesy call Work arrangement		
4	17	T	Bogota → Popayan	Travel		
5	18	F		Preparation		
6	19	S	Popayan → Pasto	Travel Foodstuff arrangement		
7	20	S	Pasto → Guachavez			
8	21	M	Diamante Paraiso	Field work		Commencement of road construction
∫						
22	7/5	M	"	"	Tokyo	Travel
23	6	T	"	"	→ Bogota	"
24	7	W	"	"	Japanese Embassy JICA INGEOMINAS	Courtesy call work arrangement
25	8	T	"	"	Bogota → Guachavez	Travel
26	9	F	"	"		Preparation
27	10	S	"	"	Guachavez → Diamante Diamante	Field work
∫						
			7/19 ∿ 7/25 Guachavez	Compilation	"	"
43	7/26		Diamante Bombona	Field work	"	"
∫						
57	8/9		"	"	"	"
58	10		Guachavez	Compilation	"	"
∫						
62	14	S	Guachavez → Pasto	Travel	"	"
63	15	S	Pasto → Popayan	"	"	"
64	16	M	Popayan	Compilation		
∫						
70	8/22	S	Popayan → Bogota	Travel	"	"
71	23	M	INGEOMINAS Japanese Embassy JICA	Verbal explanation of Survey results	"	"
			8/24 ∿ 8/26	Travel to Japan	"	"
∫						
141	11/1	M	Leader revisits to Colombia		"	"
∫						
147	7	S	Diamante	Core logging	"	"
∫						
152	12	F	"	"	"	Termination of drilling work
153	13	S	"		"	Demobilization
∫						
166	26	F	Guachavez → Pasto	Travel	Guachavez → Pasto	Travel
167	27	S	Pasto → Popayan	"	Pasto → Popayan	"
168	28	S	Popayan	Compilation	Popayan	
∫					12/1 ∿ 12/3	Travel to Japan
179	12/9	T	INGEOMINAS	Interim report		
180	10	F	Bogota	Travel		
182	12	S	→ Tokyo	"		

2-2 Method of the Survey Works

The survey works performed in this third phase of the survey program are geological survey, geochemical exploration by soil samples and diamond drilling in Diamante area. The geological survey and the geochemical exploration were carried out in 6 areas (from north, Paraiso area, Desquite area, Delicia area, Bombona northwest area, Gitana area and Diamante area), as indications of mineralization had been found in these areas. The geological survey was composed of mapping along the main river and streams as well as along the main roads, while the geochemical exploration was conducted by collecting soil samples along the cut-lines which are established in almost right angles across the direction of the extension of the mineralized zone (which is approximately N45° E to N60° E). The interval of the cut-lines is 125 to 250 meters and the points for sampling were set every lateral 25 meters along the lines.

Geochemical exploration works were also carried out in other areas than the detailed survey areas, by collecting soil samples with the interval of 50 meters along the ridges and streams, in addition to the geological mapping along the main streams and the main roads.

Easy land survey was carried out with the measuring tapes and simple transit compasses (Ushikata-made) along the survey routes, producing survey maps of the scale of 1 to 2,000. Localities of the sampling points and the details of the geological observation were mapped on this survey map. These route maps were compiled finally on the topographical map of the scale of 1 to 2,000 or 1 to 5,000.

For the geochemical exploration, three hand-augers and six pairs of hoes were prepared to collect samples from B zone, which had been produced through the weathering of the base rocks. It was pretty hard to collect samples, because the actual points of the sampling went as deep as 70 cm to

320 cm, with the average depth of approximate 160 cm.

The survey team was composed of total 6 or 7 members in a group, that is, 1 or 2 engineers, 1 assistant engineer and 3 helpers with a cook.

For the security in the works and for the smooth administration, a local office was opened in Guachavez, where a jeep was kept in case of the emergency. A wireless was also kept for the communication with Popayan and Bogota offices of INGEOMINAS, as well as with the survey camps for provision and emergency.

The approximate total amounts of the survey works performed in this phase of the program are as follows.

Surveyed area	24 Km^2
Total length of the routes surveyed	115 Km
Number of samples collected in the geochemical exploration	2,256
Number of thin sections of the rocks	16
Number of polished sections of the ores	15
Number of samples for whole rock analysis	5
Number of samples for age determination	2
Number of samples for X-ray diffraction	33
Number of samples for EPMA analysis	5
Number of samples for chemical analysis (ore)	50
Number of samples for trace element analysis	33

The diamond drilling in the second phase was carried out last year with the approximate interval of 200 meters in the northern part of the Diamante old workings.

In the third phase of the program, the interval of the drill holes narrowed and 100 meters interval was employed. The location of the drill holes were extended to about 300 meters south of the Diamante old workings, covering total length of 800 meters of the ore vein. Thus, various informations on the geology and the ore deposits were obtained successfully.

As the attitude of the ore vein was known to be almost vertical through the results of the diamond drilling in the second phase, the drill holes were planned to be inclined from the southwestern lowland toward the northeastern highland. In this way, many useful informations were obtained on the ore veins at the altitude of about 2,500 meters above sea level, in addition to some other information on the deep part of the same ore vein. At the end of the drilling works, the locations of all the drill holes, including those in the second phase, were surveyed in closing loop with easy transit compasses and measuring tapes, to make the locations of the drill holes plotted precisely.

The cores collected by the diamond drilling works were separated into two groups. The cores in which mineralization was recognized were split into two pieces with diamond cutters. One piece was crushed, milled and analysed, while the other was kept as core samples. The cores in which no mineralization was found were sent to INGEOMINAS, who collected the pieces of cores of the length of about 10 cm at the points of every 10 meters or at every point where different rock appears. These pieces have been kept as the reduced core samples. The amounts of the materials concerning the works of the diamond drilling are as follows.

Number of ore samples for the analysis	80
Number of thin sections of the rocks	16
Number of polished sections of the ores	24
Number of samples for X-ray diffraction	8
Number of samples for EPMA analysis	5
Number of samples for the measurement of filling temperature of fluid inclusions	20

2-3 Method of Analysis

As for the results of the field surveys, total 15 days of analysis works were held twice in the field, toward the end of July and in the middle of August, when rough survey maps were produced and various problems were picked up for resolution with the members of the counterpart. The chemical analysis of the samples collected in the geochemical exploration were completed at the laboratory of INGEOMINAS with a succeeding temporary interpretation of the assay value. Following statistic treatment and analysis were described in the logging sheets of the scale of 1/200, with the emphasis upon petrographical feature, variety and grade of alteration, conditions of fissilities and states of mineralization.

The informations thus obtained were compiled on the cross sections and were projected on the plan representing the geology and ore deposits at the altitude of 2,500 meters above sea level, and the continuity of the ore vein was examined. Also the results of the measurement of filling temperature of fluid inclusions were plotted on the cross sections for the study of the distribution of temperatures at which the minerals composing the ore vein were formed.

The results of the survey works were roughly conveyed verbally to the counterpart on 23 August with the withdrawal of the members of the geological survey and on 9 December, 1982, when the chief of the team was returning to Japan after completing drilling works. Also, toward the end of January in 1983, when every necessary analysis had been completed a meeting for the technical studies of the results of the survey works was held with two engineers of the counterpart, INGEOMINAS, who visited Japan.

2-4 Organization and Members of the Survey Team

Persons in charge of survey planning and negotiation in Japanese side:

Toshio Koizumi	Metal Mining Agency
Yozo Baba	- do -

Persons in charge of survey planning and negotiation in Colombian side:

Alfonso Lopez Reyna	INGEOMINAS	General Director
Raul Duran Rodriguez	- do -	Sub Director
Joaquin Buenaventura	- do -	Coordinator of Base Metal Project
Humberto Gonzales	- do -	Regional Director of Medellin

Members of the survey team in Japanese side:

Junnosuke Oikawa	Chief	MINDECO*
Yoshihiro Nagumo	Member (geology)	- do -
Minoru Saito	- do -	- do -
Shigehisa Fujiwara	- do -	- do -
Kiyotaka Obase	Member (drilling)	- do -
Tadatoshi Nasu	- do -	- do -
Kiyoshi Sakashita	- do -	- do -
Yoshihiro Nagata	- do -	- do -

Members of the survey team in Colombian side:

Abigail Orrego Lopez	Chief	INGEOMINAS	Regional Director of Popayan
Raul Munoz A.	Member (geology)	- do -	Geologist of Medellin
Humberto Caballero	- do -	- do -	Geologist of Medellin

* MINDECO is an abbreviation of Mitsui Mineral Development Engineering Co., Ltd.

PARTICULAR

PART I GEOLOGICAL SURVEY · GEOCHEMICAL EXPLORATION

PART I GEOLOGICAL SURVEY AND GEOCHEMICAL EXPLORATION

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CHAPTER 1. GEOLOGY

1-1 Outline of Geology

The area surveyed in this third phase of the program is underlain by shale, green volcanic rocks and granodiorites intruding the former two. Although, in some places along the ridges at the southernmost of the surveyed area, there are thin layers of volcanic ashes which are not consolidated yet and are derived from Quaternary volcanic activity, it is impossible to show them on the geological map because they occupy too small areas.

The above-mentioned rocks, except for the Quaternary volcanic ashes, are correlated as follows, according to the Narino quadrangle and its explanation notes by INGEOMINAS (1982).

* Shale is to the Dagua Formation (lower or middle Cretaceous)
* Green volcanic rocks are to the Diabasico Formation (probably upper Cretaceous)
* Granodiorite intrusive mass is to the Piedrancha batholith (Eocene or Miocene)

This correlation does not make good coincidence with the idea shown as a part of the conclusion of the survey report of the first phase of the program, which said as follows:

The Diabasa group is changing rock facies from volcanic rocks prevailing facies to sedimentary rocks from the lower level to the upper level, and the distribution is volcanic rocks in the west part and sedimentary rocks and partly volcanic rocks in the east part, and the general strike of the stratum reveals NNE-SSW. Structurally it represents a synclinorium structure with axis of N-S direction and intruding rock of granodiorite has appeared along the axis extending in a N-S direction.

In order to clarify the reason for this difference, careful observation of every outcrops and another investigation of the informations already in hand were carried out. However, it was impossible to find out obvious evidences to determine the relation of the strata. Further investigation would be necessary for this point.

1-2 Green Volcanic Rocks

The green volcanic rocks are composed of andesitic lava, agglomerate and tuff breccia. The rocks appear in color of green to dark green and are hard generally. The rocks are distributed mainly in the Diamante area and the neighbouring areas to the northwest of it. To mention about the relation of the rocks to the siliceous shale, the green volcanic rocks are thought to be lower stratigraphically than the siliceous shale, according to the results of the survey in the first phase, although no outcrop has been found in this survey area showing any boundary between them.

Under microscope (thin section No. QCPP49, M8021, Q1237) phenocrysts are mainly plagioclase, hornblende and biotite, and the texture is corresponding to that of andesitic volcanic rock. Actionolite and epidote are found as the secondary minerals in the rocks, and it is thought that this would show the rocks were metamorphosed to the green schist facies.

1-3 Shale

The shale is siliceous and light grey in color, apparently. In some places it contains thin layers of calcareous shale. As this rock is distributed in the eastern peripheral zone of the Piedrancha granodiorite intrusive body, extensive silicification, in some cases pyritization, is prevailed. Also there are evidences of thermal alteration in this shale. This shale is distributed in the eastern bank area of the middle-stream of Q. La Cruz and along the road between Paraiso and Guachavez.

Under microscope (thin section No. N-43, Q1129, HCA-14), the rock is composed mainly of quartz grains of the size of 0.1 to 0.2 mm. The minerals produced through the thermal alteration are contained. For instances, the calcareous parts include diopside while siliceous parts contain biotite and muscovite.

1-4 Piedrancha Granodiorite

This Piedrancha granodiorite is composed of the following three sorts of rocks.

(1) Fine grained granodiorite.

(2) Coarse grained granodiorite

(3) Aplite.

The main part of the Piedrancha granodiorite intrusive mass is composed of (1) and (2), which is distributed occupying most part of the survey area. The aplite shown as(3) is found localy in the form of small dykes intruding the former two. These intrusive rocks are thought to be derived from the magma of the same origin, from the viewpoints of the distribution and the chemical similarity. By the field evidences of intrusion, the sequenceof the intrusion of these three rocks is thought to have been (1)-(2)-(3)from the earlier stage to the later. By the result of the age determination by K-Ar isotopic method, the age of the coarse grained granodiorite is 6.5 $\pm$ 2.7 million years, which reveals that the intrusion of this granodiorite would have been at the end of Miocene Epoch in Tertiary Period.

The results of the analysis of the whole rock chemical assay of the two samples, RM-6 and F-9, collected in the survey in this third phase program, are shown in Fig. I-2, 3, 4. By Geotimes(1973), these rocks are classified granite or quartz monzonite. On the ACF diagram, they are plotted in the area of the rocks of igneous origin. It has been clarified that the fine grained granodiorite, represented by the sample F-9, is more basic than the coarse grained granodiorite, RM-6.

(1) Fine grained granodiorite

The fine grained granodiorite is hollocrystalline, composed mainly of biotite, hornblende, plagioclase and quartz, of the size under 2 mm in diameter. Under microscope, small amounts of apatite, zircon, sphene and magnetite are recognized. The color index, represented by the ratio of the amount of mafic minerals to that of whole minerals, is 25 to 30%, and it appears grey to dark grey. In places, idiomorphic crystals of biotite, about 3 to 4 mm in diameter, are contained where porphyritic texture is recognized. This fine grained granodiorite is distributed predominantly near the ridges along the border between Delicia area and Bombona area. It also is found in places as the xenolithes caught in the coarse grained granodiorite as mentioned in later paragraph. Along the stream Q.3 between Paraiso area and Delicia area, it was observed, when the going-upstream survey was carried out this year, that the coarse grained granodiorite is distributed in the downstream to middle-stream area and that the fine grained granodiorite in the upstream area.

(2) Coarse grained granodiorite

The color index of the coarse grained granodiorite is 20 to 25%. It is hollocrystalline, composed mainly of hornblende, biotite, plagioclase and quartz of the grain size of 4 to 5 mm in diameter, with such accessory minerals as orthoclase, muscovite, magnetite, apatite, zircon and sphene.

This coarse graine granodiorite, composes the main part of the Piedrancha granodiorite, and is distributed most prevailingly in the survey area. Along the marginal zone of this coarse grained granodiorite, especially in the Bombona area, it becomes rather fine grained, and increasingly toward the margin, many xenolithes of the rocks, which contains more mafic minerals and is thought to be of the same origin, are caught in this granodiorite. Sometimes is observed slight lineament (schlieren) produced by hornblende phenocrysts. This lineament has parallel orientation to that of the boundary of the wall of the intrusion.

The age of a sample of this coarse grained granodiorite, collected in a Paraiso area, has been determined to be 6.5 million years, which is the youngest of all the measurement values obtained in the Piedrancha area. On the other hand, the coarse grained granodiorite distributed in the Bombona area (sample No. B.-22) reveals 20.7 million years, which is also grouped into the Piedrancha granodiorite. Therefore, it is thought that coarse grained granodiorite might possibly be a composit complex of the rocks of the same kinds but of the different ages. An evidence for this idea is, as mentioned in the above paragraph (1), that there is an exposure where the coarse grained granodiorite is found to have intruded the fine grained granodiorite, cutting it clearly. Furthermore, through the examination of the ages obtained in 1980 - 1982, it has been clarified that the Piedrancha granodiorite is younger than the diorite or the granodiorite intruding the surrounding area of the Piedrancha granodiorite. It can be said there is a tendency that the younger the rocks are, the more acidic they are.

(3) Aplite

The aplite is leucocratic hollocrystalline intrusive rock. It is distributed in the middle-stream area and in the downstream area of the Q.2 stream and the Q.3, as well as in the downstream area of the Q.12. The width of the dykes varies from 0.1 to 10 meters. The aplite is found to have intruded the siliceous shale and the coarse grained granodiorite, and it is thought that the aplite would be one of the final products of the acidic igneous activities. No direct relation has been recognized between the aplite and the mineralization.

1-5 Geologic Structure

The following three systems of the lineament are recognized to be well developed in this survey area. (1) NW-SE, (2) NE-SW, (3) N-S. In addition to these systems another system of (4) E-W is also recognized slightly. The NW-SE system is most prevalent in the survey area, and is represented by the directions of the main rivers of the ore veins and of the fissures and joints found in the outcropped rocks. The N-S system is also prevalent although it is less frequently found than the NW-SE system. It is represented by the direction of small streams. The NE-SW system is also recognized by the direction of small streams. The E-W system is represented by the direction of joints in rocks in the northern part of the survey area.

As for the sedimentary rocks, it is hard to grasp the whole geologic structure because the area of its distribution are small and because the structure is much complicated owing to the intrusion of igneous rocks. However, according to the results of the regional geologic mapping in the first phase, it is thought that the sedimentary rocks form isoclinal foldings with the axes of the direction of NNE-SSW. It has been clarified through the analysis of the folding of the strata and the fissure systems that compressed pressure in east and west would have been intensively working to have produced sheared zones of NE-SW system and NW-SE system as well as compressed planes of N-S system and open cracks of E-W system. It is inferred that these systems would have worked at the period of the uplift of the basement, at the time of the intrusion of the igneous rocks, and at the period of the ore mineralization.

Table I - I Age Determination of Igneous Rock

Sample No.	Locality	Rock Name	Mineral	Ar^{40}	K^{40}	40Ar R/40K	Age M.Y	Remarks
RM-6	Paraiso	Granodiorite	hornblende	0.000192	0.503	0.000382	6.5 ± 2.7	*1
PD-1088	Diamante	Green volcanic rock	Whole rock	0.000996	0.791	0.001259	21.4± 1.5	

* 1 Hornblende concentrate, -80/+200 mesh

Treated with dilute HF and HNO_3 to remove alteration.

$\lambda e = 0.585 \times 10^{-10}$/year

$40K/K = 1.22 \times 10^{-4}$ g/g

$\lambda \beta = 4.72 \times 10^{-10}$/year

40 ArR : Radiogenic argon 40

$$Age = \frac{1}{\lambda e + \lambda \beta} \ln \left[\frac{\lambda \beta + \lambda e}{\lambda e} \times \frac{Ar^{40}}{K^{40}} + 1 \right]$$

Table I -2 whole Rock Analysis and Calculation of Normative Minerals

	Sample No.	RM-6	F-9	PD 1088
		granodiorite	granodiorite	green volcanic rock
Elements	SiO_2 Weight%	63.22	58.29	52.77
	TiO_2	0.53	0.66	0.73
	Al_2O_3	16.08	16.27	17.61
	Fe_2O_3	2.49	3.08	4.04
	FeO	3.44	4.19	4.84
	MnO	0.14	0.16	0.11
	MgO	2.60	3.79	6.03
	CaO	5.82	6.75	6.03
	Na_2O	2.93	2.85	4.72
	K_2O	2.12	1.80	1.31
	P_2O_5	0.16	0.22	0.24
	CO_2	0.00	0.00	0.00
	H_2O^+	0.16	0.41	0.53
	H_2O^-	0.30	0.59	0.12
Total		99.99	99.06	99.08
Normative minerals	Q	21.34	14.48	0
	OR	12.59	10.85	7.86
	AB	24.91	24.59	40.57
	AN	24.58	26.80	23.36
	Salic Total	83.41	77.13	71.80
	WO-DI	1.41	2.45	2.27
	EN-DI	0.85	1.57	1.59
	FS-DI	0.48	0.72	0.48
	EN-HY	5.65	8.06	8.58
	FS-HY	3.18	3.72	2.60
	FO-OL	0	0	3.59
	FA-OL	0	0	1.19
	MT	3.63	4.55	5.95
	IL	1.01	1.28	1.41
	AP	0.37	0.52	0.56
Femic Total		16.59	22.87	28.20
D.I = Q + OR + AB		58.83	50.32	48.44
Weight Percentage	Q	25.58	19.29	0
	AB + Or	44.95	45.95	67.46
	An	29.47	34.75	32.54

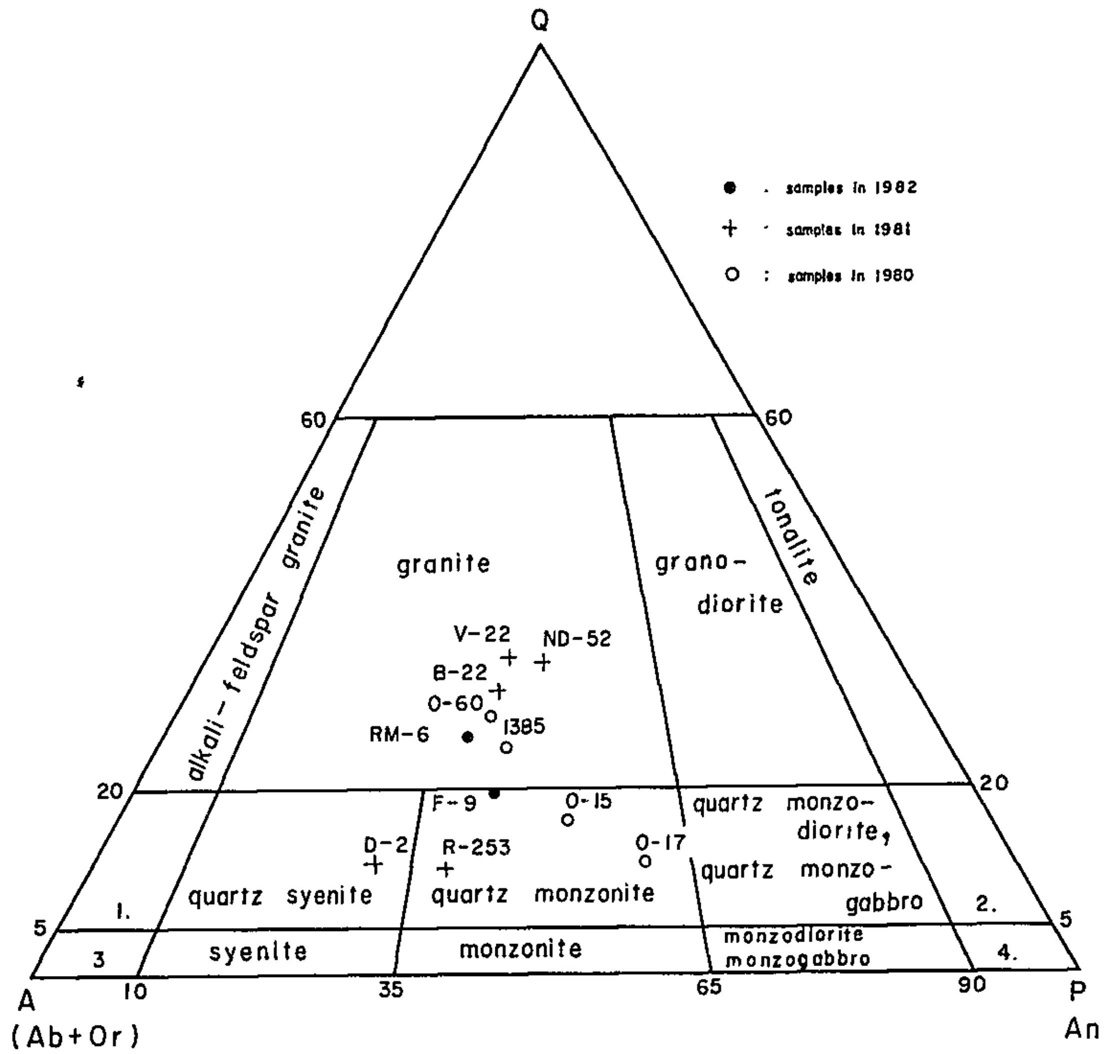


Fig. I-2 Normative Plagioclase (anorthite) — Alkali Feldspars (orthoclase + albite) - Quartz Diagram (Geotimes, 1973)

1. alkali - feldspar quartz syenite 2. quartz diorite, quartz gabbro, quartz anorthosite 3. alkali - feldspar syenite 4 diorite, gabbro, anorthosite

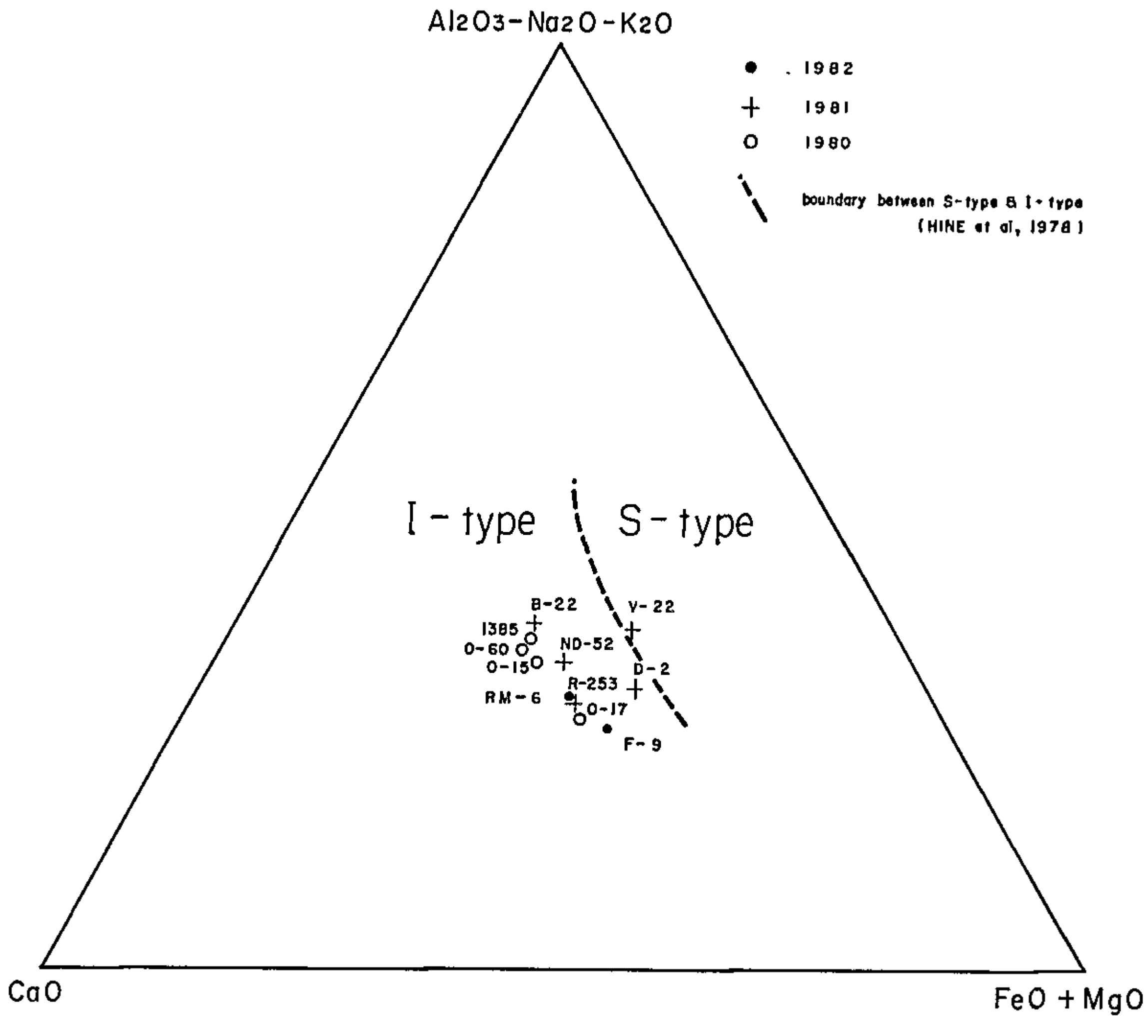


Fig I-3 ACF Diagram (molar ratios, $A = Al_2O_3 - Na_2O - K_2O$, $C = CaO$, $F = FeO + MgO$) for Granitic Rocks

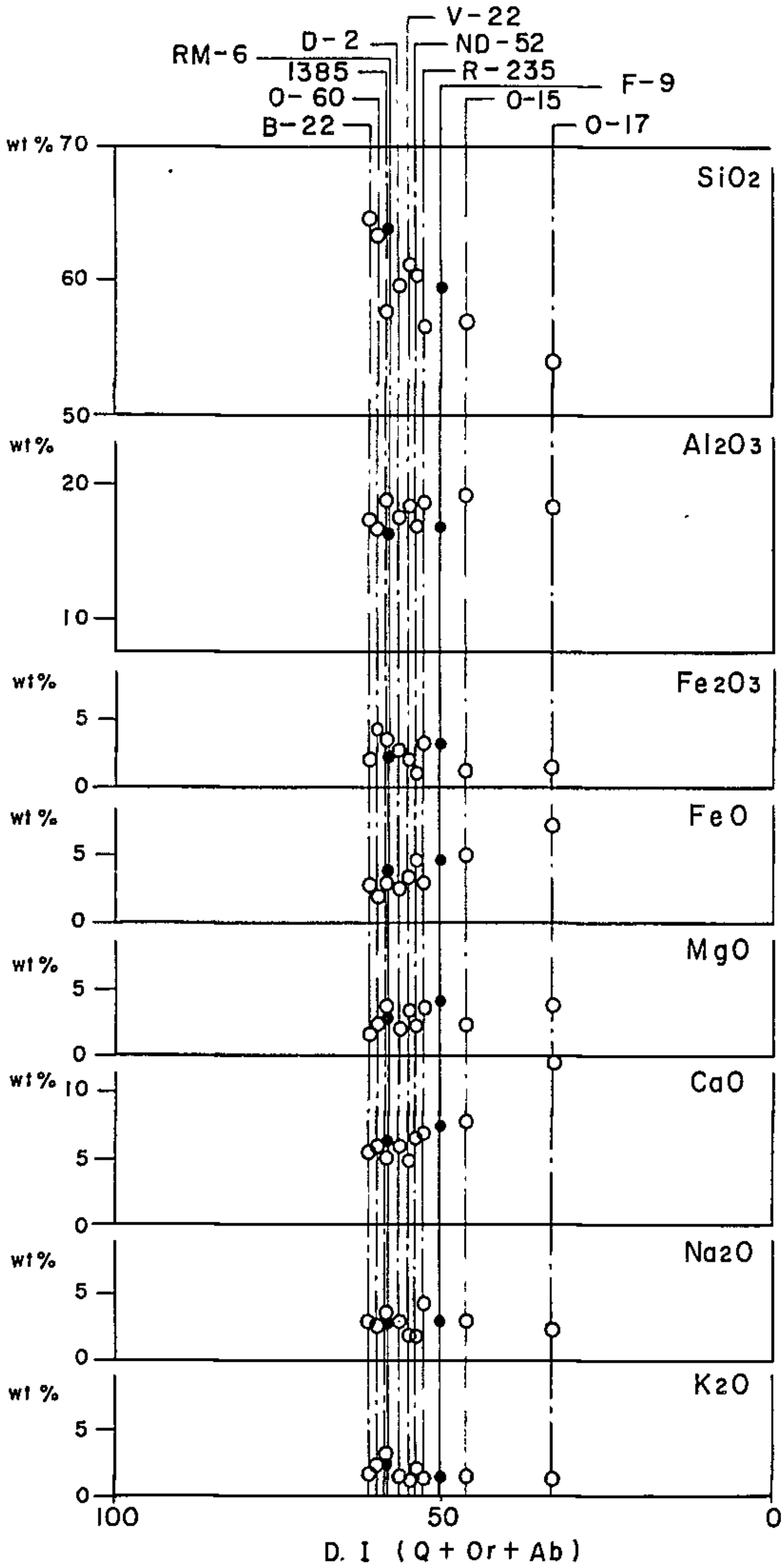


Fig.1-4 Variation Diagram of Granitic Rocks

—·—O—·— : samples in 1980, 1981

———●——— ; samples in 1982

CHAPTER 2. GEOCHEMICAL EXPLORATION

2-1 Indicative Elements

The geochemical exploration was carried out with geological survey last year by collecting soil samples in the Diamante area and in some parts of the Bombona area in the second phase of the survey program. For this geochemical exploration, arsenic and zinc were adopted as the indicative elements. The reason why these two elements were employed as the indicative elements for the geochemical exploration was that the known quartz veins in the survey area usually contain arsenopyrite, that sphalerite, though in small amount, is also recognized associated with chalcopyrite and galena, that both arsenic and zinc are known to be easily dispersed, that the chemical analysis is less expensive than that of mercury, gold etc., and that arsenic is employed very often as the indicative element for geochemical exploration for auriferous ore deposits.

As the result of employing these elements, it has been clarified that the distribution of the geochemical anomalies is well corresponding with the area where indications of mineralization are known to be. Considering that the width of ore veins found in this survey area is as narrow as less than 1 meter, the geochemical exploration in this phase was programmed to extract mineralized zones more efficiently by making the intervals of the sampling points narrower and by making use of arsenic and zinc as the indicative elements, which had been proved to be quite useful for this type of geochemical exploration for soil.

2-2 Treatment of Samples and Method of Chemical Analysis

All the soil samples totalling 2,256, collected in the works, were left dried naturally at the survey sites or at the base camp. After sieving, the materials as fine as under 80 mesh were divided into quarters, one of which was sent to the laboratory for chemical analysis. The chemical analysis was carried out at the Bogota central laboratory of INGEOMINAS, by atomic absorption method. The limit of determination in this analysis was 1 ppm. The results of the chemical analysis is shown in Appendices I-1.

2-3 Method of Analysis

Geologically, the survey area is underlain by granodiorites, green volcanic rocks and shales. As they are different chemically one another, it is thought that the contents of arsenic and zinc in every sampling point are different according to the difference of basement rocks. Therefore, the results of the chemical analysis were grouped into several categories according to the rock underlying each sampling point, for the statistic treatment of the values.

Taking common logarithms of all the assay values, their average, standard deviation, correlation coefficient etc. were calculated. The histogram and the cumulative frequency curve were prepared. These calculation was performed a computer transaction programmed by MINDECO. Anomalous values were decided by the graphical solution, with the bending points of the cumulative frequency curve to be taken as the threshold, referring the method developed by C. Lepeltier (1969). In the process of the calculation, the values of less than 1 ppm are treated as 0.1 ppm.

2-4 Results of Analysis

2-4-1 Results of Calculation

The results of the calculation of the assay values are shown in Table I-3-1. The average value of arsenic contained in the samples collected in the area of the coarse grained granodiorite is same as that of the samples collected in the area of the fine grained granodiorite. Also the average values and the standard deviations of zinc in both of the area are almost same.

The average value of arsenic of the samples collected in the area of the green volcanic rocks is higher by 9 ppm than that of the samples in the granodiorites, while the average value of zinc of the former is higher by 5 ppm than that of the latter. Therefore it is thought that they would belong to different groups. The average values of arsenic and zinc of the samples collected in the area of the shale are pretty high, but because the number of samples is as small as 27, these values are treated in a group with the values of the samples collected in the area of the green volcanic rocks, which have comparatively similar values to those in the shale area. The degree of correlation between arsenic and zinc values is highest (correlation coefficient = 0.55) with the samples collected in the area where the green volcanic rocks are distributed, followed by the samples in the areas of the granodiorites and of the shales. In Fig. I-5, diversion of the correlation is shown, totally and individually with each of the rock types.

2-4-2 Selection of Anomalous Values and Division of Grades

It is desirable for the statistical analysis that the number of samples is as large as possible and that the conditions are as simple as possible. Therefore, for the selection of the anomalous values, samples were divided into two categories. The one is a group of the samples collected in the area where the green volcanic rocks and/or the shales are distributed.

Fig. I-6 is a histogram, in which individual and totally treated data are shown.

Normal distribution is not recognized with arsenic, but the peak is found toward the lower values, which is remarkable especially with the samples in the granodiorite area. On the other hand, the distribution of zinc is almost normal, except for the portion of the lower and higher values.

A cumulative frequency curve was drawn (Fig. I-7) by getting arsenic and zinc values accumulated respectively from the highest. Taking the bending point of the curve to be the threshold, it is decided that the values higher than the threshold are taken to be anomalous. Also, as for arsenic, three grades of anomaly have been established by dividing the distributing areas of the values higher than the threshold into three blocks by logarhythmically equal interval on the figure. They are called strong anomaly, intermediate anomaly and weak anomaly. In case of zinc, two grades, strong anomaly and weak anomaly, are established by the same method except that the division is into two blocks on the figure. The results of these works are shown summarized in Table I-3-2. The proportion of anomalous values of arsenic against the whole is different from that of zinc by several times. For instance, anomalous values of arsenic are 26% in the granodiorite area while those of zinc are 3.5%, as shown in Fig. I-7-1. The tendency is same in the area where the green volcanic rocks or the shales are distributed. It is thought that this fact would reveal the following character of the mineralization. That is to say, arsenic is more aboundantly and more prevailingly distributed in this area compared to zinc, as arsenic would be related to the mineralization, while zinc is concentrated locally. The assay results of the ore are showing that the average value of arsenic and zinc are 0.9% and 0.3% respectively. It is thought from this fact that the mineralization would have carried more arsenic than zinc.

2-4-3 Distribution of Anomalies

Taking the aggregate of anomalous values of arsenic and zinc, as shown in Table I-3-2, to be anomalous zones, geochemical exploration map has been prepared by plotting the distribution of these anomalous zones. The direction of extension of each anomaly was estimated, on the basis of the information on the directions of the known ore veins and old working tunnels. There are many anomalous zones thus extracted, each of which has the width of several ten to several hundred meters, extending NW-SE, as shown on the geochemical exploration maps. All the anomalous zones are summarized and listed in Table I-4.

The outline of the individual anomalous zone is described in the following.

(1) Gitana-Marina anomaly: This is a weak anomaly found from the eastern part of the Mina Gitana Segunda to the survey line of D-41. Along this D-41 line, intense anomalies are recognized spots.

(2) Gitana-NW anomaly: This anomalies is possibly divided into 5 zones. Among them, the most prevailed anomalies, Gitana-NW (A), (B) and (C) zones, are recognized at the north-north-west of the Gitana Primera mine. Three intense anomalies of arsenic of the size of 20 - 40m x 150 - 200m are recognized in the direction of NW-SE. The anomalous zones carry weak to intense zinc anomaly. Granite dyke is found near this geochemical anomaly. In the northwest of the Gitana Primera mine, there is an arsenic anomaly of Gitana-NW (D), which is thought to be a mineral indicated continued from the ore deposit in the mine. The extension of this anomaly is recognized in further northwest. In the south of the (D) zone, another anomaly of arsenic, Gitana-NW (E), is recognized in the direction of NW-SE, with almost same size as that of (D) zone. It is thought that the above-mentioned anomalies would represent mineralization shown by possible parallel veins or continuation of veins extending from those in the Gitana Primera

mining area.

(3) Desquite anomaly: This is a zinc anomaly of the size of about 700 meters in length with the approximate width of 100 meters, extending from the Desquite mining area. The anomaly is not accompanied with arsenic anomaly, which is different from the conditions of the other anomalies.

(4) Q. Lulo anomaly: This is the arsenic anomaly related both to the quartz vein found at Q. Lulo and to the ore vein found at Q. La Cruz. Continuity is poor and small anomalies are distributed intermittently.

(5) San Antonio anomaly: The main part of this anomaly is intermediate and weak anomalous zone of arsenic of the size of 50m by 500m, extending to east-south-east from the San Antonio mine. Small and weak anomalous zones of zinc and arsenic are distributed around the main anomaly.

(6) San Antomio-S anomaly: This anomaly is represented by the arsenic and zinc anomalies, related to the quartz vein (Jarol indication of mineralization) found in the north-west of the cut-lines, Q.2 and F-6. The intervals of lines in this area are too rough to obtain detailed information.

(7) San Luis anomaly: This is an arsenic anomaly, about 2 kilometers long with the approximate width of 250 meters, extending in the southeast, to the cut-line of F-1 from the San Luis mine. In places, strong arsenic anomalies are recognized to certain extent along the extension zone of the known ore veins. In many cases, zinc anomalies are distributed in small sizes and are overlapped on the arsenic anomalies.

(8) San Luis W-1 anomaly: Parallel to the San Luis anomaly in its west, this anomaly is distributed from the cut-line of D-5 to that of F-1. This is an arsenic anomaly and would possibly be linked to the clay vein found along the cut-line of F-3.

(9) San Luis W-2 anomaly: This anomaly is a strong to weak arsenic anomaly, distributed along the ridge in the west of the San Luis W-1 anomaly. It is thought that the anomaly extends in the direction of NW-SE, but the details of its extension are not certain because the anomaly is located near the boundary of the survey area. A float of pyrite-quartz mass, about 1 meter in diameter, was found along the cut-line of D-6.

(10) Delicia anomaly: This is an arsenic anomaly, extending in the north-west of the Delicia mine. The width of the anomaly is increased along the cut-lines of F-3E and F-2E. Possibly it would extend about 2 kilometers to the quartz vein found along the cut-line of Q.3N. Viewing from the direction of extension, this arsenic anomaly is thought to be the same one as the San Luis W-2. Along the cut-line of F-3, there are high grade points of arsenic and zinc.

(11) Delicia-NW anomaly: Although parallel to the Delicia anomaly, this anomaly is not continuous in its northern part. Several arsenic anomalies are distributed. It is thought that they are linked in the direction of NW-SE. Possibly it is linked to the anomalous zones found along the cut-lines of F-2E and Q.3, but details are not certain.

(12) Delicia-W anomaly: This anomaly is composed of anomalous values of arsenic, recognized along the cut-lines, F-3E and F-4E. Because the interval of the lines is too rough, details are not certain.

(13) Bombona N anomaly: Anomalous arsenic values recognized along the cut-lines of F-3W and F-2W are regarded as an anomaly by linking them. Direction is in NW-SE and the size is 250 meters by 1,000 meters. Especially along the cut-line of F-3W, there are several high grade points of arsenic.

(14) Bombona NW anomaly: Arsenic anomalous zones widely recognized in the

Bombona-NW area are grouped and taken as three anomalies. Bombona-NW (A) zone is recognized between the right bank of Q. Bombona and Q.17, and composes weak to intermediate anomaly extending intermittently in the direction of NW-SE. No ore veins or ore deposits have been found yet in this anomaly. It is thought that Bombona-NW (B) and (C) anomalies are related to several ore veins as found along Q.18. These anomalies have possibility to extend to further west beyond the cut-line of D-10N, which is located along the western limit of the survey area.

(15) Distribution of anomalous values along streams: In some cases, the samples collected along the streams would show very high assay values. For example, most of the values of the samples along Q.11N, Q.9, Q.3, Q.4 and Q.Bombona are abnormally high. It is thought that the reason would be the contamination by stream water which played great role for the transportation of such element from mines or ore veins located in the upstream area. Therefore, they are not regarded as anomalies.

