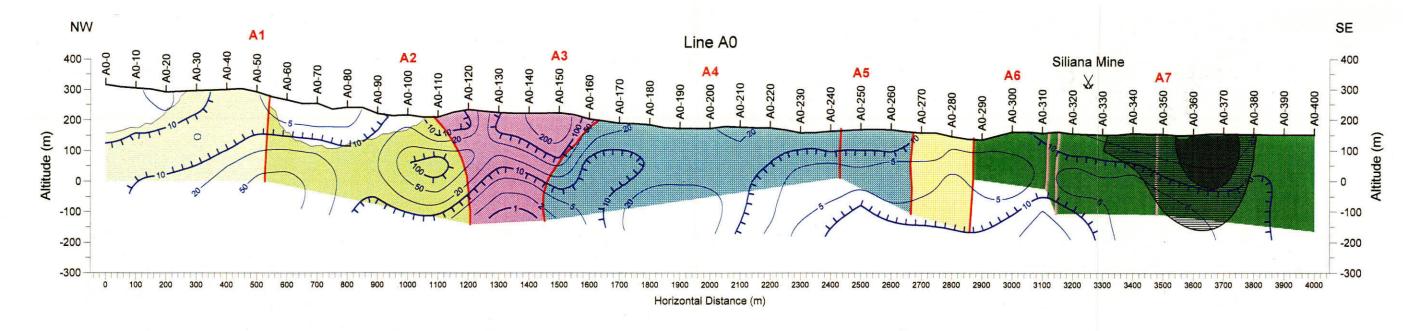
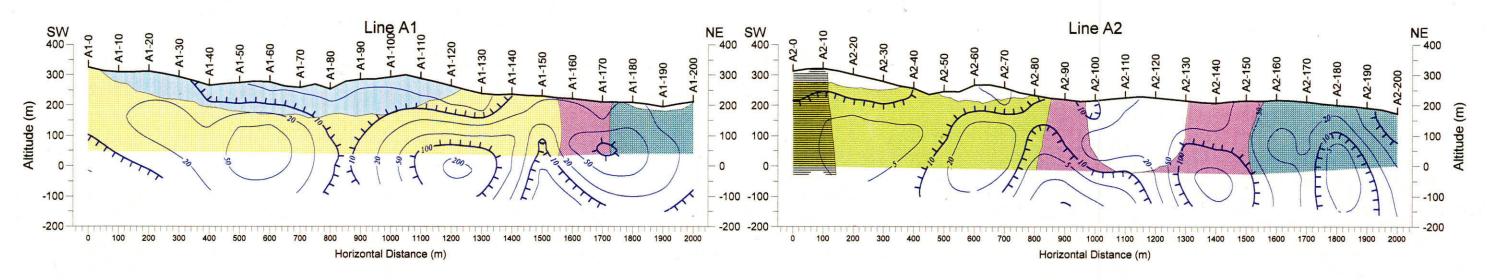
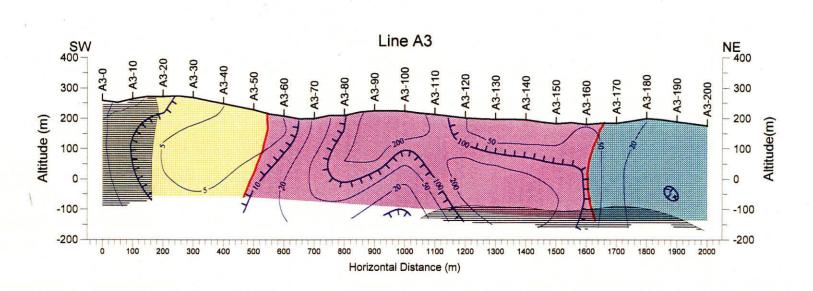
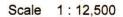


Figure 122 Interpreted IP Map in Siliana Prospect









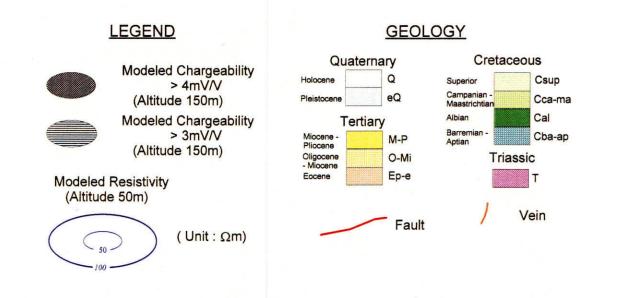
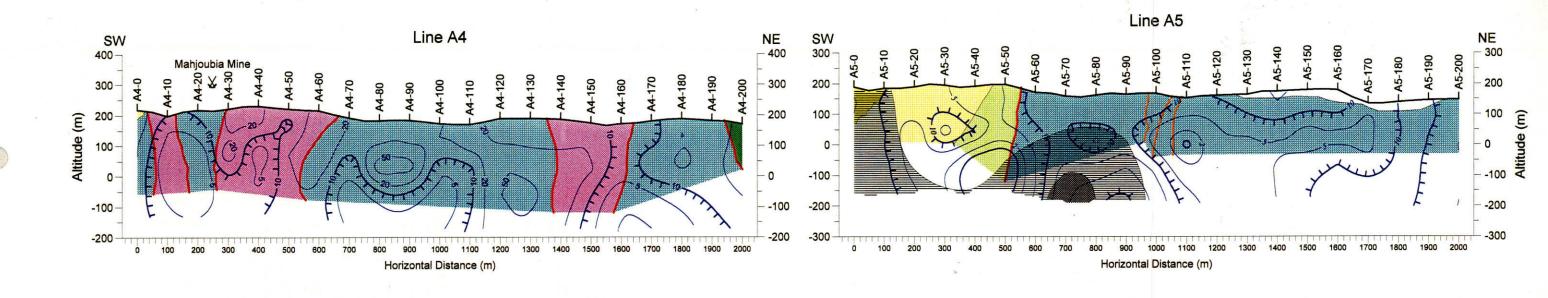
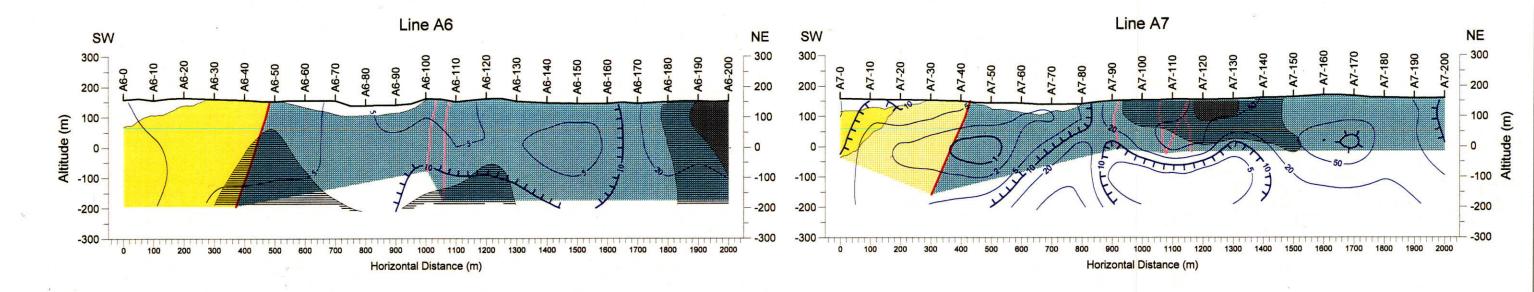


Figure 123 Interpreted IP Section (Line A0, A1, A2, A3)





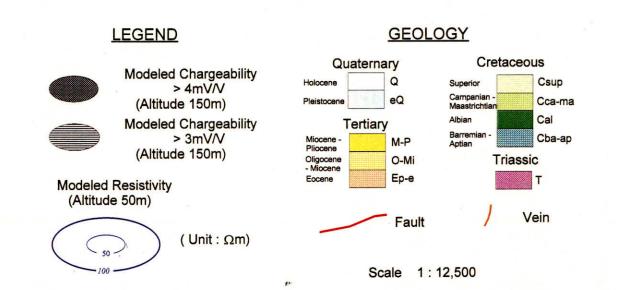


Figure 124 Interpreted IP Section (Line A4, A5, A6, A7)

on the plan the same as that of the Bazina and Kebira prospects. However the low resistivity layer extends towards upper at the lower parts of the high resistivity section in the distribution zone of the Triassic system. Therefore the zone of the low density and high resistivity is possibly correlated to the Diapir with low density. The low resistivity is dominated over the survey area and the fault can not be easily inferred on the plan. However the inferred faults are detected as a line of the resistivity discontinuity on the cross section and the resistivity distribution is considered to reflect rather well the geological strata.