Table I-3-1 Statistic Data of Soil Samples

Mother Rock Type	Element	Number of Samples	Mean (ppm)	Minimum Value (ppm)	Maximum Value (ppm)	Standard Value Deviation	Correlation Coefficient
C. G	Zn	1788	36.6	7	850	23.8	0.343
	As	1788	2.8	1-	2000+	13.0	
F. G	Zn	101	38.9	11	338	32.5	0.384
	As	101	2.8	1-	2000+	13.6	
G. R	Zn	340	43.8	11	564	31.2	0.552
	As	340	11.9	1-	2000+	25.8	
S. H	Zn	27	62.5	9	820	91.3	0.293
	·As	27	17.7	3	200	40.9	
C. G + F. G	Zn	1889	36.7	7	850	24.3	0.345
	As	1889	2.8	1-	2000+	13.0	
G. R + S. H	Zn	367	44.9	9	820	35.3	0.521
	As	367	12.2	1-	2000+	26.9	
All	Zn	2256	37.9	7	850	26.1	0.385
	As	2256	3.6	1-	2000+	16.6	

Abbreviation

C.G. : Coarse grained granodiorite, F.G. : Fine grained granodiorite

G.R. : Green volcanic rock, S.H. : Shale

1- : Less than 1 ppm, 2000+: More than 2000ppm

Table I-3-2 Results of Graphic Analysis

Element	Threshold value and classification of anomaly		Mother Rock Type: C. Gd + F. Gd	Mother Rock Type: GR + SH
Zn	Threshold value		t_{Zn} = 83 ppm	t_{Zn} = 112 ppm
	Background value		Zn < 83 ppm	Zn < 112 ppm
	Anomaly	Strong	$145^{ppm} \leqq$ Zn	$188^{ppm} \leqq$ Zn
		Weak	$83^{ppm} \leqq$ Zn < 145^{ppm}	$112^{ppm} \leqq$ Zn < 188^{ppm}
As	Threshold value		tAs = 6 ppm	tAs = 18 ppm
	Background value		As < 6 ppm	As < 18 ppm
	Anomaly	Strong	$98^{ppm} \leqq$ As	$135^{ppm} \leqq$ As
		Intermediate	$24^{ppm} \leqq$ As < 98^{ppm}	$50^{ppm} \leqq$ As < 135^{ppm}
		Weak	$6^{ppm} \leqq$ As < 24^{ppm}	$18^{ppm} \leqq$ As < 50^{ppm}

C.Gd : coarse grained granodiorite, F.Gd : fine grained granodiorite

G.R : green volcanic rock SH. : shale

Table I-4 List of Geochemical Anomalous Zone

	Anomalous Zone		Direction	Width and Length (m)	Number of Anomalous Samples					Related geology
					As			Zn		
					S	S+I	S+I+W	S	S+W	Mine, vein
1	Gitana-Marina		N50°W	100 x 1000	1	1	7	1	1	Mina Gitana Segunda Mina Marina
2	Gitana-NW	Gitana-NW (A)	N45°W	30∿120x200+	2	3	6	1	1	
		" (B)	N50°W	100∿200x600+	8	13	28	4	6	Granite dyke
		" (C)	N45°W	50 x 400?			11		2	
		" (D)	N55°W	50 x 800?	1	3	8	1	1	Mina Gitana primera
		" (E)	N55°W	70 x 800?		6	11		1	
3	Desquite		N45°W	100 x 700			3	4	11	Mina Desquite
4	Q. Lulo		N60°W ∿N45°W	200 x 1500?		1	20		3	Quartz vein
5	San Antonio		N70°W	300 x 1600?		4	17		3	Mina San Antonio vein
6	San Antonio-(S)		N55°W	300? x 2400?		3	23		4	Vein
7	San Luis		N50°W	200∿400x2000+	9	21	60		4	Mina San Luis vein
8	San Luis-W (1)		N50°W	100∿400x1200+	4	13	29		3	
9	San Luis-W (2)		N35°W	100∿300x 700+	3	14	20		4	
10	Delicia		N55°W	100∿400x2000?	5	19	44	2	5	Mina Delicia vein
11	Delicia - NW		N55°W	400? x 1500?	3	7	17	2	4	
12	Delicia - W		N55°W	100∿200x1000?		1	6		2	
13	Bombona - N		N55°W	250 x 1000+	2	3	12		2	
14	Bombona-NW	Bombona-NW (A)	N40°W	50∿100x1000?	1	6	16		1	
		" (B)	N50°W	200 x 800+	3	16	31		2	vein
		" (C)	N55°W	200 x 800+	5	16	40	2	4	vein

S: Strong anomaly, I: Intermediate anomaly, W: weak anomaly

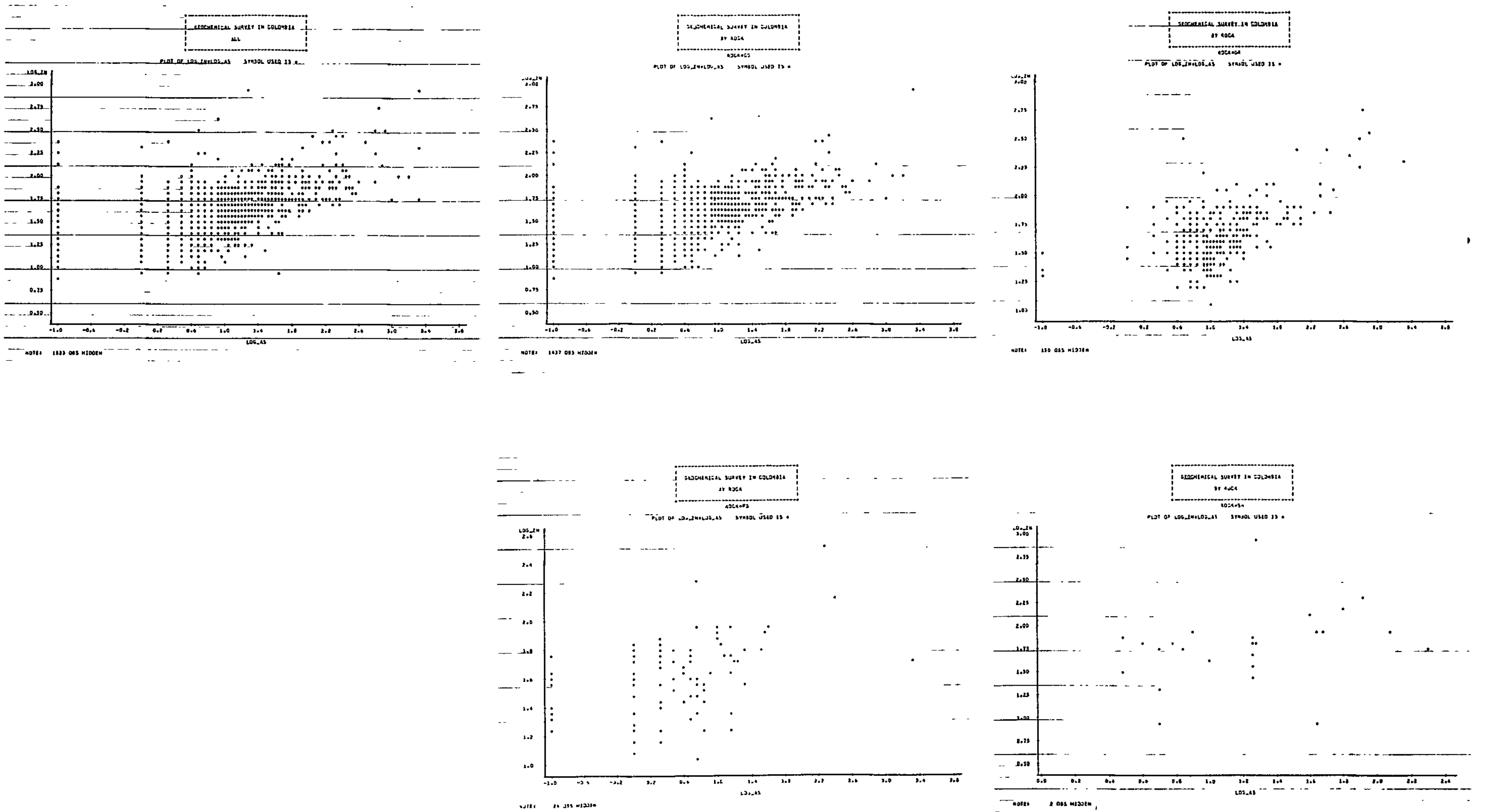


Fig. I-5 Log Zn versus Log As Distribution Map.

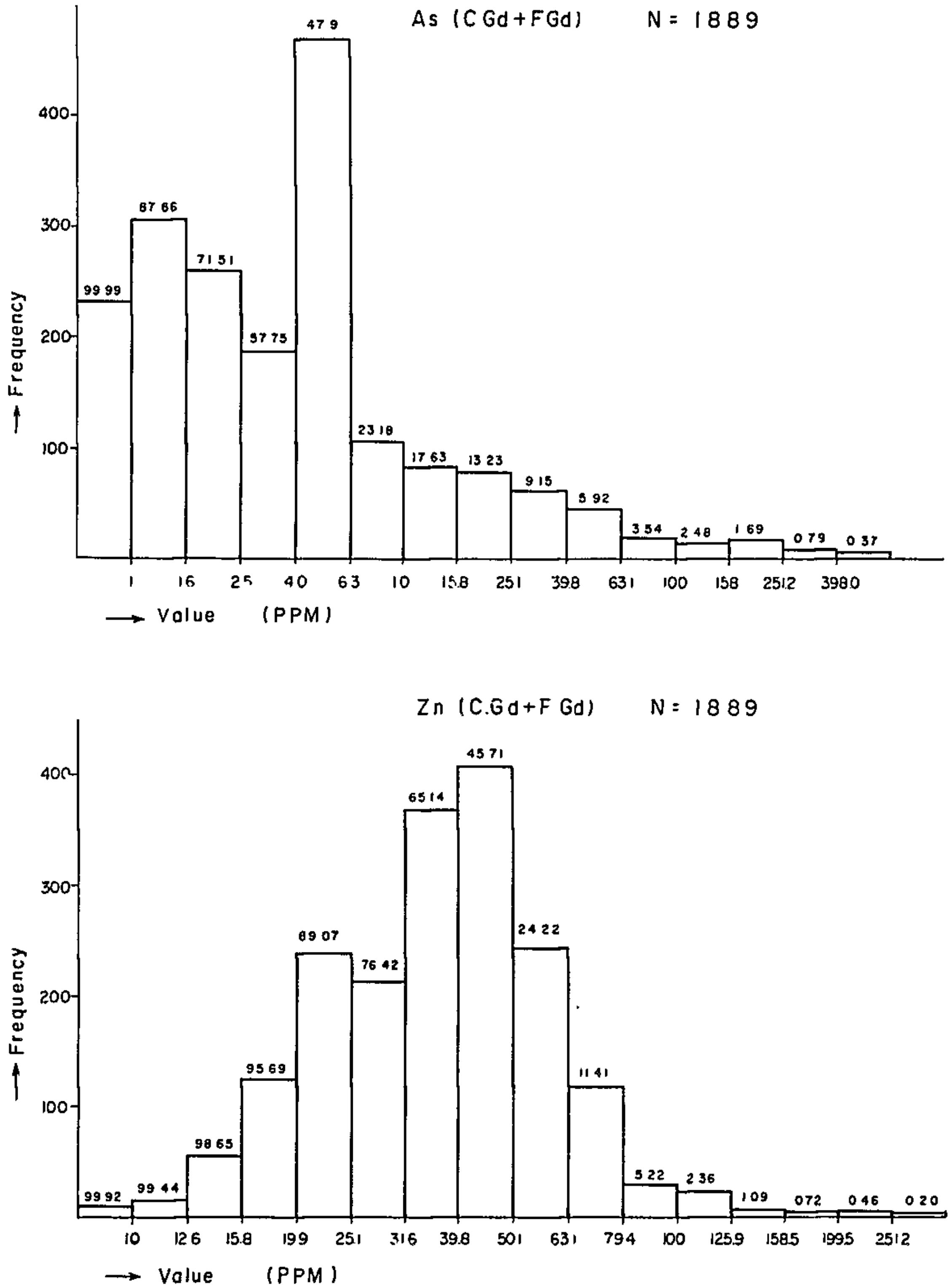
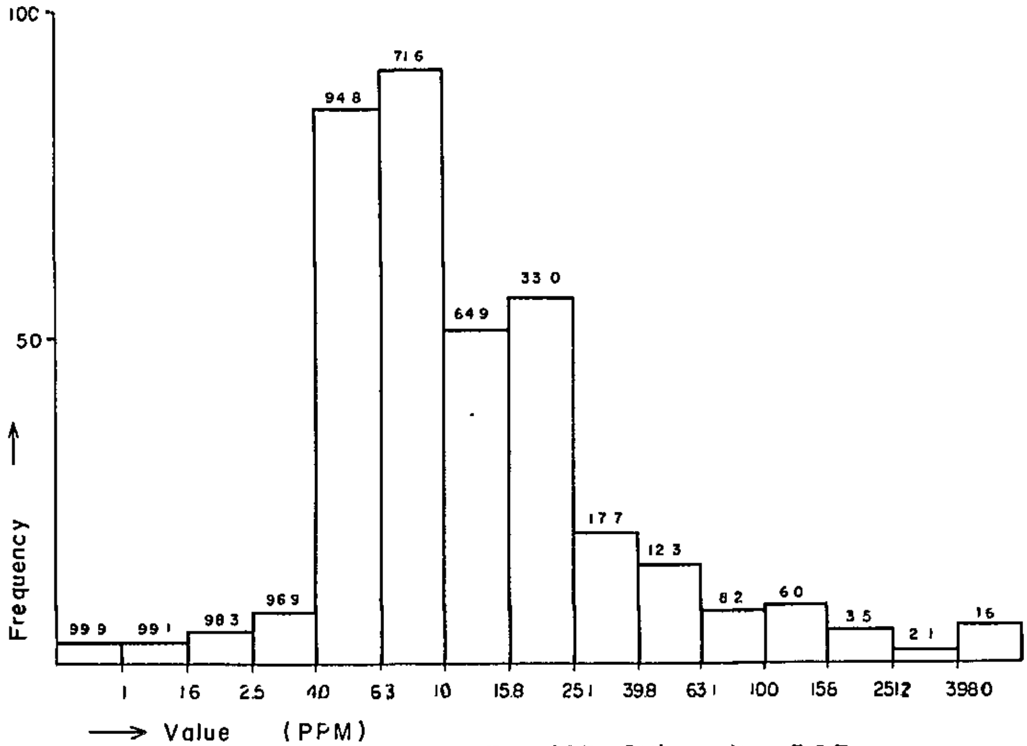


Fig. I-6-1 Histogram for Granitic Rock

(the figures above the column are cumulative frequency percentage)

As (GR+SH) N = 367



Zn (GR+SH) N = 367

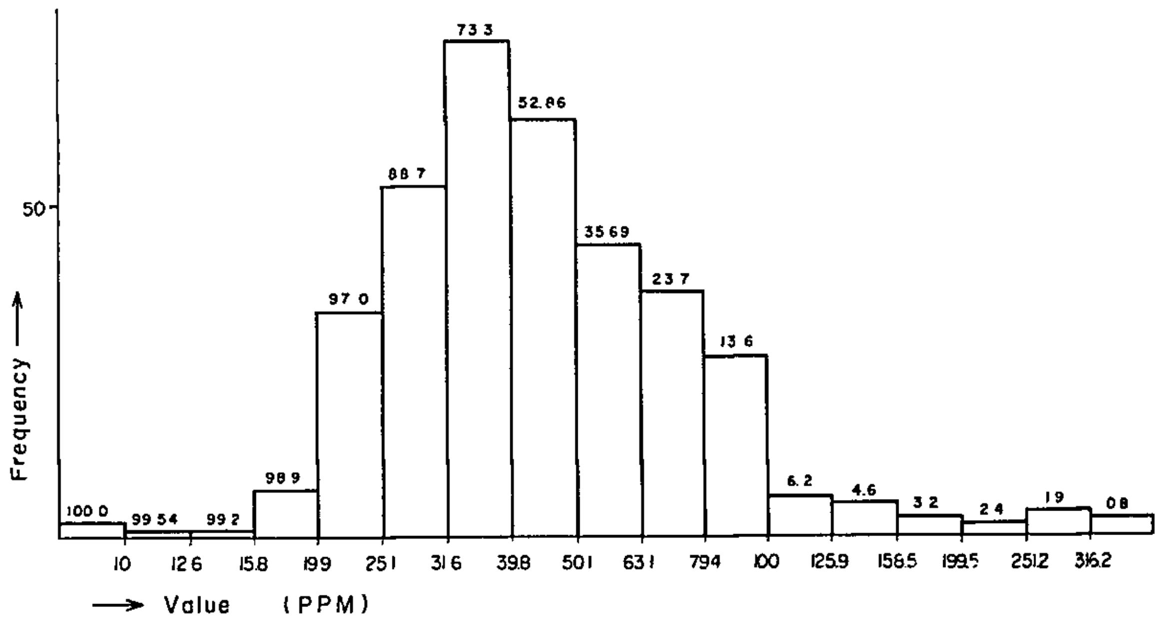
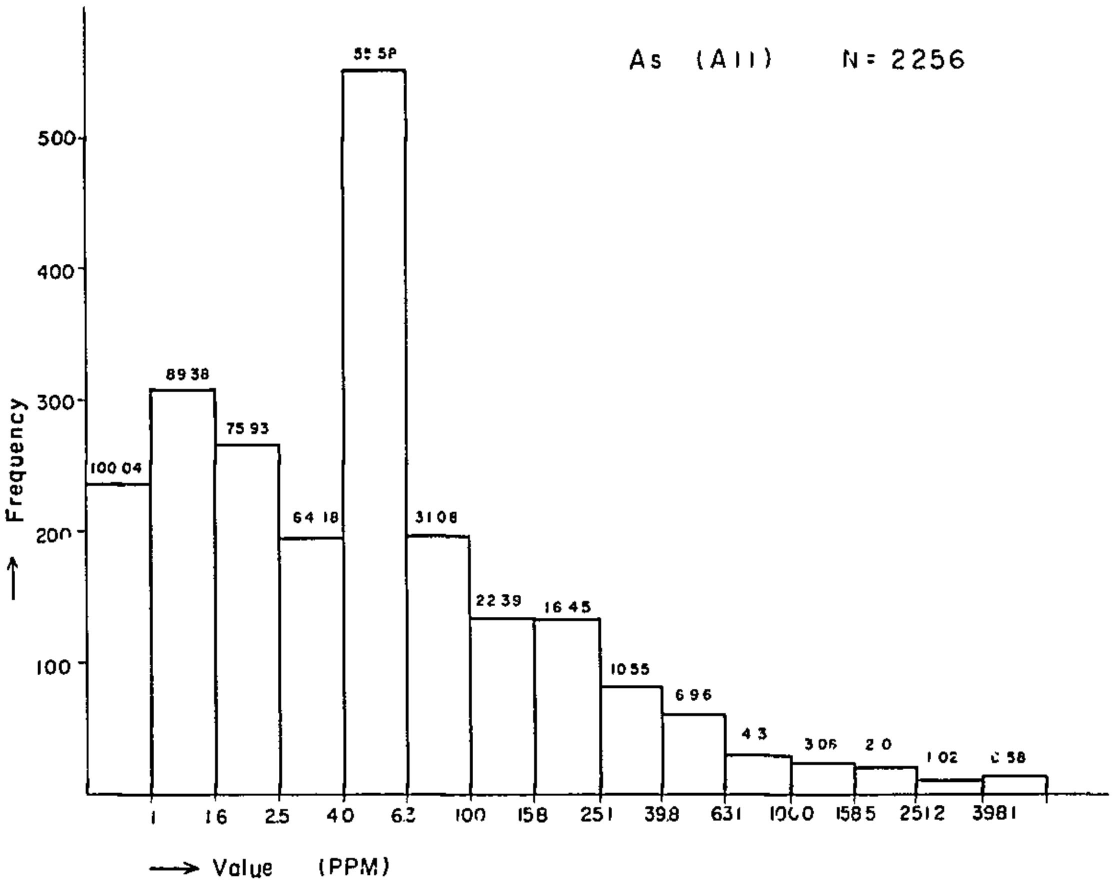


Fig I-6-2 Histogram for Shale and Greem Volcanic Rock

(the figures above the column are cumulative frequency percentage)



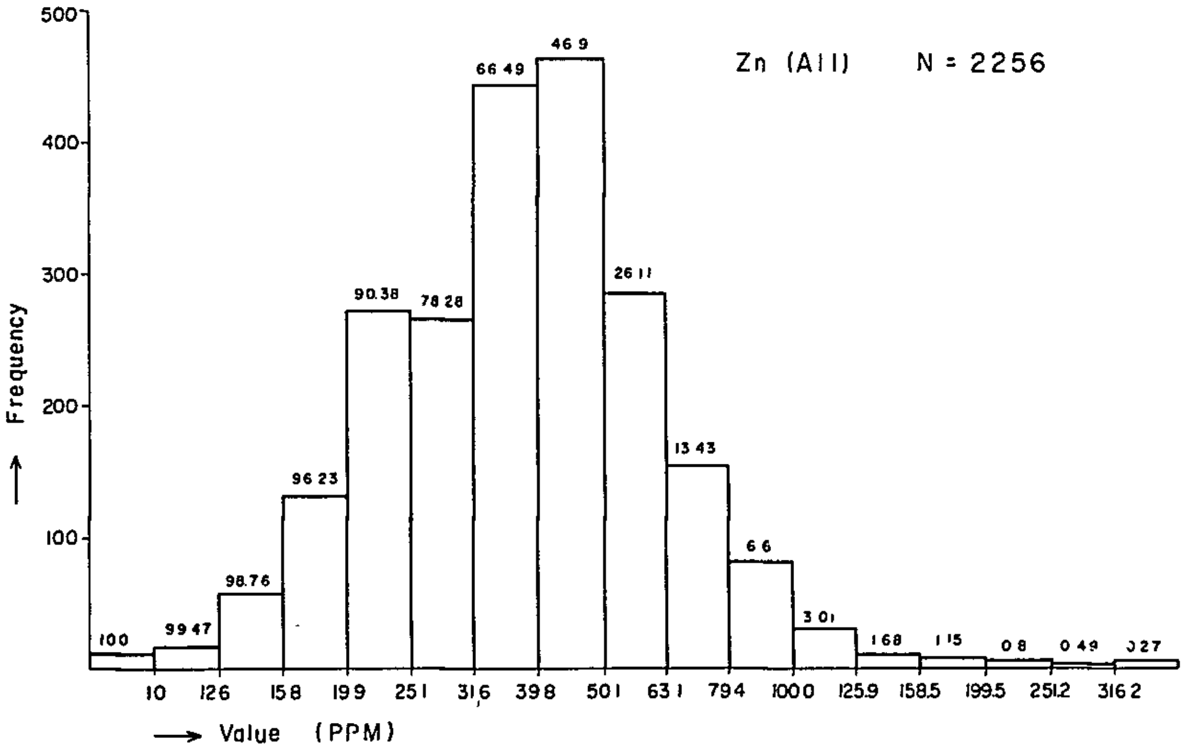


Fig. I-6-3 Histogram for All Rock Types

(the figures above the column are cumulative frequency percentage)

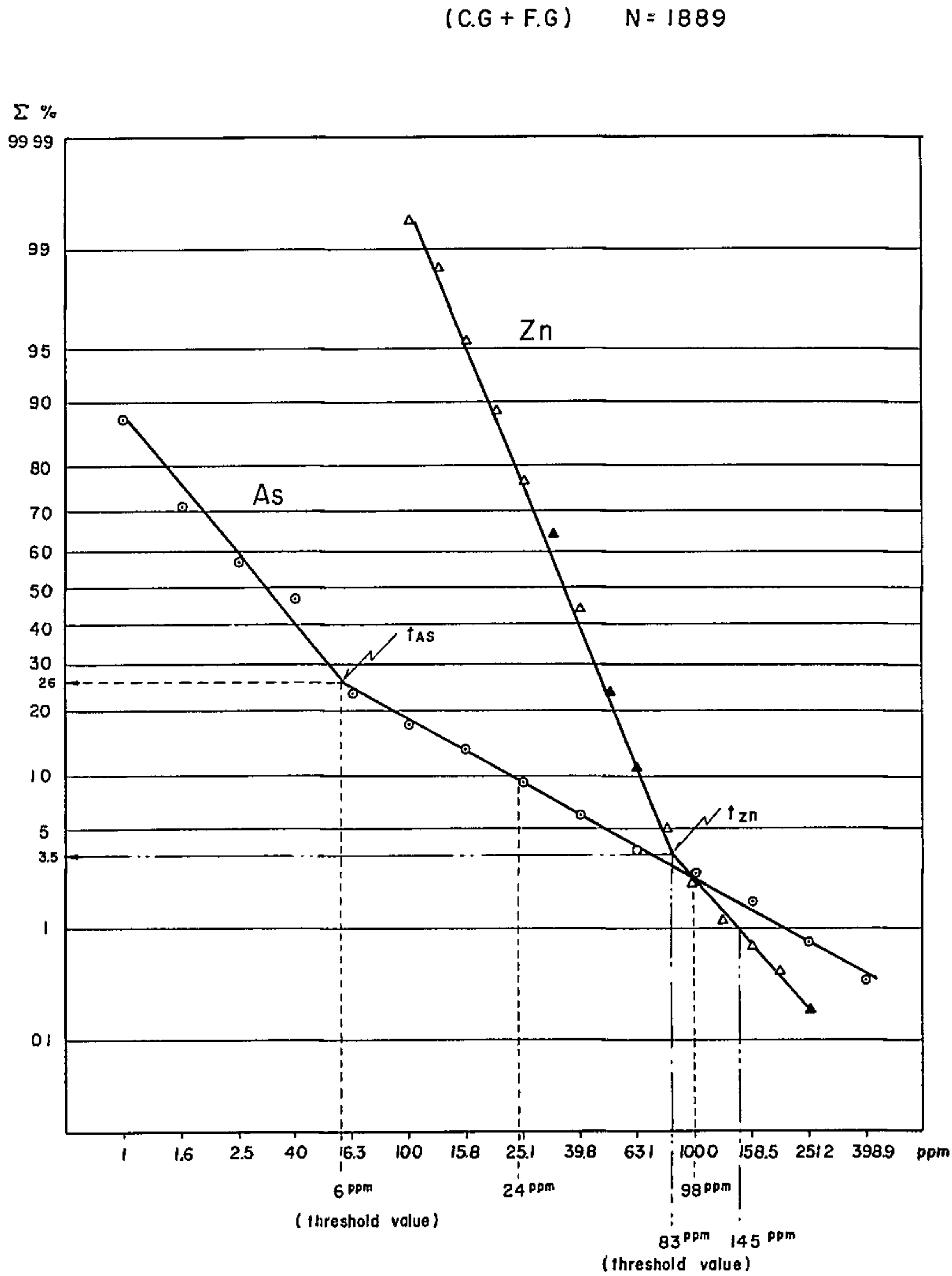


Fig. 1-7-1 Cumulative Frequency Distribution Curve for Granitic Rock Area

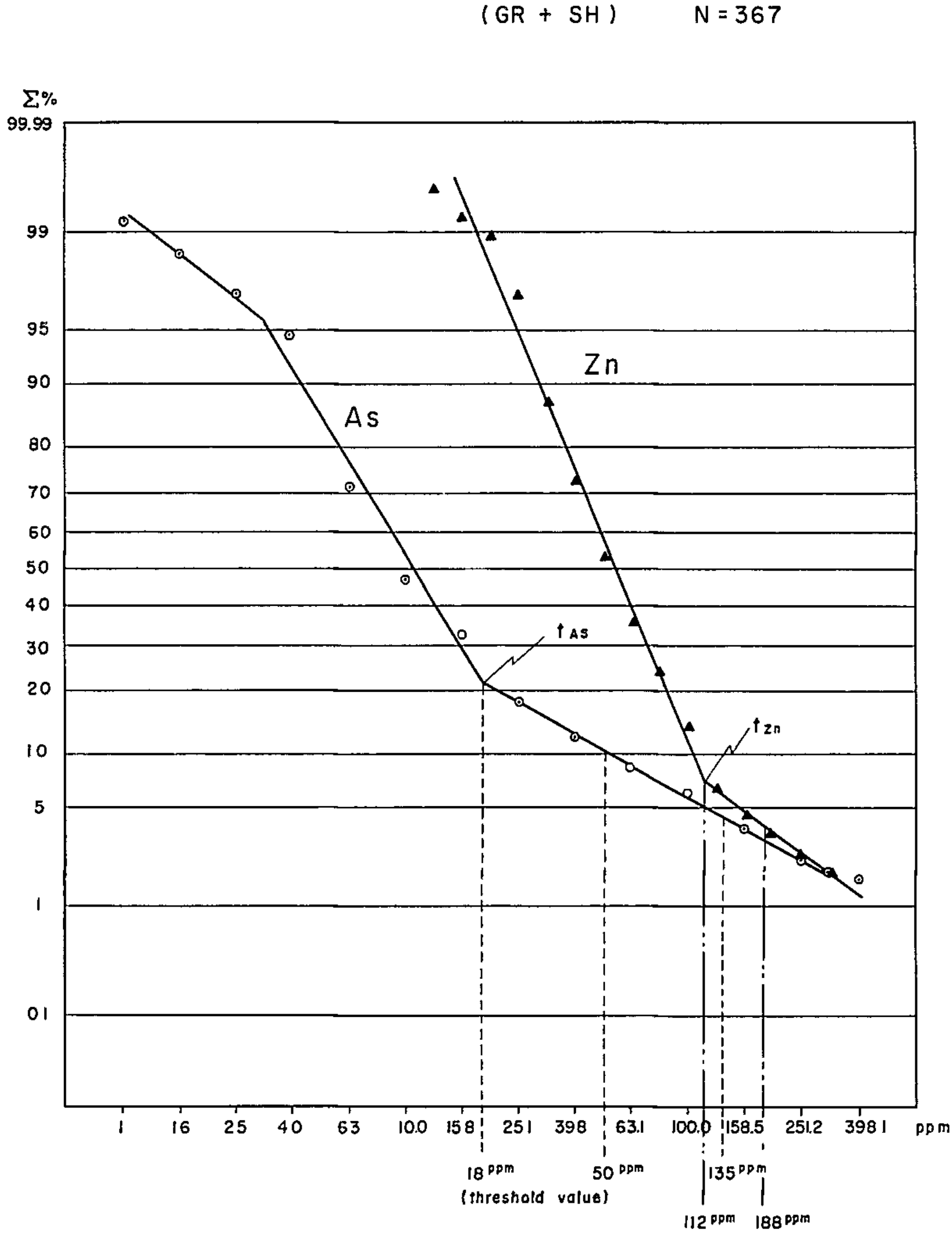


Fig. I-7-2 Cumulative Frequency Distribution Curve for Shale and Green Volcanic Rock Area

CHAPTER 3. ORE DEPOSITS

3-1 Outline of Ore Deposits

The ore deposits distributed in this survey area is gold ore veins of fissure-filling type. This is the sole type of ore deposits found in this area. The ore veins are emplaced in the green volcanic rocks and in the granodiorites, and are composed of quartz veins associated with pyrite, arsenopyrite, sphalerite and other sulphide minerals. The general trend of the ore veins are NW-SE, and the width of them is mostly 5 cm to 80 cm. Lateral extension of ore deposits is 100 to 200 meters. In many cases, ore veins are recognized in two or three parallel row, composing a mineralized zone intermittently. There are many known ore deposits in this survey area. By the geochemical exploration carried out in this third phase of the survey program, it has been clarified that there are three mineralized zones extending parallelly in the direction of NW-SE, with the approximate interval of 3 kilometers. The ore deposits and main mineral indications distributed in these mineralized zones are described in the following paragraph. General discussion on the ore deposits are given in Chapter 4.

(1) Mineralized Zone in the Eastern Area

Diamante ore deposit, Marina ore deposit, Gitana Segunda ore deposit, Mineral indications in the northwestern extension of Gitana mining area, Desquite ore deposit.

(2) Mineralized Zone in the Central Area

Mineral indications in the Paraiso area, Delicia ore deposit, Mineral indication along Q.3, Mineral indication at Jarol.

(3) Mineralized Zone in the Western Area

Mineral indications in the northwestern extension of Bombona mining area.

3-2 Mineralized Zone in the Eastern Area

In the southern part of this mineralized zone, there are two mineralized zones with the approximate interval of 300 meters. They are Diamante mineralized zone and Marina-Gitana mineralized zone. The northwestern extension of these two mineralized zones has been caught by the geochemical exploration carried out in this third phase. Desquite ore deposit is located approximately 7.5 kilometers to the northwest of area.

3-2-1 Diamante Ore Deposit

The Diamante ore deposit is the ore in which the most intense mineralization has been recognized so far in this survey area. It has been worked continuously although in a small scale, for quite a long time. Preliminary surveys were completed in the first phase of the program. Detailed geological survey and geochemical exploration were carried out last year with diamond drilling (total length of 757.2m with 7 holes) in the second phase. Also in this third phase of the program, further works of diamond drilling were planned, in order to obtain more detailed information. Actually the diamond drilling of 8 holes was completed with the total length of 1,339.5 meters.

As the results of these works, the following informations have been obtained on the Diamante ore deposit. (cf. PL.I-15)

(1) The Diamante ore deposit has been worked at Hormiga, Hormiga W, Auxiliadora, Diamante, Gualquilia Norte and S, and San Sebastian mines. The ore deposit is composed of two ore veins running close to each other in parallel in the direction of NW-SE. The extension of them is approximately 800 meters. (called Diamante principal vein)

(2) In the northwest of these two ore veins, the mineral indication caught by the drill hole PD-3 and the ore vein at Homiga mine are continuous

and the vein at Homiga W mine and that at Auxiliadora mine are also continuous.

(3) The swell and pinch of the ore vein is remarkable, and intensity of the mineralization is rather dispersed.

(4) The most enriched portion of the ore vein is found in the inner part of the tunnel, where the vein is widest with high grade ores. The extension to the depth has been caught by the drill holes of PD-6 and PD-10. However, the other portions of the ore vein are generally less wide, 30 to 80 cm, and the extension is approximately 150 to 200 meters.

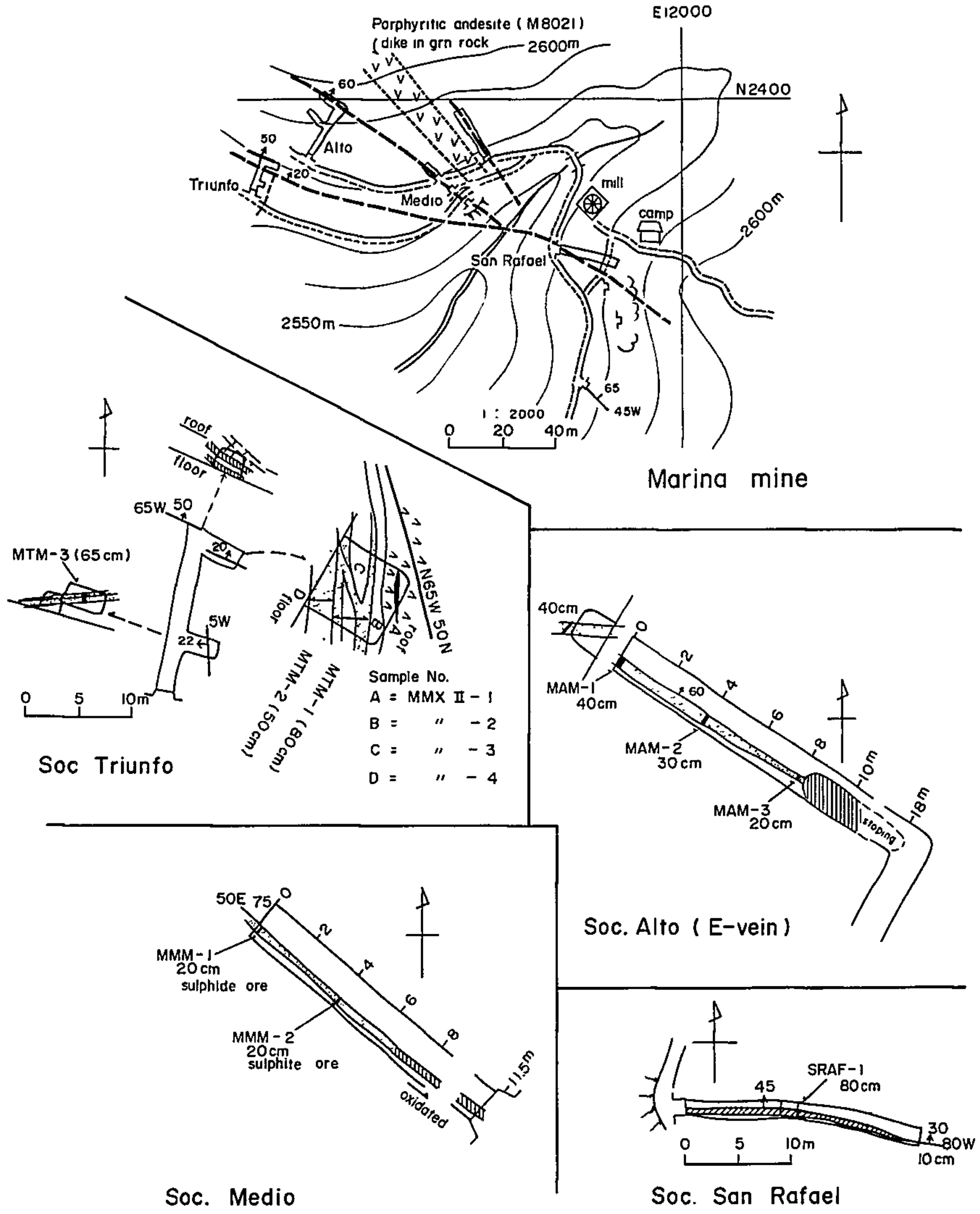
(5) The most abundant ore minerals recognized in the ore veins are pyrite and arsenopyrite. They are associated with less amount of sphalerite, chalcopyrite and galena. Tetrahedrite, bismuth-antimony minerals and silver minerals are also recognized though slightly.

(6) Gold is recognized as electrum in quartz and arsenopyrite as well as in the space among the grains of sulphide minerals. The grain size of electrum is in the order of 0.0X mm.

(7) The wall rock is composed of tuff breccia and basaltic andesite. The latter is found mainly in the southern part. There seems no genetical relation between wall rock and the enriched portion of the ore vein. Sericitization, montmorillonitization and silicification are observed near the ore vein (10 cm to 50 cm).

3-2-2 Marina Ore Deposit

The Marina ore deposit is located about 300 meters east of the Diamante main ore vein, and runs in parallel to it. There are many mines on the banks of the small stream. All of them are hand-picking workings and are down to the depth of less than 100 meters below surface. Location of ore veins and sampling points as well as assay values are shown in Fig. I-8. The general



Analysis of ore

Sample No. (width cm)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	As (%)
MTM-1 (80)	tr	tr	1.03	0 06	0 09	0 41
MTM-2 (50)	10.8	47	008	0.23	0 59	0.76
MTM-3 (65)	tr	tr	003	0 03	0 04	0.39
MAM-1 (40)	2 6	21	005	0.08	0.04	2.32
MAM-2 (30)	2 3	15	011	0 09	0.15	2.12
MAM-3 (20)	8.2	39	008	1 07	0 18	2.67
MMM-1 (20)	7 2	40	012	0.21	0.90	6 24
MMM-2 (20)	11.4	112	0.21	0.56	1 10	6 13
ARAF-1 (80)	X 17.6	56	0.04	0.40	0 04	9.4

X analyzed in 2nd phase

Study of alteration minerals

Sample No	X-ray diffractive analysis				As %	Sb %	Si %	Ca %	S %
	Ser	Mon	Kao	Oth					
MMX II-1	L	M	S		012	0.03	3463	040	0 01
" -2	L	M	S		0.07	0.02	37.96	0.29	0.01
" -3	C			S?	1 19	0 03	35.39	0.06	0 05
" -4	L	L		V	0.39	0.04	2849	057	0.02

X-ray Diffractive analysis
V very much > M much > C. common >
L less > S scarcely

Ser Sericite, Mon montmorillonite
Kao. Kaolin, Oth : Plagioclase

Fig. I-8 Vein and Sampling Location of Marina Mine trend of the ore veins is NW-SE, but varies from N 30°W to N 80°W, while the dip of the ore veins varies 20 to 75 degrees to the northeast. The maximum width of the ore veins recognized so far is 130 cm (at the working of Soc. Triunfo), but swelling and pinching are remarkable. Lateral extension of the ore veins is approximately 70 meters and the depth is 10 to 20 meters, so far ascertained. The ore deposit is in clay, oxidized and brown in color in the shallow part but in the inner part of the mine it is quartz vein with sulphide minerals.

The ore grade is as follows.

Au : tr - 17.6 g/t (average 7.5 g/t, 8 samples)

Ag : tr - 112 g/t (average 41 g/t, 8 samples)

Ag/Au ratio : 3.2 - 9.8 (average 6.1, 7 samples)

Cu : less than 0.2%

Pb, Zn : less than 1.1%

As : 0.41 - 9.4% (average 3.74%, 8 samples)

The grade of gold is comparatively high and stable. It is notable that more than 2% of arsenic is detected in auriferous ore vein, usually.

By the observation under microscope, it has been clarified that the ore minerals are mainly pyrite and arsenopyrite with sphalerite, chalcopyrite, galena and tetrahedrite, associated with very small amount of electrum, and that some of the copper minerals are replaced to covelline. Pyrite and arsenopyrite are thought to have been crystallized in early stage. Sphalerite and chalcopyrite are recognized on the corroded surface of the crystals of pyrite and arsenopyrite. Tetrahedrite is the youngest as it is observed to have cut the crystals of sphalerite and chalcopyrite. Electrum is found in aggregation of small grains less than 100 microns in diameter, contained in arsenopyrite grains (MM2A).

3-2-3 Gitana Segunda Ore Deposit

The Gitana Segunda ore deposit is located about 500 meters northwest of the Marina ore deposit, and it is thought that the both ore deposits are in the same mineralized zone. This Gitana Segunda ore deposit has been worked in small scale. Location of the ore veins and sampling points as well as assay values are shown in Fig. I-9. The width of the mineralized zone is approximately 120 meters and four ore veins have been found in it. Gold has been detected from all of the four ore veins where the assay samples were collected in the survey (Au: 2.0 - 11.8 g/t, arithmetic mean of 4 ore veins is 6.3 g/t).

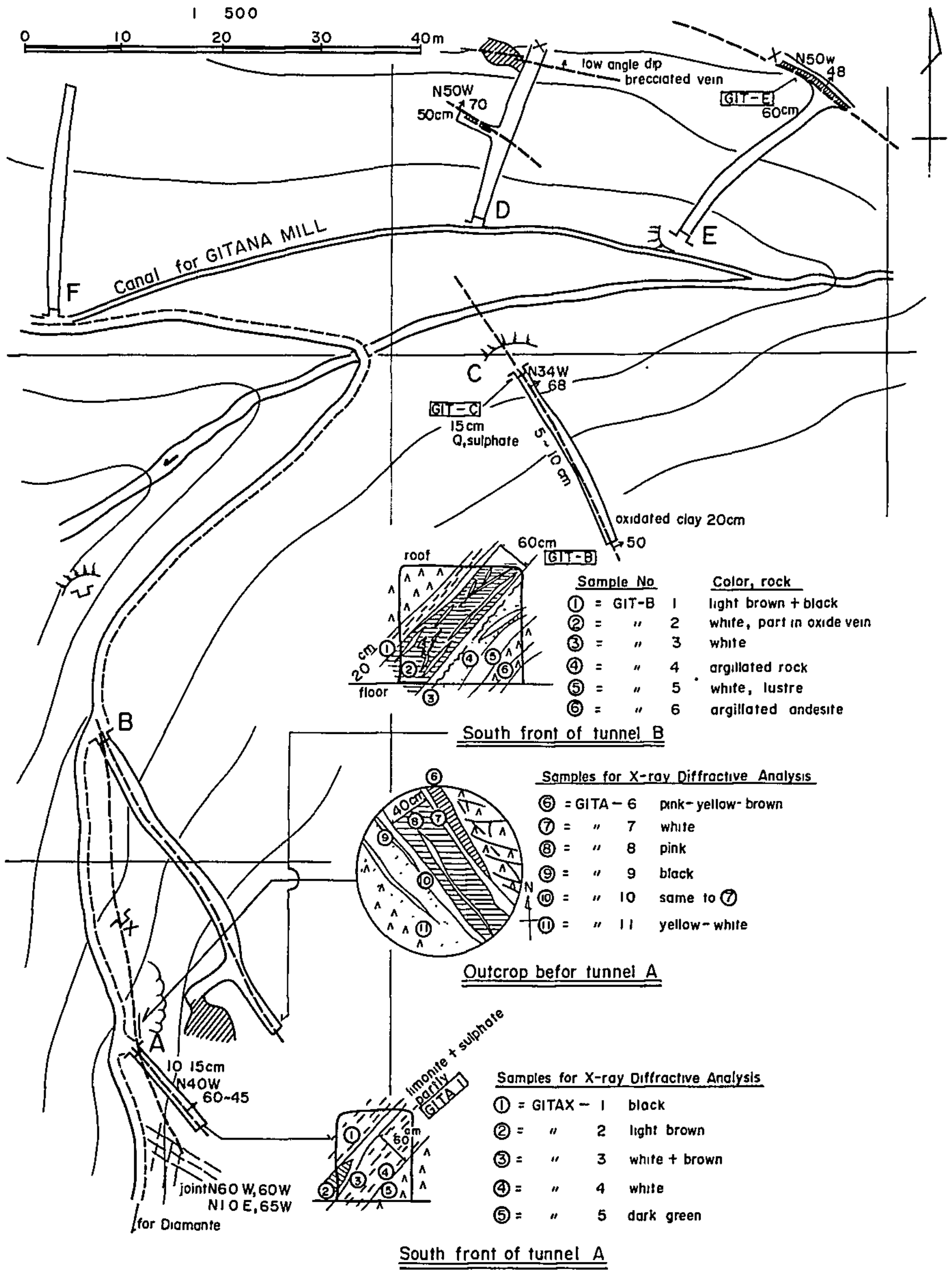
The trend of ore veins is N34° - 50°W, but they have various dip from gentle 45°E to steep 70°E. The width is 10 to 60 cm. In some places it swells up to more than 1 meter, by the observation of the mined out space, but generally the width is about 50 cm. The wall rock is non-stratified green tuff breccia. The ore deposit is composed of one or several quartz veins contained in clayey portion. As the ore veins are situated near the surface, they are white to brown in color, oxidized severely and primary sulphide minerals are rarely observed.

3-2-4 Mineral Indications in the Northwestern Extension of the Gitana Mining Area

This area is located at the neighbour of the Diamante mining area investigated in the second phase of the program.

Covered with thick vegetation, rock exposures are limited to along main rivers and streams. Almost whole of the area is underlain by dark green basaltic andesite, although siliceous shales are distributed, occupying small area, in the northwestern corner of this area.