The chargeability obtained in this prospect is considerably low and the chargeability anomaly is not detected at the known mineralized site. The chargeability anomalies exceeding 4mV/V detected in the vicinity of the southeastern end of the line A6 in the northeastern parts of the survey area and at shallow depth around an intersection between the lines A0 and A7. The vein accompanied by the weak mineralization is recognized for the latter anomaly. Notwithstanding that an indication of the mineralization is not recognized in the former anomaly zone, which is also considered an interesting anomaly, because this anomaly is situated in the vicinity of the high resistivity zone and the gravity basement rise correlated to the Triassic system. The chargeability anomalies exceeding 4mV/V detected at deeper part of the intersection by the lines A0 and A5 in the central parts of the survey area. This anomaly is also considered a promising anomaly, because this is situated in the vicinity of the high resistivity zone and the gravity basement rise correlated to the Triassic system and furthermore the weakly mineralized vein is recognized at near the surface around the anomaly zone.

# 1.3.4 El Akhouat-Argoub Adama Prospect

### (1) Gravity survey

The geophysical survey of the prospect was carried out partly in 2 lines of the L1 and the L2 in the southwest part in order to follow up the last year's survey. Bouguer anomaly observed in the gravity survey is not so much different from the last year's result. Little valid difference between this year and last year is recognized in the estimated residual gravity and the vertical first derivative. Only the results of the cross section analysis are described below. Such as the Siliana prospect, three layers model is assumed. Each layer from the lowermost to the upper most is the Triassic system with density difference of 0.00 g/cm³ as a gravity basement, the Cretaceous limestone with density difference of 0.10 through 0.40 g/cm³, the Quaternary system 0.20 g/cm³. In the line L2 which magnetic survey was applied to last year the structure is estimated by using both density and magnetic susceptibility.

## · L1 Cross Section (Figure 125)

This section crosscuts the southwestern end of the prospect from the northwest to the southeast. Broadly the top depth of the gravity basement in the section tends to increase as follows; 250 m above sea level in the northwestern end and deeper than 500 m below sea level. The gravity basement rises to around 350m above sea level in the central part of the section, and the result that overlaying high-density layer is pushed up leads the lack of the Quaternary in the surface part. The steep slopes in the both sides of the rise of the gravity basement suggest the fault structures.

### · L2 Cross Section (Figure 126)

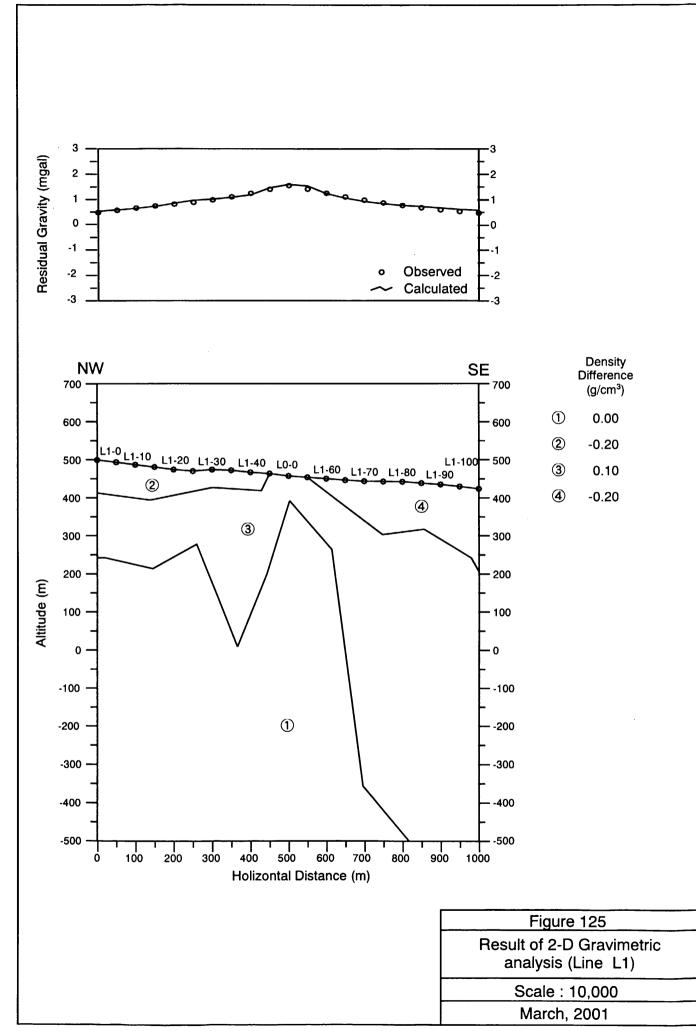
This section runs in the southwest of the El Akhouat working apart from 250m in the NW-SE direction. The top depth of the gravity basement in the section tends to increase as follows; 450 m above sea level in the northwestern end and deeper than 100 m below sea level. The drop of the top of the gravity basement suggesting the fault is estimated around the station L2·15, and the steep slopes around the L2·45 and around the L2·85 suggest the fault structures. The surface layer corresponded to the Cretaceous limestone indicates high density with density difference of 0.40 g/cm³ in the northwestern side from the center of the section, and relative low density with density difference of 0.40 g/cm³ in the other southeastern side. The variation within the surface layer may reflect increase of maar content in the Cretaceous system. In consideration of the broad plain area in the southeastern extension of the section, the low-density layer with density difference of ·0.20 g/cm³, which overlies the high-density layer and is corresponded to the Quaternary system, is assumed such as the cross section L1. (2) IP survey

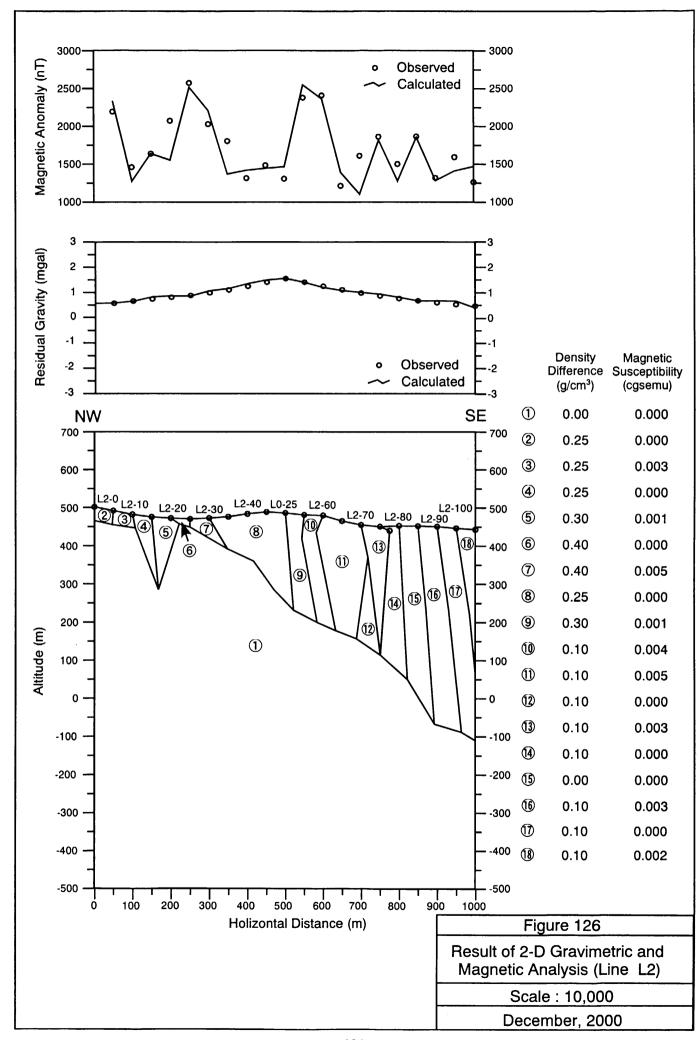
# ① Apparent resistivity and observed chargeability

In the results of the last year's survey, chargeability anomalies are observed in the central part of the line in the southwest area of the prospect and around the southwestern end of the baseline L0. Because the borehole MJLTK-2 aiming toward the former anomaly exceeding 20 mV/V caught mineralized zones, IP survey was carried out in the southwestern side of the borehole in order to estimate the southwestward extension of the mineralized zone.

Such as the line L3 the high apparent resistivity of several hundreds ohm-meters, which is corresponded to the Cretaceous limestone, is observed in the L2 in the southwest of the L3 apart from 500m. The apparent resistivity in the line L1 indicates the maximum of scores ohm-meters. In the line L2 the chargeability anomalies exceeding 10 mV/V are observed, there is no valid anomaly in the L1.

Characteristics of apparent resistivity and observed chargeability in each section are





described below.

# L1 Cross Section (Figure 127)

This section crosscuts the southwestern end of the prospect from the northwest to the southeast. The variation of apparent resistivity, ranging from 19 to 67 Ωm, is relatively small. The anomalies of high apparent resistivity around the station L1·40 and the L1·70 suggest resistivity high in the central part of the section.

Observed chargeability is low as a whole except for the weak anomaly beyond 5 mV/V in the southeastern part of the section.

## · L2 Cross Section (Figure 128)

This section runs in the southwest of the El Akhouat working apart from 250m in the NW-SE direction. Apparent resistivity in the section, ranging between 20 and 339  $\Omega$ m, is high than the L1. The high anomaly of apparent resistivity exceeding 200  $\Omega$ m is observed at the shallow depth in the central part of the section, the low anomaly less than 50  $\Omega$ m underlies.

High observed chargeability 5 or more mV/V extends, large anomaly above 10 mV/V is stretched from the central to the lower southeast part of the section.

# 2 Modeled resistivity and chargeability

The southwest end of the extended resistive anomaly above  $100~\Omega m$  at the shallow depth around the El Akhouat working reaches up to between the line L2 and the L1. As the depth level becomes lower, the resistive anomaly moves the southeastern parts of the line L1 and the L2. The line L3 where unknown mineralized zone was found is centered in the extended chargeability anomaly, which tends to become the lager as the deeper. The strong chargeability anomaly beyond 10~mV/V extends up to the line L2, and it does not reach to the L1 in the southwest end of the prospect.

Characteristics of resistivity and chargeability, as the result of modeling, are described below for each of the cross sections and the plans at elevations of 200, 300 and 400 m.

### · L1 Cross Section (Figure 129)

This section crosscuts the southwestern end of the prospect from the northwest to the southeast. The northwestern part of the section indicates low resistivity below 50  $\Omega$ m, and the thin conductive layer less than 50  $\Omega$ m overlies above the high resistivity exceeding 100  $\Omega$ m. High resistivity is corresponded to the Cretaceous limestone, the thin conductive surface layer the Quaternary system. The low resistivity supposed the Triassic systems push from the lower to upper and continues to the low resistivity in the northwestern part.

Though the weak anomaly of 5 or up mV/V is estimated in the southeastern part of the

Figure 127 Observed IP pseudo-section (Line L1)

Figure 128 Observed IP pseudo-section (Line L2)

Figure 129 Modeled IP section (Line L1)

section, it is not considered valid in the prospect where several anomalies beyond 10 mV/V is recognized

· L2 Cross Section (Figure 130)

This section runs in the southwest of the El Akhouat working apart from 250m in the NW-SE direction. High resistivity above 50  $\Omega$ m corresponded to the Cretaceous system stands the majority of the section. Within the resistive zone resistivity between the station L2·20 and the L2·70 become beyond 100  $\Omega$ m, and the southeast from the L2·70 indicate relative low resistivity between 50 and 100 $\Omega$ m. It is supposed that the former may is corresponded to limestone mainly and the latter may reflect increase of marr contents. The conductive anomaly below 30  $\Omega$ m rise from the deeper upward around the station L2·40 in the central part of the section such as the line L1. It is supposed that low resistivity in the southeast end of the section is corresponded to the Quaternary system and the conductive anomaly at the surface between the station L2·10 and 20 in the northwestern part may suggest a shear zone accompanied with a fault.

Chargeability in the majority of the section indicates high above 10 mV/V exception for the northwestern part. Especially, higher resistivity exceeding 15 mV/V is estimated at the lower part around the station L2-70.

• Plan map of modeled resistivity altitude=200m (Figure 131)

The south end of resistive anomaly above  $100 \Omega m$  extending in the central part of the line L3 through L5 along the baseline L0 is located in the line L2, and the line L1 indicates low resistivity. The former resistive anomaly is corresponded to the Cretaceous limestone forming the hill, and the latter low resistivity may reflect the Quaternary system in the plain area.

- Plan map of modeled resistivity altitude=300m (Figure 132)

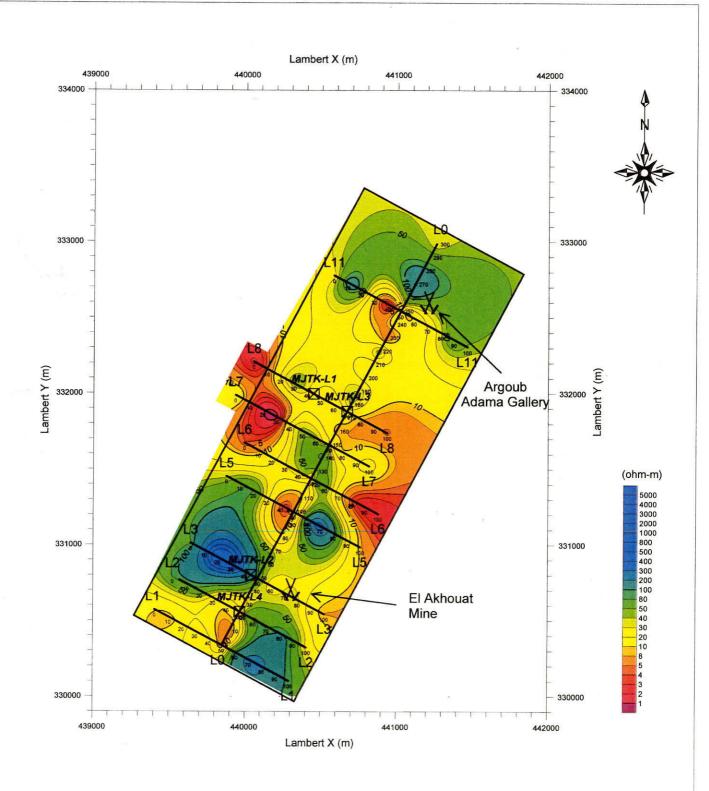
  The resistive anomaly mentioned above extends to the southeastern part of the line L1.

  The anomaly becomes broader in the southwestern area of the prospect.
- Plan map of modeled resistivity altitude=400m (Figure 133)

The resistive anomaly mentioned above is divided in two anomalies in the northwestern part from the line L2 to the L3 and in the southeastern part of the line L1 and the L2 by the conductive anomaly below  $10\Omega m$ , which appears between the station L0·0 and 25 in the southwestern end of the baseline. It is supposed that the conductive anomaly is corresponded to the rise of the Triassic system.

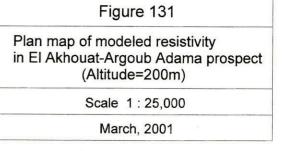
Plan map of modeled chargeability altitude=200m (Figure 134)
 In the southwestern part of the prospect the changeability anomaly above 10 mV/V

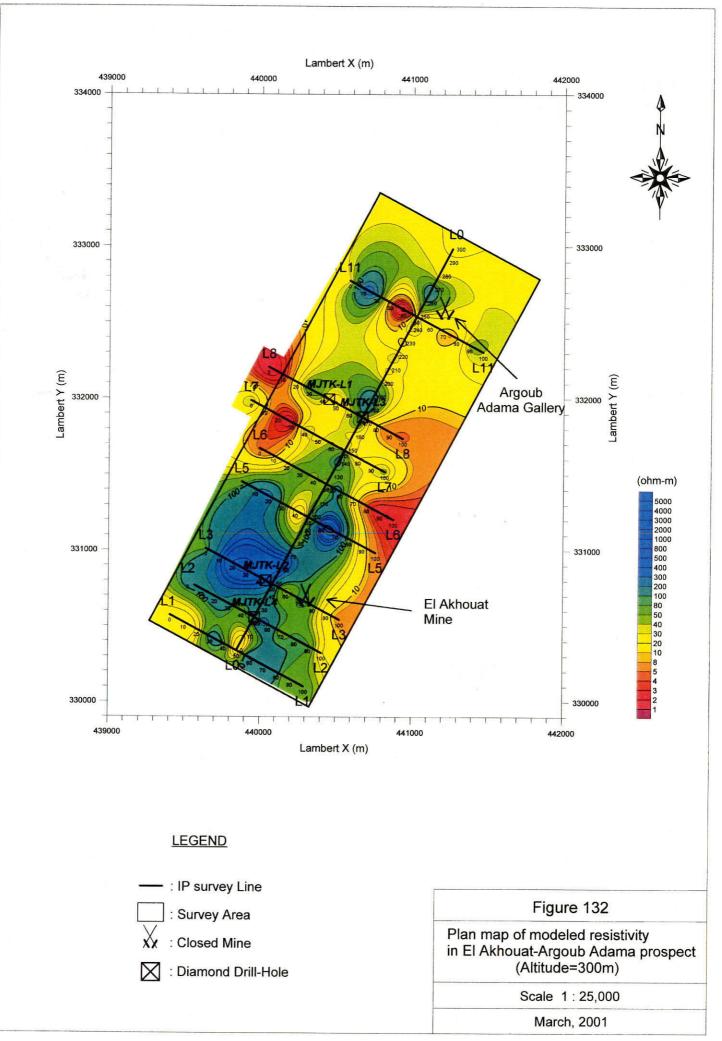
Figure 130 Modeled IP section (Line L2)