The only indication found in this area is the ore vein in the Gitana



Analysis of ore

Sample No (width cm)	Au g/t	Ag g/t	Cu (%)	Pb (%)	Zn (%)	As (%)
GITA-1 (15)	9.4	53	017	007	007	0.76
GIT-B (60)	2.1	13	0.09	0.04	0.05	1.99
GIT-C (15)	118	114	0.98	0.07	0.14	1.45
GIT-E (60)	20	34	007	005	017	2.07

Study of alteration minerals

Sample No	X-ray diffractive analysis					As	Sb	Si	Ca	S
	Ser	Mom	Kao	Ana	Oth	(%)	(%)	(%)	(%)	(%)
GTAX - 01	C		C	S		0.19	003	3560	018	002
〃 02	C	C	L	S		010	001	4746	015	001
〃 03	V	C		S		008	001	4008	008	001
〃 04	V			L		010	001	5098	011	0005
〃 05					M	024	0.04	3959	266	003
〃 06	C	C	L	S		005	0.03	4496	016	001
〃 07	C	C		L		007	0.02	3281	016	001
〃 08	S		V			009	0.02	4167	0.16	001
〃 09	S				S,M	0.06	0.02	37.33	010	001
〃 10	C	C	L	L		003	002	7141	022	001
〃 11	C	C	L	S		0.02	001	43.83	019	0.005
GITBX - 01	S				L	0.36	003	4294	026	0.02
〃 02	M			S		008	001	5470	010	0003
〃 03	L	M	M	S		019	0.03	2960	028	001
〃 04					M	015	004	3912	040	0.02
〃 05	L	M	C	S		006	003	2589	0.32	001
〃 06					M	021	004	2506	172	002

X-ray Diffractive Analysis

V: very much > M: much > C: common > L: less >
S: scarcely

Ser : Sericite, Mon : montmorillonite, Kao : kaolin
Ana. anatase
Oth : others GITAX-05 ---- plagioclase, hornblende,
phlogopite are M, chlorite is S
GITAX-09 ---- chlorite is S, halloysite is M
GITBX-01, ---- hornblende is S, chlorite and loughlinite are L
GITBX-04 ---- loughlinite is M
GITBX-06 ---- hornblende and loughlinite are M.

Fig. I-9 Vein and Sampling location of Gitana II Mine

No. 1 mine, which was described in the report of the survey in the second phase of the program. The width of the vein is 20 cm, the trend is N70°W and the dip is 70°N. Assay results are Au: 1.2 g/t, Ag: 40 g/t, As: 11.7%, and Cu, Pb Zn are less than 0.1% respectively.

By the results of the geochemical exploration carried out in this phase of the program, five anomalies have been detected. (PL. I-11) Among them, the anomaly 2D is located along the northwestern extension of the above-mentioned ore vein, and it is thought that the area represented by this anomaly would be favorable for the emplacement of ore deposit. It is also thought that the anomalies of 2A and 2B would warrant further exploration as they are superior both in sizes and in grade of values.

3-2-5 Desquite Ore Deposit

The Desquite ore deposit is located on the right bank of the Telembi river in its upstream area. The main access to the ore deposit is horse path, which goes along the east bank of La Cruz river (a branch of Telembi river) after passing the western ridge from Guachavez. The ore deposit has been worked in small scale by underground hand picking, by crushing ore with mill, and by amalgamation. As only a few people are working so intermittently, production is less than 1 ton per day in average. The trend of the ore vein is N40°W and the dip is 70°NE. The width varies 4 to 40 cm. Lateral extension of the ore vein is more than 30 meters. Vertical extension is not certain as the shafts are collapsed and filled with water. The wall rock is argillized and reddish brown in color, owing to the duplication of weathering from the surface and the alteration at the time of mineralization to form the ore veins. The underground is timbered.

The assay results of the three samples collected along the ore vein in the underground are as follows.

Sample No.	Width	Au (g/t)	Ag (g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
N-9	10 cm	5.1	9	0.00	0.05	0.06	0.03
N-10	15	tr	tr	0.00	0.02	0.03	0.02
N-11	15	tr	tr	0.00	0.03	0.05	0.02

The samples for these assay were collected from gossaneous quartz vein. The ore minerals are not recognized with naked eyes. A sample N-14 collected from the ore pile was examined under microscope. This sample reveals that sphalerite is left unoxidized. It contains spotted chalcopyrite grains.

By the geochemical exploration, a zinc anomaly has been detected around this ore deposit, extending about 700 meters with approximate width of 100 meters, and it can be said that the distribution of the anomaly is corresponding quite well with that of the ore vein.

3-3 Mineralized Zone in the Central Area

3-3-1 Mineral Indications in the Paraiso Area

Paraiso is located near the junction of Telembi River and Q. Cerro, where the topographical feature is gentle at the altitude of about 2,000 meters above sea level. The access to Paraiso area is only by the unsealed road 3 to 4 meters wide. Going over the mountain pass 3,200 meters above sea level, from Guachavez, it runs to Eden through Paraiso along the Telembi River. Eden is in the downstream area of Paraiso. As vehicles are not passable along this road, it is necessary to go on foot, which requires about 6 hours from Guachavez to Paraiso. There are three houses along the road, and some cultivated fields where corns and lulo are mainly grown are found in Paraiso area. Also there are some pastures for horses and cows. However, most of the mountainous land is left as jungles, undeveloped.

Indications of mineralization have been found in the following eight areas. Most of them are only exposures of mineralization, although some of the mineral indications are known to have been worked.

(1) San Antonio

(2) Ruidosa

(3) San Luis

(4) Q. Lulo

(5) Upstream of Q. Oso

(6) Branch of Q. Oso

(7) Western end of the geochemical survey line D-6

(8) Point RM-5 and point RM-2 along the middle-stream of Q.2

Description on the individual mineral indication is given as follows.

(1) San Antonio

The ore deposit, situated 1 km west of Paraiso, has been worked most prosperously in this area, and on the gentle eastern slope a depression like basin has been left after the mining, in scale of 90m in east-west and 25m in north-south. The ore vein is observed on the central part of the wall along the north side of the basin. The report of the survey in the second phase of the program says that there are two ore veins of the directions of N5°W and N24°W within the mineralized zone of the approximate width of 300 cm and that the assay results are Au: 4.6 g/t and Ag: 5 g/t (Exposure is not observable in this survey because of the wall collapse). A mill for cleaning ores is found in the vicinity of the outcrop, but it is not operated. White to brown argillized zone about 8 meters wide is seen around the ore veins. Samples (N63 A, B, C) collected from the ore pile were examined under microscope, and the result is that arsenopyrite, magnetite, chalcopyrite and electrum are recognized as the ore minerals, with the secondary minerals of iron hydrates and covelline. Electrum, 20 to 30 microns in diameter, is usually found by itself or along cracks in arsenopyrite grains.

(2) Ruidosa

This mineral indication is located along a branch stream of Q.1N, about 300 meters southwest of the San Antonio mineral indication. It has been worked in a small scale by hand picking. The ore vein has the width of 2.5 meters. The trend of the ore vein is N40°W and the dip is 50°SW. The assay results are as follows.

Sample No.	Length	Au (g/t)	Ag (g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
P-R-1	230 cm	tr	14	-	-	-	-
N-64	80	6.7	149	0.13	0.35	0.15	0.56

The ore vein is composed of severely sericitized and kaolinized white argillaceous vein containing thin quartz veinlets.

A small outcrop of mineralization is found about 130 meters downstream, which has been worked, too. The ore deposit is white argillized vein, 20 cm in width, trending N60°W, with the dip of 10°N. The wall rock is granodiorite, which contains small gossaneous veins. By panning the clay collected from this argillized vein, small grains of gold as well as oxidized pyrite, arsenopyrite, pyrite, magnetite, quartz etc. are detected.

(3) San Luis

This mineral indication is located about 1.5 kilometers west-southwest of the indication at San Antonio. Three ore veins are observed in the width of 3 meters along the left bank of a stream. A working tunnel as far as 5 meters was driven following the neighbouring two ore veins. Width, trend and dip of the ore veins are as follows.

Ore vein	Width	Trend	Dip	Sample
No. 1	30 cm	N30°W	65°SW	
interval	80			N54 } P-SL-1
No. 2	40	N30°W	65°SW	
interval	150			N-56 (100 cm in footwall of No. 2 ore vein)
No. 3	10	N35°W	vertical	

The assay results are as follows.

Sample	Width	Au (g/t)	Ag (g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
P-SL-1	170 cm	4.8	9	-	-	-	-
N-54	80	tr	tr	0.03	0.14	0.03	0.32
N-56	100	tr	tr	0.00	0.04	0.03	0.12

The ore deposit is composed of severely silicified vein the central belt of which is gossaneous and dark brown, while the surrounding outer belt is whitish clay. The outermost part, about 3 cm wide, is also clay in chocolate color. The wall rocks are altered, and many small veins of limonite are contained. By the microscopic observation of the ore samples (N-57A, B, C) chalcopyrite, tetrahedrite, sphalerite, galena, arsenopyrite and pyrite are recognized as ore minerals. The margin zone of galena has been replaced by cerussite, and pyrite has been changed to limonite.

An argillaceous quartz vein, 5 cm wide, of the trend of N30°W and the dip of 30°SW has been found about 200 meters southwest in the direction of extension of the above ore vein. The assay results of the sample collected from the outcrop of this quartz vein are as follows.

Sample	Width	Au (g/t)	Ag (g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
N-51	5 cm	tr	tr	0.04	0.12	0.05	0.33

Along a stream about 100 meters east of this quartz vein, there is another quartz vein running in parallel. It is argillaceous quartz vein with brownish limonitic gossan, with the width of 50 cm. It trends in N50°W with the dip of 85°NE. The assay results of the sample collected from the outcrop of this quartz vein are as follows.

Sample	Width	Au (g/t)	Ag (g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
N-3	50 cm	tr	tr	0.01	0.02	0.01	0.02

(4) Q. Lulo

This mineral indication is located along the small stream flowing in the fields between Guachavez-Eden road and Telembi river. On the floor and along the right bank of this stream four brownish gossaneous quartz veins each of which is 10 cm wide, are observed within the width of 1 meter. White argillization is recognized to the extent of 10 to 30 cm around the quartz vein. The trend of this quartz vein is N65°W and the dip is 80°N. The vein is barren by the assay results shown as follows.

Sample	Width	Au (g/t)	Ag (g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
P-L-1 (whole vein)	120 cm	tr	tr	-	-	-	-
N-73	10	tr	tr	0.00	0.00	0.00	0.01

(5) Upstream of Q. Oso

This mineral indication is located on the cutting face of the water path which is introduced from Q. Oso for the mining at the San Antonio mine. Within the width of 7 meters on the exposed surface, three parallel veins are observed. They are 5 to 10 cm wide and are trending N50°W, with the dip of 85°NE. The wall rock is weathered coarse grained granodiorite. The main vein is as wide as 10 cm. To the extent of 30 cm in both the footwall and the hanging wall of this main vein, alteration of the wall rock is recognized. In the neighbouring zone of the ore vein, sericitization is remarkable, while the outer zone is sericite-kaoline zone. Because only slight mineralization is recognized, no sample for assay has been collected.

(6) Branch of Q. Oso

This mineral indication is loacted along the stream about 450 meters from Ruidosa, on the southeastern extension of aforementioned San

Antonio and Ruidosa indications. There are two indications. The ore is found as vein on the right bank of the junction of the streams. The width of this vein is 80 cm and the trend is N80°W with the dip of 80°N. The other indication is recognized on the right bank 18 meters upstream from the former. There are two parallel veins. They are 10 cm wide. Their trends are N20°W with the dip of 80°W and N30°W with the dip of 75°W, respectively. Each of them is limonitic gossaneous and argillaceous quartz vein, and whitish clay is recognized to the extent of about 10 cm in the wall rock around the veins. Because of the slight mineralization, no sample has been collected for assay.

(7) Western end of the geochemical survey line D-6

This is an indication represented by a gossaneous float containing sulphide minerals, about 1 meter in diameter. This float was found near ridge and it is thought that the site of the original exposure would not be far from the float.

(8) Along the middle-stream of Q.2 (sample No. RM-5, RM-2)

Two mineral indications are found along the middle-stream of Q.2. The one is located near the Guachavez-Eden road and a short working tunnel is seen excavated toward the west on the left bank of the stream (RM-5). It seems that the tunnel followed an ore vein of E-W trend, but details are not certain because of the heavy weathering. The other is found along the stream about 400 meters upstream of the location of the above-mentioned indication. This ore vein is gossaneous and argillaceous quartz vein. It is vertical and is 10 cm wide. Its trend is N45°W (RM-2). The assay results of the samples collected from the respective exposure are barren, as shown below.

Sample	Au(g/t)	Ag(g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
RM-5	tr	tr	0.01	0.05	0.04	0.04
RM-2 (10cm)	tr	tr	0.00	0.00	0.10	0.01

The geochemically anomalous area detected by the geochemical exploration in the Paraiso area contain all the known mineral indications and ore deposits. It shows that the geochemical anomalies are reflecting mineralizations quite remarkably. Therefore, it is thought that those anomalies where no mineral indication has been found yet (anomaly 8.9 ---PL.I-9) would have high potentiality for the mineralization to be emplaced.

3-3-2 Delicia Ore Deposit

The Delicia ore deposit is located about 2 kilometers south of Paraiso, on the left bank of Q.Del Cerro, a branch of the Telembi river. The access to the mine is by the mountain path along the left bank of Q. Del Cerro, after branched from the Guachevez-Eden road.

Geologically, fine grained porphyritic granodiorite is distributed in the high land, while moderate to coarse grained leucocratic granodiorite occupies the low land. The border of the distribution of these two rocks is approximately at the altitude of 2,400 meters above sea level.

There are two old workings with the approximate distance of 100 meters along the small stream. The one old working, located close to D-18, is found in the granodiorite, in which iron oxides are recognized along joints and fissures. It is said that an argillaceous zone containing small quartz veins was worked and that some gold was produced. Although the mineralized zone is said to be running in NW-SE direction with the dip to NE, it is impossible to have a look at the ore vein at present, as it has been mined out. On the floor of the stream about 30 meters upstream from this point, a quartz vein, 5 cm wide, is found (N-20). Its trend is N70°W with the dip of 40°SW. The assay results of a sample collected from this quartz vein are as follows:

Au(g/t)	Ag(g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
tr	tr	0.006	0.01	0.01	0.11

The footwall of this quartz vein is white to brown argillaceous zone, 10 to 20 cm thick, and weathered granodiorite appears to the next. There are old trenchings between this quartz vein and the old workings, and several floats of the size of 40 cm in diameter, composed of quartz vein, are observed in the stream.

3-3-3 Mineral Indication Along Q.3

Within the width of 40 meters along the right bank of Q.3, four quartz veins carrying limonitic gossan are observed. They are named RM-8B, RM-8A, RM-9 and RM-10 from the downstream. On the left bank about 50 meters upstream from the point of RM-10, a land slide is seen with the approximate width of 8 meters. The site carries gossans of brown iron oxides in whitish clay zone. (This is named RM-11) Trend, dip, width and grade of the quartz veins found along this Q.3 are as follows.

					Assay Results					
		(cm)			Au g/t	Ag g/t	Cu(%)	Pb(%)	Zn(%)	As(%)
RM-8	RM-8	float in stream			tr	tr	0.00	0.00	0.00	0.08
RM-8B	RM-8B	32	N30°W	50°NE *	tr	tr	0.00	0.00	0.00	0.04
RM-8B	N-21	6	N30°W	50°NE **	tr	tr	0.01	0.01	0.03	0.06
RM-8A	RM-8A	35	N50°W	50°NE *	tr	tr	0.00	0.00	0.00	0.03
RM-8A	N-23	20	N50°W	50°NE **	tr	tr	0.01	0.01	0.03	0.29
RM-9	RM-9	15	N45°W	vert.	tr	tr	0.02	0.01	0.01	0.17
RM-10	RM-10	20	N65°W	60°NE ***	2.6	3	0.01	0.01	0.01	0.05
RM-10	N-26	55	N65°W	60°NE *	7.3	7	0.01	0.01	0.01	0.07
RM-11	RM-11	80	N25°W	40°SW	3.0	18	0.00	0.00	0.00	0.02
RM-11	N-27	200	white clay zone		tr	tr	0.00	0.00	0.00	0.02

* whole vein ** both margins *** footwall margin

Generally, these ore veins are running in NW-SE direction with the dip to NE, and the width is 15 to 55 cm. In most of the veins, marginal belt is composed of brown argillaceous zone and small quartz veins (2 to 3 cm wide) while the central belt is composed of white to yellowish brown clay zone (RM-8A, RM-8B). The wall rock of the ore veins is mostly weathered granodiorite which has not been mineralized. Because of the weathering, it is difficult to determine ore minerals except for brown iron-hydrate, which is thought to have replaced sulphide minerals. Clay minerals are mostly sericite and kaoline. Chlorite is not recognized.

At the approximate altitude of 2,200 meters above sea level along the Q.3N, a branch of Q.3 flowing on the right bank of Q.3, a mineral indication of vein type has been found. The width of this ore vein is 5 cm. Its trend is N60°W with the dip of 65°NE. Composing minerals are pyrite and quartz. The wall rock of the ore vein is granodiorite in which fissilities are well developed in parallel to the ore vein. Almost no alteration associated with mineralization has been recognized in this granodiorite. The assay results of the sample collected from this ore vein are as follows.

	width	Ag(g/t)	Ag(g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
N-32	5 cm	1.8	6	0.00	0.04	0.01	0.69

3-3-4 Mineral Indication at Jarol

This mineral indication is located about 250 meters southeast of the junction of the Guachavez-Eden road and the mountain path to Delicia. The indication lies on the floor of a stream flowing toward northwest. It is as wide as a little over 1.2 meters. The trend is N35° to 60°W with the dip of 60°NE. It is composed of white or reddish brown argillaceous vein (N-35). An argillized quartz vein is found at the point 22 meters southeast of the above mineral indication (N-39).

The assay results of the samples collected from these indications are as follows.

	Width	Au(g/t)	Ag(g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
N-35	120 cm	tr	tr	0.04	0.01	0.01	0.16
N-39	5	tr	tr	0.00	0.00	0.00	0.06

As the results of the geoehcmical exploration, three geochemical a anomalies, 10, 11 and 12 (PL. I-8), are extracted in the area where the central mineralized zone is located. The anomaly 10 includes ore deposits along Q.3, and the northwestern extension is possibly continued to the anomaly 8. The anomaly 11 includes Delicia ore veins in its southeastern part and Q.3 N ore veins in its northwestern part. This anomaly 11 extends approximately 2,000 meters with the width of 400 meters, and it is thought that this anomaly would be quite favorable for the emplacement of ore deposits so as to warrant further exploration. As the size of the anomaly 12 is smaller comparatively, it is better to give priority of exploration to the anomaly 10 and 11.

3-4 Mineralized Zone in the Western Area

3-4-1 Mineral Indications in the Northwestern Extension of Bombona Mining Area

This mineral indications occupy a drainage basin of the Bombona River, which is flowing toward the northwest, and are thought to correspond with the northwestern extension of the Bombona mineralization zone, investigated in the second phase of the program.

The land is unfrequented, covered with vegetation of high bomboos and tall trees. Although it is possible to reach the Bombona mine in a little more than 6 hours on the horseback from Guachavez, it is necessary to open a new path by bush-cutting to enter further.

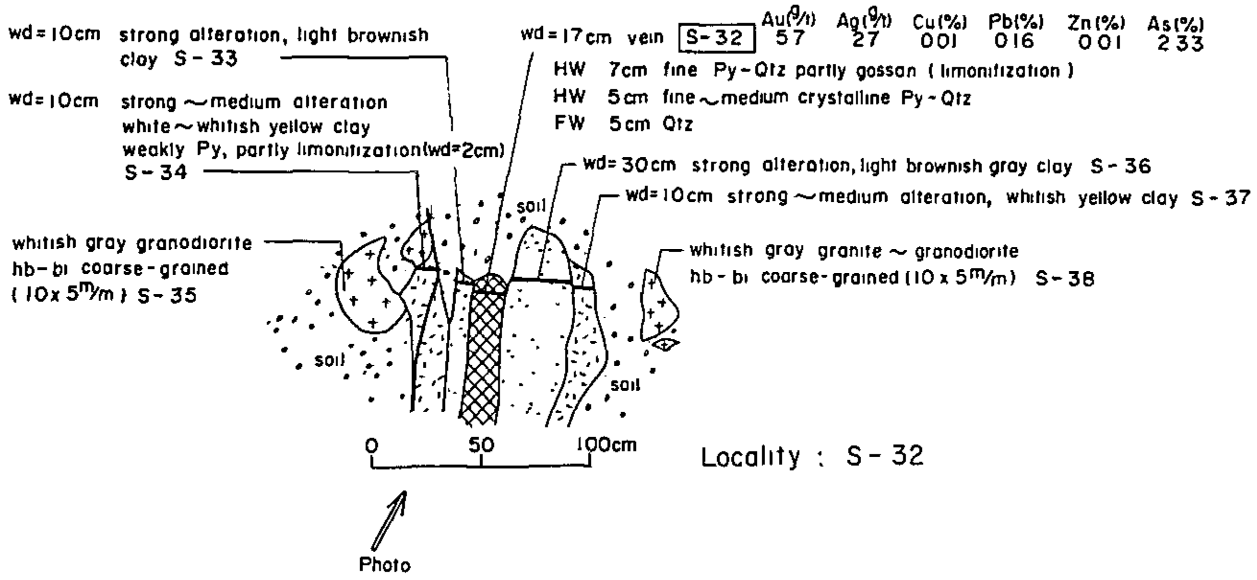
Geologically, the land is underlain by the granodiorite containing about 20% of hypidiomorphic hornblende and biotite, 5 to 10 mm in diameter. Exposure is poor because of thick soil and thick vegetation. No other mineral indications have been recognized than those found at several spots along Q.18, close to the Bombona bajo ore deposit, which were investigated by the survey in the second phase of the program. The ore veins along Q.18 are variably trending from N45°W to EW with the dip of 48°NE to 80°SW, although general trend is NW-SE. Given in Fig. I-10 are the mapped data of the four mineral indications found in the area of middle to upstream of Q.18. These indications are represented by the exposures of vein-type ore deposits. Although an old working tunnel, impossible to step in owing to collapse of the entrance, is found on the other bank of the stream against the mineral indication 3, there is no other exposure of mineralization which seems to have been worked. The indications 1 and 2 are thought to be different portions of the same ore vein, lying on the both banks of a stream. However, their trend and dips are twisted as seen in 1 : N70°W, 80°S and in 2 : N60°W, 50°N. The indications of 3 and 4 are located about 200 meters upstream. They are spaced by 20 meters each other. Trend and dip of the indication 3 are N46°W, B0°NE and those of the indication 4 are N60°W, 48°SW.

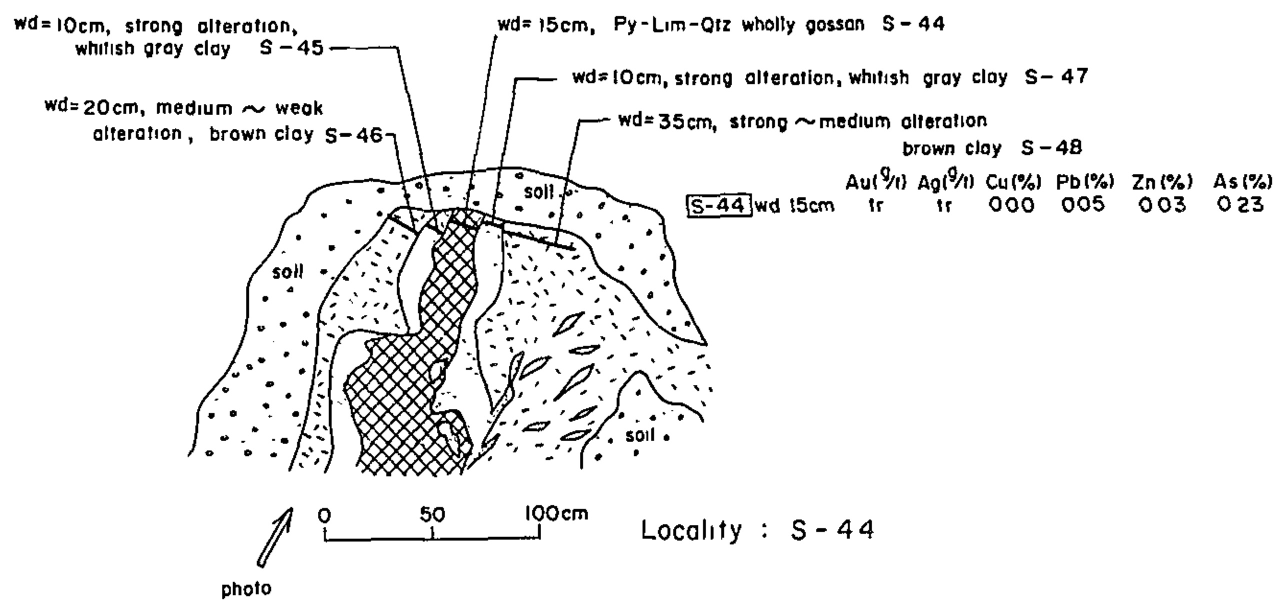
The ores are composed of chalcopyrite-pyrite-quartz vein, but they are gossaneous, reddish brown in color, by oxidation. The ore grades of these mineral indications are as follows.

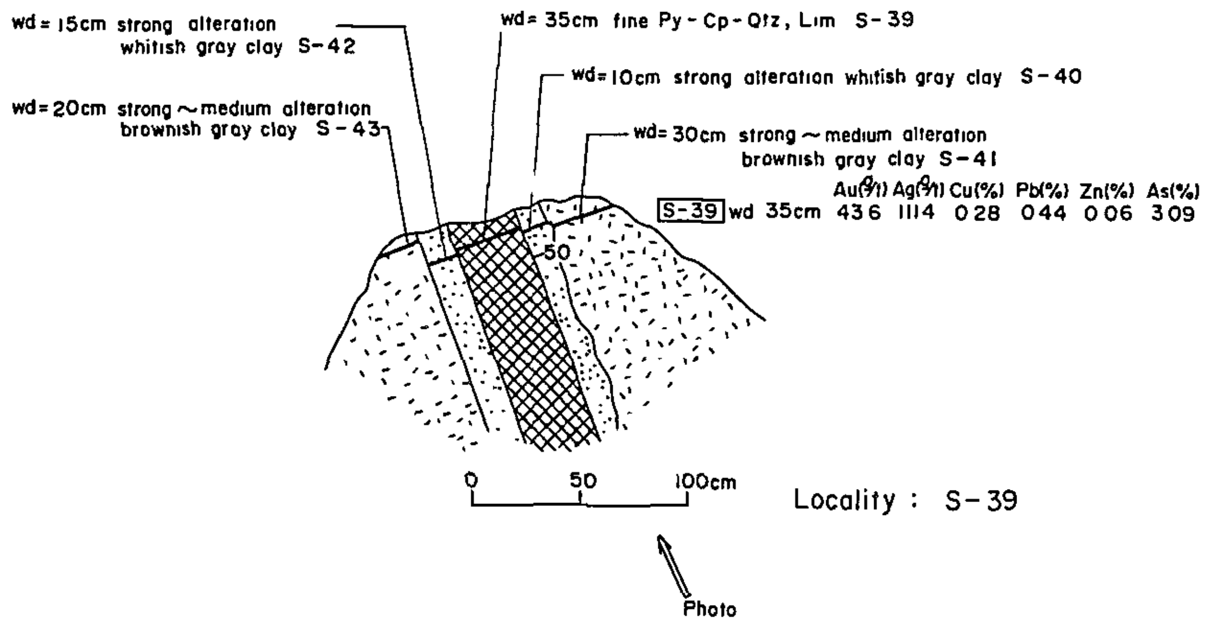
Indi- cation	Sample No.	Width cm	Grade					
			Ag(g/t)	Ag(g/t)	Cu(%)	Pb(%)	Zn(%)	As(%)
1	S-32	15	5.7	27	0.01	0.16	0.01	2.33
2	S-39	35	43.6	1144	0.28	0.44	0.06	3.09
3	S-49	80	0.7	7	0.00	0.01	0.00	0.27
4	S-44	15	tr	tr	0.00	0.05	0.03	0.03

Zonal structure is recognized with the wall rock alteration by the mineralization of the ore veins. It is represented, from the inner part to outer, by white to pale brown clay zone (10 to 30 cm), yellowish clay zone (10 to 50 cm) and weathered granodiorite zone, which are evident with naked eyes. The zonal structure of the minerals is also recognized by the results of the X-ray diffraction of the samples (S-32 to S-38) collected from the mineral indication 1. The structure is symmetrical around the ore vein (S-32). That is, the ore vein and its immediate next zone are rich in sericite. Montrorillonite is associated with sericite except in the ore vein. The outer zone is chloritized to some extent but mostly this zone is composed of non-altered wall rock, bearing fresh hornblende.

As the results of the geochemical exploration in this area, two anomalous zones running in parallel eachother have been extracted. One anomalous zone includes anomaly 14(B) and 14(C), which are along the extension of the known ore veins, while the other anomalous zone includes anomalies 13 and 14(A). It is recommended to start exploration works from the anomalous zone along the extension of the known ore deposits. It is desirable to expand the works to other unexplored areas after obtaining information on the character of ore veins.







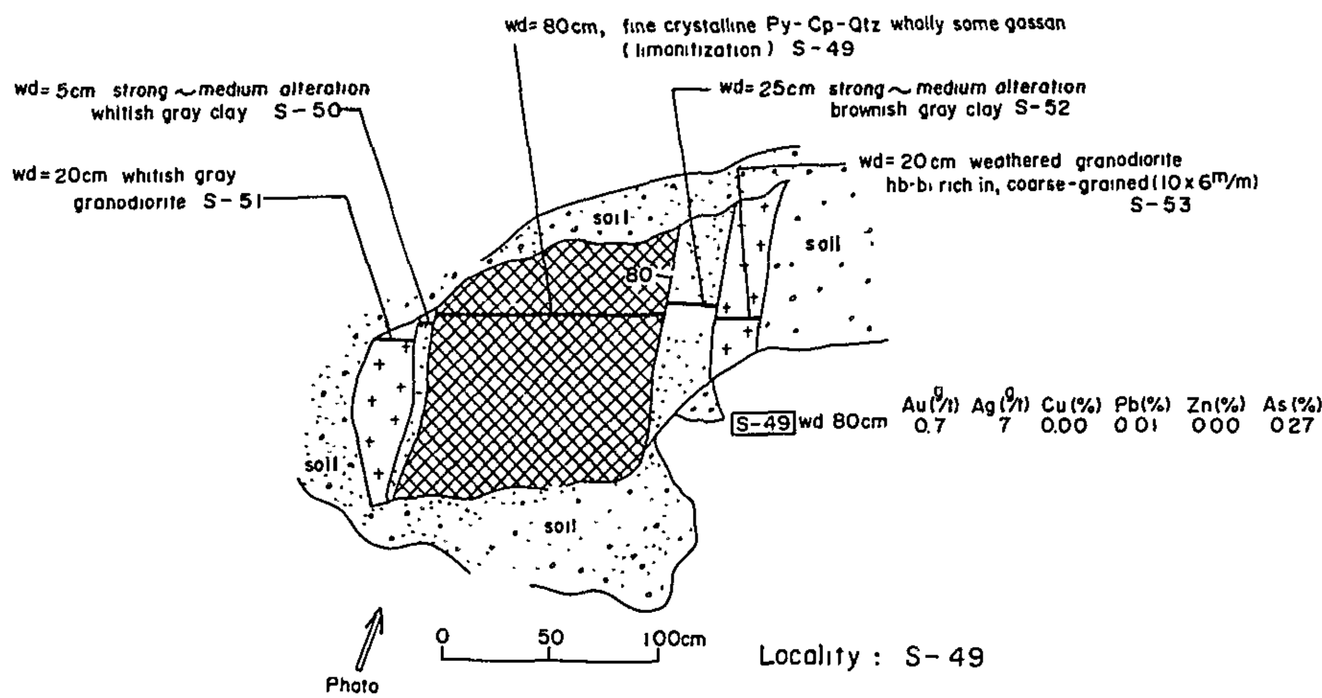


Fig. I-10 Outcrop Sketch Found at the Bank of Q.18 in Bombona Area

Table I-5 List of Veins Diamante-Paraiso-Bombona

Location		Vein					Assay grade						
Name	Position	Strike	Dip	Width (m)	Description	Sample No.	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	As (%)	Remarks
Mina Desquita	D-21A~D21B	N40W	70N	0.10	Clayey Quartz	N-9	5.1	9	0.00	0.05	0.06	0.03	
"		N40W	70N	0.15	Clayey Quartz	N-10	tr	tr	0.00	0.02	0.03	0.02	
"		N40W	70N	0.15	Clayey Quartz	N-11	tr	tr	0.00	0.03	0.05	0.02	
Desquite	D-23~D-24	N35W	85N	0.15	Pyrite Quartz	S-9	tr	tr	0.00	0.00	0.00	0.04	
"	Q. 6				Silicified Shale (grab sample)	HCA-17	tr	tr	0.01	0.00	0.00	0.02	
San Luis	D-3~D-4	N30W	65S	0.30		N-53							
"				0.80	Clayey	N-54	tr	tr	0.03	0.14	0.03	0.32	
"		N30W	65S	0.40		N-55							
"				1.00	Clayey	N-56	tr	tr	0.00	0.04	0.03	0.12	
"	D-4~D-5	N50W	85N	0.50	Clayey Quartz	N-3	tr	tr	0.01	0.02	0.01	0.02	
San Luis (Cristales)	D-4~D-5	N60E	S ?	0.30		N-50							
San Luis	D-4~D-5	N30W	30S	0.05	Clayey Quartz	N-51	tr	tr	0.04	0.12	0.05	0.33	
San Antonio	D-5~D-6	N70W	70S		Black gossan (grab sample)	HCA-1	tr	tr	0.00	0.01	0.00	0.04	
"		N70W	70S		Purplish clay (grab sample)	HCA-2	8.6	8	0.10	0.04	0.05	1.25	
"		N70W	70S		White clay (grab sample)	HCA-3	tr	tr	0.00	0.00	0.01	0.01	
Ruidosa	D-6~D-7	N40W	50S	0.80	Clayey	N-64	6.7	149	0.13	0.35	0.15	0.56	
"	D-7	N60W	10N	0.20		N-66A							
"						S-2							
"						S-3							
Lulo	D-7~D-8	N65W	80S	0.10	Clayey Quartz	N-73	tr	tr	0.00	0.00	0.00	0.01	
Paraiso	D-8~Q,Osasa	N50W	85N	0.10		N-58							
"	D-8~Q. 1-S	N80W	80N	0.80		N-67							
						N-68							
						N-69							
						N-70							
Paraiso	Q. 1-S	N20W	50S	0.10		N-71							
"	Q. 2	N45W	90	0.10	Clayey Quartz	RM-2	tr	tr	0.00	0.00	0.10	0.01	
"	Q. 2	NW			Old tunnel	RM-5	tr	tr	0.01	0.05	0.04	0.04	
Delicia	Q Del cerro	N35~60W	60N	1.20	Clayey	N-35	tr	tr	0.04	0.01	0.01	0.16	
				0.80		N-36							
				0.15		N-38							
Delicia		N10W	40N	0.05	Clayey Quartz	N-39	tr	tr	0.00	0.00	0.00	0.06	
"	Q. 3	N50W	50N		Gossan (rolling stone)	RM-8	tr	tr	0.00	0.00	0.00	0.08	
"		N30W	50N	0.35	Clayey Quartz	RM-8A	tr	tr	0.00	0.00	0.00	0.03	
"		N30W	50N	0.32	Clayey Quartz	RM-8B	tr	tr	0.00	0.00	0.00	0.04	
"		N45W	90	0.15	Clayey Quartz	RM-9	tr	tr	0.02	0.01	0.01	0.17	
"		N65W	60N	0.20	Clayey	RM-10	2.6	3	0.01	0.01	0.01	0.05	
"		N25W	40N	0.80	Clayey Quartz	RM-11	3.0	18	0.00	0.00	0 00	0.02	
						MR-11A							
"		N30W	50N	0.06	Clayey Quartz	N-21	tr	tr	0.01	0.01	0.03	0.06	
"						N-22							
"		N50W	50N	0.20	Clayey Quartz	N-23	tr	tr	0.01	0.01	0.03	0.29	
"						N-24							
"						N-25							
"		N65W	60N	0.55	Clayey	N-26	7.3	7	0.01	0.01	0.01	0.07	
"				2.00 (8.0+)	Clayey	N-27	tr	tr	0.00	0.00	0.00	0.02	
"	Q. 3-N	N60W	65N	0.05	Pyrite, Quartz	N-32	1.3	6	0.00	0.04	0.01	0.69	
"	Q. 4	NW		0.20	Clayey	S-16	tr	tr	0.00	0.01	0.00	0.11	
Mina Delicia				0.05	Quartz	N-20	tr	tr	0.06	0.01	0.01	0.11	
Bombona	Q. 18	N70W	80S	0.17	Pyrite, arsenopyrite, Quartz	S-32	5.7	27	0.01	0.16	0.01	2.33	
"		N60W	50N	0.35	Pyrite, chalcopyrite, Quartz	S-39	43.6	1144	0.28	0.44	0.06	3.09	
"		N60W	48S	0.15	Clayey Quartz	S-44	tr	tr	0.00	0.05	0.03	0.23	
"		N46W	80N	0.80	Clayey Quartz	S-49	0.7	7	0.00	0.01	0.00	0.27	
Mina Marina	tunnel	N56W	60N	0.40	Arsenopyrite, Quartz	MAM-1	2.6	21	0.05	0.18	0.04	2.32	
"	"	N56W	60N	0.30	Arsonopyrite, Quartz	MAM-2	2.3	15	0.11	0.09	0.15	2.12	
"	"	N56W	60N	0.20	Arsenopyrite, Quartz	MAM-3	8.2	39	0.08	1.07	0.18	2.67	
"	"	N65W	50N	0.80	Clayey Quartz	MTM-1	tr	tr	0.03	0.06	0.09	0.41	
"	"	N65W	50N	0.50	Clayey Quartz	MTM-2	10.8	47	0.08	0.23	0.59	2.76	
"	"	N5 W	22W	0.65	Clayey Quartz	MTM-3	tr	tr	0.03	0.03	0.04	0.39	
"	"	N50W	75N	0.20	Pyrite-arsonopyrite, Quartz	MMM-1	7.2	40	0.12	0.21	0.90	6.24	
"	"	N50W	75N	0.20	Arsenopyrite, Quartz	MMM-2	11.4	112	0.21	0.56	1.10	6.13	
Gitana	"	N40W	60-45N	0.15	Pyrite, Quartz	GITA-1	9.4	53	0.17	0.07	0.07	0.76	
"	"	N50W	48N	0.60	Clayey Quartz	GIT-E	2.0	34	0.07	0.05	0.17	2.07	
"	"	N34W	68N	0.60	Clayey Quartz	GIT-B	2.1	13	0.09	0.04	0.05	1.99	
Gitana-NW	"			0.15	Arsenopyrite, Quartz	YELA-1	0.6	36	0.11	0.04	0.06	5.50	
Gitana	"	N34W	68N	0.15	Pyrite-Arsenopyrite, Quartz	GIT-C	11.8	114	0.98	0.07	0.14	14.5	
Gitana-NW	Q 11-N	N66W	90		Clayey Quartz	Q-1116	tr	tr	0.01	0.00	0.00	0.05	
"	Q. 11-S	EW	75N	0.30	Clayey Quartz	Q-11536	tr	tr	0.03	0.02	0.01	0.13	

Table I-6 Chemical Analysis of Ore Samples in Q.3 Delicia

Locality Name	Sample No.	Sampling Length	Strike, Dip of the vein	Remarks	Assay Value					
					Au(g/t)	Ag(g/t)	Cu (%)	Pb (%)	Zn (%)	As (%)
RM-8	RM-8	Float ore	-	-	tr	tr	0.00	0.00	0.00	0.08
RM-8B	RM-8B	32 cm	N30°W, 50°NE	(1) Whole the vein	tr	tr	0.00	0.00	0.00	0.01
"	N-21	6 cm	"	(2) A part of the vein	tr	tr	0.01	0.01	0.03	0.06
RM-8A	RM-8A	35 cm	N50°W, 50°NE	(1) Whole the vein	tr	tr	0.00	0.00	0.00	0.03
"	N-23	20 cm	"	(2) A part of the vein	tr	tr	0.01	0.01	0.03	0.29
RM-9	RM-9	15 cm	N45°W, Vert.	-	tr	tr	0.02	0.01	0.01	0.17
RM-10	RM-10	20 cm	N65°W, 60°NE	(2) A part of the vein	2.6	3	0.01	0.01	0.01	0.05
"	N-26	55 cm	"	(1) Whole the vein	7.3	7	0.01	0.01	0.01	0.07
RM-11	RM-11	80 cm	N25°W, 40°SW	-	3.0	18	0.00	0.00	0.00	0.02
"	N-27	200 cm	-	White clay	tr	tr	0.00	0.00	0.00	0.02

CHAPTER 4. GENERAL DISCUSSION ON THE MINERALIZED ZONES

4-1 Relation Between Geological Structure and Mineralization

The general trend of the vein-type ore deposits distributed in this survey area is NW-SE, in spite of the differences of the wall rock, may it be the green volcanic rocks or the granodiorites.

The principal directions of the lineament detected through the survey in the first phase of the program are three systems, NW-SE, NE-SW and N-S, of which the mineralization is recognized associated with NW-SE system. By the results of the various survey works carried out in this third phase of the program, especially by the results of the geochemical exploration, are caught many ore veins or mineral indications, which are grouped, as a whole, into three rows of mineralized zones running in parallel in the direction of NW-SE, spaced approximately by 3 kilometers. It is thought that the regional lineament pattern above-mentioned is representing result of the lateral pressure in E-W direction, which would have caused the basement to form combination of a pair of conjugate shear planes (NE and NW systems) and a compressed tension fracture (NS system). It is evident that extensive fault activities were there after the formation of the ore veins, because the ore veins are observed to be cut and dislocated. The stress system of the fault activities is different, to some extent, from the systems aforementioned. It is thought the reason is that the geological structure would have varied to more complicated condition regionally as time went by. Taking as an example for it the Diamante principal mineralized zone, the general trend of which is NW-SE, it can be said that this main mineralized zone has a character of sheared plane, formed by lateral E-W pressure, as the inner-structure of the veins, the series and the branching pattern of the ore veins are revealing it to be left-lateral fault. The ore vein is composed of a combination of an almost vertical fault plane in N40°W direction and the secondarily formed and gently dipping fault plane in N70°W direction. The mineralization is recognized along these two fault planes and in the space formed in relation to the movement of these planes.

As for the relation of the wall rocks to the width and the continuity of the ore veins, it is possible to compare the Diamante ore deposits lying in the green volcanic rocks with the other ore vein, for instance Bombona ore deposit, lying in the granodiorite. The following two points of difference are noted, on the vein structure, though they would not make so remarkable difference.

(1) Pinch and swell of the ore veins in the green volcanic rocks are more remarkable and therefore the wide portions of the ore vein would have been easily formed.

(2) The ore veins found in the granodiorite are comparatively linear and continuous, although not so wide (they have long cycle of pinch and swell).

It seems that sulphide minerals as sphalerite, chalcopyrite, galena, etc. are more abundant in the veins of the Diamante ore deposit. However, as the reason would be the difference of local conditions, it cannot be said that this mineralogical difference would depend upon the difference of wall rocks.

4-2 Relation Between Igneous Activity and Mineralization

Viewing from the points that the wall rocks of the vein-type ore deposits are the Piedrancha granodiorite and the green volcanic rocks intruded by the former and that, as above-mentioned, the ore veins are running in specific direction in spite of the difference of the wall rocks, the formation of the ore veins would have been at the period when the physical properties of the granodiorite became almost similar to those of the surrounding rocks after the intrusion and consolidation. However, it is suggested that the Piedrancha granodiorite would have some relation to the mineralization in the points of their distribution and the variation of the character of the ores, because the gold ore deposits which are distributed along the margin of the granodiorite and in the immediate outer zone of its margin, are observed to have different characteristics locally ---- that is, gold-bearing quartz veins poor in sulphide minerals are distributed in the northeastern part while most of the sulphide rich ore veins are found in the southeastern part of the granodiorite. Through the surveys for these three years, it has been clarified that the Piedrancha granodiorite varies its chemical properties from diorite to granodiorite from early stage to later one, that the diorite would have been a forerunner stretching itself in NE-SW direction, accompanying dissemination of copper and molybdenum and that the Piedrancha granodiorite is distributed in form of intrusive complex, the ages of which are from 6 to 20 million years. As the ore veins found in this survey area are observed to have cut all these intrusive rocks, it is thought that the mineralization would have been at the latest stage of the igneous activities. The granodiorite belongs to the I-type according to the chemical ingredients.

4-3 Wall Rock Alteration

By the X-ray diffraction of the minerals formed by the alteration within the immediate neighbouring area of the ore veins, zonal structure is recognized symmetrically around the ore vein (Fig. I-11).

The samples N58 to N62 and S32 to S38 are collected symmetrically in the wall rocks around the two almost vertical ore veins, which are 15cm and 17 cm wide respectively. The minerals are distributed in the order of sericite-montmorillonite/kaoline-chlorite, from the central zone to the outer. Samples of GITAX 01 - 05 and GITBX 01 - 06 were collected in the underground from the vein-type ore deposit in the wall rock of the green volcanic rocks. Here also is recognized a zonal structure that montmorillonite/ kaoline zone is surrounding the sericite zone which is in the center of the mineralization. An example of wall rock alteration in Kammuridake mineralized zone (in the vicinity of the Kushikino mine, Japan) is shown in Fig. I-12, in which the variation of the minerals formed by the alteration in the wall rock are described according to the distance of 0, 5, 20 meters from the ore vein. In this survey area too, sericite and kaolinite are gradually decreasing toward the outer zone, while montmorillonite is most abundant at the point 5 meters apart from the ore vein. Chlorite increases in the outer zone.

To obtain information on the chemical ingredients, Ca, Si, Sb, As and S were analyzed. The results of the analysis are showing that As values are decreasing toward the outer zone, while the maximum value is found in the ore vein, that Ca values have quite reverse tendency to those of As, and that SiO_2 values are high in the ore vein although they are low in the surrounding area. It is evident from the above fact that a sort of devitrification would have occurred with progressive montmorillonitization in the wall rock. Viewing from the variation of minerals formed by the alteration and from the variation of the chemical ingredients, it is evident that wall rock alteration is confined to fairly narrow zones beside ore vein sitting in the center (within 1 meter from each ore vein in cases of N58 to 62 and S32 to 38).

Wall rock alteration observed in the cores collected through the drilling works for the Diamante main ore veins is as follows. There are severe silicification and sericitization near the ore veins, while montmorillonite is found sporadically. It can be observed with naked eyes that dark colored or dark green colored wall rocks have been turned to pale brown rocks with pale green spots. The width of the altered zone is 10 cm to 1.5 meters from the ore veins composed of quartz and clay.

4-4 Ore Minerals

The most common ore minerals composing the ore veins are pyrite and arsenopyrite, followed by sphalerite. There can be found small amount of chalcopyrite, galena and tetrahedrite. As gold and silver minerals, very small amount of electrum, argentite, polybasite, pyrargyrite, freibergite and silver-bearing lead-bismuth minerals are detected. The gangue minerals are mostly quartz. Calcite veins are observed only in the floats found in the landslide area near the Desquite ore deposit.

As the occurrences of the main ore minerals are described in the survey report of the second phase of the program, occurrences of gold-silver minerals are given here.

According to the EPMA image, the Ag/Au ratio of electrum is low (rich in gold). Electrum is observed to occur in small irregular aggregates, in tabular form and in dendritic form, in the sizes of several to 100 microns. Electrum is associated with idiomorphic arsenopyrite (Sample No. MM2A, D7144: same hereinafter) and rhythmically precipitating quartz (D30B0.3). Often it fills corroded surface of pyrite (ND-17A) and irregular skeleton crystal of arsenopyrite (MM3). It also occurs in dendritic form in small cracks (N63A). Argentite and polybasite are observed to occur in irregular shape along the crystal margin of pyrite (D6073B). Argentite is observed to compose a thin seams cutting chalcopyrite (PD1376.5). It also is found associated with cerussitization of galena (N57A). Silver-bearing lead-bismuth mineral (Ag-bearing cosalite-galenobismuthinite or gustavite series mineral) has been discovered in the sample No. PD14124.

There are many minerals recognized in the Diamante main ore veins. Based on the results of microscopic observation, the order of the crystallization of the minerals are inferred early to later stage as follows.

(1) Pyrite, arsenopyrite, electrum

(2) Sphalerite, chalcopyrite, galena,

(3) Argentiferous Pb-Bi mineral, tetrahedrite, pyrite, cerussite, proustite, argentiferous Pb-Bi mineral

(4) Argentite, pyrargurite

Gangue minerals are mainly quartz and small amount of dolomite is recognized. Arsenopyrite is apt to take idiomorphic form as it is a mineral formed in the early stage of the mineralization. On the corroded and depressed surface of assenopyrite, sphalerite, chalcopyrite and galena are formed. Tetrahedrite occurs as thin seams cutting chalcopyrite and sphalerite and is thought to have been formed in the later stage of the mineralization. Electrum is in most cases associated with arsenopyrite and is thought to be crystallized in the early stage. Argentite and pyrargyrite are observed in fine seams, cutting chalcopyrite formed in the later stage of the mineralization.
It is characteristic that this ore veins are containing zinc of 2 to 3% and copper of 0.2 to 0.4%. In most cases, sphalerite crystale are found to include abundant chalcopyrite dots. Galena is not found so much as a whole but it sometimes contains silver minerals. Tetrahedrite is observed com-

paratively frequently along the rims of sulphide minerals or in the space between grains of minerals. Between the periods of (1)-(2) and (3)-(4), there would have been a brecciation (fault activity), breaking the already-formed crystals. The minerals of the period of (3) and (4) are recognized to have been precipitated filling small cracks formed by the fault activity.

In the Table I-7 are given correlation coefficients of the mutual relation of ingredient elements obtained from the assay results of the ores.

Table I-7 Correlation Coefficients Among Elements of Ore Vein in the Diamante-Paraiso-Bombona Area

	Au	Ag	Cu	Pb	Zn	As
Au	X	0.82	0.29	0.41	0.11	0.31
Ag	0.82	X	0.30	0.32	-0.02	0.14
Cu	0.29	0.30	X	0.11	0.13	0.33
Pb	0.41	0.32	0.11	X	0.16	0.33
Zn	0.11	-0.02	0.13	0.16	X	0.52
As	0.31	0.14	0.33	0.33	0.52	X

It is noted that in many cases mutual relation of the elements shows positive correlation coefficient. Listed in the following the relation showing high coefficient.

Correlation coefficient	Elements		
0.5 - 0.8	Au-Ag	Au-Zn	
0.4	Au-Pb		
0.3	Ag-Pb	Au-As,	Au-Cu
	Ag-Cu	Cu-As,	Pb-As

It is natural that the coefficient of Au-Ag is high because of the important mineral to be electrum. But it is notable that the correlation coefficients of the elements of Cu and Pb against those of Au and Ag are fairly high, and that, as for the elements of Pb, Zn and Cu, the relations of As-Zn, As-Cu and As-Pb have high correlation coefficient, while there is only low correlation efficient in the relation of those Cu, Pb and Zn elements one another. Taking variations of gold contents against Ag/Au ratio, from the assay results, it is obvious that they are in inverse, proportion, as shown in Fig. I-14. That is, in this survey area, there is a tendency that gold grade of the ore would be low where the Ag/Au ratio is high.

4-5 Distribution of Metals in Diamante Mine

The results of drilling to the principal vein of Diamante Mine and all assay results of samples from abandoned are written in "PL. I-15 Plan and Longitudinal Section of Diamante Principal Vein". Based upon PL. I-15 the following elements were studied and the Fig. I-16, was drawn.

(1) Zoning by ratio of silver and gold

A : Ag/Au = 1 - 5, B : 6 - 15,

C : 16 - 30, D : over 31

(2) Over 0.3% of Cu

(3) Over 0.1% of Pb

(4) Over 2.0% of Zn

(5) Over 2.0% of As.

At the point where a drilling hole cuts a vein, the width of the vein, where the dip of the vein assumed to be vertical, and its gold content is written in PL. I-15 and only the veins whose width is over 0.25m and gold content is over 3 g/t are drawn with dot on the figure. The following can be pointed out in the Fig. I-16.

(1) Gold-silver ratio of the gold bonanza is in B zone, i.e., between 6 and 15. The area where gold-silver ratio is either over 15 or under 6, shows less gold content in absolute value. High grade gold ore in

the adjacent parallel veins, Marina ore deposit and Gitana Segunda ore deposit, show the similar results.

(2) The zones, where copper content is over 0.3%, are south of the Gualquilia Norte Pit and above 2,550m above sea level in the southern area and Hormiga Pit in the northern area. At the central area, 0.44% of copper is locally seen from the drilling No. PD-5.

(3) Over 0.1% of Pb is general in the southern area and is in some area at Hormiga Pit and upper part of the central Diamante bonanza.

(4) Distribution area of Zn over 2.0% generally coincides with the central Diamante bonanza and also is in a small scale at Gualquilia Norte Pit and its lower part, ore cut of the drilling No. PD-14.

(5) Over 2% of As is in all the area described above (1) to (4) except the area of the zone A of gold-silver ratio and also is at the lower part of Gualquilia Norte Pit, the drilling No. PD-13.

Because the figure reflects the assay results of all the ore samples collected, the vein, which are at least two separate veins are not separately described. Furthermore, minerals are randomly distributed in veins. Therefore, ore grade of the drilling core tends to reflect irregularity of mineral distribution.

From the indications of the figure and the known features of the ore deposit with the consideration of the above-mentioned irregularity, the genetic model of ore deposits in the area is inferred as follows.

4-6 Fluid Inclusion Study

(Purpose) Measurement of homogenizing temperature of fluid inclusions in quartz samples taken from drilling's cores of the Diamante mine has been conducted for studying temperature circumstance when the ore vein had formed. Determination of salinity of aqueous phase also, has been aimed at, however it was halted because the inclusions were too small to examine.

(Preparation of sample) Twenty quartz samples were collected from drilled core, so as to make representatives for all drilling holes. Thin sections were made in a thickness of 0.5mm or less polishing one side for microscopic observation.

(Inclusion) Inclusion's grain size is so small in all of the sample as 3 to 15 μm, rarely up to 20 μm. The shape of inclusions are long or short prismatic, ovoid or like a minus hexagonal crystal. Inclusions are of two phases of gaseous and aqueous. There is no three phases.

(Measurement) Equipment for measurement of temperature is LINKAM-JH600 TYPE which has a temperature rising ratio of +1°C/minute. Ten inclusions from each sample are determinated on an average.

(Results) Sample location and results of temperature measurement are shown in Fig. I-17. Six out of twenty samples did not permit determination of temperature because these inclusions were so fine and scarce to observe. But, it may be noteworthy to say that these samples are in coincidence with barren or very poor gold mineralization part.

Although it is hard to say conclusively on the genetic relation with thus obtained results because of limitted number of samples, the following may enumerate by inference:

(a) Temperature shows a variation from 188°C to 390°C, making a predominant peak around 345°C and other small peak around 250°C.

(b) Two examples show different temperatures although they are very close each other. (i.e. CFI-20 and 21, CFI-22 and 23) This may indicate a character of "complex ore vein" which had precipitation of minerals after faulting occurred at the later stage of mineralization.

(c) When the temperature is high, gold content shows higher value in general. This may coincidence with the results of microscopic observation of ores saying that electrum precipitated in the early stage of mineralization.

(d) In the quartz samples from non-mineralized part, the inclusions are scarce and very fine-grained.

4-7 Genetic Model of Ore Deposit

Ore deposits in the area were formed as follows.

(1) After intrusion and consolidation of Piedrancha granodiorite, due to stress in E-W direction, shear zone was developed in NW direction in this area where the distribution of granodiorite is large. There were developed conjugate faults to NE direction, but only NW shear zones were mineralized in this area.

(2) The shear zones of several hundred meters wide consists of groups of faults with the same direction. Some of these faults were mineralized. Vein type ore deposits were formed along main pass of ore solution through the shear zone.

(3) When ore solution moved up, surrounding temperature and pressure drop, encountering underground water and sudden pH change caused ore solution to crystallize and precipitate many minerals. Contents of each constituent elements of ore solution and physicochemical conditions decide minerals crystallized. The Fig. I-16 shows the zoning pattern of constituent elements in Diamante ore deposit.

(4) The zoning pattern shows that the Au-Zn-As zone is at the center and surrounded by the Au-Zn-Pb zone and the Pb-Cu-Ag zone and has a shape like a mushroom.

(5) Mineralized zone of the principal vein of Diamante ore deposit extends about 1,200 meters. However, gold ore zones (Au content: over 3 g/t and zone width: over 25 cm) horizontally extend rather

short, 100m to 200m because veins of the area tend to pinch and to swell. Their vertical extension is also inferred to be about 150m to 200m because their bottom is inferred not below 2,450m above sea level. (On the Fig. I-17, gold ore zone does not exist at south of the center of the figure because the drillings No. PD-11 and PD-12 did not encounter gold ore. The vein structure which was cut by these two drill holes is only an altered fracture zone. The drilling was terminated a few meters beyond cutting the vein structure and there still remains whether no mineralized zone exists beyond the terminated points of these drill holes. Because the principal vein of Diamante ore deposit consists probably of two adjacent parallel veins, there may be the southern extension of the bonanza. The distribution pattern of elements in the area is also easily interpreted that there may be the extension of the bonanza. However, we have not more data around this concerned area and the figure shows no bonanza.)

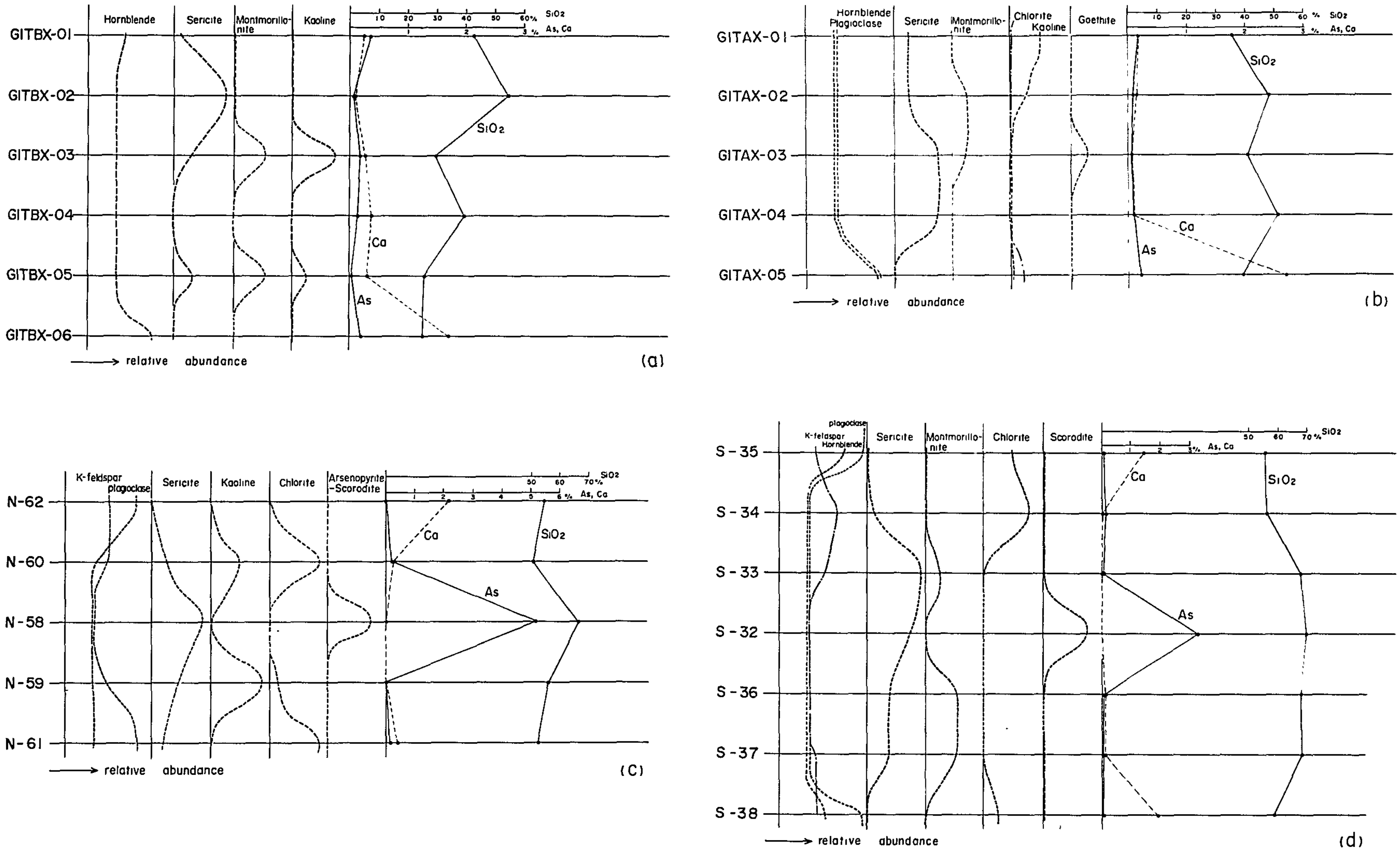


Fig. I-11 Wall Rock Alteration Chart (a)(b) Gitana Mine (c) Paraiso Area (d) Bombona – NW

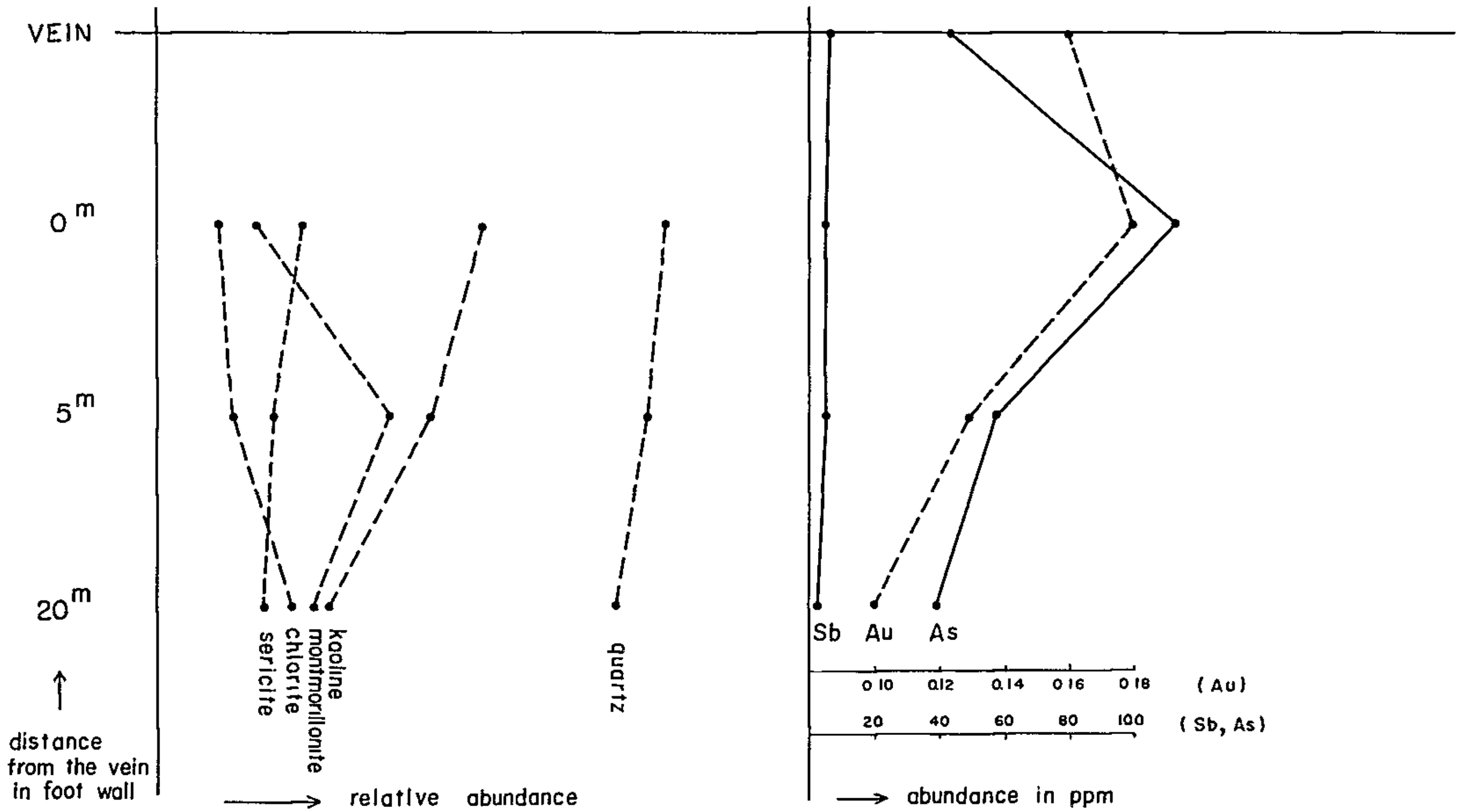


Fig. I-12 Wall Rock Alteration Chart (2)

Kanmuri-dake area, adjacent east of kushikino Au mine

[after MMAJ(1981) kushikino area geochemical exploration report (in Japanese)]

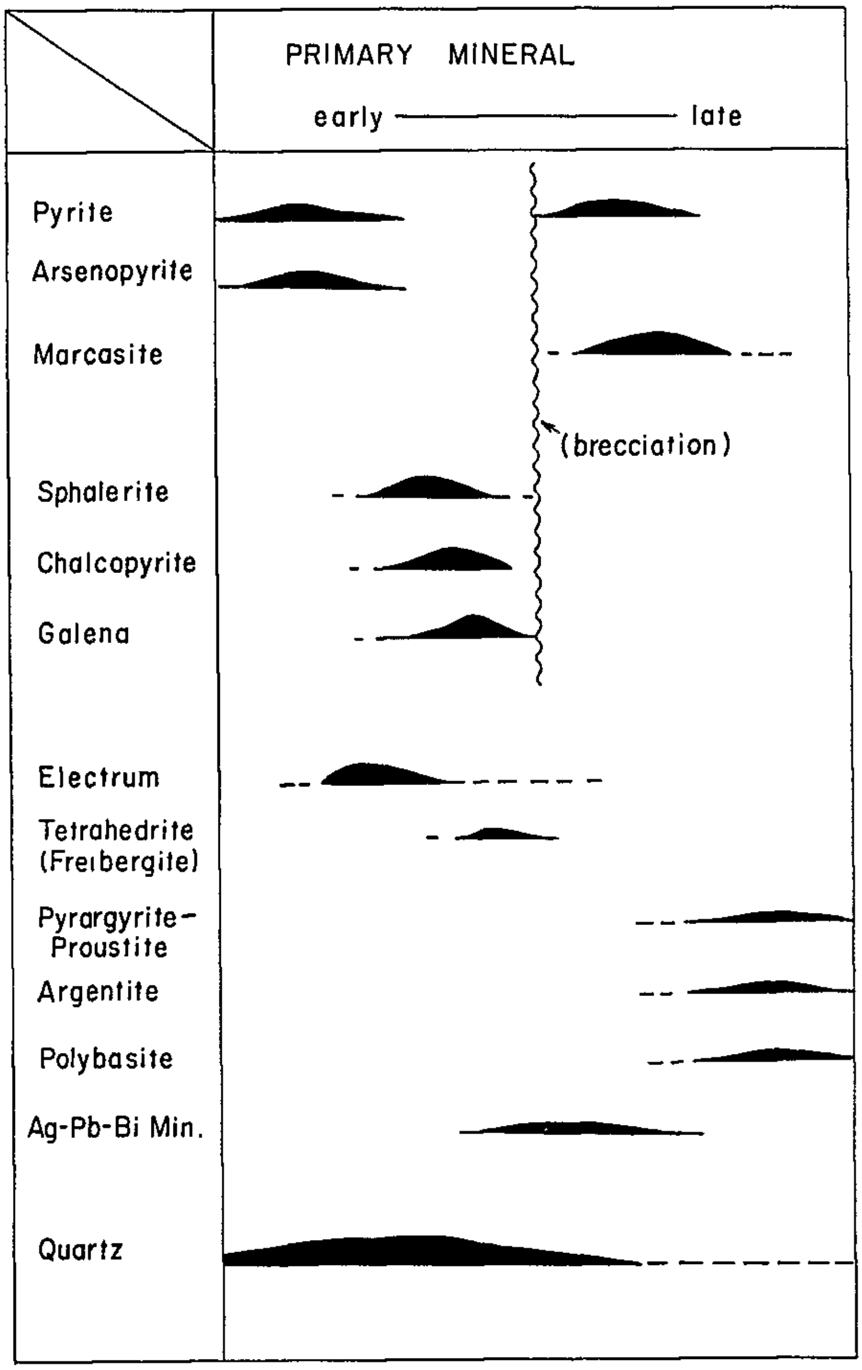


Fig. I - 13 Paragenetic Sequence of Minerals in the Diamante Principal Vein

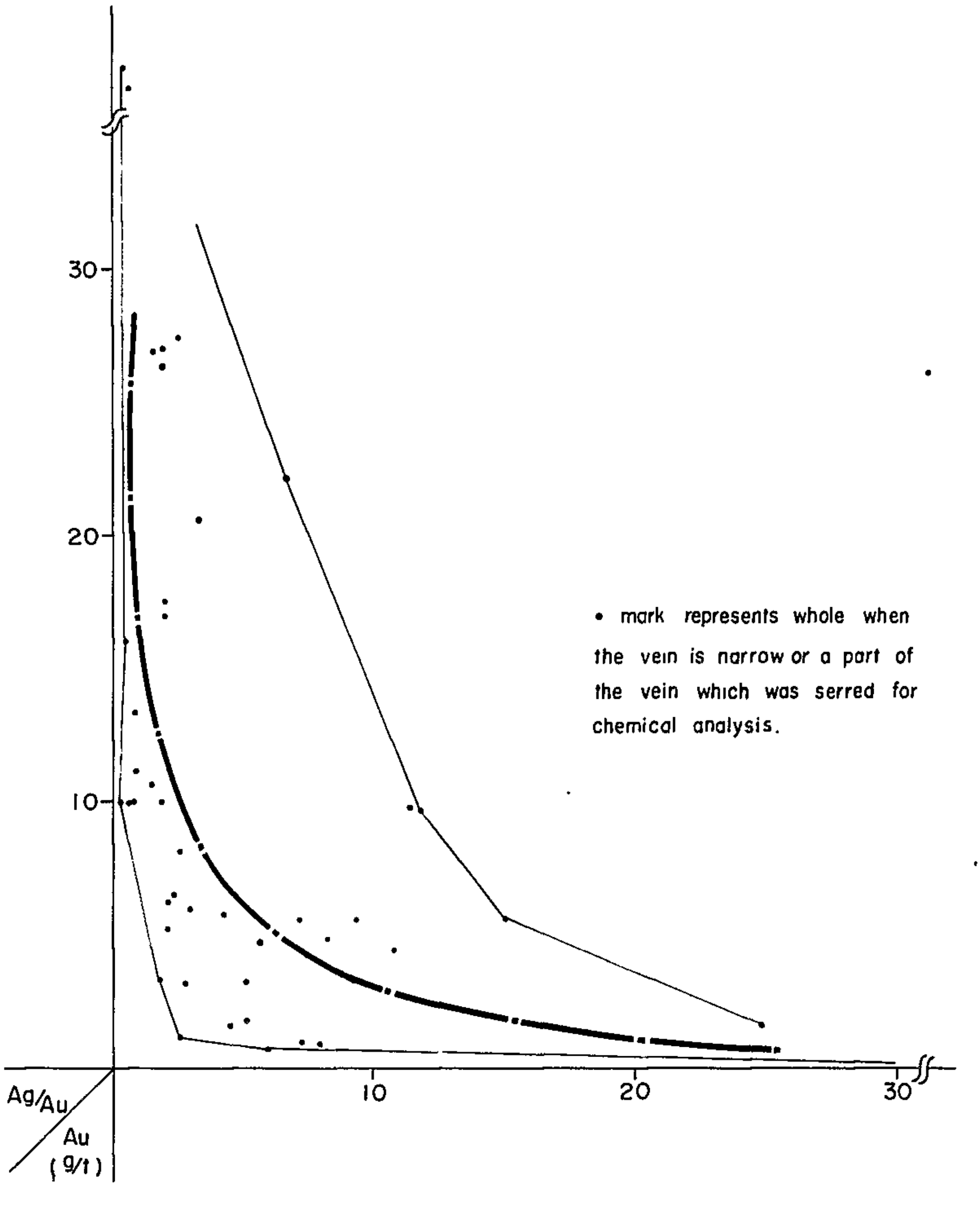


Fig. I-14 Ag/Au Versus Au Value Diagram
from Veins in Diamante—Paraiso—Bombona Area

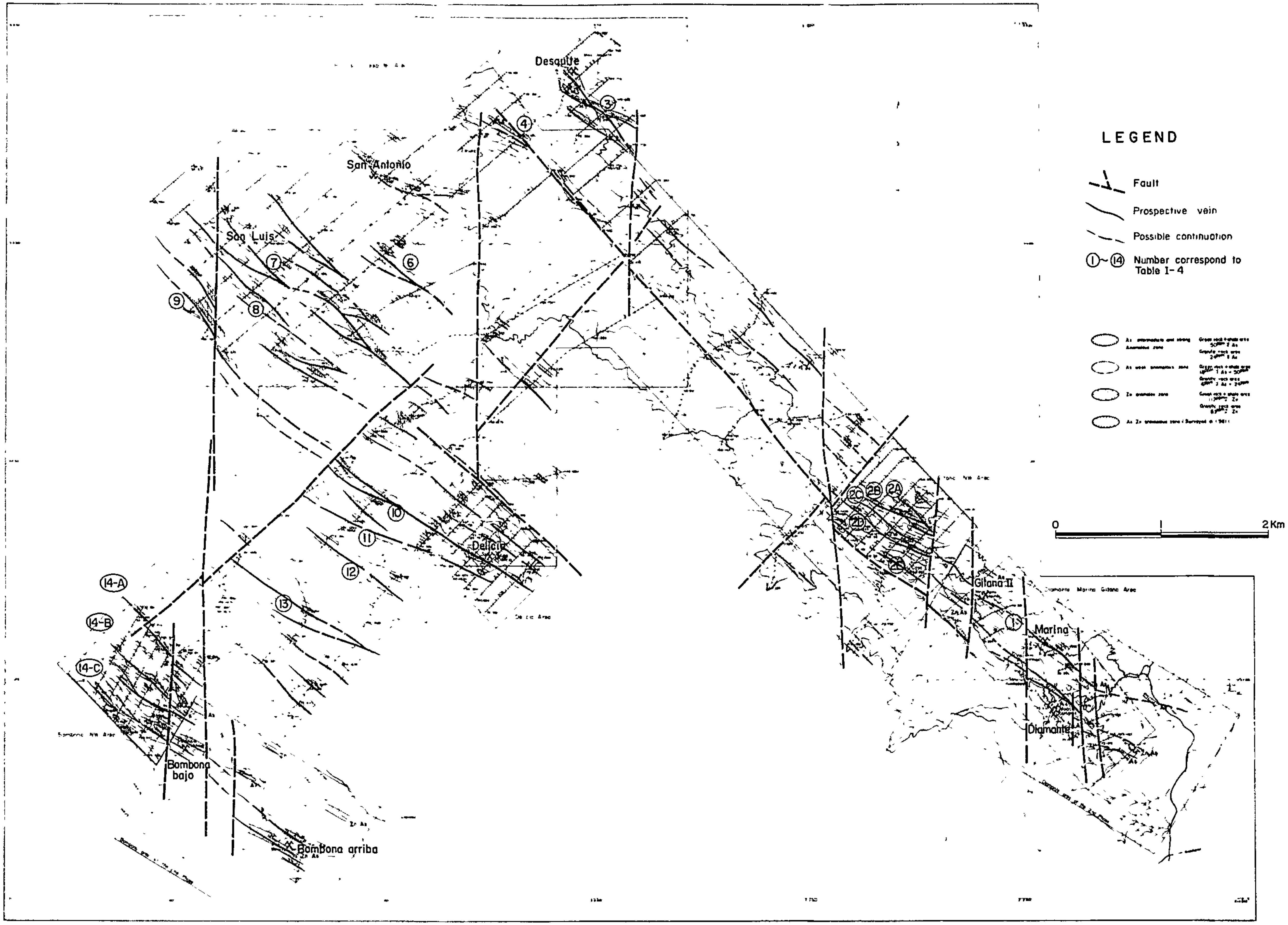


Fig. I-15 Prospective Zones extracted after Geochemical Survey in the Diamante — Paraiso — Bombona Area

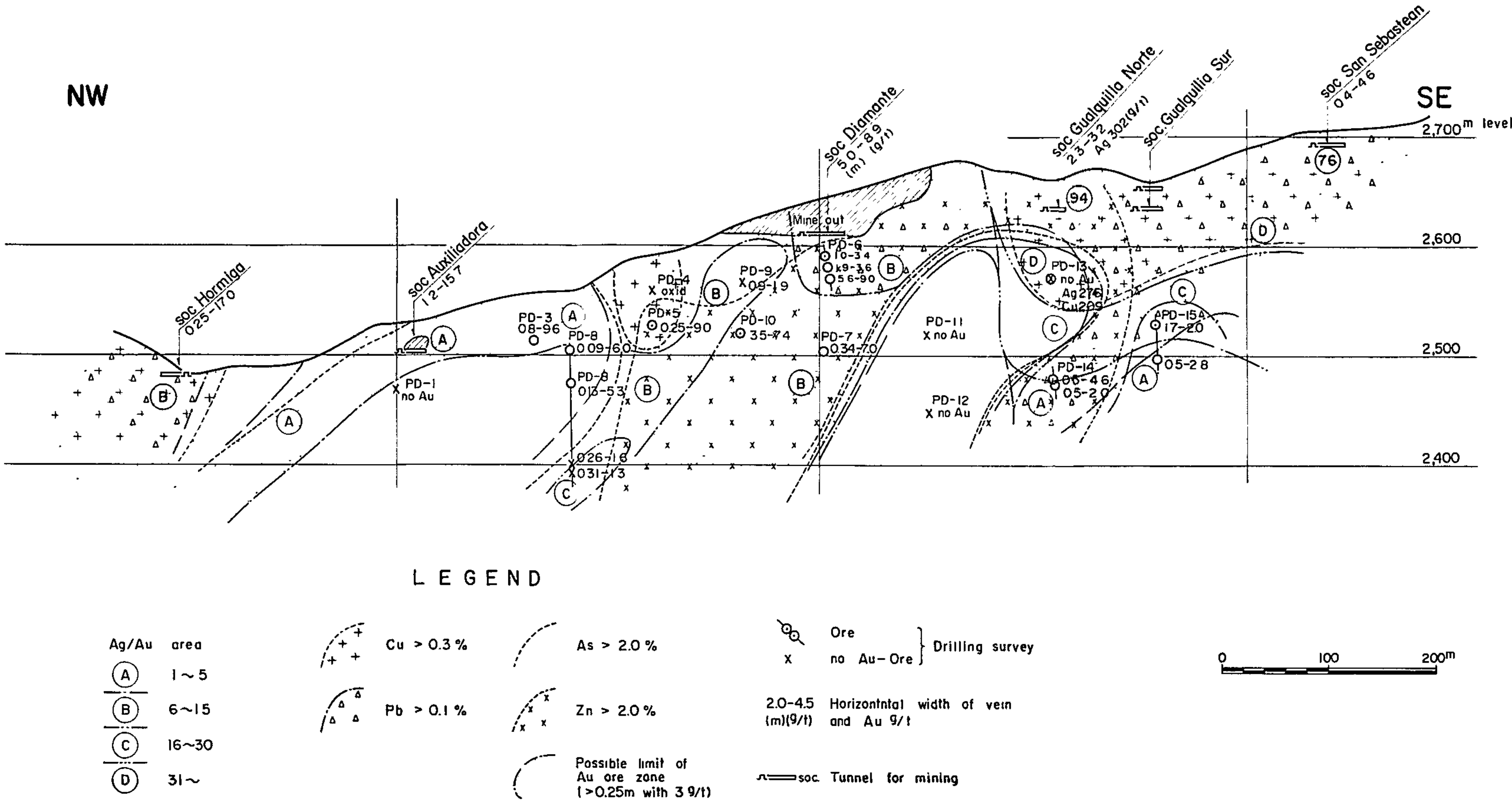
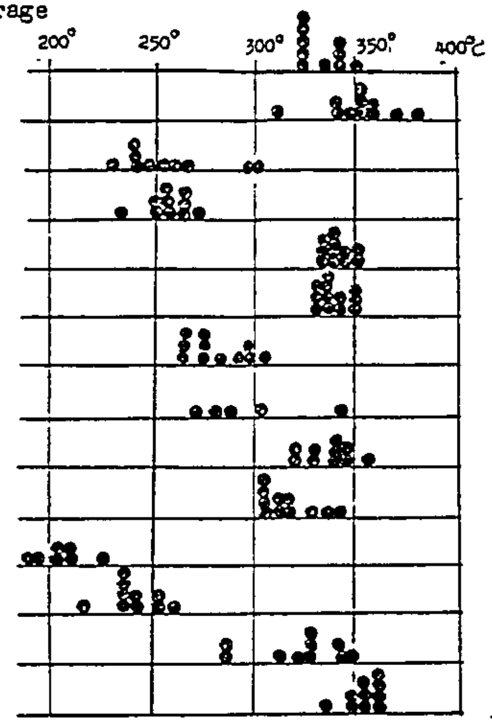
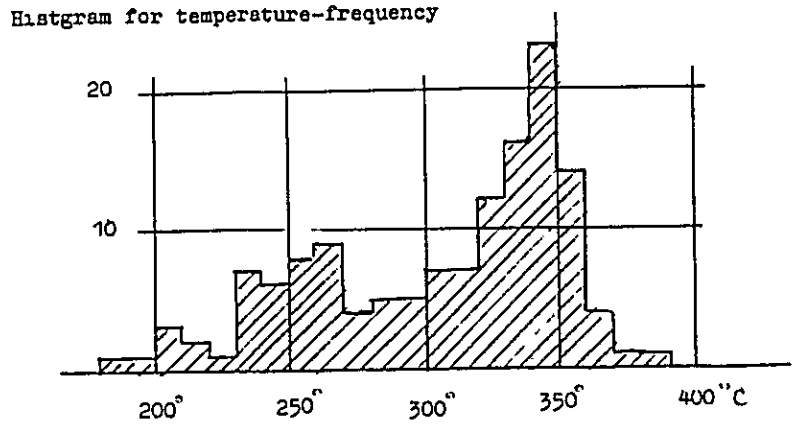


Fig. I-16 Longitudinal Section of Diamante Principal Vein for Studying Survey Results

Sample No.	Location D.D.H.-depth (m)	TEMPERATURE min.-max. (C)	Num.	Average (C)
3	PD-10	111.5	322°--351°	10	334°
4	PD-10	114.6	312°--380°	11	352°
7	PD-12	191.6	230°--300°	10	257°
8	PD-12	193.6	233°--269°	10	256°
13	PD-15	115.7	294°--352°	10	337°
15	PD-15	148.9	329°--351°	12	389°
17	PD-1	33.6	262°--306°	11	281°
18	PD-5	105.7	271°--343°	5	297°
19	PD-5	109.2	319°--355°	10	336°
20	PD-6	64.8	303°--342°	11	317°
21	PD-6	93.8	188°--226°	7	205°
22	PD-7	142.2	217°--260°	10	240°
23	PD-7	144.8	284°--347°	10	321°
24	PD-8	90.6	334°--363°	10	353°



note;Sample No.6(PD-11 134°.5m),No.9(PD-13 101.5m),No.11(PD-14 126.8m) No.12(PD-14 163.0m),No.25(PD-8 119.8m),No.26(PD-9 81.5m) are not determinated because their inclusion are too small and scarece.



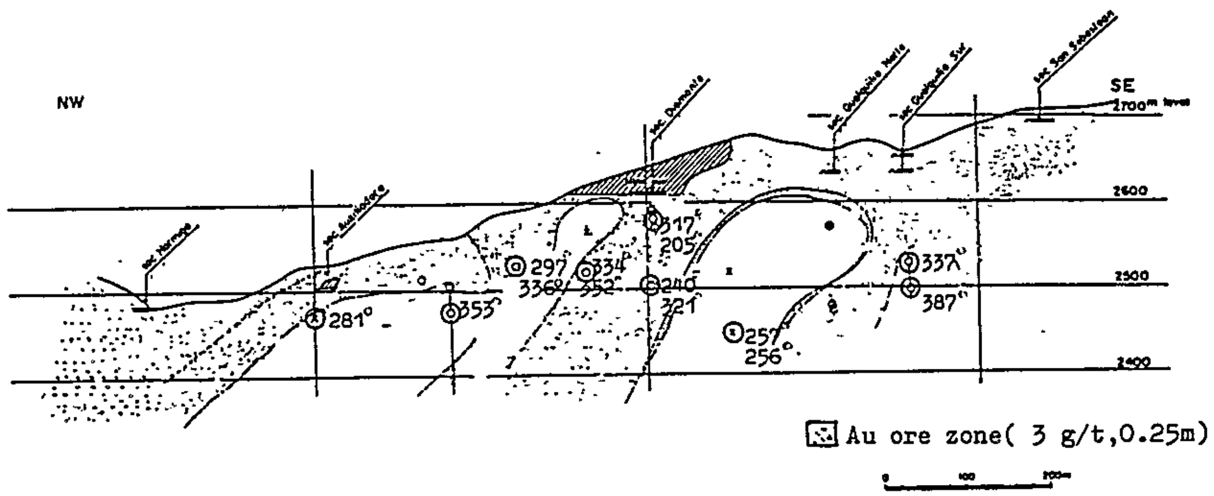
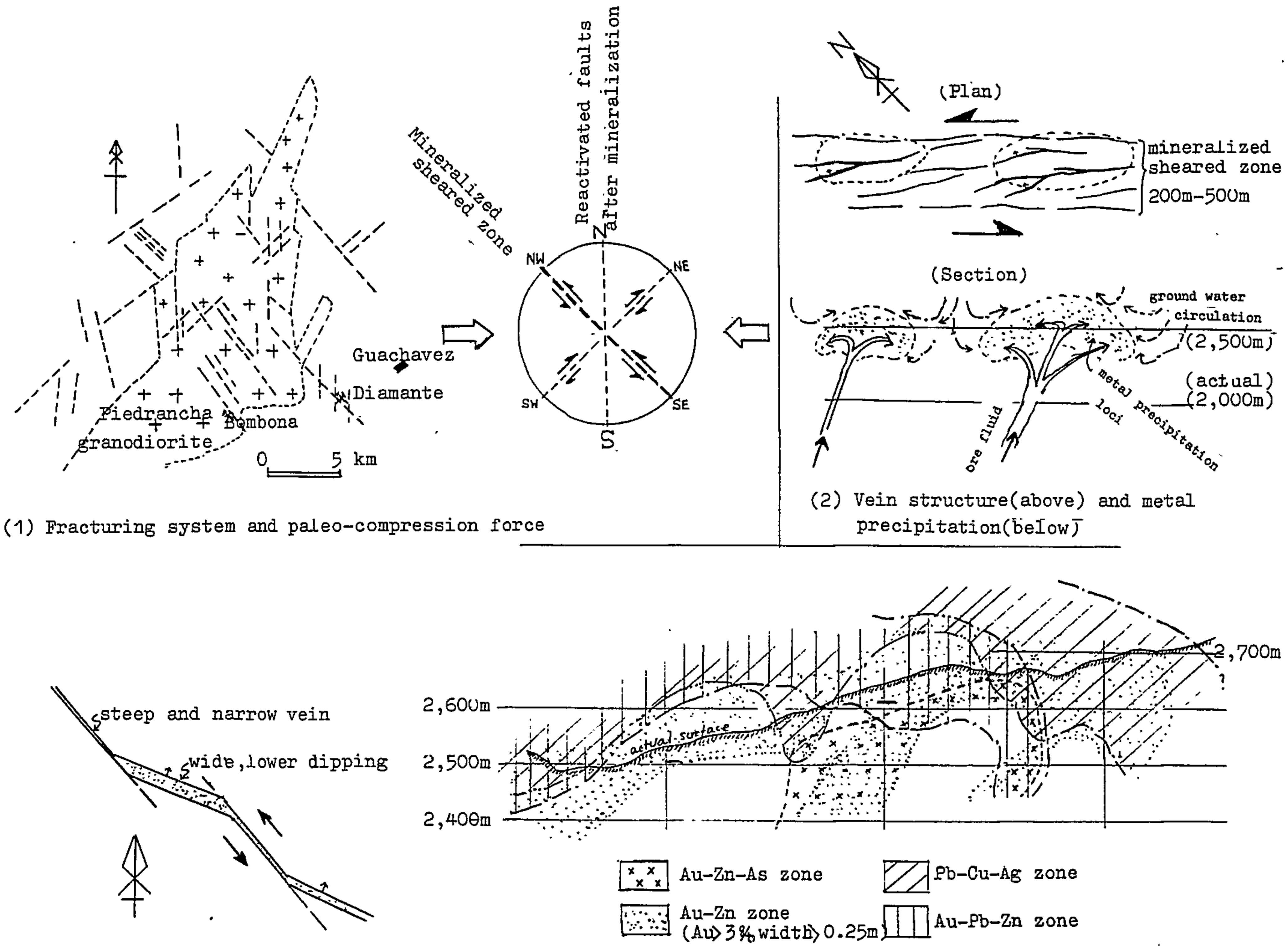


Fig.I-17 Location of Samples for Fluid Inclusion Study and their Results



(1) Fracturing system and paleo-compression force

(2) Vein structure(above) and metal precipitation(below)

(3) Formation of space for Bonanza

(4) Zoning pattern of metallic elements

Fig.I-18 Genetic Model for Auriferous Polymetallic Veins in the Surveyed Area

CHAPTER 5. CONCLUSION AND RECOMMENDATION

5-1 Conclusion

In this third phase of the program, diamond drilling was carried out for the Diamante main mineralized zone, in addition to the geological survey and the geochemical exploration in Diamante-Paraiso-Bombona area.
The details of the works of diamond drilling are described in Part II.
Including the results of the diamond drilling, the conclusion of the surveys carried out in this phase is as follows.