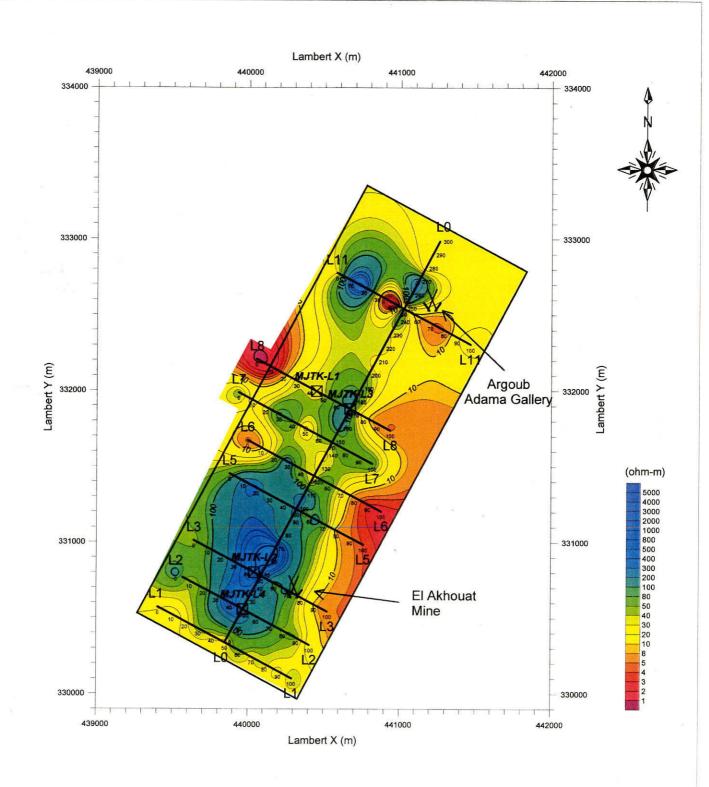




: IP survey Line
: Survey Area
: Closed Mine
: Diamond Drill-Hole



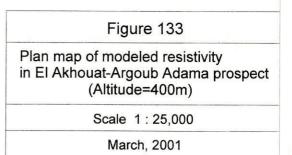


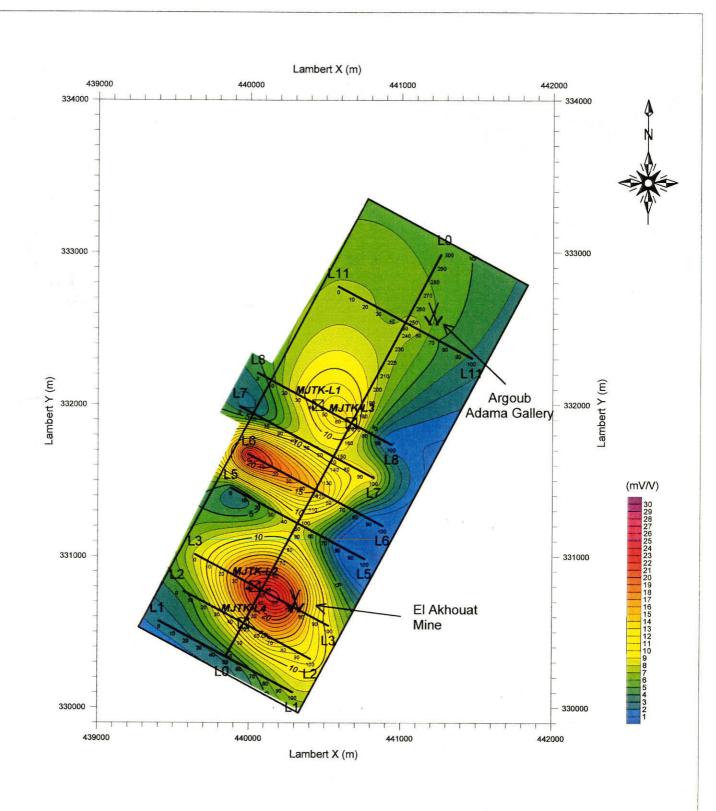


# **LEGEND**

: IP survey Line
: Survey Area
: Closed Mine

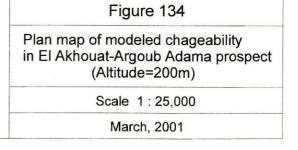
: Diamond Drill-Hole







∷ IP survey Line
 ∷ Survey Area
 ∴ Closed Mine
 ∷ Diamond Drill-Hole



extends along the baseline L0 between the line L2 and the L4. The anomaly doesn't reach up to the line L1 in the southwestern end of the prospect. The small chargeability anomaly beyond 20 mV/V is recognized around the line L3.

• Plan map of modeled chargeability altitude=300m (Figure 135)

The changeability anomaly above 10 mV/V in the southwestern part of the prospect is united into one with that in the northwestern end of the line L6 in the central part of the prospect. Though the zone indicating above 15 mV/V extends to the station L2-70 within the anomaly, the higher zone beyond 20 mV/V is limited in the central part of the line L3.

· Plan map of modeled chargeability altitude=400m (Figure 136)

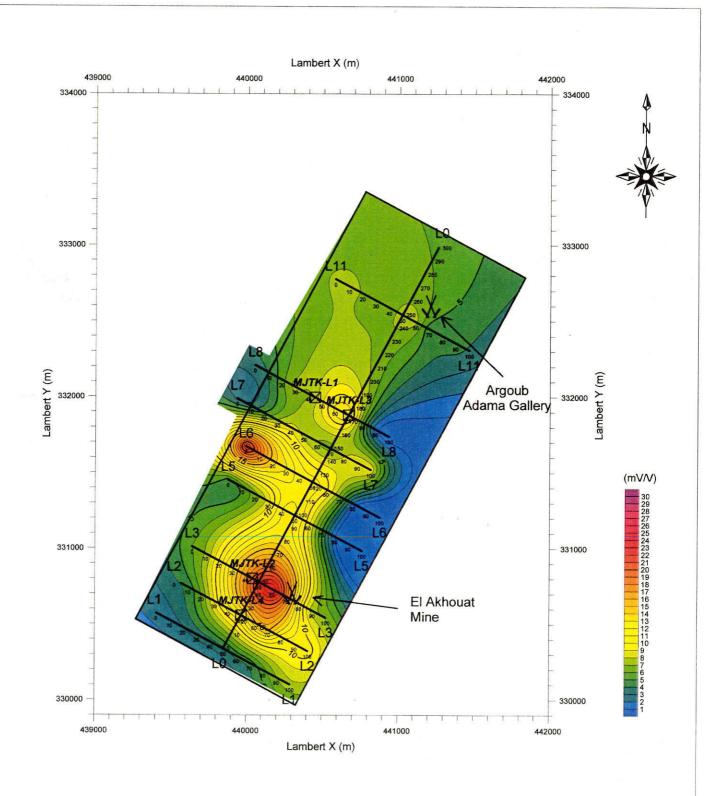
The chargeability anomaly exceeding 10mV/V mentioned above is divided into 2 anomalies around the central part of the line L3 and around the northwestern part of the L6 again. Within both anomalies the higher zone indicating beyond 20mV/V extends. The line L2 investigated in this year, however, is located the southwestern marginal zone of the high chargeability above 15 mV/V, and the anomaly doesn't extend to the line L1.

## ③ Interpretation

In comparison between the cross sections L1 and the L2, the high resistivity, which may reflect the Cretaceous limestone, is corresponded to the high-density layer. The density variation within the high-density layer is similar to the resistivity variation in the high resistivity. The zone with density difference of  $0.10 \text{ g/cm}^3$  approximately agreed with that ranging between 50 and  $100 \Omega \text{m}$ .

The conductive layer below 30 Ωm, which push up the overlying resistive layer from the lower, corresponded to the rise of the Triassic gravity basement. The rise of the Triassic system is sifted southeastward around the station L3-70 in the line L3 of the northeast neighbor of the L2. The feature is consistent with the geological structure that a transforming fault runs between the line L2 and the L3.