(1) Geologically, the rocks distributed in the surveyed area are composed of the green volcanic rocks and the Piedrancha granodiorite intruding the former.

The ages of the intrusion are in the range of 6 to 20 million years.

(2) The mineralization is represented by the fissure-filling polymetallic vein type ore deposits, the wall rock of which are the two aforementioned.

(3) It has been clarified that the mineralized zones are running in parallel three rows in the NW-SE direction, spaced approximately by interval of 3 kilometers (Three rows are Bombona, San Luis - Delicia and Desquite - Diamante).

(4) The mineralized zones are as wide as several hundred meters and in each of them several ore veins are distributed.

(5) The width of each ore vein is generally small. The maximum width so far recognized in the surveys is 5.6 meters observed in the Diamante main mineralized zone. The lateral extension of enriched portions is as short as 150 to 200 meters, and the depth is inferred to be appoximately 200 meters, viewing from general attitude of gold ore deposits.

(6) Gold minerals are composed mainly of electrum. It is thought that its precipitation and crystallization would have been at the final stage of the formation of the arsenopyrite. There is a tendency that gold grade is high where abundant arsenopyrite is recognized.

(7) It is not likely that there is high correlation coefficient in the relation between the grades of zinc and gold. But locally zinc grade comes up to 10% in some of the enriched portion in the Diamante gold ore vein. Zinc indications are more abundantly found in the Desquite-Diamante mineralized zone than in other two zones.

(8) By the results of the geochemical exploration carried out by collecting soil samples, as many as 20 geochemical anomalies have been detected. There are 10 anomalies out of 20 where mineral indications have been recognized. It is thought that there is possibility for mineral indication to be discovered in these other 10 anomalies.

Following 6 anomalies are thought to be the most favorable areas for the emplacement of ore deposits, viewing from the points of the scale and the individual anomalous values.

Gitana - NW	San Luis,	San Luis - W
Delicia - NW,	Bombona - N,	Bombona - NW

5-2 Recommendation

There are many gold mines worked in a small scale in this survey area. In most cases, residual gold enrichment zones formed near the surface have been the object of the working. It has been clarified that abundant sulphide ores are still left at the depth of the ore deposit in the Diamante mine. It is expected as well as that workable ore deposits are left at the depth of the other ore veins found in this area. Also it is obvious that many geochemical anomalies extracted by the geochemical exploration would have high potentiality for the emplacement of gold ore deposits.

It is comparatively easy to construct a new road in this area to the vicinity of Paraiso, as the area is within the reach of Guachavez village. The area is thought to have favorable geographical conditions for the development of mines with abundant water.

However, it is necessary before the development to carry out sufficient studies and examinations on the methods of the recovery of gold from arsenopyrite, as the ore contains fair amount of arsenopyrite. It is also necessary before the investment for development of mine to grasp clearly the ore reserve and the ore grade by excavating tunnels. Rough feasibility study would be required for the development of mine by investigating problems concerning infrastructure and by carrying out preliminary concentration test.

References

Baum,W. & Göbel,V.W (1978): Investigations on Metallogeny, Calc–Alkaline Magmatism, and Related Tectonism in a Continental Margin Province, Western Cordillera of Colombia S.A.
Proceedings of Fifth Quadrennial IAGOD Symposium

Galviz,J.(1982): Un arco de islas terciario en el occidonte Colombiano.
Univ. Nacional (en imprinta)

INGEOMINAS(1982): Mapa Geologico del Departamento de Nariño
Escala 1:400,000

Lepeltier,C.(1969): A Simplified Statistic Treatment of Geochemical Data by Graphical Representation.
Econ. Geol. Vol.64 p.538–550

Nagasawa,K.(1981): Clay minerals associated with Au–Ag mineralization (in Japanese)
Mining Geology Special Issue No.10

Perez–Tellez,G.(1980): Evoluci'on geologica de la Subcuenca del Alto Patia, Departmento del Cauca, Colombia.
Geologia Norandina 2 Diciembre 1980

Takenouchi,S.(1981): Fluid inclusion studies of Tertiary gold deposits (in Japanese)
Mining Geology Special Issue No. 10

PARTICULAR

PART II DRILLING SURVEY

PART II DRILLING SURVEY

LIST OF FIGURES

LIST OF PLATES

CHAPTER 1. DRILLING WORKS

1-1 Construction of Roads for Transportation

Helicopters were used for the transportation of materials and equipment during the second year, but this year a 3m wide road was constructed for about 15 Km between Guachavez and Diamante Mine. The team leader, who first left with the geological survey team on June 14, borrowed bulldozers from INGEOMINAS, prepared a field camp, procured materials and secured laborers, negotiated with local land owners and related government offices, and partially started road construction. Three drilling members left on July 5 and when they arrived at Guchavez on July 9, they proceeded with work divided into the construction of this main road, the construction of a road for movement and transportation near the mine and the ground levelling for drilling sites. The old road, of which construction had been given up after manually excavating a 2 ∿ 4m width 30 to 50 years ago in an attempt to build a motor road along the Telembi River, was used as the main road construction, widening it and levelling the ground. However, a stretch of about 1 Km descending from the opposite bank of the Diamante Mine to the mine was newly excavated.

The local terrain is extremely steep and there is much rain. So, the road construction was, indeed, difficult as frequent collapses occurred during and after its construction and because the road surface did not easily harden. Where the road crossed brooks, the stream were spanned with wooden or stone bridges. Where it crossed marshes, gravel and boulders were used. To ensure smooth transportation of material and equipment, 8-15 temporary workers were posted, whenever necessary to maintain and repair the road.

In April 1982, a regular motor road began to be constructed between

Guachavez and Diamante by the Ministry of Public Works of the Government of Colombia and by the time drilling was completed the road construction had progressed to 4 Km from Guachavez.

1-2 Drilling Sites and Drilled Length

The Diamante area is about 10 Km from Guachavez village by a horse path crossing over a pass 3,200m in elevation. The distance takes about three hours to travel on horseback or by foot.

The position (longitude and latitude) of each drilling hole, its elevation and its drilled length are as follows:

Name of hole	Longitude	Latitude	Elevation	Drilled length proposed	Drilled length actual	Direction	Dip
PD-8	12,196	1,950	2,564.5	180	180.50	225°	-75°
PD-9	12,208	1,740	2,604.4	130	131.00	45°	-30°
PD-10	12,208	1,740	2,604.4	200	200.50	45°	-50°
PD-11	12,290	1,619	2,606.6	140	140.50	60°	-40°
PD-12	12,290	1,619	2,606.6	200	200.20	60°	-55°
PD-13	12,377	1,524	2,618.8	120	121.50	60°	-40°
PD-14	12,377	1,524	2,618.8	200	200.20	60°	-60°
PD-15	12,434	1,443	2,624.1	160	161.50	60°	-60°
Total				1,330	1,335.90		

(* E 12,000, N 2,000 and elevation 2,500m are used for Station 21 before the pithead of Mina Auxiliadora. Last year, E 2,000 and N 2,000 were used for the same station but a change was made for this year due to an expanded scope of the precision geological survey.)

1-3 Construction of Sites

1-3-1 Transportation

Because the construction of the road for motor transport progressed with difficulty, material and equipment were brought by manpower together with self-propelled transportation from the warehouses where they had been stored last year. All transportation between holes was handled by manpower together with a rooper (universal pulling and lifting machine) and self-propelled transportation.

1-3-2 Setting Up

Setting up work was started from PD-8. The construction of the mountainous transport route between the drilling sites of PD-8, PD-9 and PD-10, PD-11 and 12, PD-13 and 14, and PD-15, the construction of a 1,600m haul-out route (width: 2m) to the main route and the ground levelling at drilling sites were done manually.

1-3-3 Water for Drilling

For holes PD-9 and 10, $1\frac{1}{2}$ inch polyethylene pipes were laid for 300m with a pump-up height of 10m by HOPE-F pump. For holes PD-8, PD-11, and 12, PD-13 and 14, and PD-15, natural intake was made from a nearby mountain stream, using $1\frac{1}{2}$ inch and 1-inch polyethylene pipes. The total length of pipes used for this purpose was 1,000m.

1-4 Drilling

The top soil was drilled by 101-mm metal crown without using water. When bedrock was hit, drilling was made by the NQ wireline method, inserting and installing one casing pipe after another. For the final caliber, the BQ wireline method was used. The progress of drilling of each hole was as follows:

1-4-1 PD-8 (Direction 225°, Inclination -75°)

Drilled length, 180.50m

Core length: 173.50m

Core recovery: 96.1% (excluding top soil)

Day drilling was started: July 15, 1982

Day drilling was completed: July 25, 1982

0.00m ∿ 4.50m

Waterless drilling was made by 101mm metal crown. Talus sediments were drilled to a depth of 4.50m. With stabilized lithology, NW casing pipe was inserted to 4.50m.

4.50m ∿ 132.80m

Drilling was made by NQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were diabase and agglomerate. At 4.50m ∿ 11.30m, there were many cracks and lost-circulation frequently occurred. So drilling was made while preventing lost-circulation by a Tel-stop. From that depth, the lithology was relatively stabilized and BW casing pipe was inserted to 132.80m. Meanwhile, three mineralized parts were detected and confirmed at 59.10m ∿ 59.45m, 77.90m ∿ 79.30m and 90.20m ∿ 90.70m.

132.80m ∿ 181.50m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate, diabase, quartz veinlets and fracture zone. At 132.80m ∿ 151.50m, the lithology was relatively stabilized. From 151.50m to 180.50m, the lithology was clayey and fractured. The drilling was completed after accomplishing the purpose by drilling to 180.50m, securing the hole wall with libonite mudwater. Meanwhile, four mineralized layers were detected and confirmed at 136.00 ∿ 137.40m, 142.30m ∿ 142.80m, 155.80m ∿ 158.60m and 166.40m ∿ 169.50.

1-4-2 PD-9 (Direction 45°, Inclination -30°)

Drilled length: 131.00m

Core length: 103.30m

Core recovery: 85.4% (excluding top soil)

Day drilling was started: July 29

Day drilling was completed: August 7

0.00m ∿ 9.20m

Waterless drilling was made by 101mm metal crown. A clayey layer was drilled to a depth of 9.20m. When bedrock was hit, NW casing pipe was inserted to 9.20m.

9.20m ∿ 74.20m

Drilling was made by NQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were diabase and agglomerate. At 9.20m ∿ 50.00m lost-circulation and collapse of hole frequently occurred due to a fracture zone with many cracks. So cementation and prevention of lost-circulation were effected as drilling progressed. Then, drilling was made to 74.20m under relatively stabilized lithological conditions. With stabilized lithology, BW casing pipe was inserted to 74.20m.

74.20m ∿ 131.00m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate and clayey zone. With relatively stabilized lithology, drilling was made to 131.00m and completed after accomplishing the purpose. Meanwhile, a mineralized layer was detected and confirmed at 77.30m ∿ 85.30m.

1-4-3 PD-10 (Direction 45°, Inclination -50°)

Drilled length: 200.50m

Core length: 183.30m

Core recovery: 95.6% (excluding top soil)

Day drilling was started: August 9

Day drilling was completed: August 21

0.00m ∿ 8.70m

Waterless drilling was made by 101mm metal crown. A clayey layer was drilled to a depth of 8.70m. When the bedrock was hit, NW casing pipe was inserted to 8.70m.

8.70m ∿ 120.20m

Drilling was made by NQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were weathered diabase with many cracks, agglomerate and fracture zone. At 8.70m to 17.90m, the hole was enlarged by NW diamond shoebit and NW casing pipe was extended because of the frequent occurrence of cracks and collapses. Then, after the stabilization of lithology, the pipe was inserted to 17.90m.

At 17.90m to 91.70m, the lithology was remarkable for many cracks but drilling was made while preventing lost-circulation. Deeper still, the rocks were agglomerate tuff, quartz veinlets and clayey zone. As lithology became stabilized, BW casing pipe was inserted to 120.20m. Meanwhile, a mineralized layer was detected and confirmed at 105.20m ∿ 116.10m.

120.20m ∿ 200.50m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate, shale, diabase and there was a clayey zone. The lithology was relatively stabilized and the boring was completed after drilling to 200.50m and accomplishing the purpose.

1-4-4 PD-11 (Direction 60°, Inclination -40°)

Drilled length: 140.50m

Core length: 124.90m

Core recovery: 98.1% (excluding top soil)

Day drilling was started: August 29

Day drilling was completed: September 7

0.00m ∿ 13.20m

Waterless drilling was made by 101mm metal crown. A clayey layer was drilled for 13.20m. When the bedrock was hit, NW casing pipe was inserted to 13.20m.

13.20m ∿ 83.60m

Drilling was made by NQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were weathered diabase and agglomerate. At 13.20m ∿ 20.30m, the hole was enlarged by NW diamond shoebit for cementation because of the frequent occurrence of cracks and collapses, and NW casing pipe was extended to 20.30m and installed. Cracks developed beyond that depth but drilling was made by preventing lost-circulation. When lithology was stabilized at 83.60m, BW casing pipe was inserted to 83.60m.

83.60m ∿ 140.50m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate and diabase and these held a fracture zone between them. The lighology was relatively stabilized and the drilling was completed after drilling to 140.50m and accomplishing the purpose. Meanwhile, a mineralized layer was detected and confirmed at 131.80m ∿ 137.60m.

<u>1-4-5 PD-12 (Direction 60°, Inclination -55°)</u>

Drilled length: 200.50m

Core length: 178.20m

Core recovery: 97.4% (excluding top soil)

Day drilling was started: September 12

Day drilling was completed: September 24

0.00m ∿ 17.20m

Waterless drilling was made by 101mm metal crown. A clayey layer was drilled to a depth of 17.20m and NW casing pipe was inserted.

17.20m ∿ 120.20m

Drilling was made by NQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate and held a fracture zone in between. At 17.20m ∿ 40.00m, the lithology contained many cracks and lost-circulation and collapses were frequent. So, drilling was made while preventing lost-circulation and carrying out cementation. Later, the lithology was stabilized, and BW casing pipe was inserted to 120.20m.

120.20m ∿ 200.20m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate, diabase and quartz veinlets with sporadic fracture zones. At 165.00m ∿ 177.40m, a clayey zone collapsed and rod jamming occurred but drilling was continued while securing the hole wall with libonite mudwater. The drilling was completed after drilling to 200.20m and accomplishing the purpose. Meanwhile, a mineralized layer was detected and confirmed at 178.50m ∿ 189.00m

1-4-6 PD-13 (Direction 60°, Inclination -40°)

Drilled length: 121.50m

Core length: 104.70m

Core recovery: 93.9% (excluding top soil)

Day drilling was started: October 1

Day drilling was completed: October 8

0.00m ∿ 10.00m

Waterless drilling was made by 101mm metal crown. A clayey layer was drilled to 10.00mm. There was 2 ℓ/min of spring water. Because of the collapse of the hole wall, NW casing pipe was inserted to 10.00m.

10.00m ∿ 72.00m

Drilling was made by NQ-WL diamond bit, using bentonite mudwater. The rocks were agglomerate and diabase with a fracture zone inbetween and had many cracks. At 10.00m ∿ 20.50m, the hole was enlarged with NW diamond shoebit because of the frequent occurrence of cracks and collapses. NW casing pipe was extended and, as the lithology became stabilized, it was inserted to 20.50m. At 20.50m ∿ 72.00m, the rocks had many cracks but drilling was made while preventing lost-circulation. When the lithology was stabilized, BW casing pipe was inserted to 70.00m.

72.00m ∿ 121.50m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate, diabase, quartz veinlets and clay zone. Drilling was continued, using libonite mudwater, though the rocks had many cracks and were clayey and fractured. The drilling was completed after drilling to 121.50m and accomplishing the purpose. Meanwhile, two mineralized layers were detected and confirmed at 76.10m ∿ 78.70m and 100.60m ∿ 101.80m.

<u>1-4-7 PD-14 (Direction 60°, Inclination -60°)</u>

Drilling length: 200.20m

Core length: 184.50m

Core recovery: 98.0% (excluding top soil)

Day drilling was started: October 1

Day drilling was completed: October 23

0.00m ∿ 8.60m

Waterless drilling was made by 101mm metal crown. A clay layer was drilled to 8.60m. There was 2 ℓ/min of spring water. NW casing pipe was inserted to 8.60m because of collapse of the hole wall.

8.60m ∿ 120.90m

Drilling was made by NQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were weathered diabase and agglomerate and had many cracks. At 8.60m ∿ 31.00m, the hole was enlarged by cementation and NW diamond shoebit because of frequent occurrence of cracks and collapses, and NW casing pipe was extended and installed to 12.00m. Later, cracks developed but drilling was made while preventing lost-circulation. Drilling was made to 120.90m and, as the lithology became stabilized, BW casing pipe was inserted to 120.90m.

120.90m ∿ 200.20m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerate, diabase and quartz veins and contained fracture zones. Drilling through the many fracture zones that existed was made while securing the hole wall by means of libonite. The drilling was completed after drilling to 200.20m and accomplishing the purpose. Meanwhile, three mineralized layers were detected and confirmed at 123.70m ∿ 129.00m, 141.00m ∿ 141.70m and 158.30m ∿ 164.40m

1-4-8 PD-15 (Direction 60°, Inclination -60°)

Drilled length: 161.50m

Core length: 158.30m

Core recovery: 98.6% (excluding top soil)

Day drilling was started: November 1

Day drilling was completed: November 12

0.00m ∿ 1.00m

Waterless drilling was made by 101mm metal crown. A clay layer was drilled for 1.00m. Then, as the lithology was stabilized, NW casing pipe was inserted to 1.00m.

1.00m ∿ 96.00m

Drilling was made by NQ-WL diamond bit, using bentonite mudwater. The rocks were agglomerate tuff breccia, agglomerate, shale and diabase. The lithology was stabilized, though with spring water (10 ℓ/min), and BW casing pipe was inserted to 96.00m. Meanwhile, a mineralized layer was detected and confirmed at 41.50m ∿ 41.90m

96.00m ∿ 161.50m

Drilling was made by BQ-WL diamond bit, using libonite and bentonite mudwater. The rocks were agglomerates, agglomerate tuff breccia, diabase and quartz veins and contained fracture zones. Fracture zones with spring water (10 ℓ/min) developed but drilling was made while securing the hole wall, using libonite. The boring was completed after drilling to 161.50m and accomplishing the purpose. Meanwhile, two mineralized layers were detected and confirmed at 109.90m ∿ 122.50m and 147.80m ∿ 152.10m.

1-5 Mobilization and Demobilization

1-5-1 Mobilization

Three to six days were consumed for mobilization and setting up prior to the start of drilling at drill sites of PD-8, PD-9 and 10, PD-11 and 12, PD-13 and 14, and PD-15. Another day or two were necessary to change a inclination at the same place.

1-5-2 Demobilization

For demobilization, materials and equipment were transported from Diamante to Guachavez by small four-wheel drive 2-ton trucks. Due to the unfavorable road conditions of the rainy period, accessary tools and equipments were carried on horseback and kept at Guachavez for maintenance.

1-6 Drilling Performance Results

1-6-1 Work Efficiency

As indicated in AII-12, the total length of drilling holes was 1,335.90m, the drilled length per shift of all drilling work was 5.08m and the drilled length per shift of actual drilling work was 5.64m.

The penetration rate and the rotation speed of the bit were as follows:

	Penetration rate	Rotation rate
Hard	1.0 ∿ 2.0 cm/min	400 ∿ 500 rpm
Medium	2.0 ∿ 3.0 cm/min	300 ∿ 400 rpm
Soft	3.0 ∿ 4.0 cm/min	50 ∿ 150 rpm

In the above actual drilling results, the drilled length per shift was small because the lithology consisted of fracture zones with many cracks containing clay, generally speaking.

1-6-2 Core Recovery

As indicated in AII-12, cores totaling 1,210.70m for a total drilled length of 1,259.30m, excluding 76.60m representing top soil, were recovered.

The average core recovery was 96.1%.

Fig. II - I PROGRESS RECORD OF DIAMOND DRILLING PD-8

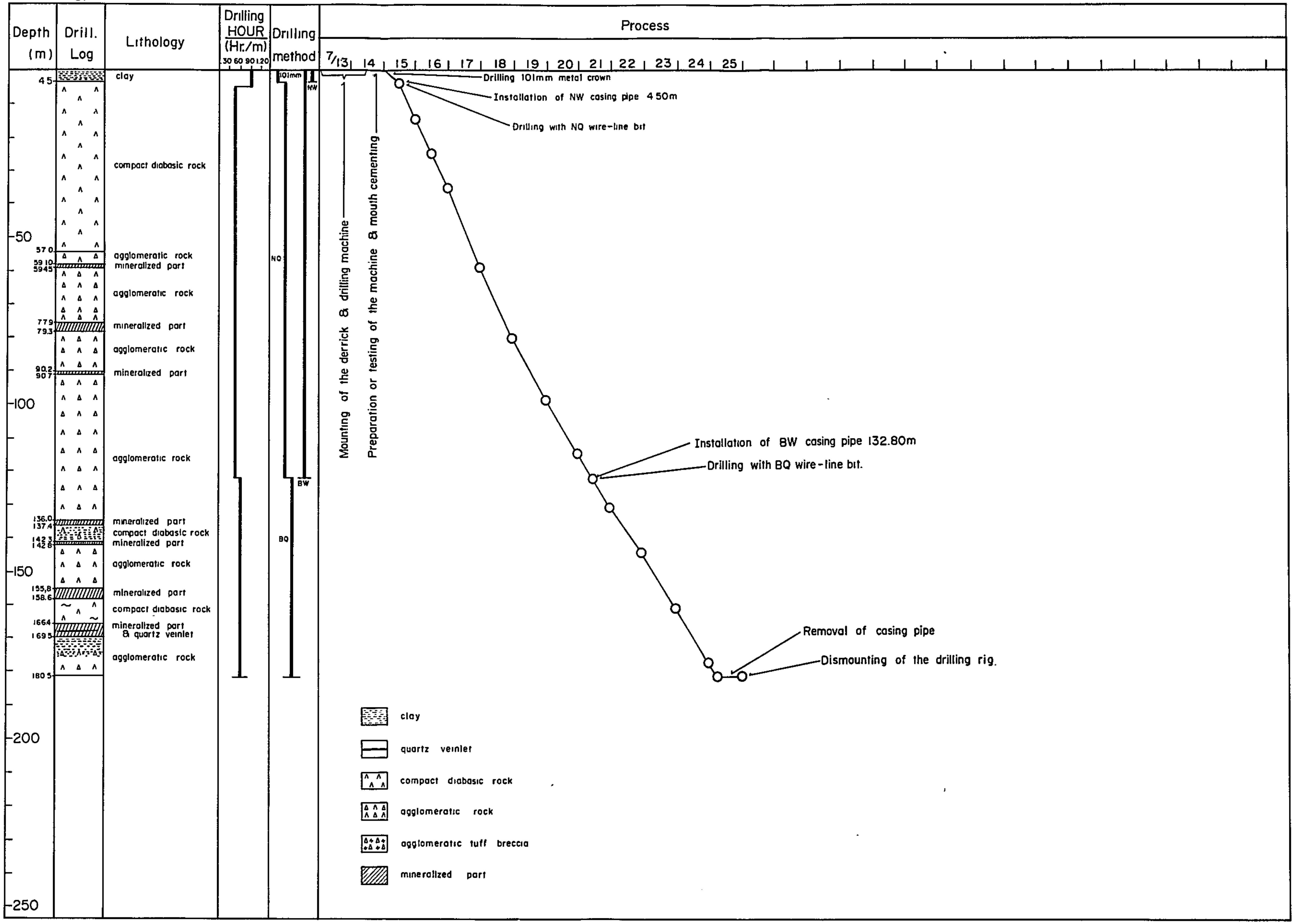


Fig. II - 2 PROGRESS RECORD OF DIAMOND DRILLING PD-9

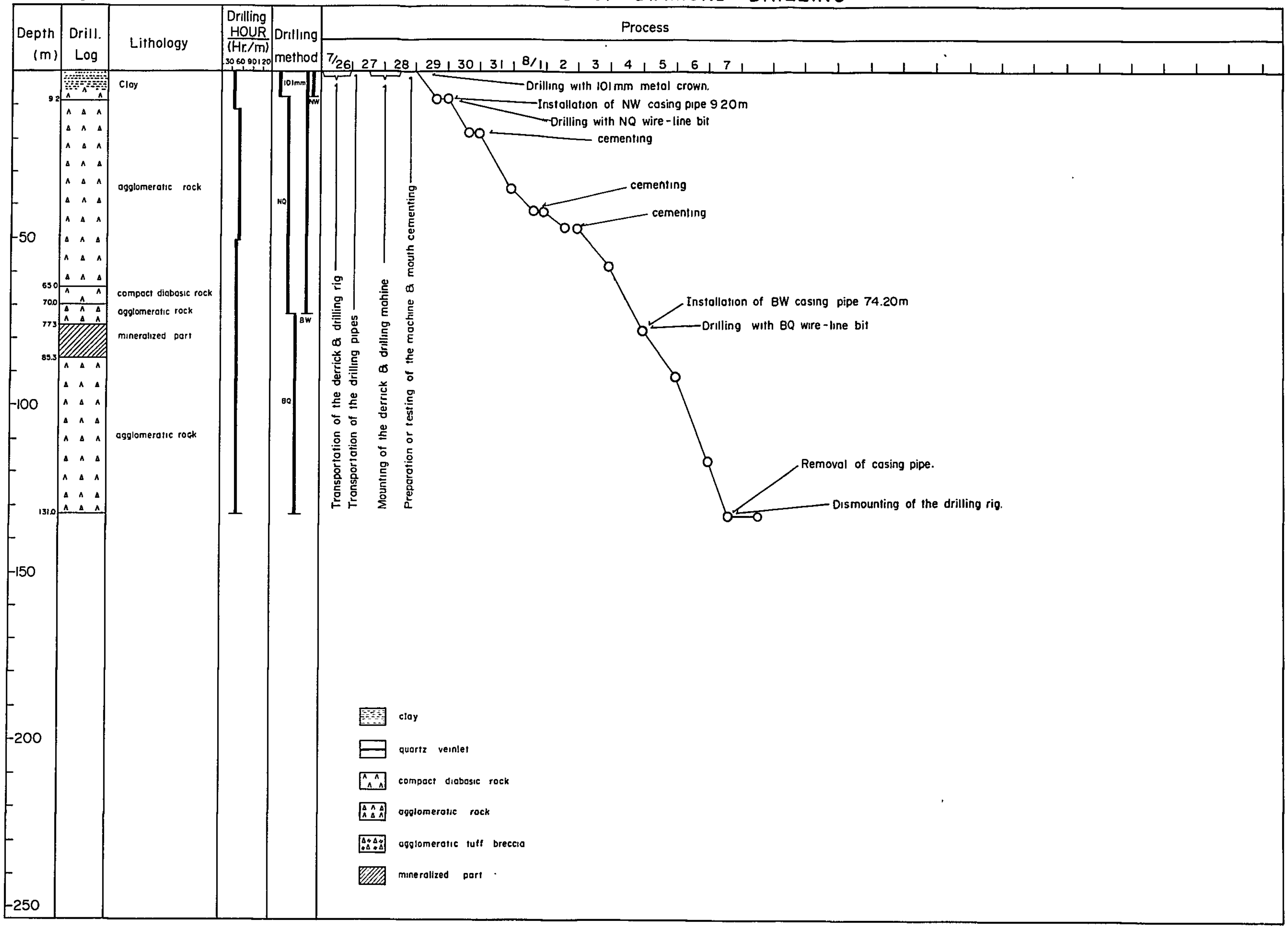


Fig. II - 3 PROGRESS RECORD OF DIAMOND DRILLING PD-10

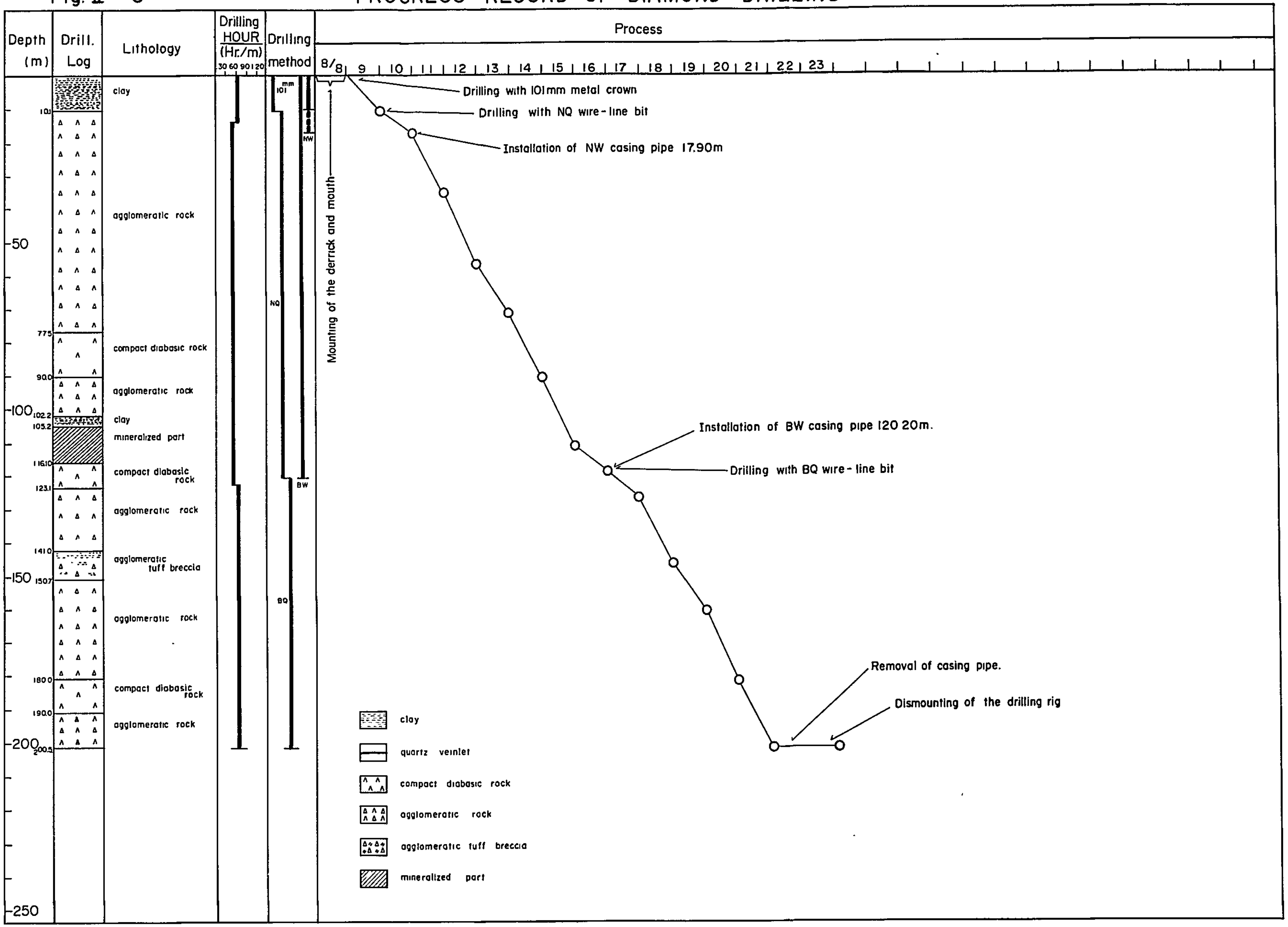


Fig. II - 4

PROGRESS RECORD OF DIAMOND DRILLING PD-11

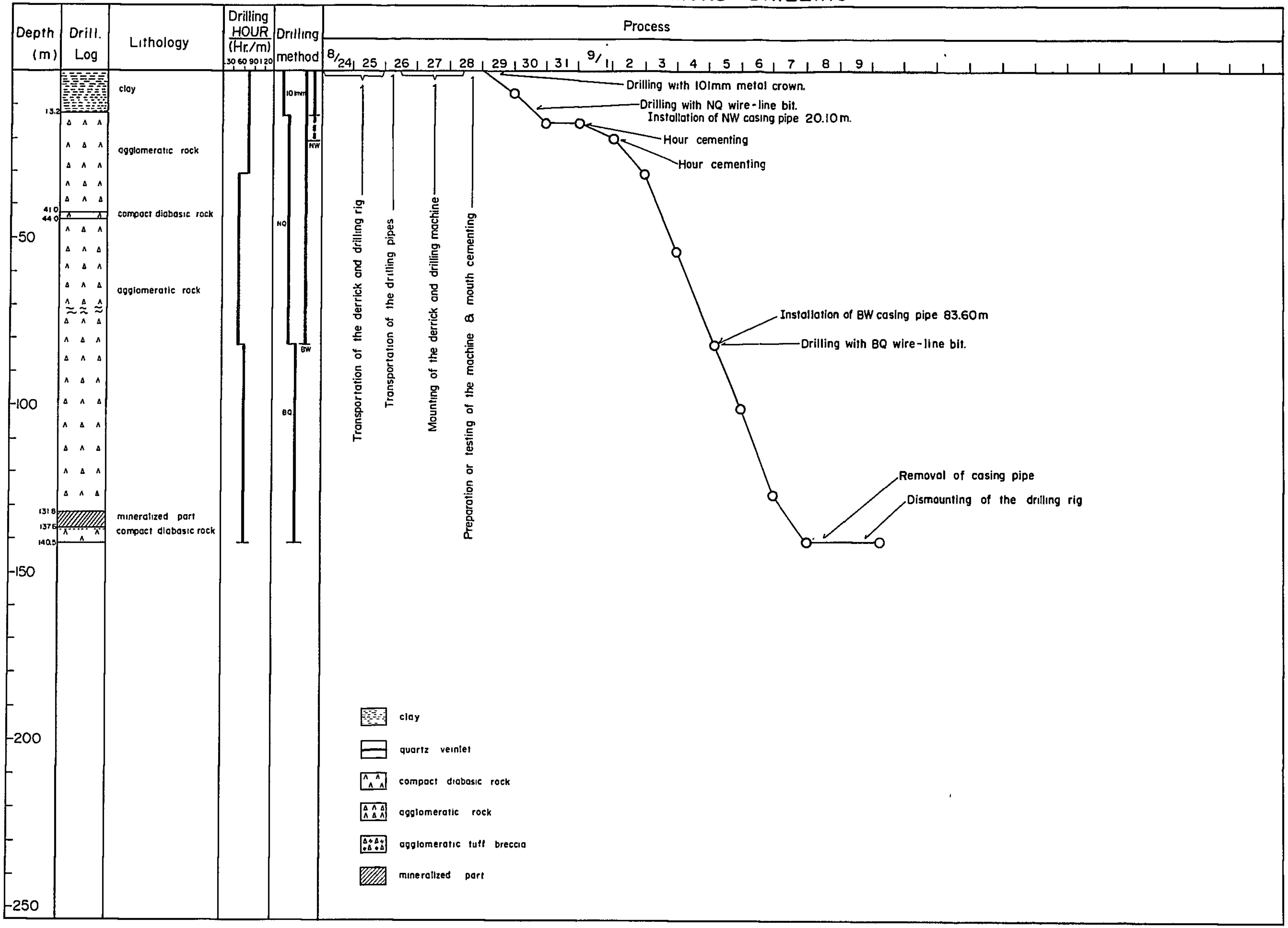


Fig. II - 5 PROGRESS RECORD OF DIAMOND DRILLING PD-12

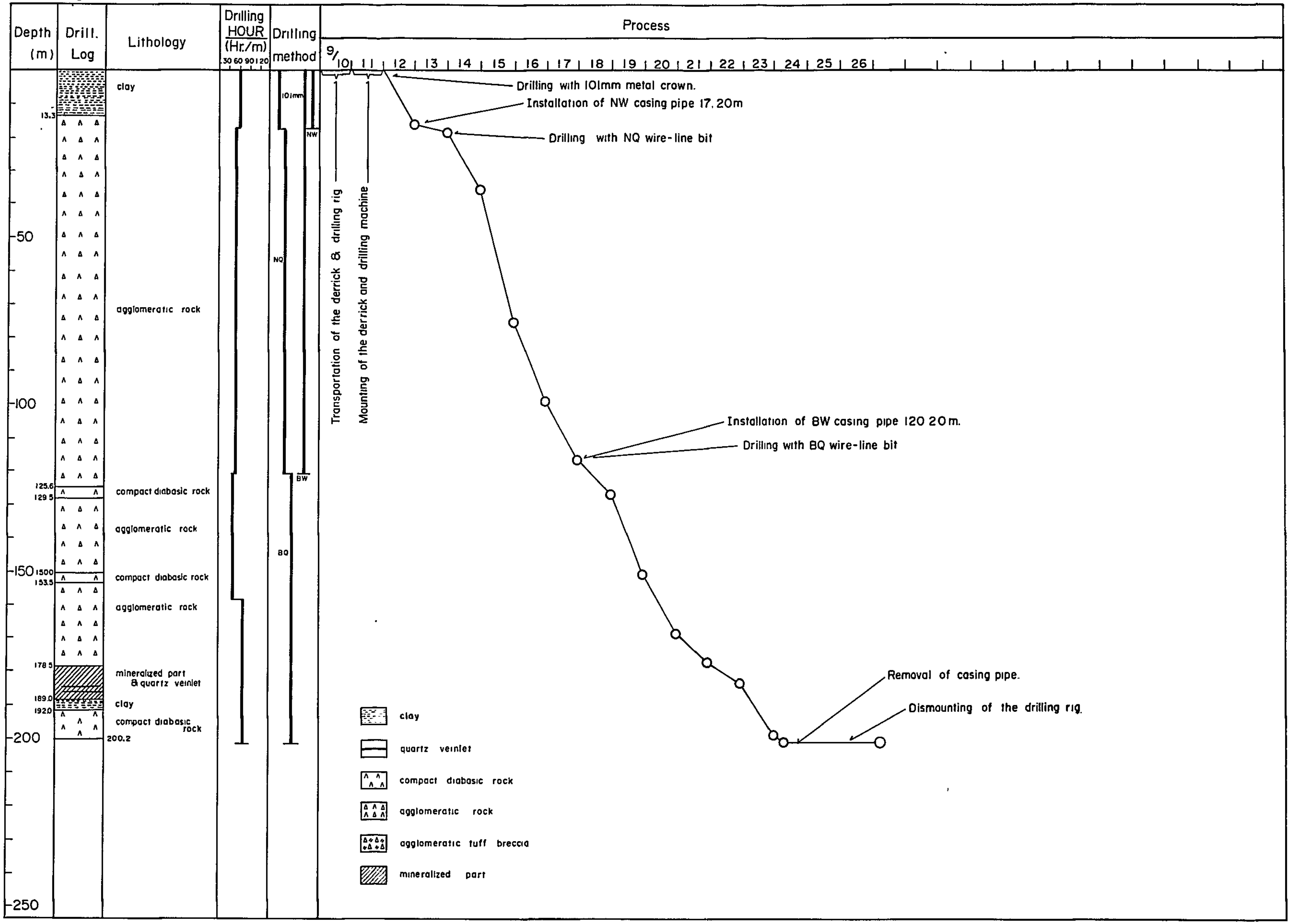


Fig. II-6

PROGRESS RECORD OF DIAMOND DRILLING PD-13

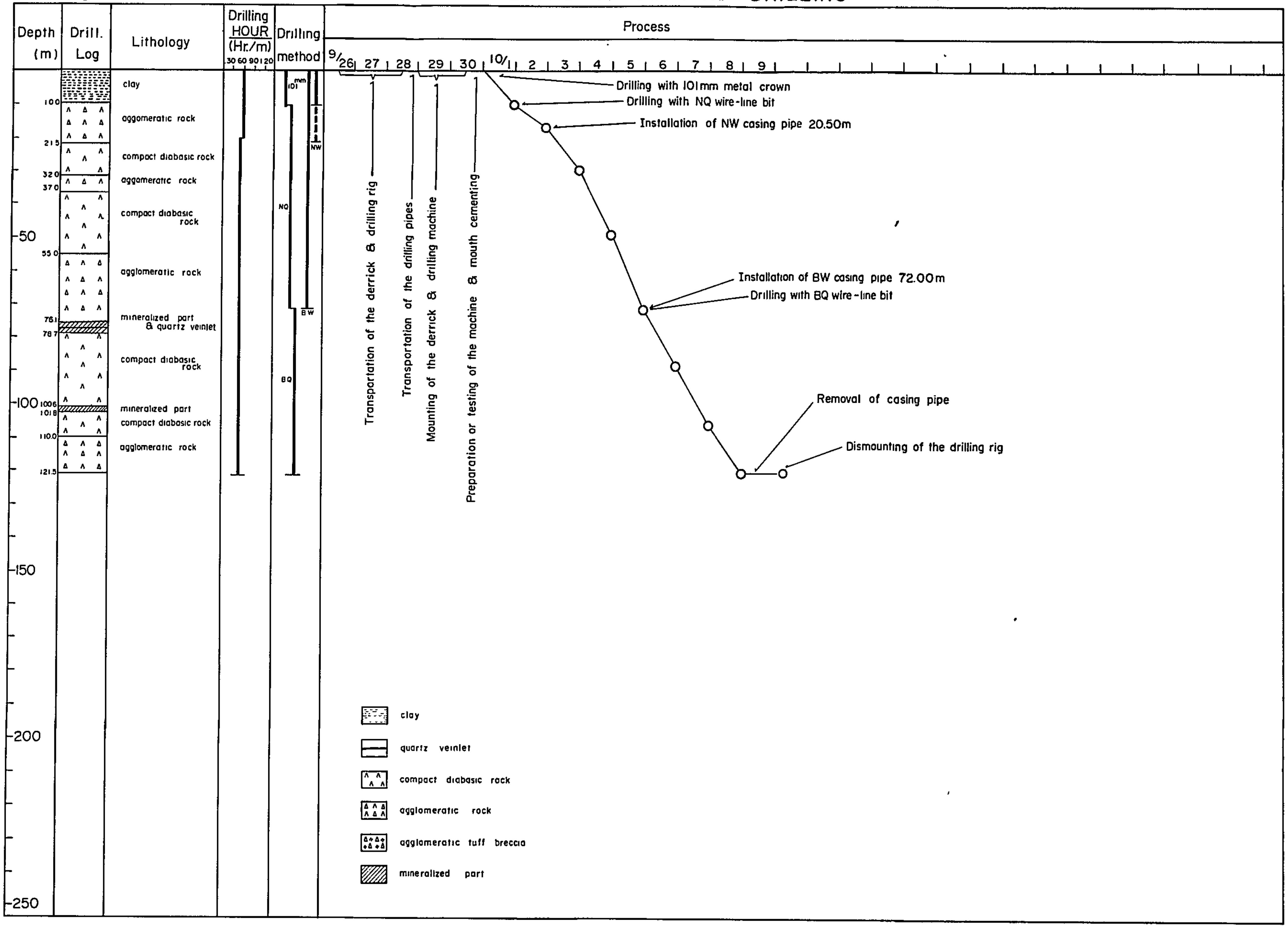


Fig. II - 7 PROGRESS RECORD OF DIAMOND DRILLING PD-14

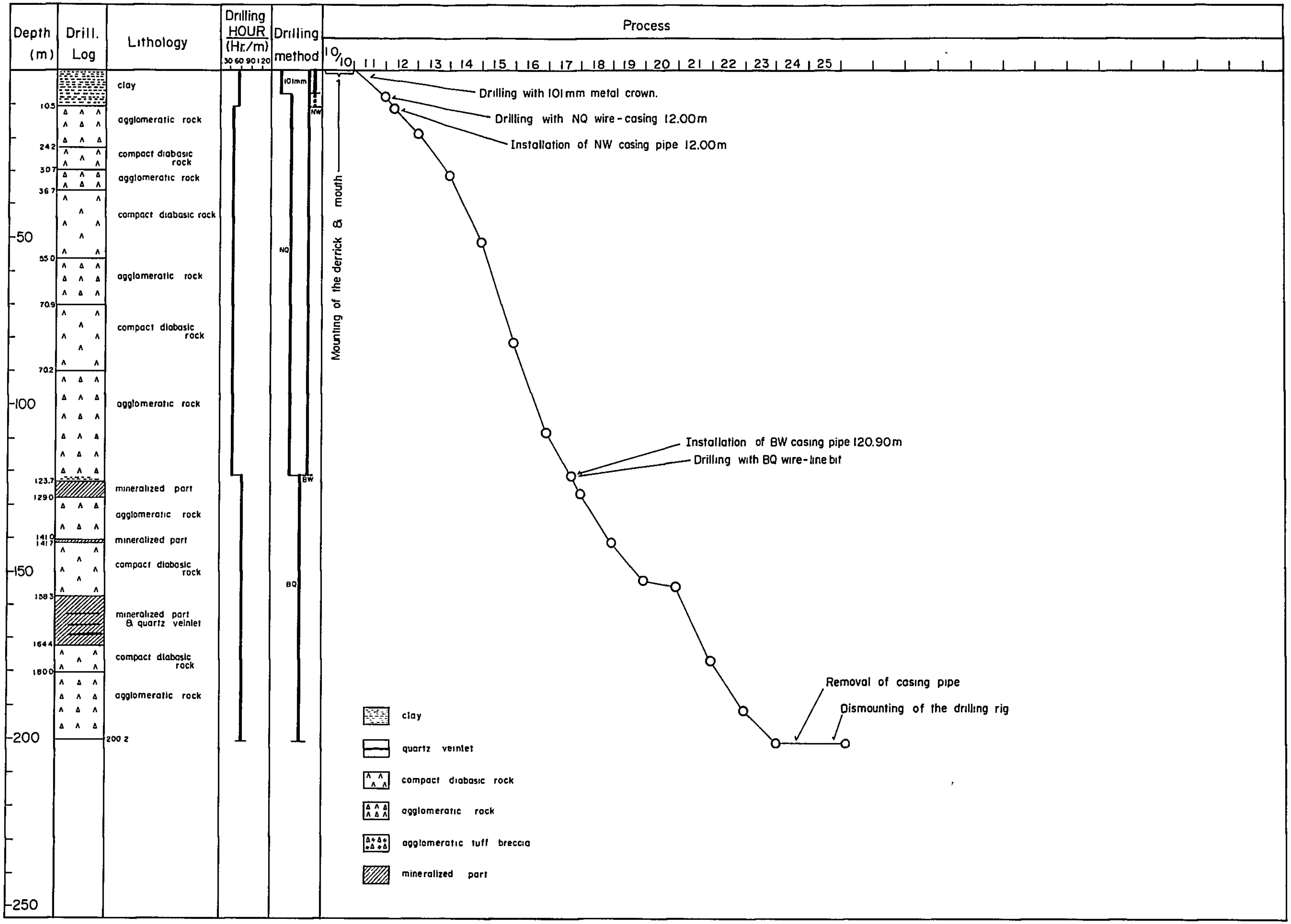
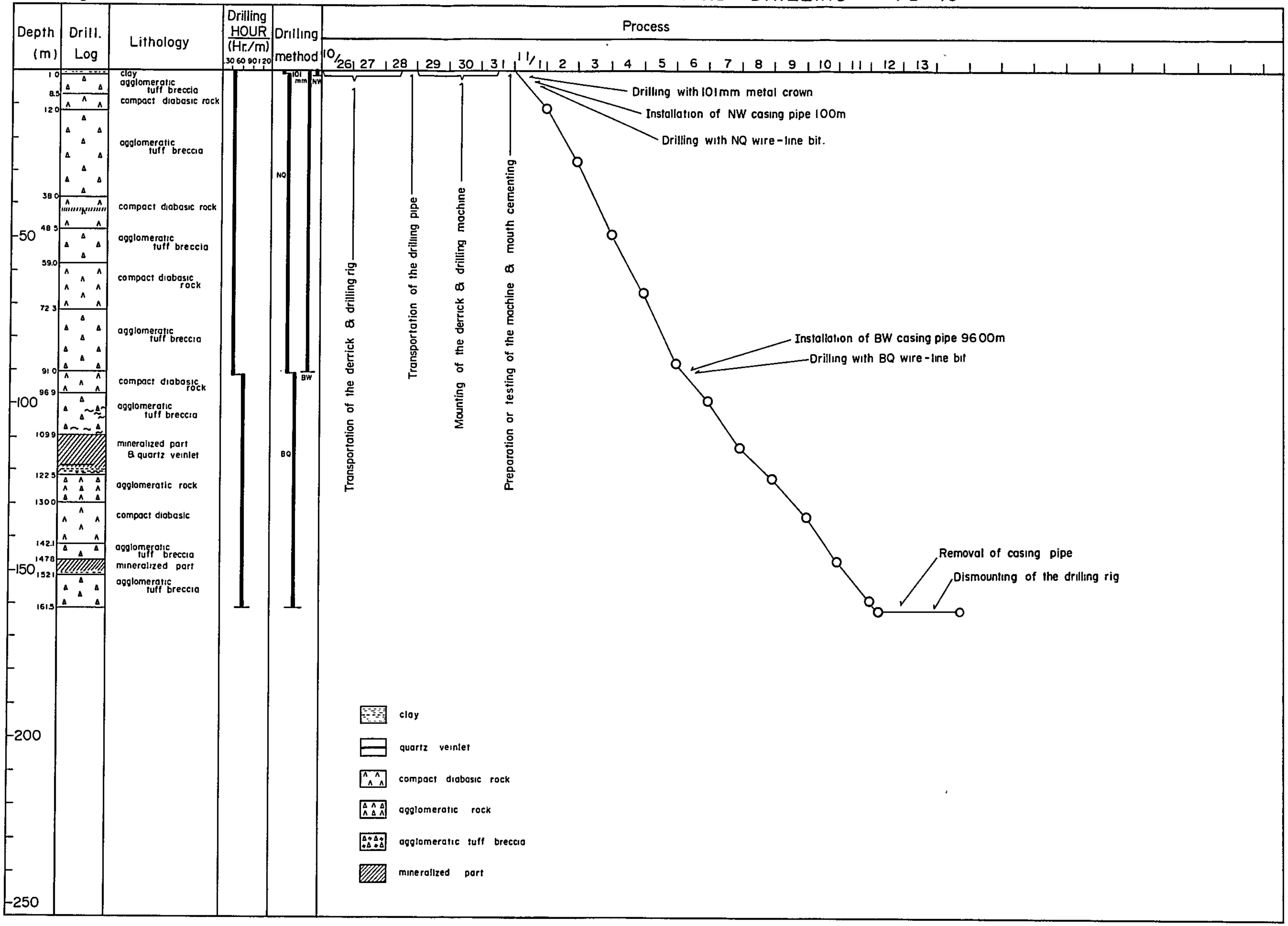