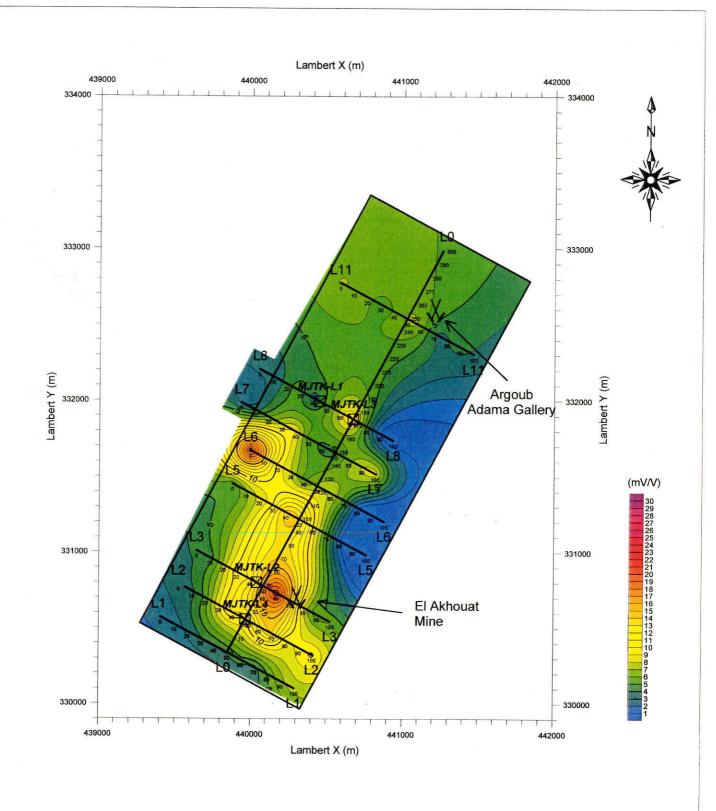
The chargeability anomaly above 10 mV/V extends up to the line, and is not recognized around the line L1. The boundary of the anomaly is corresponded to the small valley runs through between the line L1 and the L2 toward the northwestern part of the L3. It is supposed that the valley limits the area of the chargeability anomaly related to the mineralization. In the 3 boreholes of the MJLTK-1 at the station L8-40, the MJLTK-3 at the L8-60 and the MJLTK-4 at the L2-40, which are drilled within the chargeability anomalies above 10mV/V, the rocks are not mineralized so much and include a lot of pyrite. The borehole MJLTK-2 at the station L3-40, which caught mineralized zones, is located in the higher chargeability anomaly beyond 20 mV/V, and some of the specimens collected from the





: IP survey Line
: Survey Area
: Closed Mine
: Diamond Drill-Hole

# Figure 135 Plan map of modeled chageability in El Akhouat-Argoub Adama prospect (Altitude=300m) Scale 1:25,000 March, 2001





: IP survey Line
: Survey Area
: Closed Mine
: Diamond Drill-Hole

# Figure 136 Plan map of modeled chageability in El Akhouat-Argoub Adama prospect (Altitude=400m) Scale 1:25,000 March, 2001

mineralized zones indicate considerably higher chargeability exceeding 100 mV/V. From the good understanding on the relationships of chargeability anomaly to mineralization, it is supposed that chargeability becomes a effective parameter, which specifies the exploration area and classifies mineralization.

# Chapter 2 Drilling Investigation

# 2.1 Summary of the Drilling Operation

The drilling operation of the 2nd year campaign comprised two holes for the Bou Khil prospect (MJTK-B1 and B2) and four holes for the El Akhouat-Argoub Adama prospect (MJTK-L1, L2, L3 and L4).

The drilling operation results are summarized in Table 11. The drilling program had been originally planned to drill four holes, two holes each for the Bou Khil and El Akhouat Argoub Adama, totaling 1,600m in length. The program was altered, in the course of the operation, to add two more holes with the length of 400m each for the El Akhouat Argoub Adama and to increase the total meterage to 2,400m. However, the two holes in the Bou Khil prospect failed to reach the intended depth of 400m due to operational accidents, such as jamming, and unfavorable ground conditions, such as unconsolidated sandstones. Accordingly, these holes were immaturely terminated at 216.80m and 142.10m respectively. In addition, in the El Akhouat Argoub Adama prospect, the hole MJTK-L3 was completed at the depth of 374.50m, having penetrated the basement Triassic system at the shallower depth than originally estimated. The achieved total length of drilling resulted in 1,933.50m for the six drill holes compared to the planned 2,400m.

Table 11 Drilling Operation Result

	MJTK-B1	MJTK-B2	MJTK-L1	MJTK-L2	MJTK-L3	MJTK-L4
Preparation Phase	7/11/2000	11/1/2001	21/9/2000	20/10/2000	25/12/2000	2/2/2001
Number of Days	4.5	3.0	6.0	2.5	5.5	3.5
Drilling (From)	11/11/2000	14/1/2001	27/9/2000	21/10/2000	30/12/2000	5/2/2001
$(T_0)$	9/1/2001	29/1/2001	17/10/2000	4/11/2000	30/1/2001	27/2/2001
Drilling Days	63.5	16.0	21.0	14.5	31.5	22.0
Mobilization Phase	10/1/2001	30/1/2001	18/10/2000	5/11/2000	31/1/2001	28/2/2001
Number of Days	1.0	1.0	2.0	2.0	2.0	2.0
Total of Days	69.0	20.0	29.0	19.0	39.0	27.5
Planned Depth	400.00m	400.00m	400.00m	400.00m	400.00m	400.00m
Drilled Depth	216.80m	142.10m	400.10m	400.00m	374.50m	$400.00 \mathrm{m}$
Overburden	1.50m	9.00m	21.70m	0.80m	0.60m	0.50m
Core Length	169.00m	$58.90 \mathrm{m}$	351.10m	375.50m	344.10m	372.10m
Recovery	78.4%	44.3%	92.8%	94.0%	86.1%	93.1%
HW Casing	_	60m	_	_	_	15m
HQ Casing	_	_	_			
NW Casing	189m	126m	54m	33m	81m	60m
Meters/Day	3.41m	8.88m	19.05m	27.58m	11.88m	18.18m
Meters/Total Days	3.14m	7.10m	13.79m	21.05m	9.60m	14.54m

# 2.2 Procedure of the Drilling Operation

# 2.2.1 Operation Schedule

The achieved drilling schedule for each drill hole is shown in Table 12. The drilling operation was initially carried out by only one drill machine. However, the second machine was introduced at the end of December when it was decided to drill additional two holes in the El Akhouat-Argoub Adama prospect.

Table 12 Drilling Schedule

	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
MJTK-B1		-	11/7		1/10		
MJTK-B2					1/11	1/30	
MJTK-L1	9/21-	10/18					
MJTK-L2		10/20	11/5				
MJTK-L3				12/25		1/31	
MJTK-L4					2/	2	2/28

## 2.2.2 Drilling Work and Work Force

The drilling work was carried out using a wire-line method, being contracted to two drilling companies stationed in Tunis, the Republic of Tunisia. The contractors were Sondages Service Travaux for the originally planned four holes and Tunisian Mineral Services for the additional two holes.

Two drill machines were employed for the drilling work, each of which was operated on 2-shifts/20-hours a day basis in principle. The work force for each shift comprised one drill engineer and two assistants, together with a worker to take care of drill water supply.

# 2.2.3 Machines, Tools and Drill Water Supply

The used drill machines and tools are listed in Table 13. The numbers and types of used drill bits, together with the consumed amounts of consumables, are indicated in Table 14. The two drill machines used are both RESKA30, made in Italy.

Drill water was supplied from a spring at the portal of the abandoned Bou Khil mine for the operation in the Bou Khil prospect and from the El Akhouat mineral processing plant for that in the El Akhouat Argoub Adama prospect. However, water supply from the plant was refused for drilling of the additional two holes in the El Akhouat Argoub Adama prospect. Therefore, drill water sources were sought elsewhere, such as wells or irrigation ponds in the vicinity of the drilling sites.

Table 13 List of Drill Machines and Tools

Drilling Machines:

-RESKA (2 set): model R30, made in Italy, with diesel engine (137HP),

Water Supply Pomp:

-HATZ (1 set): made in Tunisia, with diesel engine,

-NENZI (1 set): made in Tunisia, with diesel engine,

Water Tank:

·2 set (6m3), iron,

-2 set (3,000L), iron,

Tractor:

·Kubota (2 set): made in Japan,

Table 14 List of Drill Bits and Consumables

Specification	Unit	MJTK-B1	MJTK-B2	MJTK-L1	MJTK-L2	MJTK-L3	MJTK-L4
Diamond bit (HQ)	pcs.	2	1	1			
Diamond reamer (HW)	pcs.	2	1	1			
Diamond bit (NQ)	pcs.	2	1	1	1	2	2
Diamond reamer (NW)	pcs.	2	1	2	2	1	1
Dieseloil	1	1,420	700	920	900	2,920	5,000
Lubricant oil	1	140	60	60	80	110	75
Grease	kg	38	20	17	21	30	25
Cement	kg	1,150					
Bentonite	kg	900	1,800				

# 2.2.4 Drill Core Sampling and Storage

Drill cores of each drilling run was recovered from the core tube and placed in a wooden core box. The drill cores in the core boxes were then photographed, geologically observed and sampled at intervals. The core boxes, bundled in a 30-box batch, was transported to and stored in the storage owned by ONM, after completion of the photographing, geological observation and sampling. The drill core samples were submitted for chemical analysis at the ONM's analytical laboratory in Tunis.

# 2.3 Result of Drilling Investigation

### 2.3.1 Bou Khil Prospect

The geological summary plan of the Bou Khil prospect is shown in Figure 137, incorporating the drill hole locations. As shown in the figure, the geology of the prospect comprises the Triassic diapir, the Cretaceous carbonates (limestone and limestone marl alternations), the transition zone consisting of brecciated dolomitic carbonates, sedimentary rocks (marl, sandstone, argillite and conglomerate) of the Tertiary system (Eocene, Oligocene and Miocene) and the Quaternary system. The Cretaceous system

contains the Bou Khil ore deposit that was mined in the past and produced some 400 thousand tons of ores with the average grade of combined lead and zinc at about 10 %. Celestite deposits, such as Chantier 2 and Saint-Pierre, have been located in the transition zone trending in the NE-SW direction.

Two drill holes, MJTK·B 1 and B 2, were put down along the two geophysical survey lines, B3 (A·A') and B5 (B·B'), of the 1st Year Campaign in this prospect, in order to explore the Chantier 2 deposit and to verify the IP anomaly outlined by the geophysical survey. The columnar section of each hole is shown in the figure 144 to 145.

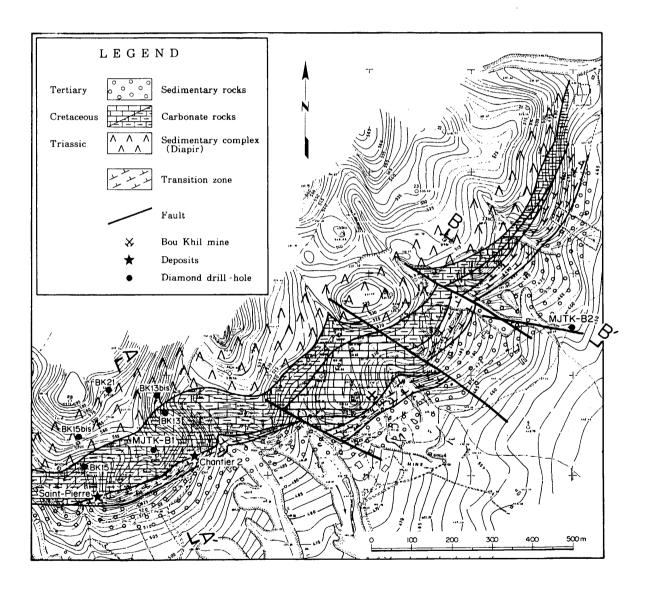


Figure 137 Geology and Drill Hole Location of the Bou Khil Prospect

### (1) MJTK-B 1

This hole was drilled along the geophysical survey line B3 (A-A'), as shown in Figure 137, to verify the IP anomaly outlined in the course of the 1st Year Campaign and to explore the southwestern extension of the Chantier 2 deposit. The columnar section of the hole and the geological profile along the survey line are presented in Figures 144 and 138 respectively.

The IP survey in the 1st Year Campaign identified an IP anomaly along the survey line B3 where the transition zone distributed. Since celestite mineralization had been known to occur associated with the transition zone, a celestite ore sample was collected and submitted for laboratory testing. The test result indicated that the celestite ore was very low in its chargeability at around 3.5 mV/V or less, which made it difficult to effectively interpret the field measurement in terms of the relationship between the celestite mineralization and its chargeability. It is, therefore, one of the purposes of this hole to clarify the ground nature that produced the IP anomaly, specifically for its relationship with the celestite mineralization.

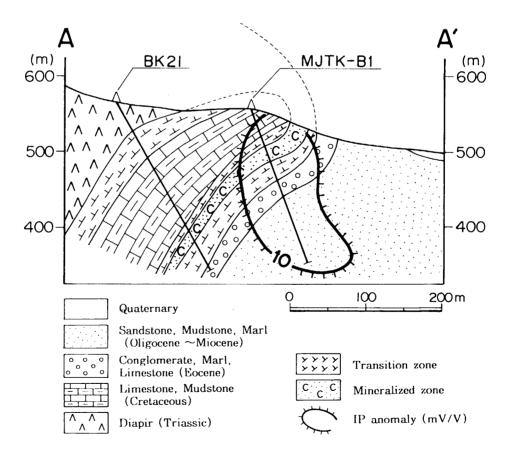


Figure 138 Geological Profile along the Hole, MJTK-B1

The Chantier 2 deposit had been explored by 5 drill holes with the total length of 970.85 m (Figure 137 and Table 15) in the past. A probable reserve of 3 million tons with an average grade of 70 % SrSO<sub>4</sub> had been estimated based on the drilling result. Of the five, drill holes, the hole, BK13bis, intersected a celestite ore zone of 22m in width with an average grade of 72 % SrSO<sub>4</sub> as shown in Table 15. However, the exploration to the southwest of the section BK13bis·BK13 had been very much limited with a scarce number of drill holes. In addition, the celestite ore zone had been intersected by only two of the five holes, BK13bis and BK21. Taking account of these past exploration results, the southwest of the section BK13bis·BK13 was selected for the drilling target in the current operation.

Table 15 Ore Intersections of Past Drill Holes in the Bou Khil Prospect

Drill	Depth	Thickness	Grade	e (%)	Length	Direction	Inclination	Elevation
Hole	(m)	(m)	Pb+Zn	SrSO <sub>4</sub>	(m)	(°)	(°)	(m)
BK13	87. 00-96. 00	9. 0	8. 3	-	169. 50	160	-65	530. 66
BK13bis	138. 00-160. 00	22. 0	-	72. 64	209. 50	160	-65	538. 44
BK15	66. 55-71. 55	5. 0	18. 7	-	127. 20	170	-70	540. 18
BK15bis	-	-	-	-	210.00	170	-70	559. 23
BK21	194. 00-207. 00	13. 0	_	38. 01	254. 65	160	-60	572. 38

The geology of this hole is composed of a unit of limestone argillite alternation (Cretaceous) from 0.00 to 33.00m, the transition zone from 33.00 to 103.10m, a unit of conglomerate marl-limestone (Eocene) from 103.10 to 121.80m and a unit of semi- or non-consolidated sandstone interbedded with adhesive argillite layers (Oligocene Miocene) from 121.80 to 216.80m. The transition zone consists mainly of gray to dark gray dolomite, being occasionally brecciated and including pyrite, marcasite and celestite mineralization in places. Under microscope, dolomite (<0.2 mm), calcite (<0.2mm), quartz (<0.8mm), wollastonite (<1.0mm) and opaques are observed in rock specimen of the transition zone.

Celestite mineralization occurs in breccias and veins in the interval between 47.50 and 73.80m. The brecciated celestite contains a minor amount of sphalerite and is inter-fragmentally filled with black and compact dolomite accompanying abundant euhedral pyrite. The celestite mineralization of vein-form comprises celestite and calcite as major constituents, accompanying such ore minerals as pyrite, marcasite and sphalerite. Celestite forms euhedral to subhedral crystals with sizes up to 0.05mm. Pyrite occurs as subhedral crystals with sizes of ±0.02mm. Marcasite also forms euhedral to subhedral crystals with sizes ranging from 0.05 to 0.2mm and indicates framboidal textures. Sphalerite occurs as subhedral crystals with sizes of ±0.05mm. The analytical results of the celestite section are indicated in Table 16.

Table 16 Analytical Results of the Celestite Section in MJTK-B1

Drill Hole	Depth (m)	Thickness (m)	Type of Ore	Grade (%) SrSO <sub>4</sub>
MJTK-B1	47. 5-58. 5	11. 0	Brecciated, Vein	16. 89
	59. 5-65. 5	6. 0	Brecciated	20. 33
	67. 8-73. 8	6. 0	Brecciated, Vein	7. 80

The IP anomaly that was outlined by the geophysical survey in the 1st Year Campaign is correlated to the transition zone intersected between 40 and 120m of this hole. Pyrite marcasite mineralization is intense in the transition zone, which may be attributed to the cause of the IP anomaly. The investigation results to date and the celestite intersection of this hole suggest that the celestite mineralization of the Chantier 2 continues southwestward for a distance of at least 75m from the BK13bis-BK13 section.

### (2) MJTK-B 2

This hole was drilled along the geophysical survey line B5, as shown in Figure 137, to verify the IP anomaly outlined in the course of the 1st Year Campaign. The columnar section of the hole and the geological profile including the hole are presented in Figures 145 and 139 respectively.