Fig. II - 8 PROGRESS RECORD OF DIAMOND DRILLING PD-15



CHAPTER 2. GEOLOGY AND MINERALIZATION OF THE DRILL HOLES

2-1 PD-8

(1) Purpose: A vein with a width of 30 cm and Au 9.69 g/t was detected at PD-3, which was drilled in the second phase. But no mineralized zones were found at PD-4 to the south and only veinlets were found at PD-5 bored from the same point. This hole was aimed to see mineralization at the intermediate position.

(2) Lithology and mineralization: The rocks from the surface to 3.5m were black basaltic andesite but at 3.5m to 14.6m, they were medium-grained diorite. The latter rocks did not outcrop and were not found in other drill holes. They were neither mineralized nor altered and were relatively fresh. From the depth of 14.6m to 58.00m is found a black or dark green cryptocrystalline basaltic andesite that is homogeneous, massive and dense. The flow structure seen at about 25.4m presumably represents lava. From that level to the bottom of the hole is tuff breccia. Fracture zones were found to about 15m but none existed below. Eight veins were found. Of these, veins with ore grades of Au 0.6 g/t or better are as follows:

Footage (drilled length) m	Au g/t	Ag g/t	Cu %	Pb %	Zn %	As %
A . 591 - 5945 (035)	60	4	0.03	001	0.01	0.08
B . 779 - 793 (1.40)	1.1	4	0.02	0.05	0.07	0.07
C . 902 - 90.7 (050)	53	5	<0.01	0.03	0.09	0.52
D . 1664 - 167.4 (100)	10	13	0.10	0.03	1.60	2.10
E . 1683 - 1695 (1.20)	13	37	001	003	0.40	520

The above A, B and C veins are mainly composed of quartz and contain only small quantities of sulfide minerals. The D and E veins are within the same vein structure and, for 5.5m from 165.9m to 171.4m, they are discolored to gray by such alterations as silicification and argillization.

Similarly, altered zones existed at 136.0m - 137.4m, 139.8m - 142.8m and 153.7m - 158.6m and the white clay contained a small quantity of sulfide minerals.

2-2 PD-9

(1) Purpose: Several high-grade veins exist for a horizontal width of about 20m in the deepest front of the cross cut, Socavon Diamante, located in the approximate center of the mining area of Diamante. Satisfactory results were obtained at PD-6 and PD-7 in the second-year survey of the parts below those veins. But at the PD-4 and PD-5 surveys on the northern extension of the veins, the results were unsatisfactory, as already stated. PD-9 was intended to see mineralization between PD-6, -7 and PD-4, -5.

(2) Lithology and mineralization: The rocks are tuff breccia all the way to the bottom of the hole at 131.00m. Only at 65m to 85m is there homogeneous andesite lava. Relatively large fracture zones were found at 14.5m - 19.7m and 30.1m - 39.0m. Also, four fracture zones exist from 115m to the bottom. The breccia has spheric pores, the size of 1 mm to 5 mm, which are filled with quartz, epidote, pyrrhotite and chalcopyrite.

A vein structure was found at 78.0m - 84.7m and a small quantity of sulfide minerals was observed to comprise it along with clay and quartz. However, the gold grade exceeded 1 g/t only at the following position:

78.0 - 79.0 (1.00m) Au 1.9 g/t, Ag 15 g/t, Cu 0.02%, Pb 0.05%
Zn 1.40%, As 9.70%

2-3 PD-10

(1) Purpose: Drilling was carried out at the same point, dipping with a different angle, to see conditions under the above-mentioned PD-9 hole.

(2) Lithology and mineralization: Most rocks are tuff breccia but dense and massive basaltic andesite exist at the depth of 80m, 120m and 183m. As a whole, it is chloritized and also epidotized. The matrix of tuff breccia at about 67.5m contains a black vitreous part of about 0.5mm in thickness, which shows a flow structure.

A vein was mineralized for 10.9m from 105.2m to 116.1m. As a whole, the average grade is Au 5.5 g/t but there are the following two high-grade parts:

Footage (drilled length) m m m m	Au g/t	Ag g/t	Cu %	Pb %	Zn %	As %
109.0 - 110.0 (1.00)	24.8	42	0.13	0.16	2.09	2.54
114.8 - 116.1 (1.30)	15.0	84	0.25	0.13	5.53	12.6

This vein is considered to be on the extension of the ore shoot in the Diamante pit since no vein appeared between it and the bottom of the hole, though a small alteration was found there. The continuous grades at places including the above-mentioned two high-grade parts are as follows:

109.0 - 116.1 (7.10)	7.4	41	0.13	0.06	2.91	3.70

2-4 PD-11

(1) Purpose: This drilling was planned to survey the vicinity about 100m south of the ore shoot of the Diamante pit with the object of seeing the southward continuity from this pit.

(2) Lithology and mineralization: The rocks are tuff breccia with intercalations of lava at 42m and 139m. As a whole, they are epidotized and show many green spots the size of 1 mm to 5 mm.

Mineralized parts were found at 131.8m to 138.0m as cores of sericitized clay and quartz veinlets but the results of analysis did not indicate that they contained gold, silver and other elements. These parts are considered to be on the extension from the principal vein of Diamante.

It is yet to be seen whether the vein will reappear.

2-5 PD-12

(1) Purpose: This drilling was carried out to see the mineralization under the above-mentioned PD-11.

(2) Lithology and mineralization: Bedrock was hit at 13.3m. From this depth to 179.8m, the rocks were mainly tuff breccia and this contained five layers, three to six meters thick, of massive basaltic andesite lava between 108.8m and 153.5m.

As for mineralization , 179.8m to 193.6m was found to be a relatively thick altered zone but the results of analysis indicated that Au 0.9 g/t and Ag 10 g/t was present at 186.0m - 187.0m (1.00m) only, and at other levels there was no content of gold and silver and the content of sulfide minerals was small. The altered zone consisted of clay containing quartz fragments.

2-6 PD-13

(1) Purpose: There is the Gualquilia Norte pit about 200m southeast of the above-mentioned Diamante pit. It has a water-mill ore grinding equipment. Small-scale operation is in progress there, processing pyrite-containing ores mined from the pit. This hole purported to see the conditions under the Gualquilla Norte pit and was planned to survey a point about 100m in a beeline from the survey positions of the foregoing PD-11 and PD-12.

(2) Lithology and mineralization: The country rock consists of alternate layers of tuff breccia and massive and compact basaltic andesite. The massive andesite includes vitreous parts showing flow structure.

Two lines of vein structure were found at about 76.5m and 100.6m but the results of analysis did not indicate the existence of gold; they just contained some silver and copper.

Footage (drilled length)	Au g/t	Ag g/t	Cu %	Pb %	Zn %	As %
m m m						
76.5 - 77.0 (0.50)	tr	276	2.09	0.03	0.12	0.11

2-7 PD-14

(1) Purpose: This drilling was carried out to see the mineralization under the above-mentioned PD-13.

(2) Lithology and mineralization: As in PD-13, alternate layers of tuff breccia and basaltic andesite appear in this hole. Fracture zones are found about 27m, 40m, 74m and 151m.

Veins were discovered at 123.7m - 129.0m, 141.0m - 141.7m and 158.3m - 164.4m. There are argillization and microcrystalline pyrite dissemination. These include fragments of quartz veins, but the results of analysis indicated that only the following two samples contained gold.

Footage (drilled length)	Au g/t	Ag g/t	Cu %	Pb %	Zn %	As %
m m m						
160.3 - 161.3 (1.00)	4.6	8	0.02	0.04	0.32	0.35
163.3 - 164.4 (1.10)	2.0	35	0.12	0.13	2.56	2.62

2-8 PD-15

(1) Purpose: In the Gualquilia Sur pit being operated in a small scale south of the Diamante principal vein, there is a fairly substantial quartz vein of 30 - 40cm in width and this vein contains several g/t of gold. The PD-15 hole is aimed to see the mineralization under this lode.

(2) Lithology and mineralization: Alternate layers of tuff breccia and basaltic andesite appear. They are not only chloritized but, as a whole, they are also epidotized.

Four veins were found from the depth of 110m downward and each showed the following values in their analysis:

Footage (drilled length)	Au	Ag	Cu	Pb	Zn	As
	g/t	g/t	%	%	%	%
m m m						
110.1 - 113.4 (3.30)	2.0	46	0.27	0.12	0.25	0.84
120.8 - 121.4 (0.60)	1.6	43	0.24	0.03	0.64	1.73
147.5 - 148.5 (1.00)	2.8	9	0.00	0.05	0.13	0.26
152.1 - 153.1 (1.00)	0.9	9	0.01	0.03	0.13	1.13

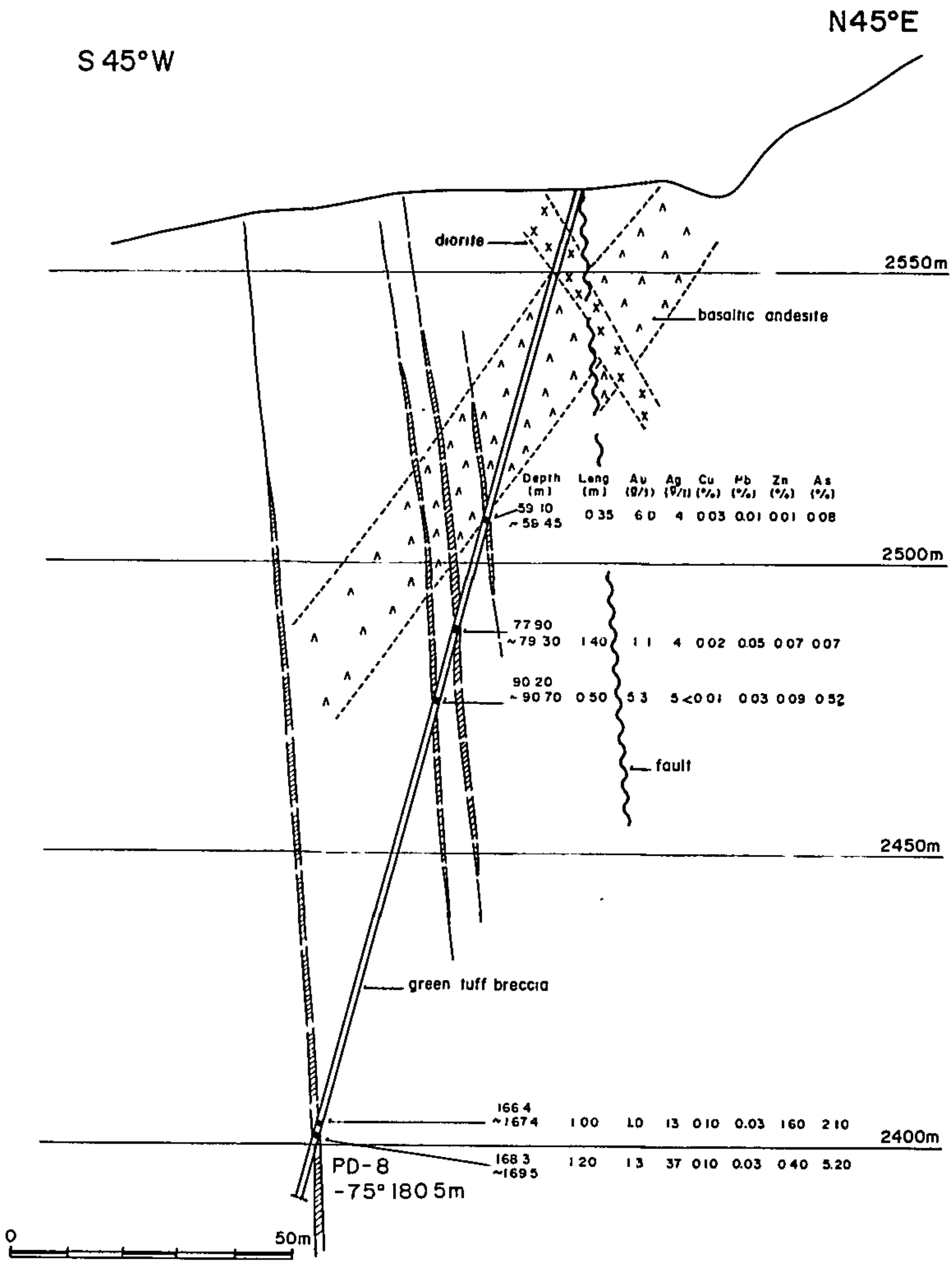


Fig. II − 9 Geological Section for PD − 8

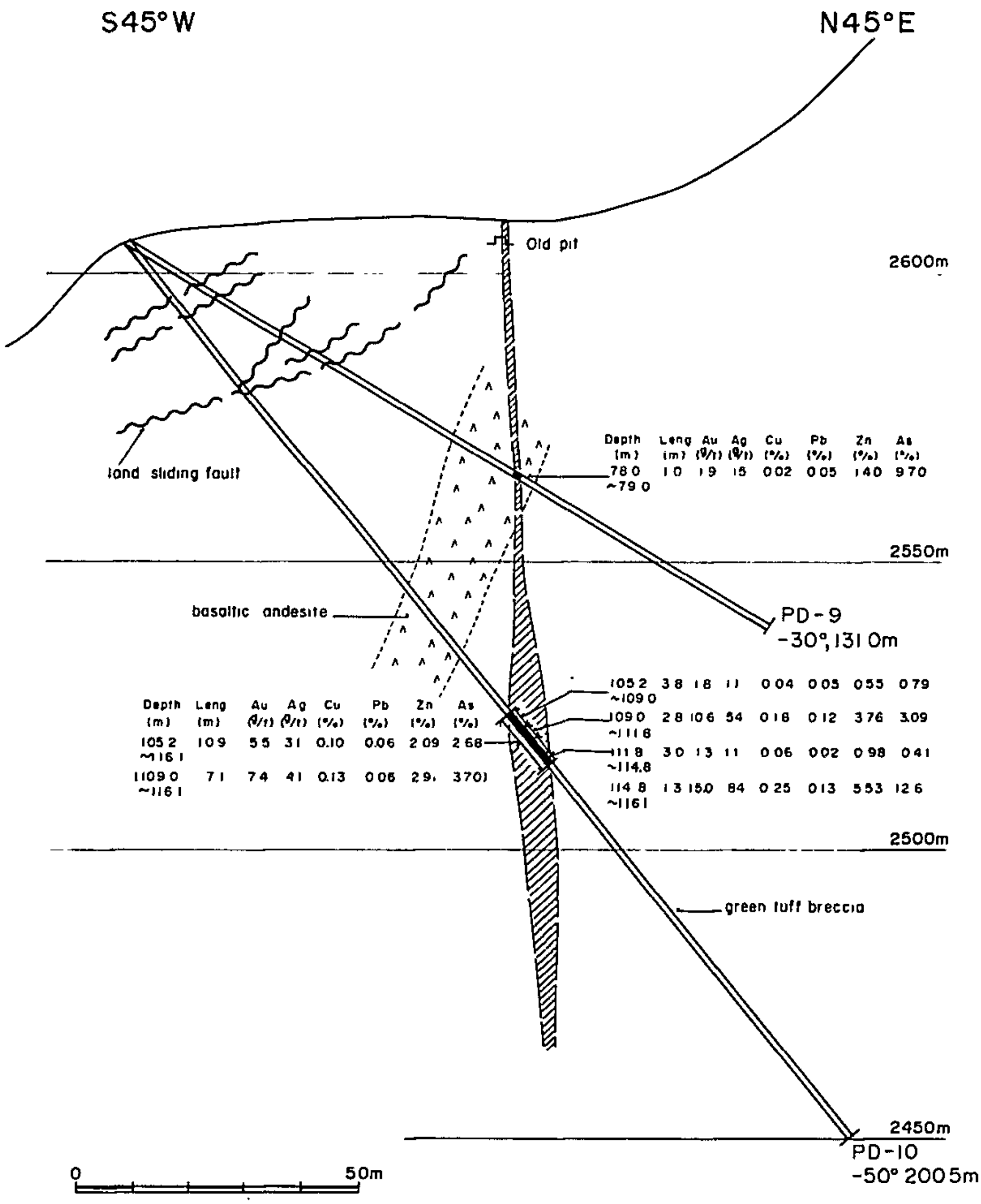


Fig. II - 10 Geological Section for PD-9, PD-10

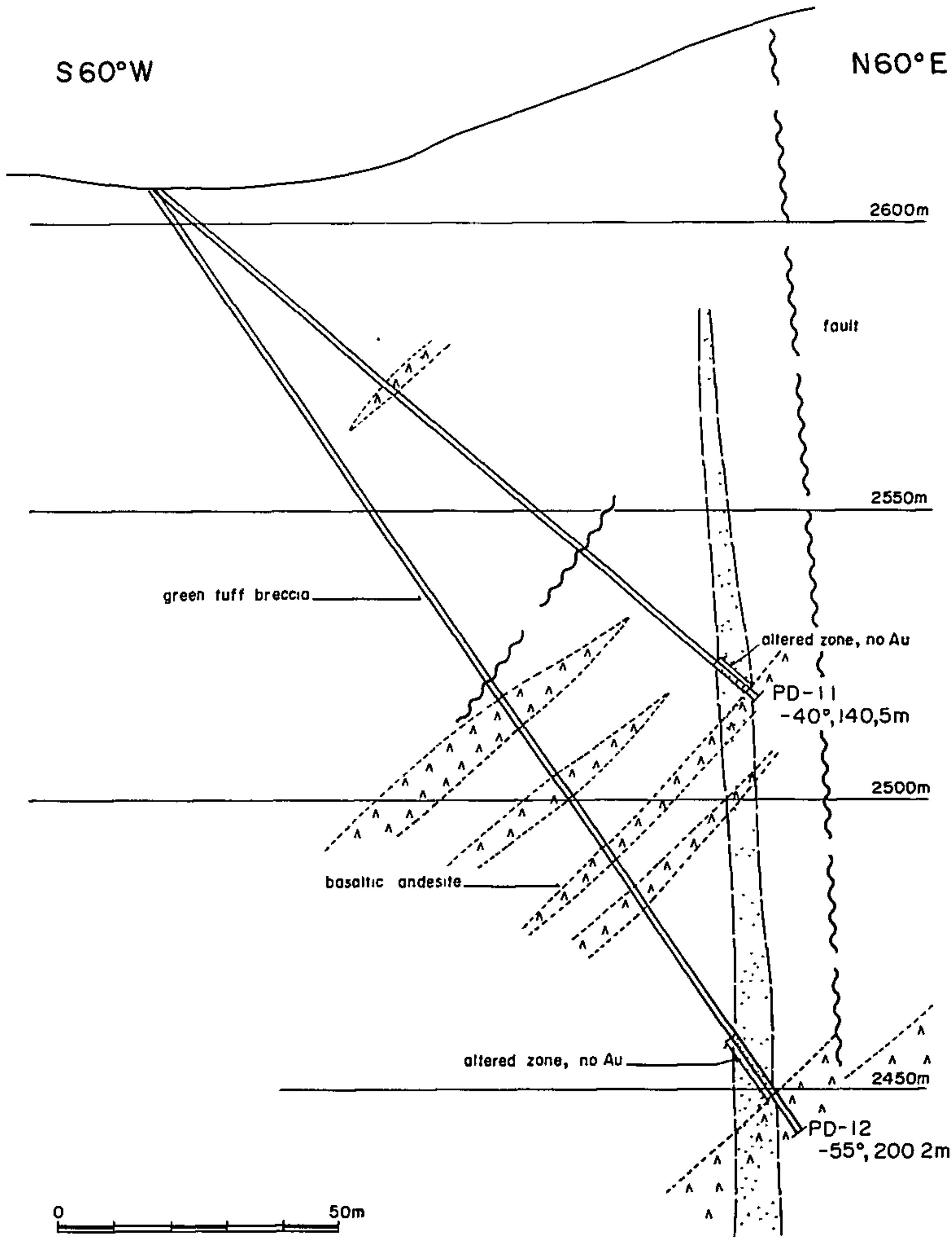


Fig. II - 11 Geological Section for PD-11, PD-12

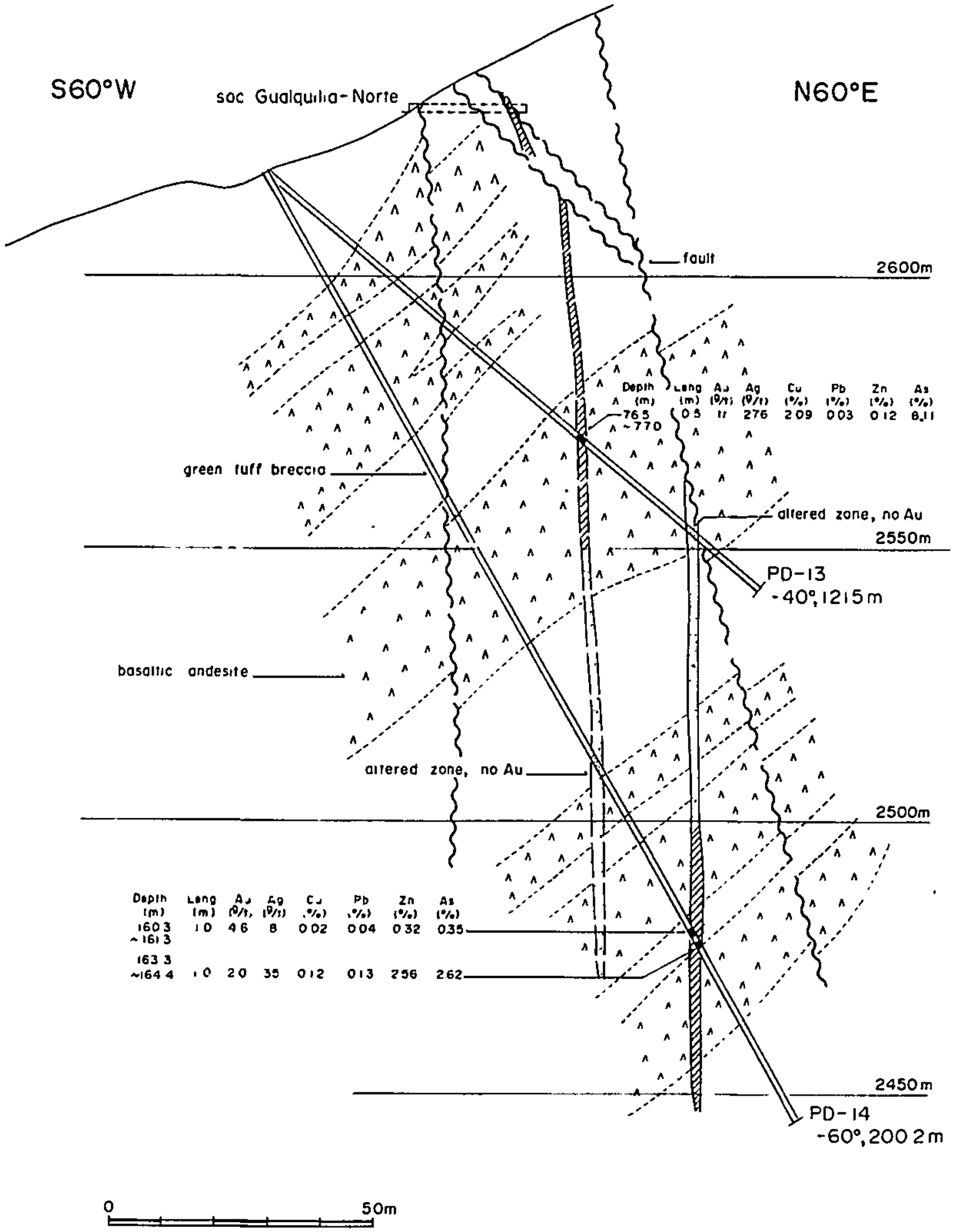


Fig. II - 12 Geological Section for PD-13, PD-14

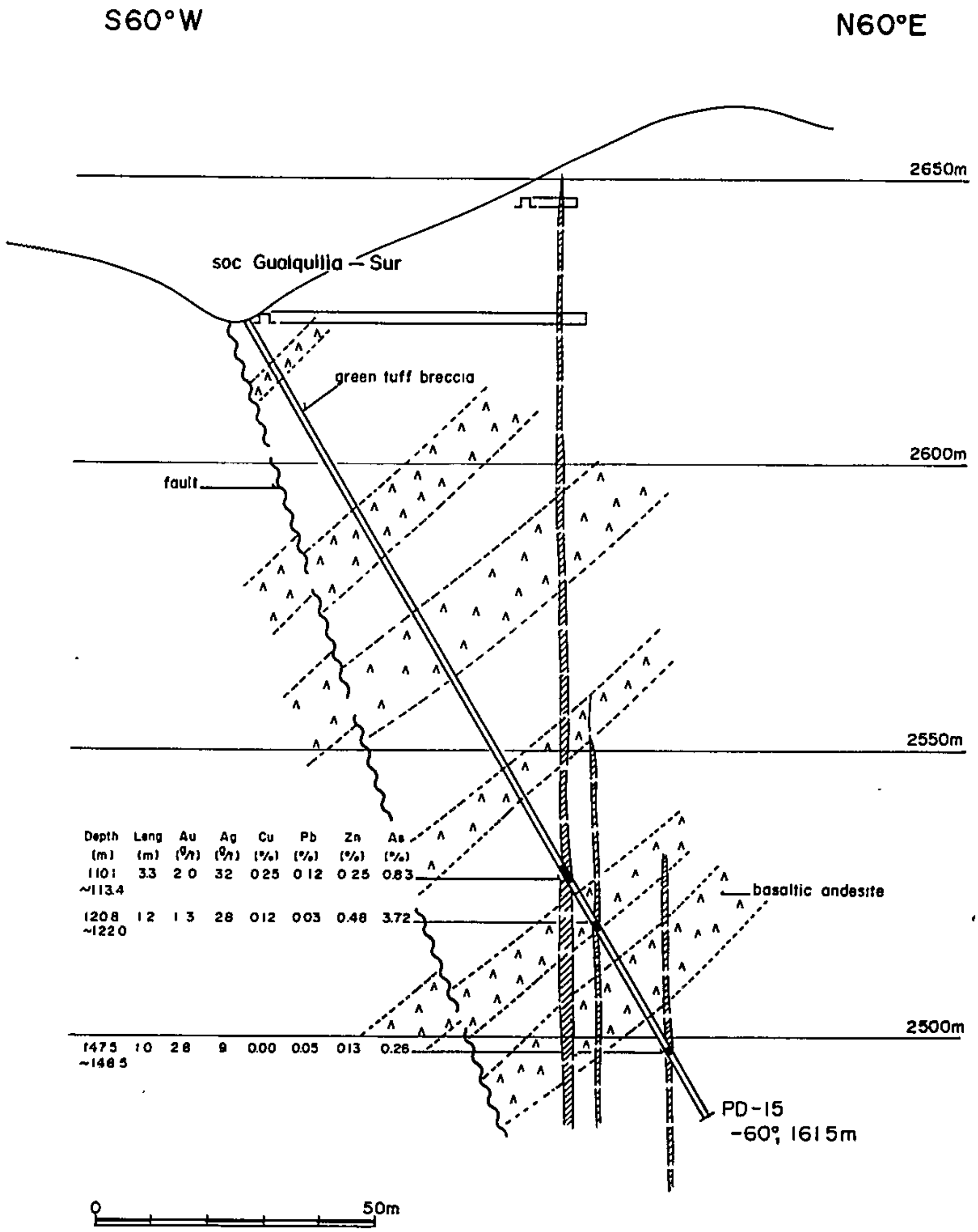


Fig. II - 13 Geological Section for PD-15

APPENDICES
PART I
GEOLOGICAL AND GEOCHEMICAL DATA

LIST OF APPENDICES

A. I - I Chemical Analysis of Soil Samples

Key to the following tables,

No	:	sample number	
area	:	PA	Paraiso
		DL	Delicia
		DQ	Desquite
		BO	Bombona
		DA	Diamante
		GT	Gitana
		MA	Between Paraiso-Gitana
Line	:	geochemical sampling line	
Rock	:	geology	
		CG	coarse grained granodiorite
		FG	fine grained granodiorite
		GR	green volcanic rock
		SH	shale
Zn, As	:	assay value in ppm	

NO	AREA	LINE	ROCK	ZN	AS
FS 1	PA	D08	CG	75	7.0
FS 2	PA	D08	CG	28	5.0
FS 3	PA	D08	CG	60	3.0
FS 4	PA	D08	CG	48	0.1
FS 5	PA	D08	CG	47	5.0
FS 6	PA	D08	CG	28	4.0
FS 7	PA	D08	CG	37	4.0
FS 8	PA	D08	CG	77	10.0
FS 9	PA	D08	CG	36	4.0
FS 10	PA	D08	CG	31	2.0
FS 11	PA	D08	CG	73	4.0
FS 12	PA	D08	CG	26	3.0
FS 13	PA	D08	CG	48	2.0
FS 14	PA	D08	CG	74	8.0
FS 15	PA	D08	CG	55	6.0
FS 16	PA	D08	CG	41	5.0
FS 17	PA	D08	CG	26	4.0
FS 18	PA	D08	CG	44	5.0
FS 19	PA	D08	CG	29	4.0
FS 20	PA	D08	CG	43	3.0
FS 21	PA	D08	CG	20	3.0
FS 22	PA	D08	CG	20	3.0
FS 23	PA	D08	CG	41	4.0
FS 24	PA	D08	CG	37	4.0
FS 25	PA	D08	CG	50	4.0
FS 26	PA	D08	CG	34	4.0
FS 27	PA	D08	CG	31	6.0
FS 28A	PA	D08	CG	56	6.0
FS 28B	PA	D08	CG	71	4.0
FS 29	PA	D08	CG	74	3.0
FS 30	PA	D08	CG	94	14.0
FS 31	PA	D08	CG	43	3.0
FS 32	PA	D08	CG	25	3.0
FS 33	PA	D08	CG	16	4.0
FS 34	PA	D08	CG	86	4.0
FS 35	PA	D08	CG	84	10.0
FS 36	PA	D08	CG	34	5.0
FS 37	PA	D08	CG	37	6.0
FS 38	PA	D08	CG	37	5.0
FS 39	PA	D08	CG	34	5.0
FS 40	PA	D08	CG	64	6.0
FS 41	PA	D08	CG	44	13.0
FS 42	PA	D08	CG	55	8.0
FS 43	PA	D08	CG	25	4.0
FS 44	PA	D08	CG	32	1.0
FS 45	PA	D08	CG	38	7.0
FS 46	PA	D08	CG	35	1.0
FS 47	PA	D08	CG	26	1.0
FS 48	PA	D08	CG	25	5.0
FS 49	PA	D08	CG	21	4.0
FS 50	PA	D08	CG	20	0.1
FS 51	PA	D08	CG	80	8.0
FS 52	PA	D08	CG	41	2.0
FS 53	PA	D08	CG	43	6.0
FS 54	PA	D08	CG	34	5.0
FS 55	PA	D08	CG	38	16.0
FS 56	PA	D08	CG	54	43.0
FS 57	PA	D08	CG	20	4.0
FS 58	PA	D08	CG	36	6.0
FS 59	PA	D08	CG	43	9.0
FS 60	PA	D08	CG	44	22.0
FS 61	PA	D08	CG	80	300.0
FS 62	PA	D08	CG	43	7.0
FS 63	PA	D08	CG	100	265.0
FS 64	PA	D08	CG	26	7.0
FS 65	PA	D08	CG	66	6.0
FS 66	PA	D08	CG	42	4.0
FS 67	PA	D08	CG	49	5.0
FS 68	PA	D08	CG	51	5.0
FS 69	PA	D08	CG	33	8.0
FS 70	PA	D08	CG	69	14.0
FS 71	PA	D08	CG	49	10.0
FS 72	PA	D08	CG	44	4.0
FS 73	PA	D08	CG	34	4.0
FS 74	PA	D08	CG	39	3.0
FS 75	PA	D08	CG	44	13.0
FS 76	PA	D08	CG	65	5.0
FS 77	PA	D08	CG	69	5.0
FS 78	PA	D08	CG	78	5.0
FS 79	PA	D08	CG	69	6.0
FS 80	PA	D08	CG	73	6.0
FS 81	PA	D08	CG	64	6.0
FS 82	PA	D08	CG	65	3.0
FS 83	PA	D08	CG	79	9.0
FS 84	PA	D08	CG	65	5.0
FS 85	PA	D08	CG	77	5.0
FS 86	PA	D08	CG	54	1.0
FS 87	PA	D08	CG	52	35.0
FS 88	PA	D08	CG	52	48.0
FS 89	PA	D08	CG	43	5.0
FS 90	PA	D08	CG	36	15.0
FS 91	PA	D08	CG	34	34.0
FS 92	PA	D08	CG	35	74.0
FS 93	PA	D04	CG	19	3.0
FS 94	PA	D04	CG	42	6.0
FS 95	PA	D04	CG	31	4.0
FS 96	PA	D04	CG	66	20.0
FS 97	PA	D04	CG	59	1.0
FS 98	PA	D04	CG	30	1.0
FS 99	PA	D04	CG	45	19.0
FS 100	PA	D04	CG	63	0.1
FS 101	PA	D04	CG	29	2.0
FS 102	PA	D04	CG	56	13.0
FS 103	PA	D04	CG	63	18.0
FS 104	PA	D04	CG	71	10.0
FS 105	PA	D04	CG	86	4.0
FS 106	PA	D04	CG	28	0.1
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FS 110	PA	D04	CG	49	0.1
FS 111	PA	D04	CG	45	4.0
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FS 113	PA	D04	CG	46	1.0
FS 114	PA	D04	CG	47	0.1
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FS 118	PA	D04	CG	106	72.0
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FS 120	PA	D04	CG	30	13.0
FS 121	PA	D04	CG	67	2.0
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FS 123	PA	D04	CG	26	0.1
FS 124	PA	D04	CG	52	2.0
FS 125	PA	D04	CG	28	4.0
FS 126	PA	D04	CG	58	1.0
FS 127	PA	D04	CG	50	1.0
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FS 130	PA	D04	CG	32	1.0
FS 131	PA	D04	CG	69	3.0
FS 132	PA	D04	CG	54	0.1
FS 133	PA	D04	CG	34	0.1
FS 134	PA	D04	CG	29	1.0
FS 135	PA	D04	CG	30	0.1
FS 136	PA	D04	CG	120	4.0
FS 137	PA	D04	CG	35	0.1
FS 138	PA	D04	CG	42	2.0
FS 139	PA	D04	CG	32	1.0
FS 140	PA	D04	CG	56	1.0
FS 141	PA	D04	CG	49	2.0
FS 142	PA	D04	CG	13	0.1
FS 143	PA	D04	CG	25	0.1
FS 144	PA	D04	CG	71	0.1
FS 145	PA	D04	CG	52	2.0
FS 146	PA	D04	CG	35	0.1
FS 147	PA	D04	CG	33	0.1
FS 148	PA	D04	CG	25	0.1
FS 149	PA	D04	CG	26	0.1
FS 150	PA	D04	CG	53	0.1
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FS 157	PA	D04	CG	35	8.0
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FS 161	PA	D04	CG	56	0.1
FS 162	PA	D04	CG	41	2.0
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FS 167	PA	D04	CG	45	0.1
FS 168	PA	D04	CG	63	5.0
FS 169	PA	D04	CG	76	5.0
FS 170	PA	D02	CG	34	1.0
FS 171	PA	D02	CG	44	1.0
FS 172	PA	D02	CG	55	5.0
FS 173	PA	D02	CG	37	5.0
FS 174	PA	D02	CG	40	5.0
FS 175	PA	D02	CG	33	3.0
FS 176	PA	D02	CG	48	4.0
FS 177	PA	D02	CG	37	5.0
FS 178	PA	D02	CG	38	0.1
FS 179	PA	D02	CG	47	1.0
FS 180	PA	D02	CG	41	4.0
FS 181	PA	D02	CG	53	0.1
FS 182	PA	D02	CG	42	4.0
FS 183	PA	D02	CG	43	0.1
FS 184	PA	D02	CG	52	2.0
FS 185	PA	D02	CG	44	1.0
FS 186	PA	D02	CG	17	2.0
FS 187	PA	D02	CG	7	0.1
FS 188	PA	D02	CG	32	5.0
FS 189	PA	D02	CG	38	4.0
FS 190	PA	D02	CG	49	1.0
FS 191	DL	F01	CG	61	3.0
FS 192	DL	F01	CG	38	6.0
FS 193	DL	F01	CG	15	5.0
FS 194	DL	F01	CG	42	4.0
FS 196	DL	F01	CG	23	2.0
FS 197	DL	F01	CG	21	1.0
FS 198	DL	F01	CG	29	1.0
FS 199	DL	F01	CG	21	1.0
FS 200	DL	F01	CG	32	4.0
FS 201	DL	F01	CG	41	5.0
FS 202	DL	F01	CG	10	5.0
FS 203	DL	F01	CG	18	3.0