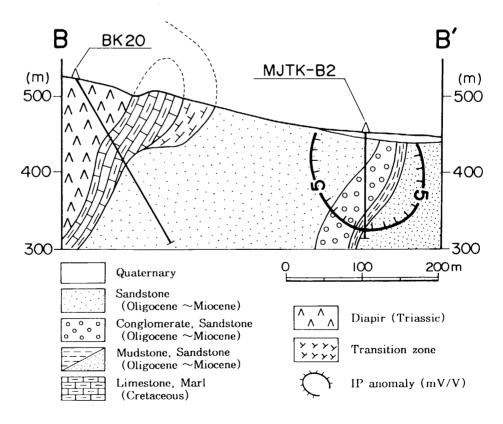


Figure 139 Geological Profile along the Hole, MJTK-B2

The geology of this hole is composed of a unit of non-/semi-consolidated sandstone from 0.00 to 40.10m, a unit of conglomerate interbedded with sandstone layers from 40.10 to 109.70m and a unit of non-consolidated sandstone interbedded with adhesive argillite layers from 109.70 to 142.10m, all of which are sedimentary rocks of the Tertiary Oligocene to Miocene ages, as shown in Figures 139 and 145.

The IP anomaly that was outlined by the geophysical survey in the 1st Year Campaign is correlated to the conglomerate unit interbedded with sandstone layers that is intersected between 70.00 and 110.00m of this hole. The calcareous sandstone layers are intensely mineralized with pyrite, which is considered the main cause of the IP anomaly.

# 2.3.2 El Akhouat-Argoub Adama Prospect

The geological summary plan of the El Akhouat-Argoub Adama prospect is shown in Figure 140, incorporating the drill hole locations. As shown in the figure, the geology of the prospect comprises the Triassic diapir, the Cretaceous limestone and marl, the Tertiary system (Eocene, Oligocene and Miocene) consisting mainly of limestone, sandstone, argillite and conglomerate, and the Quaternary system. The Cretaceous system contains the El Akhouat ore deposit that was mined in the past and produced some 55 thousand tons of ores.

Four drill holes, MJTK-L1, L2, L3 and L4, were put down along the geophysical survey lines, L2, L3 and L8, of the 1st Year Campaign in this prospect as shown in Figure 142, in order to locate new prospective ore deposits and to verify the IP anomaly outlined by the geophysical survey. The columnar section of each hole is shown in the figure 146 to 149.

### (1) MJTK-L1

The objectives of this hole were to characterize the mineralization associated with the Cretaceous system distributing in close proximity to the Triassic diapir and to verify the IP anomaly outlined by the geophysical prospecting in the 1st Year Campaign. The hole was drilled along the geophysical survey line, L8, as shown in Figure 140. The columnar hole section and the geological profile along the section including the hole are shown in Figures 146 and 141 respectively.

The hole geology comprises the Triassic diapir and the Cretaceous system. The Triassic diapir is intersected in the intervals between 0.00 and 137.40m and between 364.10 and 400.10m, and consists of sedimentary complex including gypsum, limestone, dolomite and argillite. The Cretaceous system is principally composed of marl occurring in the interval between 137.40 and 364.10m.

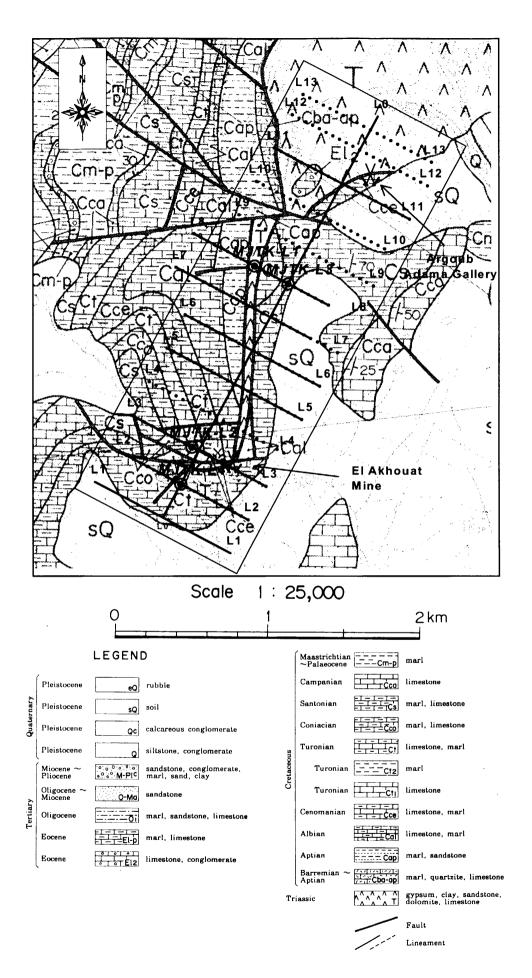


Figure 140 Geology and Drill Hole Location of the El Akhouat - Argoub Adama Prospect

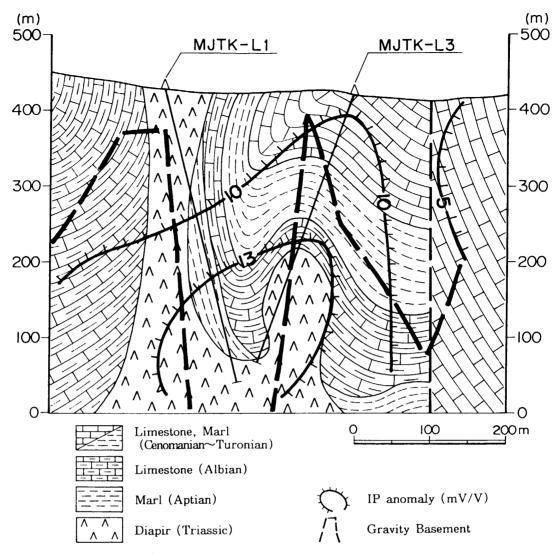


Figure 141 Geological Profile along the Hole, MJTK-L1 and L3

The hole aimed at testing the mineralization associated with the Cretaceous system in the interval between 137.40 and 364.10m, however, failed to locate Pb-Zn mineralization of any significance. Fossil remains were washed out and collected from 10 drill core samples in order to determine the geologic age and stratigraphic divisions of the marl intersected in the interval between 137.40 and 364.10m. The fossil examination identified the stratigraphic position of the marl at the stage ranging from the upper Aptian to the Albian base of the upper Cretaceous system. The major ore deposits in the general area of the El Akhouat-Argoub Adama prospect are mostly located in association with Cretaceous formations of the Albian, Cenomanian or Turonian stage. Therefore, the stratigraphic position of the marl in question is different from any of those which contain prospective mineralization (Table 17).

The IP anomaly that was identified in the 1st Year Campaign, is correlated to the section deeper than 250m in this hole. The marl deeper than 250m is intensely pyritized and contains abundant framboidal pyrite, which is considered the cause of the IP anomaly.

Table 17 Geologic Age and Stratigraphic Division of the Marl in MJTK-L1

No.	Depth (m)	Rock Name	Sedimentary Environment	Stratigraphic Division
1	150.00	dolosparite	lagoon	Upper Aptian~Lower Albian
2	170.00	dolosparite	lagoon	Aptian
3	180.00	dolosparite	lagoon	Upper Aptian~Lower Albian
4	200.00	dolosparite	lagoon	Aptian
5	250.00	mudstone	lagoon	Upper Aptian~Lower Albian
6	280.00	mudstone	lagoon	Upper Aptian~Lower Albian
7	300.00	dolosparite	lagoon	Aptian
8	320.00	marl	lagoon	Upper Aptian~Lower Albian
9	350.00	marl	lagoon	Aptian
10	360.00	marl	lagoon	Upper Aptian~Lower Albian

# (2) MJTK-L2

This hole was drilled along the geophysical survey line, L3, as shown in Figure 142 in order to verify the new mineral indication that had been located in the 1st Year Campaign. The columnar hole section and the geological profile along the section including the hole are shown in Figures 147 and 142 respectively.

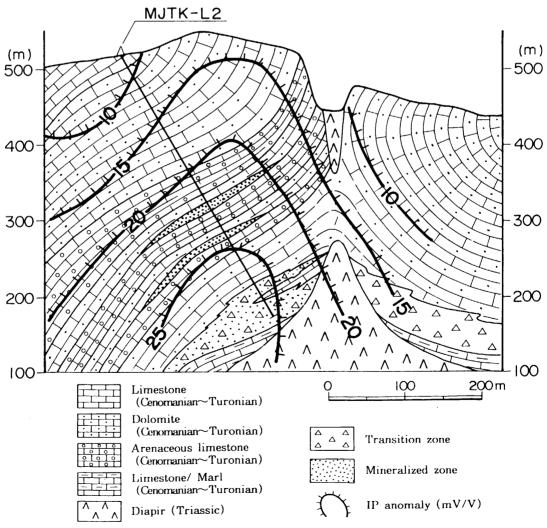


Figure 142 Geological Profile along the Hole, MJTK-L2

The geology of this hole comprises dolomite from 0.00 to 84.00 m, foliated dolomite from 84.00 to 173.50m, calcareous sandstone dolomitic limestone alternation from 173.50 to 290.60m, dolomitic limestone from 290.60 to 334.80m and brecciated dolomitic limestone from 334.80 to 400.00m, end of the hole, all of which are correlated to the carbonates of the Cenomanian to Coniacian stages of the Cretaceous system. A metamorphic mineral, wollastonite is formed in the brecciated dolomitic limestone. Nine drill core samples are collected and submitted for microscopic observation of thin sections. The observation result is presented in Table 18.