NO	AREA	LINE	ROCK	ZN	AS	NO	AREA	LINE	ROCK	ZN	AS
FS 204	DL	F01	CG	12	3.0	FS 307	DL	03E	CG	21	3.0
FS 205	DL	F01	CG	40	5.0	FS 308	DL	03E	CG	18	2.0
FS 206	DL	F01	CG	15	3.0	FS 309	DL	03E	CG	40	1.0
FS 207	DL	F01	CG	29	4.0	FS 310	DL	03E	CG	15	0.1
FS 208	DL	F01	CG	29	5.0	FS 311	DL	03E	CG	39	3.0
FS 209	DL	F01	CG	22	5.0	FS 312	DL	03E	CG	17	2.0
FS 210	DL	F01	CG	26	6.0	FS 313	DL	03E	CG	22	2.0
FS 211	DL	F01	CG	16	1.0	FS 314	DL	03E	CG	17	3.0
FS 212	DL	F01	CG	16	6.0	FS 315	DL	03E	CG	43	6.0
FS 213	DL	F01	CG	104	35.0	FS 316	DL	03E	CG	22	4.0
FS 214	DL	F01	CG	30	6.0	FS 317	DL	03E	CG	57	25.0
FS 215	DL	F01	CG	27	4.0	FS 318	DL	03E	CG	62	48.0
FS 216	DL	F01	CG	43	5.0	FS 319	DL	03E	CG	143	780.0
FS 217	DL	F01	CG	24	7.0	FS 320	DL	03E	CG	20	5.0
FS 218	DL	F01	CG	28	9.0	FS 321	DL	03E	CG	73	12.0
FS 219	DL	F01	CG	60	18.0	FS 322	DL	03E	CG	51	136.0
FS 220	DL	F01	CG	20	7.0	FS 323	DL	03E	CG	24	13.0
FS 221	DL	F01	CG	22	3.0	FS 324	DL	03E	CG	64	28.0
FS 222	DL	F01	CG	31	8.0	FS 325	DL	03E	CG	42	7.0
FS 223	DL	F01	CG	44	18.0	FS 326	DL	03E	CG	23	6.0
FS 224	DL	F01	CG	95	84.0	FS 327	DL	03E	CG	48	7.0
FS 225	DL	F01	CG	38	10.0	FS 328A	DL	03E	CG	46	7.0
FS 226	DL	F01	CG	43	27.0	FS 328B	DL	03E	CG	47	4.0
FS 227	DL	F01	CG	115	280.0	FS 329	DL	03E	FG	38	2.0
FS 228	DL	F01	CG	40	54.0	FS 330	DL	03E	FG	54	5.0
FS 229	DL	F01	CG	70	13.0	FS 331	DL	03E	FG	93	14.0
FS 230	DL	F01	CG	16	7.0	FS 332	DL	03E	FG	91	6.0
FS 231	DL	F01	CG	39	5.0	FS 333	DL	03E	FG	57	5.0
FS 232	DL	F01	CG	19	0.1	FS 334	DL	03E	FG	40	3.0
FS 233	DL	F01	CG	15	2.0	FS 335	DL	03E	FG	45	0.1
FS 234	DL	F01	CG	36	3.0	FS 336	DL	03E	FG	18	0.1
FS 235	DL	F01	CG	21	15.0	FS 337	DL	03E	FG	41	0.1
FS 236	DL	F01	CG	30	3.0	FS 338	DL	03E	FG	39	5.0
FS 237	DL	F01	CG	20	4.0	FS 339	DL	03E	FG	53	3.0
FS 238	DL	F01	CG	43	3.0	FS 340	DL	03E	FG	70	1.0
FS 239	DL	F01	CG	41	3.0	FS 341	DL	208	CG	58	5.0
FS 240	DL	F01	CG	59	4.0	FS 342	DL	208	CG	23	0.1
FS 241	DL	F01	CG	23	1.0	FS 343	DL	208	CG	59	5.0
FS 242	DL	F01	CG	24	4.0	FS 344	DL	208	CG	24	5.0
FS 243	DL	F01	CG	77	2.0	FS 345	DL	208	CG	52	95.0
FS 244	DL	F01	CG	56	1.0	FS 346	DL	208	CG	52	9.0
FS 245	DL	F01	CG	20	3.0	FS 347	DL	208	CG	46	6.0
FS 246	DQ	22A	CG	11	1.0	FS 348	DL	208	CG	42	5.0
FS 247	DQ	22A	CG	55	5.0	FS 349	DL	208	CG	58	1.0
FS 248	DQ	22A	CG	88	3.0	FS 350	DL	208	CG	18	2.0
FS 249	DQ	22A	CG	224	2.0	FS 351	DL	208	CG	22	2.0
FS 250	DQ	22A	CG	100	1.0	FS 352	DL	208	CG	22	2.0
FS 251	DQ	22A	CG	136	0.1	FS 353	DL	208	CG	24	5.0
FS 252	DQ	22A	CG	25	2.0	FS 354	DL	208	CG	37	6.0
FS 253	DQ	22A	CG	22	1.0	FS 355	DL	208	CG	32	5.0
FS 254	DQ	22A	CG	37	2.0	FS 356	DL	208	CG	25	2.0
FS 255	DQ	22A	CG	50	3.0	FS 357	DL	208	CG	20	4.0
FS 256	DQ	22A	CG	29	2.0	FS 358	DL	208	CG	20	3.0
FS 257	DQ	22A	CG	29	5.0	FS 359	DL	208	CG	27	1.0
FS 258	DQ	22A	CG	57	4.0	FS 360	DL	208	CG	37	4.0
FS 259	DQ	22A	CG	87	4.0	FS 361	DL	208	CG	26	3.0
FS 260	DQ	22A	CG	32	2.0	FS 362	DL	208	CG	22	2.0
FS 261	DQ	22A	CG	37	1.0	FS 363A	DL	208	CG	50	2.0
FS 262	DQ	22A	CG	20	4.0	FS 363B	DL	208	CG	49	3.0
FS 263	DQ	22A	CG	34	3.0	FS 363C	DL	208	CG	30	3.0
FS 264	DQ	22A	CG	36	4.0	FS 364	DL	208	CG	29	2.0
FS 265	DQ	22A	CG	18	4.0	FS 365	DL	208	CG	89	15.0
FS 266	DQ	22A	CG	16	2.0	FS 366	DL	208	CG	34	3.0
FS 267	DQ	D24	CG	30	3.0	FS 367	DL	208	CG	31	3.0
FS 268	DQ	D24	CG	16	1.0	FS 368	DL	208	CG	41	6.0
FS 269	DQ	D24	CG	24	2.0	FS 369	DL	208	CG	50	15.0
FS 270	DQ	D24	CG	18	3.0	FS 370	DL	15	CG	91	45.0
FS 271	DQ	D24	CG	26	2.0	FS 371	DL	15	CG	99	40.0
FS 272	DQ	D24	CG	39	1.0	FS 372	DL	15	CG	105	55.0
FS 273	DQ	D24	CG	15	3.0	FS 373	DL	15	CG	79	85.0
FS 274	DQ	D24	CG	28	1.0	FS 374	DL	15	CG	55	3.0
FS 275	DQ	D24	CG	17	1.0	FS 375	DL	15	CG	68	40.0
FS 276	DQ	D24	CG	70	6.0	FS 376	DL	15	CG	57	28.0
FS 277	DQ	D24	CG	28	1.0	FS 377	DL	15	CG	77	4.0
FS 278	DQ	D24	CG	30	1.0	FS 378	DL	15	CG	113	25.0
FS 279	DQ	D24	CG	62	0.1	FS 379	DL	15	CG	68	5.0
FS 280	DQ	D24	CG	47	2.0	FS 380	DL	15	CG	38	25.0
FS 281	DQ	D24	CG	40	1.0	FS 381	DL	15	CG	77	40.0
FS 282	DQ	D24	CG	44	6.0	FS 382	DL	15	CG	59	5.0
FS 283	DQ	D24	CG	20	1.0	FS 383	DL	15	CG	14	18.0
FS 284	DQ	D24	CG	17	1.0	FS 384	DL	15	CG	40	76.0
FS 285	DQ	D24	CG	17	1.0	FS 385	DL	15	CG	63	22.0
FS 286	DQ	D24	CG	46	6.0	FS 386	DL	15	CG	81	40.0
FS 287	DQ	D24	CG	52	6.0	FS 387	80	03W	FG	17	14.0
FS 288	DQ	D24	CG	15	0.1	FS 388	80	03W	FG	21	5.0
FS 289	DQ	D24	CG	25	2.0	FS 389	80	03W	FG	45	4.0
FS 290	DQ	D24	CG	56	5.0	FS 390	80	03W	FG	56	5.0
FS 291	DQ	D24	CG	63	8.0	FS 391	80	03W	FG	63	5.0
FS 292	DQ	D24	CG	22	1.0	FS 392	80	03W	FG	27	4.0
FS 293	DQ	D24	CG	18	0.1	FS 393	80	03W	FG	44	4.0
FS 294	DQ	D24	CG	29	0.1	FS 394	80	03W	FG	83	10.0
FS 295	DQ	D24	CG	30	1.0	FS 395	80	03W	FG	77	2.0
FS 296	DL	03E	CG	20	2.0	FS 396	80	03W	FG	63	20.0
FS 297	DL	03E	CG	25	0.1	FS 397	80	03W	FG	37	20.0
FS 298	DL	03E	CG	26	2.0	FS 398	80	03W	FG	54	2000.0
FS 299	DL	03E	CG	40	2.0	FS 399	80	03W	FG	53	16.0
FS 300	DL	03E	CG	19	0.1	FS 400	80	03W	FG	139	258.0
FS 301	DL	03E	CG	38	4.0	FS 401	80	03W	FG	58	12.0
FS 302	DL	03E	CG	28	1.0	FS 402	80	03W	FG	49	4.0
FS 304	DL	03E	CG	20	0.1	FS 403	80	03W	FG	34	3.0
FS 305	DL	03E	CG	28	2.0	FS 404	80	D11	CG	71	15.0
FS 306	DL	03E	CG	21	2.0	FS 405	80	D11	CG	45	6.0

NO	AREA	LINE	ROCK	ZN	AS
FS 406	BO	D11	CG	40	5.0
FS 407	BO	D11	CG	53	12.0
FS 408	BO	D11	CG	20	3.0
FS 409	BO	D11	CG	38	0.1
FS 410	BO	D11	CG	20	2.0
FS 411	BO	D11	CG	35	0.1
FS 412	BO	D11	CG	34	0.1
FS 413	BO	D11	CG	23	2.0
FS 414	BO	D11	CG	46	10.0
FS 415	BO	D11	CG	61	4.0
FS 416	BO	D11	CG	17	0.1
FS 417	BO	D11	CG	33	0.1
FS 418	BO	D11	CG	28	4.0
FS 419	BO	D11	CG	46	2.0
FS 420	BO	D11	CG	42	8.0
FS 421	BO	D11	CG	72	28.0
FS 422	BO	D11	CG	61	13.0
FS 423	BO	D11	CG	41	3.0
FS 424	BO	D11	CG	29	3.0
FS 425	BO	D11	CG	46	18.0
FS 426	BO	D11	CG	62	32.0
FS 427	BO	D11	CG	65	18.0
FS 428	BO	D11	CG	38	3.0
FS 429	BO	D11	CG	41	4.0
FS 430	BO	D11	CG	67	6.0
FS 431	BO	D11	CG	36	2.0
FS 432	BO	D11	CG	38	2.0
FS 433	BO	D11	CG	54	46.0
FS 434	BO	D11	CG	40	0.1
FS 435	BO	D11	CG	17	1.0
FS 436	BO	D4W	FG	32	7.0
FS 437	BO	D4W	FG	36	2.0
FS 438	BO	D4W	FG	17	0.1
FS 439	BO	D4W	FG	94	10.0
FS 440	BO	D4W	FG	65	32.0
FS 441	BO	D4W	FG	47	2.0
FS 442	BO	D4W	FG	35	7.0
FS 443	BO	D4W	FG	18	2.0
FS 444	BO	D14	CG	40	30.0
FS 445	BO	D14	CG	48	48.0
FS 446	BO	D14	CG	55	45.0
FS 447	BO	D14	CG	58	140.0
FS 448	BO	D14	CG	14	1.0
FS 449	BO	D14	CG	11	0.1
FS 450	BO	D14	CG	59	160.0
FS 451	BO	D14	CG	71	100.0
FS 452	BO	D14	CG	57	10.0
FS 453	BO	D14	CG	93	168.0
FS 454	BO	D14	CG	39	5.0
FS 455A	BO	D14	CG	39	1.0
FS 455B	BO	D14	CG	55	4.0
FS 455C	BO	D14	CG	32	6.0
FS 456	BO	D14	CG	35	75.0
FS 457	BO	D14	CG	25	6.0
FS 458	BO	D14	CG	13	1.0
FS 459	BO	D14	CG	23	3.0
FS 460	BO	D14	CG	16	4.0
FS 461	BO	D14	CG	31	5.0
FS 462	BO	D14	CG	62	21.0
FS 463	BO	D14	CG	24	3.0
FS 464	BO	D14	CG	33	5.0
FS 465	BO	D14	CG	16	6.0
FS 466	DA	D43	GR	47	5.0
FS 467	DA	D43	GR	71	10.0
FS 468	DA	D43	GR	37	5.0
FS 469	DA	D43	GR	55	15.0
FS 470	DA	D43	GR	79	5.0
FS 471	DA	D43	GR	70	6.0
FS 472	DA	D43	GR	87	8.0
FS 473	DA	D43	GR	115	16.0
FS 474	DA	D43	GR	302	5.0
FS 475	DA	D44	GR	51	6.0
FS 476	DA	D44	GR	39	4.0
FS 477	DA	D44	GR	45	4.0
FS 478	DA	D44	GR	37	4.0
FS 479	DA	D44	GR	32	5.0
FS 480	DA	D44	GR	32	2.0
FS 481	DA	D44	GR	26	4.0
FS 482	DA	D44	GR	32	3.0
FS 483	DA	D44	GR	28	1.0
SS 501	PA	D07	CG	41	1.0
SS 502	PA	D07	CG	32	2.0
SS 503	PA	D07	CG	29	2.0
SS 504	PA	D07	CG	29	1.0
SS 505	PA	D07	CG	39	2.0
SS 506	PA	D07	CG	27	1.0
SS 507	PA	D07	CG	24	0.1
SS 508	PA	D07	CG	32	1.0
SS 509	PA	D07	CG	63	5.0
SS 510	PA	D07	CG	40	0.1
SS 511	PA	D07	CG	47	1.0
SS 512	PA	D07	CG	42	0.1
SS 513	PA	D07	CG	39	0.1
SS 514	PA	D07	CG	43	4.0
SS 515	PA	D07	CG	34	2.0
SS 516	PA	D07	CG	37	1.0
SS 517	PA	D07	CG	30	4.0
SS 518	PA	D07	CG	35	2.0
SS 519	PA	D07	CG	27	2.0

NO	AREA	LINE	ROCK	ZN	AS
SS 520	PA	D07	CG	38	1.0
SS 521	PA	D07	CG	35	1.0
SS 522	PA	D07	CG	36	4.0
SS 523	PA	D07	CG	26	3.0
SS 524	PA	D07	CG	35	3.0
SS 525	PA	D07	CG	35	4.0
SS 526	PA	D07	CG	31	0.1
SS 527	PA	D07	CG	25	1.0
SS 528	PA	D07	CG	33	3.0
SS 529	PA	D07	CG	24	0.1
SS 530	PA	D07	CG	37	0.1
SS 531	PA	D07	CG	100	35.0
SS 532	PA	D07	CG	36	5.0
SS 533	PA	D07	CG	63	10.0
SS 534	PA	D07	CG	71	6.0
SS 535	PA	D07	CG	37	4.0
SS 536	PA	D07	CG	46	3.0
SS 537	PA	D07	CG	35	0.1
SS 538	PA	D07	CG	41	0.1
SS 539	PA	D07	CG	35	0.1
SS 540	PA	D07	CG	36	0.1
SS 541	PA	D07	CG	34	0.1
SS 542	PA	D07	CG	37	0.1
SS 543	PA	D07	CG	34	0.1
SS 544	PA	D07	CG	40	1.0
SS 545	PA	D07	CG	36	0.1
SS 546	PA	D07	CG	40	0.1
SS 547	PA	D07	CG	42	2.0
SS 548	PA	D07	CG	37	1.0
SS 549	PA	D07	CG	36	0.1
SS 550	PA	D07	CG	35	1.0
SS 551	PA	D07	CG	39	1.0
SS 552	PA	D07	CG	42	0.1
SS 553	PA	D07	CG	38	0.1
SS 554	PA	D07	CG	38	0.1
SS 555	PA	D07	CG	44	1.0
SS 556	PA	D07	CG	38	0.1
SS 557	PA	D07	CG	38	1.0
SS 558	PA	D07	CG	34	1.0
SS 559	PA	D07	CG	25	1.0
SS 560	PA	D07	CG	38	0.1
SS 561	PA	D07	CG	41	0.1
SS 562	PA	D07	CG	40	0.1
SS 563	PA	D07	CG	39	1.0
SS 564	PA	D07	CG	17	0.1
SS 565	PA	D07	CG	41	0.1
SS 566	PA	D07	CG	50	1.0
SS 567	PA	D07	CG	42	0.1
SS 568	PA	D07	CG	21	0.1
SS 569	PA	D07	CG	68	3.0
SS 570	PA	D07	CG	36	0.1
SS 571	PA	D07	CG	44	0.1
SS 572	PA	D07	CG	43	0.1
SS 573	PA	D07	CG	39	52.0
SS 574	PA	D07	CG	55	10.0
SS 575	PA	D07	CG	56	5.0
SS 576	PA	D07	CG	36	4.0
SS 577	PA	D07	CG	38	10.0
SS 578	PA	D07	CG	49	1.0
SS 579	PA	D07	CG	26	4.0
SS 580	PA	D07	CG	51	9.0
SS 581	PA	D07	CG	35	5.0
SS 582	PA	D07	CG	50	2.0
SS 583	PA	D07	CG	18	4.0
SS 584	PA	D07	CG	81	6.0
SS 585	PA	D07	CG	82	3.0
SS 586	PA	D07	CG	44	2.0
SS 587	PA	D07	CG	79	3.0
SS 588	PA	D07	CG	30	4.0
SS 589	PA	D07	CG	32	0.1
SS 590	PA	D07	CG	26	1.0
SS 591	PA	D07	CG	13	0.1
SS 592	PA	D07	CG	37	0.1
SS 593	PA	D07	CG	24	0.1
SS 594	PA	D07	CG	69	12.0
SS 595	PA	D07	CG	28	1.0
SS 596	PA	D07	CG	41	0.1
SS 597	PA	D07	CG	47	2.0
SS 598	PA	D07	CG	72	10.0
SS 599	PA	D07	CG	22	0.1
SS 600	PA	D07	CG	47	0.1
SS 601	PA	D07	CG	60	0.1
SS 602	PA	D07	CG	51	18.0
SS 603	PA	D07	CG	68	6.0
SS 604	PA	D07	CG	33	5.0
SS 605	PA	D07	CG	46	1.0
SS 606	PA	D07	CG	25	4.0
SS 607	PA	D07	CG	17	0.1
SS 608	PA	D07	CG	30	0.1
SS 609	PA	D07	CG	39	0.1
SS 610	PA	D07	CG	45	3.0
SS 611	PA	D07	CG	52	1.0
SS 612	PA	D07	CG	27	3.0
SS 613	PA	D07	CG	32	2.0
SS 614	PA	D07	CG	38	2.0
SS 615	PA	D07	CG	27	1.0
SS 616	PA	D07	CG	57	3.0
SS 617	PA	D07	CG	50	4.0
SS 618	PA	D07	CG	53	2.0
SS 619	PA	D07	CG	38	5.0
SS 620	PA	D07	CG	41	0.1
SS 621	PA	D07	CG	33	6.0

NO	AREA	LINE	ROCK	ZN	AS	NO	AREA	LINE	ROCK	ZN	AS
SS 622	PA	D07	CG	42	1.0	SS 723	PA	F05	CG	43	1.0
SS 623	PA	D07	CG	23	5.0	SS 724	PA	F05	CG	45	3.0
SS 624	PA	D07	CG	60	10.0	SS 725	PA	F05	CG	55	1.0
SS 625	PA	D07	CG	137	26.0	SS 726	PA	F05	CG	42	1.0
SS 626	PA	D03	CG	33	5.0	SS 727	PA	F05	CG	7	2.0
SS 627	PA	D03	CG	33	6.0	SS 728	PA	F05	CG	32	1.0
SS 628	PA	D03	CG	55	0.1	SS 729	DQ	218	CG	46	5.0
SS 629	PA	D03	CG	45	0.1	SS 730	DQ	218	CG	50	1.0
SS 630	PA	D03	CG	63	2.0	SS 731	DQ	218	CG	16	0.1
SS 631	PA	D03	CG	45	0.1	SS 732	DQ	218	CG	400	8.0
SS 632	PA	D03	CG	51	1.0	SS 733	DQ	218	CG	143	0.1
SS 633	PA	D03	CG	42	3.0	SS 734	DQ	218	CG	245	0.1
SS 634	PA	D03	CG	16	2.0	SS 735	DQ	218	CG	41	0.1
SS 635	PA	D03	CG	24	3.0	SS 736	DQ	218	CG	20	0.1
SS 636	PA	D03	CG	58	5.0	SS 737	DQ	218	CG	45	1.0
SS 637	PA	D03	CG	49	2.0	SS 738	DQ	218	CG	35	1.0
SS 638	PA	D03	CG	25	2.0	SS 739	DQ	218	CG	40	2.0
SS 639	PA	D03	CG	50	1.0	SS 740	DQ	218	CG	18	5.0
SS 640	PA	D03	CG	27	1.0	SS 741	DQ	218	CG	0	0.1
SS 641	PA	D03	CG	42	0.1	SS 742	DQ	218	CG	19	5.0
SS 642	PA	D03	CG	42	1.0	SS 743	DQ	218	CG	19	0.1
SS 643	PA	D03	CG	42	1.0	SS 744	DQ	218	CG	22	3.0
SS 644	PA	D03	CG	29	1.0	SS 745	DQ	218	CG	12	2.0
SS 645	PA	D03	CG	38	4.0	SS 746	DQ	218	CG	13	0.1
SS 646	PA	D03	CG	57	2.0	SS 747	DQ	218	CG	14	0.1
SS 647	PA	D03	CG	37	0.1	SS 748	DQ	218	CG	33	0.1
SS 648	PA	D03	CG	39	9.0	SS 749	DQ	218	CG	32	0.1
SS 649	PA	D03	CG	25	1.0	SS 750	DQ	218	CG	10	14.0
SS 650	PA	D03	CG	39	4.0	SS 751	DQ	218	CG	11	2.0
SS 651	PA	D03	CG	44	33.0	SS 752	DQ	D25	CG	41	3.0
SS 652	PA	D03	CG	29	5.0	SS 753	DQ	D25	CG	135	5.0
SS 653	PA	D03	CG	27	0.1	SS 754	DQ	D25	CG	43	4.0
SS 654	PA	D03	CG	52	6.0	SS 755	DQ	D25	CG	43	4.0
SS 655	PA	D03	CG	23	3.0	SS 756	DQ	D25	CG	57	5.0
SS 656	PA	D03	CG	36	5.0	SS 757	DQ	D25	CG	62	4.0
SS 657	PA	D03	CG	49	4.0	SS 758	DQ	D25	CG	16	5.0
SS 658	PA	D03	CG	32	1.0	SS 759	DQ	D25	CG	17	4.0
SS 659	PA	D03	CG	33	2.0	SS 760	DQ	D25	CG	47	5.0
SS 660	PA	D03	CG	35	6.0	SS 761	DQ	D25	CG	59	4.0
SS 661	PA	D03	CG	49	7.0	SS 762	DQ	D25	CG	38	3.0
SS 662	PA	D03	CG	54	5.0	SS 763	DQ	D25	CG	36	3.0
SS 663	PA	D03	CG	51	8.0	SS 764	DQ	D25	CG	35	11.0
SS 664	PA	D03	CG	46	18.0	SS 765	DQ	D25	CG	48	6.0
SS 665	PA	D03	CG	31	6.0	SS 766	DQ	D25	CG	59	4.0
SS 666	PA	D03	CG	21	5.0	SS 767	DQ	D25	CG	37	4.0
SS 667	PA	D03	CG	34	4.0	SS 768	DQ	D25	CG	47	1.0
SS 668	PA	D03	CG	32	5.0	SS 769	DQ	D25	CG	53	5.0
SS 669	PA	D03	CG	28	5.0	SS 770	DQ	D25	CG	41	4.0
SS 670	PA	D03	CG	62	3.0	SS 771	DQ	D25	CG	22	4.0
SS 671	PA	D02	CG	51	4.0	SS 772	DQ	D25	CG	24	4.0
SS 672	PA	D02	CG	30	2.0	SS 773	DQ	D25	CG	30	5.0
SS 673	PA	D02	CG	24	3.0	SS 774	DQ	D25	CG	27	4.0
SS 674	PA	D02	CG	13	5.0	SS 775	DQ	D25	CG	13	2.0
SS 675	PA	D02	CG	45	6.0	SS 776	DQ	D25	CG	28	5.0
SS 676	PA	D02	CG	28	5.0	SS 777	DQ	D25	CG	49	1.0
SS 677	PA	D02	CG	36	2.0	SS 778	DQ	D25	CG	42	2.0
SS 678	PA	D02	CG	33	4.0	SS 779	DQ	D25	CG	26	5.0
SS 679	PA	D02	CG	46	2.0	SS 780	DL	D17	CG	37	1.0
SS 680	PA	D02	CG	40	6.0	SS 781	DL	D17	CG	25	4.0
SS 681	PA	D02	CG	48	9.0	SS 782	DL	D17	CG	35	2.0
SS 682	PA	D02	CG	42	6.0	SS 783	DL	D17	CG	43	5.0
SS 683	PA	D02	CG	47	1.0	SS 784	DL	D17	CG	25	0.1
SS 684	PA	D02	CG	26	1.0	SS 785	DL	D17	CG	20	4.0
SS 685	PA	D02	CG	32	1.0	SS 786	DL	D17	CG	10	6.0
SS 686	PA	D02	CG	40	2.0	SS 787	DL	D17	CG	11	5.0
SS 687	PA	D02	CG	31	1.0	SS 788	DL	D17	CG	39	0.1
SS 688	PA	D02	CG	33	1.0	SS 789	DL	D17	CG	42	0.1
SS 689	PA	D02	CG	57	9.0	SS 790	DL	D17	CG	40	1.0
SS 690	PA	D02	CG	44	5.0	SS 791	DL	D17	CG	45	5.0
SS 691	PA	D07	CG	25	4.0	SS 792	DL	D17	CG	40	1.0
SS 692	PA	D07	CG	24	2.0	SS 793	DL	D17	CG	48	5.0
SS 693	PA	D07	CG	27	5.0	SS 794	DL	D17	CG	26	4.0
SS 694	PA	D07	CG	24	1.0	SS 795	DL	D17	CG	55	11.0
SS 695	PA	D07	CG	39	3.0	SS 796	DL	D17	CG	85	56.0
SS 696	PA	D07	CG	34	3.0	SS 797	DL	D17	CG	43	6.0
SS 697	PA	D07	CG	31	2.0	SS 798	DL	D17	CG	17	0.1
SS 698	PA	D07	CG	45	2.0	SS 799	DL	D17	CG	17	3.0
SS 699	MA	F05	CG	47	1.0	SS 800	DL	D17	CG	10	4.0
SS 700	MA	F05	CG	47	1.0	SS 801	DL	D17	CG	22	3.0
SS 701	MA	F05	CG	21	1.0	SS 802	DL	D17	CG	16	6.0
SS 702	MA	F05	CG	46	4.0	SS 803	DL	D17	CG	56	0.1
SS 703	MA	F05	CG	40	[illegible]	SS 804	DL	D17	CG	16	2.0
SS 704	MA	F05	CG	49	0.1	SS 805	DL	D17	CG	36	[illegible]
SS 705	MA	F05	CG	56	0.1	SS 806	DL	D17	CG	16	7.0
SS 706	MA	F05	CG	24	5.0	SS 807	DL	D17	CG	18	1.0
SS 707	MA	F05	CG	28	6.0	SS 808	DL	D17	CG	32	5.0
SS 708	MA	F05	CG	23	5.0	SS 809	DL	D17	CG	18	4.0
SS 709	MA	F05	CG	40	3.0	SS 810	DL	D17	CG	15	3.0
SS 710	MA	F05	CG	40	6.0	SS 811	DL	D17	CG	50	13.0
SS 711	PA	F05	CG	48	2.0	SS 812	DL	D17	CG	53	4.0
SS 712	PA	F05	CG	43	3.0	SS 813	DL	F02	CG	62	37.0
SS 713	PA	F05	CG	48	4.0	SS 814	DL	F02	CG	23	46.0
SS 714	PA	F05	CG	22	4.0	SS 815	DL	F02	CG	30	0.1
SS 715	PA	F05	CG	45	1.0	SS 816	DL	F02	CG	47	14.0
SS 716	PA	F05	CG	40	0.1	SS 817	DL	F02	CG	59	3.0
SS 717	PA	F05	CG	18	1.0	SS 818	DL	F02	CG	26	3.0
SS 718	PA	F05	CG	43	0.1	SS 819	DL	F02	CG	56	54.0
SS 719	PA	F05	CG	46	0.1	SS 820	DL	F02	CG	27	6.0
SS 720	PA	F05	CG	40	0.1	SS 821	DL	F02	CG	850	2000.0
SS 721	PA	F05	CG	24	1.0	SS 822	DL	F02	CG	26	6.0
SS 722	PA	F05	CG	41	1.0	SS 823	DL	F02	CG	15	30.0

NO	AREA	LINE	ROCK	ZN	AS	NO	AREA	LINE	ROCK	ZN	AS
NS 1037	PA	D05	CG	44	3.0	NS 1140	PA	D01	CG	31	3.0
NS 1038	PA	D05	CG	24	2.0	NS 1141	PA	D01	CG	33	1.0
NS 1039	PA	D05	CG	25	5.0	NS 1142	PA	D01	CG	49	2.0
NS 1040	PA	D05	CG	34	1.0	NS 1143	PA	D01	CG	41	3.0
NS 1041	PA	D05	CG	30	2.0	NS 1144	PA	D01	CG	41	1.0
NS 1042	PA	D05	CG	48	2.0	NS 1145	PA	D01	CG	28	5.0
NS 1043	PA	D05	CG	22	3.0	NS 1146	PA	D01	CG	60	1.0
NS 1044	PA	D05	CG	46	15.0	NS 1147	PA	D01	CG	42	4.0
NS 1045	PA	D05	CG	32	3.0	NS 1148	PA	D01	CG	40	6.0
NS 1046	PA	D05	CG	18	2.0	NS 1149	PA	D01	CG	36	2.0
NS 1047	PA	D05	CG	52	2.0	NS 1150	PA	D01	CG	38	3.0
NS 1048	PA	D05	CG	31	1.0	NS 1151	PA	D01	CG	42	2.0
NS 1049	PA	D05	CG	46	2.0	NS 1152	PA	D01	CG	25	2.0
NS 1050	PA	D05	CG	46	1.0	NS 1153	PA	D01	CG	48	2.0
NS 1051	PA	D05	CG	35	1.0	NS 1154	PA	D01	CG	32	3.0
NS 1052	PA	D05	CG	20	1.0	NS 1155	PA	09E	CG	14	5.0
NS 1053	PA	D05	CG	28	1.0	NS 1156	PA	09E	CG	27	1.0
NS 1054	PA	D05	CG	63	2.0	NS 1157	PA	09E	CG	20	2.0
NS 1055	PA	D05	CG	41	48.0	NS 1158	PA	09E	CG	30	3.0
NS 1056	PA	D05	CG	61	4.0	NS 1159	PA	09E	CG	17	5.0
NS 1057	PA	D05	CG	45	3.0	NS 1160	PA	09E	CG	16	3.0
NS 1058	PA	D05	CG	46	1.0	NS 1161	PA	09E	CG	24	5.0
NS 1059	PA	D05	CG	29	3.0	NS 1162	PA	09E	CG	33	17.0
NS 1060	PA	D05	CG	34	1.0	NS 1163	PA	09E	CG	53	35.0
NS 1061	PA	D05	CG	30	5.0	NS 1164	PA	09E	CG	42	7.0
NS 1062	PA	D05	CG	46	76.0	NS 1165	PA	09E	CG	29	13.0
NS 1063	PA	D05	CG	38	33.0	NS 1166	PA	09E	CG	19	4.0
NS 1064	PA	D05	CG	72	13.0	NS 1167	PA	09E	CG	27	6.0
NS 1065	PA	D05	CG	61	18.0	NS 1168	PA	09E	CG	16	5.0
NS 1066	PA	D05	CG	55	100.0	NS 1169	PA	09E	CG	17	3.0
NS 1067	PA	D05	CG	56	165.0	NS 1170	PA	09E	CG	21	2.0
NS 1068	PA	D05	CG	93	38.0	NS 1171	PA	09E	CG	20	3.0
NS 1069	PA	D05	CG	81	80.0	NS 1172	PA	09E	CG	18	4.0
NS 1070	PA	D05	CG	66	40.0	NS 1173	PA	09E	CG	20	1.0
NS 1071	PA	D05	CG	46	48.0	NS 1174	PA	09E	CG	18	3.0
NS 1072	PA	D05	CG	59	25.0	NS 1175	PA	09E	CG	20	3.0
NS 1073	PA	D05	CG	51	27.0	NS 1176	PA	09E	CG	21	8.0
NS 1074	PA	D05	CG	37	1.0	NS 1177	PA	09E	CG	28	4.0
NS 1075	PA	D05	CG	50	1.0	NS 1178	PA	09E	CG	13	5.0
NS 1076	PA	D05	CG	28	2.0	NS 1179	PA	09E	CG	21	2.0
NS 1077	PA	D05	CG	38	1.0	NS 1180	PA	09E	CG	81	4.0
NS 1078	PA	D05	CG	35	2.0	NS 1181	PA	09E	CG	72	1.0
NS 1079	PA	D05	CG	37	2.0	NS 1182	PA	09E	CG	13	2.0
NS 1080	PA	D05	CG	76	2.0	NS 1183	PA	09E	CG	19	2.0
NS 1081	PA	D05	CG	93	1.0	NS 1184	PA	09E	CG	24	3.0
NS 1082	PA	D05	CG	68	3.0	NS 1185	PA	09E	CG	22	2.0
NS 1083	PA	D05	CG	40	2.0	NS 1186	PA	09E	CG	32	2.0
NS 1084	PA	D05	CG	37	3.0	NS 1187	PA	09E	CG	27	1.0
NS 1085	PA	D05	CG	32	4.0	NS 1188	PA	09E	CG	14	3.0
NS 1086	PA	D05	CG	27	1.0	NS 1189	PA	09E	CG	15	2.0
NS 1088	PA	D05	CG	34	1.0	NS 1190	DQ	21A	CG	31	3.0
NS 1089	PA	D05	CG	33	1.0	NS 1191	DQ	21A	CG	29	3.0
NS 1090	PA	D05	CG	21	1.0	NS 1192	DQ	21A	CG	31	2.0
NS 1091	PA	D05	CG	49	3.0	NS 1193	DQ	21A	CG	44	3.0
NS 1092	PA	D05	CG	42	2.0	NS 1194	DQ	21A	CG	39	1.0
NS 1093	PA	D05	CG	54	2.0	NS 1195	DQ	21A	CG	43	2.0
NS 1094	PA	D05	CG	55	5.0	NS 1196	DQ	21A	CG	20	1.0
NS 1095	PA	D05	CG	21	4.0	NS 1197	DQ	21A	CG	27	5.0
NS 1096	PA	D05	CG	36	3.0	NS 1198	DQ	21A	CG	36	1.0
NS 1097	PA	D05	CG	28	0.1	NS 1199	DQ	21A	CG	33	3.0
NS 1098	PA	D05	CG	45	0.1	NS 1200	DQ	21A	CG	22	5.0
NS 1099	PA	D05	CG	18	2.0	NS 1201	DQ	21A	CG	22	2.0
NS 1100	PA	D05	CG	26	1.0	NS 1202	DQ	21A	CG	17	5.0
NS 1101	PA	D05	CG	59	2.0	NS 1203	DQ	21A	CG	31	3.0
NS 1102	PA	D05	CG	53	2.0	NS 1204	DQ	21A	CG	9	1.0
NS 1103	PA	D05	CG	53	1.0	NS 1205	DQ	21A	CG	27	1.0
NS 1104	PA	D05	CG	72	1.0	NS 1206	DQ	21A	CG	46	5.0
NS 1105	PA	D05	CG	67	1.0	NS 1207	DQ	21A	CG	42	2.0
NS 1106	PA	D05	CG	36	2.0	NS 1208	DQ	22B	CG	17	4.0
NS 1107	PA	D05	CG	36	2.0	NS 1209	DQ	22B	CG	62	5.0
NS 1108	PA	D05	CG	27	2.0	NS 1210	DQ	22B	CG	63	1.0
NS 1109	PA	D05	CG	29	1.0	NS 1211	DQ	22B	CG	58	2.0
NS 1110	PA	D05	CG	52	4.0	NS 1212	DQ	22B	CG	56	1.0
NS 1111	PA	D05	CG	38	3.0	NS 1213	DQ	22B	CG	39	0.1
NS 1112	PA	D05	CG	41	1.0	NS 1214	DQ	22B	CG	29	4.0
NS 1113	PA	D05	CG	32	2.0	NS 1215	DQ	22B	CG	41	4.0
NS 1114	PA	D05	CG	41	2.0	NS 1216	DQ	22B	CG	35	4.0
NS 1115	PA	D05	CG	44	2.0	NS 1217	DQ	22B	CG	50	4.0
NS 1116	PA	D05	CG	43	4.0	NS 1218	DQ	22B	CG	85	4.0
NS 1117	PA	D05	CG	47	4.0	NS 1219	DQ	22B	CG	18	4.0
NS 1118	PA	D05	CG	44	4.0	NS 1220	DQ	22B	CG	24	4.0
NS 1119	PA	D05	CG	35	3.0	NS 1221	DQ	22B	CG	24	4.0
NS 1120	PA	D05	CG	75	2.0	NS 1222	DQ	22B	CG	46	4.0
NS 1121	PA	D05	CG	142	4.0	NS 1223	DQ	22B	CG	81	4.0
NS 1122	PA	D05	CG	90	2.0	NS 1224	DQ	22B	CG	32	12.0
NS 1123	PA	D05	CG	52	3.0	NS 1225	DQ	22B	CG	26	3.0
NS 1124	PA	D05	CG	48	1.0	NS 1226	DQ	22B	CG	64	2.0
NS 1125	PA	D05	CG	38	4.0	NS 1227	DQ	22B	CG	26	4.0
NS 1126	PA	D05	CG	43	3.0	NS 1228	DQ	22B	CG	51	4.0
NS 1127	PA	D05	CG	56	3.0	NS 1229	DQ	22B	CG	34	5.0
NS 1128	PA	D05	CG	62	4.0	NS 1230	DQ	22B	CG	33	1.0
NS 1129	PA	D05	CG	46	4.0	NS 1231	DQ	22B	CG	46	1.0
NS 1130	PA	D05	CG	56	5.0	NS 1232	DQ	22B	CG	63	1.0
NS 1131	PA	D05	CG	55	2.0	NS 1233	DQ	22B	CG	33	4.0
NS 1132	PA	D05	CG	46	2.0	NS 1234	DQ	22B	CG	34	1.0
NS 1133	PA	D05	CG	45	2.0	NS 1235	DQ	22B	CG	42	4.0
NS 1134	PA	D05	CG	86	2.0	NS 1236	DQ	22B	CG	18	2.0
NS 1135	PA	D01	CG	37	3.0	NS 1237	DQ	22B	CG	25	3.0
NS 1136	PA	D01	CG	54	2.0	NS 1238	DQ	22B	CG	34	3.0
NS 1137	PA	D01	CG	44	4.0	NS 1239	DQ	22B	CG	52	5.0
NS 1138	PA	D01	CG	37	4.0	NS 1240	DQ	22B	CG	20	3.0
NS 1139	PA	D01	CG	24	1.0	NS 1241	DQ	22B	CG	66	7.0

NO	AREA	LINE	ROCK	ZN	AS
SS 824	DL	F02	CG	39	14.0
SS 825	DL	F02	CG	36	15.0
SS 826	DL	F02	CG	36	18.0
SS 827	DL	F02	CG	9	2.0
SS 828	DL	F02	CG	45	14.0
SS 829	DL	F02	FG	41	1.0
SS 830	DL	F02	FG	42	6.0
SS 831	DL	F02	FG	70	1.0
SS 832	DL	F02	FG	59	1.0
SS 833	DL	F02	FG	60	1.0
SS 834	DL	F02	FG	35	2.0
SS 835	DL	F02	FG	28	2.0
SS 836	DL	F02	FG	37	1.0
SS 837	DL	F02	FG	55	0.1
SS 838	DL	D19	CG	31	2.0
SS 839	DL	D19	CG	64	18.0
SS 840	DL	D19	CG	53	5.0
SS 841	DL	D19	CG	78	38.0
SS 842	DL	D19	CG	17	4.0
SS 843	DL	D19	CG	14	4.0
SS 844	DL	D19	CG	52	11.0
SS 845	DL	D19	CG	176	0.1
SS 846	DL	D19	CG	11	3.0
SS 847	DL	D19	CG	10	2.0
SS 848	DL	D19	CG	19	0.1
SS 849	DL	D19	CG	22	4.0
SS 850	DL	D19	CG	18	4.0
SS 851	DL	D19	CG	18	5.0
SS 852	DL	D19	CG	36	6.0
SS 853	DL	D19	CG	19	6.0
SS 854	DL	D19	CG	32	5.0
SS 855	DL	D19	CG	39	1.0
SS 856	DL	D19	CG	49	16.0
SS 857	DL	D19	CG	38	0.1
SS 858	DL	D19	CG	22	4.0
SS 859	DL	D19	CG	27	5.0
SS 860	DL	D19	CG	44	13.0
SS 861	DL	D19	CG	23	5.0
SS 862	DL	D19	CG	13	3.0
SS 863	DL	D19	CG	20	5.0
SS 864	DL	D19	CG	43	17.0
SS 865	DL	D19	CG	21	5.0
SS 866	DL	D19	CG	23	1.0
SS 867	DL	D19	CG	38	0.1
SS 868	DL	D19	CG	43	1.0
SS 869	DL	D19	CG	65	14.0
SS 870	DL	D15	CG	54	16.0
SS 871	DL	D15	CG	82	90.0
SS 872	DL	D15	CG	42	6.0
SS 873	DL	D15	CG	81	10.0
SS 874	DL	D15	CG	48	1.0
SS 875	DL	D15	CG	93	20.0
SS 876	DL	D15	CG	82	26.0
SS 877	DL	D15	CG	52	6.0
SS 878	DL	D15	CG	72	128.0
SS 879	DL	D15	CG	18	3.0
SS 880	DL	D15	CG	30	2.0
SS 881	DL	D15	CG	40	6.0
SS 882	DL	D15	CG	38	13.0
SS 883	DL	D15	CG	44	10.0
SS 884	DL	D15	CG	160	46.0
SS 885	DL	D15	CG	39	0.1
SS 886	BD	10N	CG	62	11.0
SS 887	BD	10N	CG	44	45.0
SS 888	BD	10N	CG	43	47.0
SS 889	BD	10N	CG	32	2.0
SS 890	BD	10N	CG	56	18.0
SS 891	BD	10N	CG	70	5.0
SS 892	BD	10N	CG	62	7.0
SS 893	BD	10N	CG	36	0.1
SS 894	BD	10N	CG	34	0.1
SS 895	BD	10N	CG	30	3.0
SS 896	BD	10N	CG	32	2.0
SS 897	BD	10N	CG	32	1.0
SS 898	BD	10N	CG	34	1.0
SS 899	BD	10N	CG	35	5.0
SS 900	BD	10N	CG	33	6.0
SS 901	BD	10N	CG	57	2.0
SS 902	BD	10N	CG	48	1.0
SS 903	BD	10N	CG	56	50.0
SS 904	BD	10N	CG	48	0.1
SS 905	BD	10N	CG	49	1.0
SS 906	BD	10N	CG	41	0.1
SS 907	BD	10N	CG	36	1.0
SS 908	BD	10N	CG	34	9.0
SS 909	BD	10N	CG	10	0.1
SS 910	BD	10N	CG	29	0.1
SS 911	BD	10N	CG	27	4.0
SS 912	BD	10N	CG	36	1.0
SS 913	BD	10N	CG	34	4.0
SS 914	BD	10N	CG	33	8.0
SS 915	BD	10N	CG	34	2.0
SS 916	BD	10N	CG	24	1.0
SS 917	BD	10N	CG	24	1.0
SS 918	BD	10N	CG	42	1.0
SS 919	BD	10N	CG	65	34.0
SS 920	BD	10N	CG	32	15.0
SS 921	BD	10N	CG	26	2.0
SS 922	BD	10N	CG	38	1.0
SS 923	BD	D13	CG	48	19.0
SS 924	BD	D13	CG	52	80.0
SS 925	BD	D13	CG	57	76.0
SS 926	BD	D13	CG	44	0.1
SS 927	BD	D13	CG	38	0.1
SS 928	BD	D13	CG	17	3.0
SS 929	BD	D13	CG	37	2.0
SS 930	BD	D13	CG	46	33.0
SS 931	BD	D13	CG	34	1.0
SS 932	BD	D13	CG	18	1.0
SS 933	BD	D13	CG	33	2.0
SS 934	BD	D13	CG	36	2.0
SS 935	BD	D13	CG	36	16.0
SS 936	BD	D13	CG	117	82.0
SS 937	BD	D13	CG	44	58.0
SS 938	BD	D13	CG	24	50.0
SS 939	BD	D13	CG	32	19.0
SS 940	BD	D13	CG	38	0.1
SS 941	BD	D13	CG	30	13.0
SS 942	BD	D13	CG	47	8.0
SS 943	BD	D13	CG	26	2.0
SS 944	BD	D11	CG	87	100.0
SS 945	BD	D11	CG	49	32.0
SS 946	BD	D11	CG	26	34.0
SS 947	BD	D11	CG	52	37.0
SS 948	BD	D11	CG	16	3.0
SS 949	BD	D12	CG	79	29.0
SS 950	BD	D12	CG	101	1600.0
SS 951	BD	D12	CG	45	20.0
SS 952	BD	D12	CG	52	17.0
SS 953	BD	D12	CG	103	1200.0
SS 954	BD	D12	CG	24	4.0
SS 955	BD	D12	CG	32	3.0
SS 956	BD	D13	CG	92	384.0
SS 957	BD	D13	CG	28	4.0
SS 958	BD	D13	CG	40	84.0
SS 959	BD	D13	CG	50	30.0
SS 960	BD	D13	CG	32	6.0
SS 961	BD	D13	CG	26	4.0
SS 962	BD	D13	CG	44	76.0
SS 963	BD	D13	CG	15	4.0
SS 964	BD	D13	CG	15	4.0
SS 965	BD	D13	CG	42	28.0
SS 966	BD	D13	CG	43	5.0
SS 967	BD	D13	CG	28	2.0
SS 968	BD	D13	CG	50	19.0
SS 969	BD	D13	CG	50	20.0
SS 970	BD	D13	CG	40	4.0
SS 971	BD	D13	CG	45	0.1
SS 972	DA	D42	GR	50	5.0
SS 973	DA	D42	GR	22	10.0
SS 974	DA	D42	GR	24	10.0
SS 975	DA	D42	GR	25	13.0
SS 976	DA	D42	GR	22	9.0
SS 978	DA	D42	GR	20	0.1
SS 979	DA	D42	GR	33	6.0
SS 980	DA	D42	GR	30	20.0
SS 981	DA	D41	GR	36	5.0
SS 982	DA	D41	GR	60	80.0
SS 983	DA	D41	GR	18	17.0
SS 984	DA	D41	GR	26	7.0
SS 985	DA	D41	GR	33	6.0
SS 986	DA	D41	GR	564	700.0
SS 987	DA	D41	GR	27	4.0
SS 988	DA	D41	GR	62	10.0
SS 989	DA	D41	GR	32	5.0
NS 1001	PA	D08	CG	67	2.0
NS 1002	PA	D08	CG	57	3.0
NS 1003	PA	D08	CG	16	1.0
NS 1004	PA	D08	CG	31	0.1
NS 1005	PA	D08	CG	45	0.1
NS 1006	PA	D08	CG	23	2.0
NS 1007	PA	D08	CG	32	2.0
NS 1008	PA	D08	CG	19	1.0
NS 1009	PA	D08	CG	42	1.0
NS 1010	PA	D08	CG	23	0.1
NS 1011	PA	D08	CG	15	1.0
NS 1012	PA	D08	CG	12	0.1
NS 1013	PA	D08	CG	57	1.0
NS 1014	PA	D08	CG	29	1.0
NS 1015	PA	D08	CG	28	1.0
NS 1016	PA	D08	CG	32	2.0
NS 1017	PA	D08	CG	32	2.0
NS 1018	PA	D08	CG	50	2.0
NS 1019	PA	D08	CG	31	5.0
NS 1020	PA	D08	CG	60	2.0
NS 1021	PA	D08	CG	17	1.0
NS 1022	PA	D08	CG	16	2.0
NS 1023	PA	D08	CG	52	4.0
NS 1024	PA	D08	CG	62	9.0
NS 1025	PA	D08	CG	44	10.0
NS 1026	PA	D08	CG	49	10.0
NS 1027	PA	D08	CG	30	4.0
NS 1028	PA	D08	CG	50	1.0
NS 1029	PA	D08	CG	25	6.0
NS 1030	PA	D08	CG	45	6.0
NS 1031	PA	D08	CG	49	5.0
NS 1032	PA	D08	CG	116	240.0
NS 1033	PA	D08	CG	15	11.0
NS 1034	PA	D05	CG	40	4.0
NS 1035	PA	D05	CG	47	2.0
NS 1036	PA	D05	CG	48	3.0

NO	AREA	LINE	ROCA	ZN	AS
NS 1242	DQ	22B	CG	115	20.0
NS 1243	DL	D18	CG	36	1.0
NS 1244	DL	D18	CG	21	4.0
NS 1245	DL	D18	CG	18	3.0
NS 1246	DL	D18	CG	110	19.0
NS 1247	DL	D18	CG	77	30.0
NS 1248	DL	D18	CG	68	1.0
NS 1249	DL	D18	CG	77	5.0
NS 1250	DL	D18	CG	49	21.0
NS 1251	DL	D18	CG	53	12.0
NS 1252	DL	D18	CG	262	260.0
NS 1253	DL	D18	CG	50	10.0
NS 1254	DL	D18	CG	61	25.0
NS 1255	DL	D18	CG	33	5.0
NS 1256	DL	D18	CG	41	2.0
NS 1257	DL	D18	CG	47	11.0
NS 1258	DL	D18	CG	51	6.0
NS 1259	DL	D18	CG	50	30.0
NS 1260	DL	D18	CG	67	10.0
NS 1261	DL	D18	CG	73	18.0
NS 1262	DL	D18	CG	56	14.0
NS 1263	DL	D18	CG	70	320.0
NS 1264	DL	D18	CG	83	25.0
NS 1265	DL	D18	CG	74	215.0
NS 1266	DL	D18	CG	54	4.0
NS 1267	DL	D18	CG	60	5.0
NS 1268	DL	D18	CG	26	6.0
NS 1269	DL	D18	CG	49	6.0
NS 1270	DL	D18	CG	47	7.0
NS 1271	DL	D18	CG	46	2.0
NS 1272	DL	D18	CG	20	5.0
NS 1273	DL	D18	CG	45	3.0
NS 1274	DL	D18	CG	51	2.0
NS 1275	MA	F06	CG	44	2.0
NS 1276	MA	F06	CG	76	2.0
NS 1277	MA	F06	CG	37	1.0
NS 1278	MA	F06	CG	47	3.0
NS 1279	MA	F06	CG	29	2.0
NS 1280	MA	F06	CG	38	5.0
NS 1281	MA	F06	CG	50	3.0
NS 1282	MA	F06	CG	64	3.0
NS 1283	MA	F06	CG	26	2.0
NS 1284	MA	F06	CG	35	3.0
NS 1285	MA	F06	CG	44	55.0
NS 1286	MA	F06	CG	36	7.0
NS 1287	MA	F06	CG	54	5.0
NS 1288	MA	F06	CG	40	10.0
NS 1289	MA	F06	CG	55	26.0
NS 1290	MA	F06	CG	31	7.0
NS 1291	MA	F06	CG	14	0.1
NS 1292	MA	F06	CG	37	5.0
NS 1293	MA	F06	CG	50	6.0
NS 1294	MA	F06	CG	30	5.0
NS 1295	MA	F06	CG	47	4.0
NS 1296	MA	F06	CG	52	5.0
NS 1297	MA	F06	CG	36	4.0
NS 1298	MA	F06	CG	30	4.0
NS 1299	MA	F06	CG	25	5.0
NS 1300	MA	F06	CG	25	3.0
NS 1301	MA	F06	CG	24	3.0
NS 1302	MA	F06	CG	39	2.0
NS 1303	MA	F06	CG	27	3.0
NS 1304	MA	F06	CG	28	3.0
NS 1305	MA	F06	CG	33	7.0
NS 1306	MA	F06	CG	23	4.0
NS 1307	MA	F06	CG	41	4.0
NS 1308	MA	F06	CG	37	4.0
NS 1309	MA	F06	CG	18	4.0
NS 1310	MA	F06	CG	18	1.0
NS 1311	MA	F06	CG	42	4.0
NS 1312	MA	F06	CG	35	4.0
NS 1313	MA	F06	CG	10	4.0
NS 1314	MA	F06	CG	27	1.0
NS 1315	MA	F06	CG	33	4.0
NS 1316	DL	F07	CG	40	2.0
NS 1317	DL	F07	CG	51	9.0
NS 1318	DL	F07	CG	59	960.0
NS 1319	DL	F07	CG	11	5.0
NS 1320	DL	F07	CG	17	2.0
NS 1321	DL	F07	CG	68	6.0
NS 1322	DL	F07	CG	33	4.0
NS 1323	DL	F07	CG	33	3.0
NS 1324	DL	F07	CG	46	8.0
NS 1325	DL	F07	CG	26	6.0
NS 1326	DL	F07	CG	30	4.0
NS 1327	DL	F07	CG	20	4.0
NS 1328	DL	F07	CG	44	28.0
NS 1329	DL	F07	CG	29	3.0
NS 1330	DL	F07	CG	37	3.0
NS 1331	DL	F07	CG	48	4.0
NS 1332	DL	F07	CG	17	17.0
NS 1333	DL	F07	CG	21	4.0
NS 1334	DL	F18	CG	39	2.0
NS 1335	GT	D36	GR	25	10.0
NS 1336	GT	D36	GR	33	6.0
NS 1337	GT	D36	GR	114	36.0
NS 1338	GT	D36	GR	43	8.0
NS 1339	GT	D36	GR	78	21.0
NS 1340	GT	D36	GR	258	110.0
NS 1341	GT	D36	GR	310	660.0
NS 1342	GT	D36	GR	58	62.0
NS 1343	GT	D36	GR	74	26.0
NS 1344	GT	D36	GR	81	8.0
NS 1345	GT	D36	GR	30	6.0
NS 1346	GT	D36	GR	29	6.0
NS 1347	GT	D36	GR	38	13.0
NS 1348	GT	D36	GR	47	15.0
NS 1349	GT	D36	GR	44	37.0
NS 1350	GT	D36	GR	36	7.0
NS 1351	GT	D36	GR	34	11.0
NS 1352	GT	D36	GR	27	6.0
NS 1353	GT	D36	GR	34	19.0
NS 1354	GT	D36	GR	24	8.0
NS 1355	GT	D36	GR	30	8.0
NS 1356	GT	D36	GR	29	6.0
NS 1357	GT	D36	GR	335	600.0
NS 1358	GT	D36	GR	73	20.0
NS 1359	GT	D36	GR	57	4.0
NS 1360	GT	D36	GR	67	18.0
NS 1361	GT	D36	GR	34	17.0
NS 1362	GT	D36	GR	21	9.0
NS 1363	GT	D36	GR	28	9.0
NS 1364	GT	D36	GR	132	60.0
NS 1365	GT	D36	GR	99	50.0
NS 1366	GT	D36	GR	47	20.0
NS 1367	GT	D36	GR	57	15.0
NS 1368	GT	D34	GR	26	9.0
NS 1369	GT	D34	GR	22	6.0
NS 1370	GT	D34	GR	24	5.0
NS 1371	GT	D34	GR	28	6.0
NS 1372	GT	D34	GR	61	13.0
NS 1373	GT	D34	GR	101	30.0
NS 1374	GT	D34	GR	61	44.0
NS 1375	GT	D34	GR	110	12.0
NS 1376	GT	D34	GR	39	14.0
NS 1377	GT	D34	GR	38	14.0
NS 1378	GT	D34	GR	223	500.0
NS 1379	GT	D34	GR	125	200.0
NS 1381	GT	D34	GR	73	280.0
NS 1382	GT	D34	GR	75	38.0
NS 1383	GT	D34	GR	29	6.0
NS 1384	GT	D34	GR	31	8.0
NS 1385	GT	D34	GR	33	9.0
NS 1386	GT	D34	GR	39	50.0
NS 1387	GT	D34	GR	195	2000.0
NS 1388	GT	D34	GR	70	170.0
NS 1389	GT	D34	GR	47	25.0
NS 1390	GT	D34	GR	32	20.0
NS 1391	GT	D34	GR	38	9.0
NS 1393	GT	D34	GR	22	6.0
NS 1394	GT	D34	GR	33	5.0
NS 1395	GT	D34	GR	28	6.0
NS 1396	GT	D34	GR	46	5.0
NS 1397	GT	D34	GR	32	6.0
NS 1398	GT	D34	GR	28	5.0
NS 1399	GT	D34	GR	29	16.0
NS 1400	GT	D34	GR	34	5.0
NS 1401	GT	D34	GR	27	6.0
NS 1402	GT	D34	GR	41	15.0
NS 1403	GT	D34	GR	37	12.0
NS 1405	GT	D32	GR	11	10.0
NS 1406	GT	D32	GR	23	16.0
NS 1407	GT	D32	GR	31	7.0
NS 1408	GT	D32	GR	44	8.0
NS 1409	GT	D32	GR	24	14.0
NS 1410	GT	D32	GR	41	6.0
NS 1411	GT	D32	GR	43	19.0
NS 1412	GT	D32	GR	43	7.0
NS 1413	GT	D32	GR	45	13.0
NS 1414	GT	D32	GR	33	8.0
NS 1415	GT	D32	GR	70	35.0
NS 1416	GT	D32	GR	127	20.0
NS 1417	GT	D32	GR	131	46.0
NS 1423	GT	D32	GR	31	9.0
NS 1424	GT	D32	GR	34	9.0
NS 1425	GT	D32	GR	33	2.0
NS 1426	GT	D32	GR	31	5.0
NS 1427	GT	D32	GR	29	8.0
NS 1428	GT	D32	GR	31	8.0
NS 1429	GT	D32	GR	43	5.0
NS 1430	GT	D30	GR	17	6.0
NS 1431	GT	D30	GR	33	8.0
NS 1432	GT	D30	GR	87	3.0
NS 1433	GT	D30	GR	83	5.0
NS 1436	GT	D30	GR	50	13.0
NS 1437	GT	D30	GR	48	10.0
NS 1438	GT	D30	GR	54	35.0
NS 1439	GT	D30	GR	41	9.0
NS 1440	GT	D30	GR	57	12.0
NS 1441	GT	D30	GR	43	13.0
NS 1442	GT	D30	GR	46	5.0
NS 1443	GT	D30	GR	45	9.0
NS 1444	GT	D30	GR	60	6.0
NS 1445	GT	D30	GR	39	20.0
NS 1446	GT	D30	GR	16	8.0
NS 1447	GT	D30	GR	16	4.0
NS 1448	GT	D30	GR	85	6.0
NS 1449	GT	D30	GR	46	9.0
NS 1450	GT	D30	GR	39	8.0
NS 1451	GT	D30	GR	49	14.0
NS 1452	GT	D30	GR	76	2.0
NS 1453	GT	D30	GR	59	14.0
NS 1454	GT	D30	GR	81	4.0
NS 1455	GT	D30	GR	83	1.0

NO	AREA	LINE	ROCK	ZN	AS
NS 1458	GT	D30	GR	53	7.0
NS 1459	GT	D30	GR	43	7.0
NS 1460	GT	D30	GR	60	19.0
NS 1463	GT	D30	GR	61	7.0
NS 1464	GT	D30	GR	87	6.0
NS 1465	GT	D30	SH	84	8.0
NS 1466	GT	D30	SH	84	8.0
NS 1467	GT	F06	CG	30	5.0
NS 1468	GT	F08	CG	24	4.0
NS 1469	GT	F06	CG	36	4.0
NS 1470	GT	F06	CG	23	7.0
NS 1471	GT	F06	CG	36	7.0
NS 1473	GT	F08	SH	66	7.0
NS 1474	GT	F08	SH	20	5.0
NS 1476	GT	F06	SH	26	16.0
NS 1477	GT	F08	SH	9	43.0
NS 1478	GT	F08	SH	46	16.0
NS 1482	GT	F10	CG	55	2.0
NS 1483	GT	F10	CG	54	3.0
NS 1484	GT	F10	CG	39	3.0
NS 1485	GT	F10	CG	66	3.0
NS 1486	GT	F10	CG	72	1.0
NS 1487	GT	F10	CG	40	5.0
NS 1488	GT	F10	SH	30	3.0
NS 1489	GT	F10	SH	59	5.0
NS 1490	GT	F10	SH	9	5.0
NS 1491	GT	F10	SH	69	4.0
NS 1492	GT	F10	SH	74	3.0
NS 1493	GT	F10	SH	44	10.0
NS 1495	GT	F10	CG	35	4.0
NS 1496	GT	F10	CG	32	2.0
NS 1497	GT	F10	CG	25	2.0
RS 1501	PA	D06	CG	38	6.0
RS 1502	PA	D06	CG	23	2.0
RS 1503	PA	D06	CG	34	2.0
RS 1504	PA	D06	CG	24	1.0
RS 1505	PA	D06	CG	40	2.0
RS 1506	PA	D06	CG	19	1.0
RS 1507	PA	D06	CG	42	0.1
RS 1508	PA	D06	CG	37	1.0
RS 1509	PA	D06	CG	16	0.1
RS 1510	PA	D06	CG	53	2.0
RS 1511	PA	D06	CG	50	0.1
RS 1512	PA	D06	CG	23	2.0
RS 1513	PA	D06	CG	58	2.0
RS 1514	PA	D06	CG	58	2.0
RS 1515	PA	D06	CG	39	4.0
RS 1516	PA	D06	CG	47	3.0
RS 1517	PA	D06	CG	32	2.0
RS 1518	PA	D06	CG	58	1.0
RS 1519	PA	D06	CG	28	0.1
RS 1520	PA	D06	CG	42	0.1
RS 1521	PA	D06	CG	13	2.0
RS 1522	PA	D06	CG	32	4.0
RS 1523	PA	D06	CG	39	0.1
RS 1524	PA	D06	CG	34	2.0
RS 1525	PA	D06	CG	24	0.1
RS 1526	PA	D06	CG	43	0.1
RS 1527	PA	D06	CG	34	5.0
RS 1528	PA	D06	CG	28	1.0
RS 1529	PA	D06	CG	24	0.1
RS 1530	PA	D06	CG	52	0.1
RS 1531	PA	D06	CG	19	1.0
RS 1532	PA	D06	CG	35	4.0
RS 1533	PA	D06	CG	23	3.0
RS 1534	PA	D06	CG	23	5.0
RS 1535	PA	D06	CG	58	12.0
RS 1536	PA	D06	CG	37	7.0
RS 1537	PA	D06	CG	50	3.0
RS 1538	PA	D06	CG	42	6.0
RS 1539	PA	D06	CG	53	13.0
RS 1540	PA	D06	CG	43	6.0
RS 1541	PA	D06	CG	26	11.0
RS 1542	PA	D06	CG	39	6.0
RS 1543	PA	D06	CG	47	9.0
RS 1544	PA	D06	CG	44	4.0
RS 1545	PA	D06	CG	20	4.0
RS 1546	PA	D06	CG	24	3.0
RS 1547	PA	D06	CG	27	17.0
RS 1548	PA	D06	CG	37	13.0
RS 1549	PA	D06	CG	56	120.0
RS 1550	PA	D06	CG	34	2.0
RS 1551	PA	D06	CG	78	48.0
RS 1552	PA	D06	CG	31	11.0
RS 1553	PA	D06	CG	81	100.0
RS 1554	PA	D06	CG	54	24.0
RS 1555	PA	D06	CG	34	48.0
RS 1556	PA	D06	CG	54	29.0
RS 1557	PA	D06	CG	26	3.0
RS 1558	PA	D06	CG	46	3.0
RS 1559	PA	D06	CG	40	19.0
RS 1560	PA	D06	CG	40	2.0
RS 1561	PA	D06	CG	42	7.0
RS 1562	PA	D06	CG	56	29.0
RS 1563	PA	D06	CG	48	230.0
RS 1564	PA	D06	CG	69	330.0
RS 1565	PA	D06	CG	78	119.0
RS 1566	PA	D06	CG	45	2.0
RS 1567	PA	D06	CG	38	3.0
RS 1568	PA	D06	CG	41	16.0
RS 1569	PA	D06	CG	38	3.0
RS 1570	PA	D06	CG	47	0.1
RS 1571	PA	D06	CG	18	0.1
RS 1572	PA	D06	CG	61	0.1
RS 1573	PA	D06	CG	28	1.0
RS 1574	PA	D06	CG	59	0.1
RS 1575	PA	D06	CG	46	2.0
RS 1576	PA	D06	CG	32	0.1
RS 1577	PA	D06	CG	52	0.1
RS 1578	PA	D06	CG	45	1.0
RS 1579	PA	D06	CG	40	0.1
RS 1580	PA	D06	CG	44	2.0
RS 1581	PA	D06	CG	36	0.1
RS 1582	PA	D06	CG	59	2.0
RS 1583	PA	D06	CG	125	144.0
RS 1584	PA	D06	CG	69	35.0
RS 1585	PA	D06	CG	66	62.0
RS 1586	PA	D06	CG	51	5.0
RS 1587	PA	D06	CG	35	4.0
RS 1588	PA	D06	CG	37	3.0
RS 1589	PA	D06	CG	35	4.0
RS 1590	PA	D06	CG	27	0.1
RS 1591	PA	D06	CG	65	0.1
RS 1592	PA	D06	CG	57	68.0
RS 1593	PA	D06	CG	32	16.0
RS 1594	PA	D06	CG	33	1.0
RS 1595	PA	D06	CG	28	1.0
RS 1596	PA	D06	CG	21	1.0
RS 1597	PA	D06	CG	46	1.0
RS 1598	PA	D06	CG	65	1.0
RS 1599	PA	D06	CG	50	2.0
RS 1600	PA	D06	CG	30	0.1
RS 1601	PA	D06	CG	39	25.0
RS 1602	PA	D06	CG	32	0.1
RS 1603	PA	D06	CG	24	2.0
RS 1604	PA	D06	CG	41	1.0
RS 1605	PA	D06	CG	36	1.0
RS 1606	PA	D06	CG	34	1.0
RS 1607	PA	D06	CG	33	1.0
RS 1608	PA	D06	CG	44	0.1
RS 1609	PA	D06	CG	49	0.1
RS 1610	PA	D06	CG	21	1.0
RS 1611	PA	D06	CG	21	1.0
RS 1612	PA	D06	CG	11	0.1
RS 1613	PA	D06	CG	24	1.0
RS 1614	PA	D06	CG	29	1.0
RS 1615	PA	D06	CG	20	0.1
RS 1616	PA	D06	CG	30	1.0
RS 1617	PA	D06	CG	45	1.0
RS 1618	PA	D06	CG	20	0.1
RS 1619	PA	D06	CG	32	1.0
RS 1620	PA	D06	CG	17	2.0
RS 1621	PA	D06	CG	32	0.1
RS 1622	PA	D01	CG	23	0.1
RS 1623	PA	D01	CG	23	0.1
RS 1624	PA	D01	CG	43	1.0
RS 1625	PA	D01	CG	31	0.1
RS 1626	PA	D01	CG	66	5.0
RS 1627	PA	D01	CG	35	0.1
RS 1628	PA	D01	CG	29	0.1
RS 1629	PA	D01	CG	33	1.0
RS 1630	PA	D01	CG	73	0.1
RS 1631	PA	D01	CG	31	0.1
RS 1632	PA	D01	CG	42	1.0
RS 1633	PA	D01	CG	58	1.0
RS 1634	PA	D01	CG	54	3.0
RS 1635	PA	D01	CG	38	0.1
RS 1636	PA	D01	CG	56	1.0
RS 1637	PA	D01	CG	40	1.0
RS 1638	PA	D01	CG	47	0.1
RS 1639	PA	D01	CG	44	0.1
RS 1640	PA	D01	CG	21	0.1
RS 1641	PA	D01	CG	34	0.1
RS 1642	PA	D01	CG	46	0.1
RS 1643	PA	09W	CG	35	4.0
RS 1644	PA	09W	CG	22	4.0
RS 1645	PA	09W	CG	15	5.0
RS 1646	PA	09W	CG	11	3.0
RS 1647	PA	09W	CG	18	2.0
RS 1648	PA	09W	CG	19	3.0
RS 1649	PA	09W	CG	24	2.0
RS 1650	PA	09W	CG	20	0.1
RS 1651	PA	09W	CG	26	1.0
RS 1652	PA	09W	CG	14	2.0
RS 1653	PA	09W	CG	25	2.0
RS 1654	PA	09W	CG	24	5.0
RS 1655	PA	09W	CG	68	1.0
RS 1656	PA	09W	CG	17	1.0
RS 1657	PA	09W	CG	26	0.1
RS 1658	PA	09W	CG	21	1.0
RS 1659	PA	09W	CG	20	1.0
RS 1660	PA	09W	CG	29	3.0
RS 1661	PA	09W	CG	67	20.0
RS 1662	PA	09W	CG	47	11.0
RS 1663	PA	09W	CG	42	12.0
RS 1664	PA	09W	CG	25	3.0
RS 1665	PA	09W	CG	36	1.0
RS 1666	PA	09W	CG	61	5.0
RS 1667	PA	09W	CG	33	4.0
RS 1668	PA	09W	CG	56	3.0
RS 1669	PA	09W	CG	30	12.0

NO	AREA	LINE	ROCK	ZN	AS
RS 1670	PA	09W	CG	67	15.0
RS 1671	PA	09W	CG	30	2.0
RS 1672	PA	09W	CG	52	19.0
RS 1673	PA	09W	CG	37	0.1
RS 1674	PA	09W	CG	32	0.1
RS 1675	PA	09W	CG	28	0.1
RS 1676	PA	09W	CG	34	2.0
RS 1677	PA	09W	CG	52	0.1
RS 1678	PA	09W	CG	39	3.0
RS 1679	PA	09W	CG	57	3.0
RS 1680	PA	09W	CG	15	4.0
RS 1681	PA	09W	CG	41	5.0
RS 1682	PA	09W	CG	17	0.1
RS 1683	PA	09W	CG	19	3.0
RS 1684	PA	09W	CG	11	5.0
RS 1685	PA	09W	CG	36	20.0
RS 1686	PA	09W	CG	97	38.0
RS 1687	PA	09W	CG	43	36.0
RS 1688	PA	09W	CG	36	6.0
RS 1689	PA	09W	CG	78	3.0
RS 1690	PA	09W	CG	81	196.0
RS 1691	PA	09W	CG	45	100.0
RS 1692	PA	09W	CG	62	380.0
RS 1693	PA	09W	CG	49	190.0
RS 1694	PA	09W	CG	76	50.0
RS 1695	PA	09W	CG	62	0.1
RS 1696	PA	09W	CG	82	31.0
RS 1697	PA	09W	CG	22	6.0
RS 1698	PA	09W	CG	82	620.0
RS 1699	DQ	21C	CG	20	3.0
RS 1700	DQ	21C	CG	64	1.0
RS 1701	DQ	21C	CG	211	1.0
RS 1702	DQ	21C	CG	44	1.0
RS 1703	DQ	21C	CG	41	2.0
RS 1704	DQ	21C	CG	15	3.0
RS 1705	DQ	21C	CG	16	0.1
RS 1706	DQ	21C	CG	18	1.0
RS 1707	DQ	21C	CG	22	1.0
RS 1708	DQ	21C	CG	15	1.0
RS 1709	DQ	21C	CG	14	2.0
RS 1710	DQ	21C	CG	34	2.0
RS 1711	DQ	21C	CG	73	1.0
RS 1712	DQ	21C	CG	38	0.1
RS 1713	DQ	21C	CG	18	0.1
RS 1714	DQ	21C	CG	27	1.0
RS 1715	DQ	21C	CG	50	0.1
RS 1716	DQ	21C	CG	97	3.0
RS 1717	DQ	21C	CG	46	3.0
RS 1718	DQ	21C	CG	25	0.1
RS 1719	DQ	21C	CG	25	2.0
RS 1720	DQ	D23	CG	42	1.0
RS 1721	DQ	D23	CG	52	2.0
RS 1722	DQ	D23	CG	47	4.0
RS 1723	DQ	D23	CG	40	3.0
RS 1724	DQ	D23	CG	34	1.0
RS 1725	DQ	D23	CG	32	1.0
RS 1726	DQ	D23	CG	18	1.0
RS 1727	DQ	D23	CG	43	0.1
RS 1728	DQ	D23	CG	61	5.0
RS 1729	DQ	D23	CG	35	2.0
RS 1730	DQ	D23	CG	93	6.0
RS 1731	DQ	D23	CG	17	2.0
RS 1732	DQ	D23	CG	33	3.0
RS 1733	DQ	D23	CG	16	2.0
RS 1734	DQ	D23	CG	46	2.0
RS 1735	DQ	D23	CG	17	2.0
RS 1736	DQ	D23	CG	23	1.0
RS 1737	DQ	D23	CG	16	0.1
RS 1738	DQ	D23	CG	24	1.0
RS 1739	DQ	D23	CG	61	1.0
RS 1740	DQ	D23	CG	53	1.0
RS 1741	DQ	D23	CG	30	1.0
RS 1742	DQ	D23	CG	59	2.0
RS 1743	DQ	D23	CG	18	2.0
RS 1744	DQ	D23	CG	29	3.0
RS 1745	DQ	D23	CG	28	4.0
RS 1746	DQ	D23	CG	28	0.1
RS 1747	DQ	D23	CG	47	6.0
RS 1748	DQ	D23	CG	47	16.0
RS 1749	DQ	D23	CG	20	7.0
RS 1750	DQ	D23	CG	40	7.0
RS 1751	DQ	D23	CG	59	7.0
RS 1752	DQ	D23	CG	66	5.0
RS 1753	DL	D16	CG	32	12.0
RS 1754	DL	D16	CG	15	5.0
RS 1755	DL	D16	CG	23	6.0
RS 1756	DL	D16	CG	42	20.0
RS 1757	DL	D16	CG	38	4.0
RS 1758	DL	D16	CG	17	1.0
RS 1759	DL	D16	CG	75	5.0
RS 1760	DL	D16	CG	58	15.0
RS 1761	DL	D16	CG	41	9.0
RS 1762	DL	D16	CG	18	5.0
RS 1763	DL	D16	CG	41	16.0
RS 1764	DL	D16	CG	30	1.0
RS 1765	DL	D16	CG	20	2.0
RS 1766	DL	D16	CG	22	2.0
RS 1767	DL	D16	CG	33	0.1
RS 1768	DL	D16	CG	14	2.0
RS 1769	DL	D16	CG	51	2.0
RS 1770	DL	D16	CG	21	3.0
RS 1771	DL	D16	CG	40	1.0
RS 1772	DL	D16	CG	15	2.0
RS 1773	DL	D16	CG	11	2.0
RS 1774	DL	D16	CG	17	2.0
RS 1775	DL	D16	CG	13	5.0
RS 1776	DL	D16	CG	21	1.0
RS 1777	DL	D16	CG	28	2.0
RS 1778	DL	D16	CG	22	3.0
RS 1779	DL	D16	CG	22	1.0
RS 1780	DL	D16	CG	22	5.0
RS 1781	DL	D16	CG	29	4.0
RS 1782	DL	D16	CG	51	4.0
RS 1783	DL	D16	CG	43	0.1
RS 1784	DL	003	CG	56	35.0
RS 1785	DL	003	CG	51	5.0
RS 1786	DL	003	CG	120	34.0
RS 1787	DL	003	CG	68	35.0
RS 1788	DL	003	CG	47	4.0
RS 1789	DL	003	CG	43	5.0
RS 1790	DL	003	CG	122	172.0
RS 1791	DL	003	CG	37	14.0
RS 1792	DL	003	CG	28	4.0
RS 1793	DL	003	CG	51	32.0
RS 1794	DL	003	CG	40	29.0
RS 1795	DL	003	CG	54	100.0
RS 1796	DL	003	CG	54	39.0
RS 1797	DL	003	CG	65	21.0
RS 1798	DL	003	CG	110	38.0
RS 1799	DL	003	CG	115	35.0
RS 1800	DL	003	CG	103	47.0
RS 1801	DL	003	CG	115	46.0
RS 1802	DL	003	CG	141	43.0
RS 1803	DL	003	CG	188	200.0
RS 1804	DL	003	CG	225	140.0
RS 1805	DL	003	CG	70	60.0
RS 1806	DL	003	CG	52	33.0
RS 1807	DL	003	CG	54	35.0
RS 1808	DL	003	CG	46	22.0
RS 1809	DL	04E	CG	38	12.0
RS 1810	DL	04E	CG	25	2.0
RS 1811	DL	04E	CG	23	0.1
RS 1812	DL	04E	CG	20	3.0
RS 1813	DL	04E	CG	21	3.0
RS 1814	DL	04E	CG	15	3.0
RS 1815	DL	04E	CG	24	25.0
RS 1816	DL	04E	CG	45	11.0
RS 1817	DL	04E	CG	25	6.0
RS 1818	DL	04E	CG	18	13.0
RS 1819	DL	04E	CG	61	3.0
RS 1820	DL	04E	CG	18	6.0
RS 1821	DL	04E	CG	21	4.0
RS 1822	DL	04E	CG	23	7.0
RS 1823	DL	04E	CG	19	11.0
RS 1824	DL	04E	FG	39	0.1
RS 1825	DL	04E	FG	39	6.0
RS 1826	DL	04E	FG	40	0.1
RS 1827	DL	04E	FG	22	1.0
RS 1828	DL	04E	FG	18	14.0
RS 1829	DL	04E	FG	23	6.0
RS 1830	DL	04E	FG	19	1.0
RS 1831	DL	04E	FG	63	3.0
RS 1832	DL	04E	FG	31	5.0
RS 1833	DL	04E	FG	20	5.0
RS 1834	DL	04E	FG	15	1.0
RS 1835	DL	20A	CG	39	5.0
RS 1836	DL	20A	CG	23	1.0
RS 1837	DL	20A	CG	32	0.1
RS 1838	DL	20A	CG	19	2.0
RS 1839	DL	20A	CG	21	1.0
RS 1840	DL	20A	CG	37	2.0
RS 1841	DL	20A	CG	15	1.0
RS 1842	DL	20A	CG	18	2.0
RS 1843	DL	20A	CG	20	1.0
RS 1844	DL	20A	CG	27	0.1
RS 1845	DL	20A	CG	16	1.0
RS 1846	DL	20A	CG	18	2.0
RS 1847	DL	20A	CG	15	0.1
RS 1848	DL	20A	CG	12	0.1
RS 1849	DL	20A	CG	42	5.0
RS 1850	DL	20A	CG	15	0.1
RS 1851	DL	20A	CG	24	1.0
RS 1852	DL	20A	CG	23	1.0
RS 1853	DL	20A	CG	22	1.0
RS 1854	DL	20A	CG	16	1.0
RS 1855	DL	20A	CG	22	2.0
RS 1856	DL	20A	CG	23	5.0
RS 1857	DL	20A	CG	30	2.0
RS 1858	DL	20A	CG	43	5.0
RS 1859	DL	20A	CG	32	1.0
RS 1860	DL	20A	CG	26	4.0
RS 1861	DL	20A	CG	20	1.0
RS 1862	DL	20A	CG	27	0.1
RS 1863	DL	20A	CG	16	1.0
RS 1864	DL	20A	CG	44	1.0
RS 1865	DL	20A	CG	23	2.0
RS 1866	DL	20A	CG	40	11.0
RS 1867	BD	02W	CG	44	1.0
RS 1868	BD	02W	FG	38	0.1
RS 1869	BD	02W	FG	25	2.0
RS 1870	BD	02W	FG	29	1.0
RS 1871	BD	02W	FG	43	1.0
RS 1872	BD	02W	FG	20	0.1
RS 1873	BD	02W	FG	19	1.0

NO	AREA	LINE	ROCK	ZN	AS
RS 1874	BO	02W	FG	12	1.0
RS 1875	BO	02W	FG	23	0.1
RS 1876	BO	02W	FG	22	1.0
RS 1877	BO	02W	FG	17	2.0
RS 1878	BO	02W	FG	31	1.0
RS 1879	BO	02W	FG	26	0.1
RS 1880	BO	02W	FG	14	1.0
RS 1881	BO	02W	FG	52	2.0
RS 1882	BO	02W	FG	45	15.0
RS 1883	BO	02W	FG	15	2.0
RS 1884	BO	02W	FG	14	1.0
RS 1885	BO	02W	FG	52	17.0
RS 1886	BO	02W	FG	31	6.0
RS 1887	BO	02W	FG	79	10.0
RS 1888	BO	02W	FG	93	40.0
RS 1889	BO	02W	FG	54	1.0
RS 1890	BO	02W	FG	61	1.0
RS 1891	BO	02W	FG	64	2.0
RS 1892	BO	02W	FG	44	1.0
RS 1893	BO	02W	FG	184	6.0
RS 1894	BO	02W	FG	53	1.0
RS 1895	BO	02W	FG	70	2.0
RS 1896	BO	D10	CG	56	30.0
RS 1897	BO	D10	CG	37	20.0
RS 1898	BO	D10	CG	19	1.0
RS 1899	BO	D10	CG	13	5.0
RS 1900	BO	D10	CG	37	21.0
RS 1901	BO	D10	CG	52	4.0
RS 1902	BO	D10	CG	98	4.0
RS 1903	BO	D10	CG	24	8.0
RS 1904	BO	D10	CG	36	16.0
RS 1905	BO	D10	CG	42	12.0
RS 1906	BO	D10	CG	37	3.0
RS 1907	BO	D10	CG	48	5.0
RS 1908	BO	D10	CG	38	28.0
RS 1909	BO	D10	CG	35	13.0
RS 1910	BO	D10	CG	53	68.0
RS 1911	BO	D10	CG	30	39.0
RS 1912	BO	D10	CG	30	10.0
RS 1913	BO	D10	CG	20	5.0
RS 1914	BO	D10	CG	50	33.0
RS 1915	BO	D10	CG	40	4.0
RS 1916	BO	D10	CG	19	5.0
RS 1917	BO	D10	CG	58	55.0
RS 1918	BO	D10	CG	42	16.0
RS 1919	BO	D10	CG	31	42.0
RS 1920	BO	D10	CG	43	7.0
RS 1921	BO	D10	CG	25	10.0
RS 1922	BO	D10	CG	15	2.0
RS 1923	BO	D10	CG	37	24.0
RS 1924	BO	D10	CG	56	66.0
RS 1925	BO	D10	CG	72	38.0
RS 1926	BO	D10	CG	18	0.1
RS 1927	BO	D10	CG	37	7.0
RS 1928	BO	D10	CG	22	1.0
RS 1929	BO	D10	CG	76	96.0
RS 1930	BO	D10	CG	94	146.0
RS 1931	BO	D10	CG	42	12.0
RS 1932	BO	D10	CG	38	1.0
RS 1933	BO	D12	CG	55	55.0
RS 1934	BO	D12	CG	58	53.0
RS 1935	BO	D12	CG	50	36.0
RS 1936	BO	D12	CG	48	10.0
RS 1937	BO	D12	CG	34	3.0
RS 1938	BO	D12	CG	39	4.0
RS 1939	BO	D12	CG	70	46.0
RS 1940	BO	D12	CG	104	98.0
RS 1941	BO	D12	CG	46	13.0
RS 1942	BO	D12	CG	27	5.0
RS 1943	BO	D12	CG	87	28.0
RS 1944	BO	D12	CG	34	14.0
RS 1945	BO	D12	CG	32	5.0
RS 1946	BO	D12	CG	23	6.0
RS 1947	BO	D12	CG	74	18.0
RS 1948	BO	D12	CG	56	14.0
RS 1949	BO	D12	CG	32	6.0
RS 1950	BO	D12	CG	20	2.0
RS 1951	BO	D12	CG	42	35.0
RS 1952	BO	D12	CG	29	16.0
RS 1953	BO	D12	CG	39	15.0
RS 1954	BO	D12	CG	37	22.0
RS 1955	BO	D12	CG	39	12.0
RS 1956	BO	D12	CG	24	37.0
RS 1957	BO	D12	CG	28	1.0
RS 1958	BO	D12	CG	41	17.0
RS 1959	BO	D12	CG	35	2.0
RS 1960	BO	D12	CG	248	180.0
RS 1961	BO	D12	CG	53	180.0
RS 1962	BO	D12	CG	55	14.0
RS 1963	BO	04W	FG	17	1.0
RS 1964	BO	04W	FG	338	184.0
RS 1965	BO	04W	FG	59	2.0
RS 1966	BO	04W	FG	38	6.0
RS 1967	BO	04W	FG	34	7.0
RS 1968	BO	04W	FG	23	15.0
RS 1969	BO	04W	FG	11	6.0
RS 1970	BO	04W	FG	17	7.0
RS 1971	BO	04W	FG	18	2.0
RS 1972	BO	D14	CG	89	230.0
RS 1973	BO	D14	CG	87	140.0
RS 1974	BO	D14	CG	60	230.0
RS 1975	BO	D14	CG	72	192.0
RS 1976	BO	D14	CG	69	16.0
RS 1977	BO	D14	CG	52	5.0
RS 1978	BO	D14	CG	31	7.0
RS 1979	BO	D14	CG	43	19.0
RS 1980	BO	D14	CG	25	16.0
RS 1981	BO	D14	CG	33	2.0
RS 1982	BO	D14	CG	44	2.0
RS 1983	BO	D14	CG	49	11.0
RS 1984	BO	D14	CG	49	19.0
RS 1985	BO	D14	CG	52	13.0
RS 1986	BO	D14	FG	60	12.0
RS 1987	BO	D14	FG	37	0.1
RS 1988	BO	D14	FG	21	5.0
RS 1989	BO	D14	FG	84	35.0
RS 1990	BO	D14	FG	28	7.0
RS 1991	BO	D14	FG	56	15.0
RS 1992	BO	D14	FG	72	11.0
HS 1	GT	D37	GR	23	3.0
HS 2	GT	D37	GR	31	0.1
HS 3	GT	D37	GR	26	9.0
HS 4	GT	D37	GR	33	12.0
HS 5	GT	D37	GR	72	40.0
HS 6	GT	D37	GR	79	29.0
HS 8	GT	D37	GR	51	28.0
HS 9	GT	D37	GR	67	28.0
HS 10	GT	D37	GR	32	9.0
HS 11	GT	D37	GR	28	11.0
HS 12	GT	D37	GR	48	23.0
HS 13	GT	D37	GR	26	9.0
HS 14	GT	D37	GR	22	8.0
HS 15	GT	D37	GR	25	10.0
HS 16	GT	D37	GR	24	10.0
HS 17	GT	D37	GR	22	0.1
HS 18	GT	D37	GR	31	9.0
HS 19	GT	D37	GR	37	10.0
HS 20	GT	D37	GR	30	12.0
HS 21	GT	D37	GR	28	5.0
HS 22	GT	D37	GR	25	4.0
HS 23	GT	D37	GR	80	80.0
HS 24	GT	D37	GR	32	9.0
HS 25	GT	D37	GR	30	10.0
HS 26	GT	D37	GR	43	21.0
HS 27	GT	D37	GR	70	28.0
HS 28	GT	D37	GR	28	9.0
HS 29	GT	D37	GR	27	8.0
HS 30	GT	D37	GR	39	14.0
HS 31	GT	D37	GR	34	10.0
HS 32	GT	D37	GR	35	22.0
HS 33	GT	D37	GR	48	25.0
HS 34	GT	D35	GR	30	9.0
HS 35	GT	D35	GR	39	11.0
HS 36	GT	D35	GR	39	46.0
HS 37	GT	D35	GR	60	49.0
HS 38	GT	D35	GR	37	1.0
HS 39	GT	D35	GR	66	38.0
HS 40	GT	D35	GR	43	30.0
HS 41	GT	D35	GR	177	640.0
HS 42	GT	D35	GR	33	13.0
HS 43	GT	D35	GR	258	240.0
HS 44	GT	D35	GR	54	120.0
HS 45	GT	D35	GR	67	80.0
HS 46	GT	D35	GR	60	26.0
HS 47	GT	D35	GR	70	48.0
HS 48	GT	D35	GR	66	27.0
HS 49	GT	D35	GR	48	20.0
HS 50	GT	D35	GR	36	10.0
HS 51	GT	D35	GR	30	10.0
HS 52	GT	D35	GR	24	4.0
HS 53	GT	D35	GR	28	5.0
HS 54	GT	D35	GR	34	10.0
HS 55	GT	D35	GR	85	70.0
HS 56	GT	D35	GR	57	72.0
HS 57	GT	D35	GR	60	120.0
HS 58	GT	D35	GR	38	19.0
HS 59	GT	D35	GR	70	26.0
HS 60	GT	D35	GR	40	23.0
HS 61	GT	D35	GR	45	7.0
HS 62	GT	D35	GR	84	100.0
HS 63	GT	D35	GR	32	14.0
HS 64	GT	D35	GR	15	8.0
HS 65	GT	D35	GR	25	11.0
HS 66	GT	D35	GR	29	11.0
HS 67	GT	D33	GR	18	7.0
HS 68	GT	D33	GR	26	6.0
HS 69	GT	D33	GR	40	10.0
HS 70	GT	D33	GR	44	15.0
HS 71	GT	D33	GR	50	18.0
HS 72	GT	D33	GR	36	18.0
HS 73	GT	D33	GR	43	24.0
HS 74	GT	D33	GR	23	5.0
HS 75	GT	D33	GR	24	10.0
HS 76	GT	D33	GR	39	7.0
HS 77	GT	D33	GR	58	15.0
HS 78	GT	D33	GR	73	30.0
HS 80	GT	D33	GR	81	104.0
HS 81	GT	D33	GR	38	12.0
HS 82	GT	D33	GR	23	10.0
HS 83	GT	D33	GR	37	13.0
HS 84	GT	D33	GR	99	200.0