Table 18 Microscopic Observation Result of Thin Sections (MJTK-L2)

***************************************	Location		Minerals											
No.	(Depth)	Rock Name			P	rima	ry				Se	cond	lary a	and Alteration
	(m)		Qz	Dol	Pl	Bio	Mus	Cal	Oq	Qz	Ch	Cal	Oq	Others
1	19.30	Dolomite		0				0		+				layered structure
2	33.00	Dolomite		$\odot$				$\circ$						layered structure
3	50.00	Dolomite		$\odot$				$\circ$						
4	66.00	Dolomite		$\odot$				$\circ$				$\triangle$		
5	85.00	Dolomite	1	$\odot$				$\circ$				$\circ$	$\triangle$	
6	138.20	Dolomite		$\odot$		?		$\circ$	+		?			
7	275.00	Limestone		$\triangle$				$\odot$				$\circ$	+	
8	280.70	Dolomite/Sandstone	0	$\odot$	$\circ$	?	?	$\circ$	+		?	$\circ$		layered structure
9	356.40	Metamorphosed Dolomite	+	0				0	0			0		wollastonite

 $\bigcirc$ :abundant,  $\bigcirc$ :moderate,  $\triangle$ :a few, +:rare,

Qz:quartz, Dol:dolomite, Pl:plagioclase, Bio:biotite, Mus:muscovite, Cal:calcite, Oq:opaque minerals,

The mineralization occurs intermittently in the drill section between 225.50 and 382.90m, in banded, veinlets/ veinlet network or brecciated forms. The major ore minerals are sphalerite, galena and marcasite associated with such gangues as calcite and quartz. The sphalerite ranges from 0.01 to 0.5mm in sizes, occasionally reaching 7mm, and forms euhedral to subhedral crystals indicating colloform, poikilitic (main crystals) or spherulitic textures. The galena forms anhedral crystals with sizes ranging from 0.01 to 0.5mm. The marcasite is less than 0.3mm in sizes, mostly ranging from 0.01 to 0.3 mm, and forms euhedral crystals indicating poikilitic (sub-crystals) or spherulitic textures. The microscopic observation result of polished sections is summarized in Table 19.

Table 19 Microscopic Observation Result of Polished Sections (MJTK-L2)

No.	Depth	Ore Type	Opaque Minerals								
110.	(m) Ore Type		Ga Sph		Mar	Py	Others	Texture			
1	277.00	Veinlet		⊚(anh·subh)	⊚(euh)			Sph-Mar:spherulite			
2	297.60	Banded	⊚(anh)	O(anh-subh)	$\Delta$ (euh)	+(subh)		Py:framboidal			
3	298.60	Network veins	+ (anh)	⊚(anh-subh)	O(euh)	+(subh)		·			
4	299.60	Brecciated	∆(anh)	O(anh-subh)	⊚(euh)			Sph-Mar:poikilitic			
5	300.60	Brecciated	O(anh)	⊚(anh-subh)	$\Delta(\text{euh})$			Sph:colloform			
6	301.60	Banded		⊚(anh·subh)	O(euh)	+(subh)	Goethite	Sph:colloform			
7	380.60	Brecciated	O(anh)	O(anh-subh)	$\Delta$ (subh)	∆(euh)					

©:abundant(>50%), O:moderate(50-20%), Δ:a few(20-5%), +:rare(<5%),

anh anhedral, subh subhedral, euh euhedral, Sph sphalerite, Mar marcasite, Py Pyrite,

This hole intersected three ore zones in the interval between 225.50 and 382.90m of the total depth of 400m. Within the ore zones, the three 1-m sections of mineralized carbonate rocks, from 237.50 to 238.50m, from 275.60 to 276.60m and from 379.90 to 380.90m, indicated assay results of 0.7% Pb and 20.0% Zn, 1.92% Pb and 36.0% Zn, and 3.45% Pb and 16.0% Zn respectively. The analytical results are presented in Table 20.

Table 20 Analytical Results of Drill Core Samples (MJTK-L2)

Drill Hole	Depth	Thickness	Type of Ore	Grade (%)			
	(m)	(m)	Type of ole	Pb	Zn	Pb+Zn	
MJTK-L2	222. 5-238. 5	16. 0	Network~Veinlets	0. 21	4.06	4. 27	
	265. 8-277. 6	11. 8	Network~Veinlets	0.40	6. 00	6. 30	
	346. 3-369. 3	23. 0	Brecciated	0. 45	2. 48	2. 93	
	373. 9-382. 9	9. 0	Brecciated	2. 02	5. 18	7. 20	

The IP anomaly that was identified by the geophysical prospecting in the 1st Year Campaign can be correlated to the section deeper than 160m of this hole. Since a number of drill sections deeper than 225.50m contain significant amounts of pyrite, sphalerite and galena, the cause of the IP anomaly may be attributed to the mineralization.

### (3) MJTK-L3

This hole was drilled along the geophysical survey line, L8, as shown in Figure 142 in order to verify the IP anomaly that had been identified by the geophysical prospecting in the 1st Year Campaign. The columnar hole section and the geological profile along the section including the hole are shown in Figures 148 and 141 respectively.

The hole, MJTK-L1, was drilled to test mineralization associated with the Cretaceous system in the vicinity of the Triassic diapirs. As aforementioned, however, the Cretaceous system in this hole was correlated to upper Aptian to the base of Albian and was proved to be different in the stratigraphic division from the mineralized Cretaceous formations in the general area. The geological structure was fully reviewed based on the result of this hole in order to estimate locations where prospective Cretaceous formations would distribute. The hole location of MJTK-L3 was thus determined along the geophysical survey line, L8, along which the hole, MJTK-L1, had been also located. Another objective of the hole, MJTK-L3, was to identify subsurface diapir bodies interpreted along L8 according to the gravity cross-section analysis in the 1st Year Campaign.

The geology of this hole comprises the Triassic diapirs and the Cretaceous system that are often brecciated. The Triassic system is observed in sections of the intervals from 216.70 to 334.20m and from 372.80 to 374.50m, consisting of sedimentary complexes that include gypsum, limestone, dolomite, arenite and argillite. The Cretaceous system

occurs in sections of the intervals from 0.00 to 204.00m and from 341.40 to 372.80m and consists of limestone and marl. The brecciation is developed in the intervals from 204.00 to 216.70m and from 334.20 to 341.40m.

Two mineralized zones are intersected in this hole, in the intervals from 178.40 to 180.80m and from 198.40 to 201.60m, and consist of pyrite-calcite veinlets or networks carrying minor amounts of sphalerite and galena. In addition, celestite-calcite veins carrying minor sphalerite and pyrite-calcite (sphalerite) veinlets are observed in association with the brecciated zones, however, without forming any significant concentrations.

The IP anomaly that was identified in the 1st Year Geophysical Prospecting can be correlated to the depth deeper than 240m of this hole, as shown in Figure 143. The hole deeper than 240m mainly comprises diapirs in which black compact dolomite, carrying an appreciable amount of pyrite, is ubiquitously observed. Particularly in the interval between 260.80 and 271.80m, abundant euhedral pyrite is contained in the black compact dolomite. Therefore, the cause of the IP anomaly can be attributed to this black compact dolomite containing abundant pyrite. Besides, the subsurface diapir interpreted by the gravity cross-section analysis is correlated to that in the interval between 216.70 and 334.20m.

### (4) MJTK-L4

This hole was drilled along the geophysical survey line, L2, as shown in Figure 140 in order to explore the southwestern extension of the new mineral indication that had been confirmed by the hole, MJTK-L2. The columnar hole section and the geological profile along the section including the hole are shown in Figures 149 and 143 respectively.

The geology of this hole comprises limestone from 0.00 to 143.30m, alternation of marl and limestone from 143.30 to 207.80m and marl from 334.80 to 400.00m, end of the hole, all of which are correlated to the carbonates of the Albien to Turonian stages of the Cretaceous system.

Mineralized sections are identified in the intervals from 109.10 to 143.30m and from 173.20 to 188.20m, consist of pyrite-calcite veinlets and networks carrying minor galena and sphalerite, however, without any significant concentration.

The IP anomaly that was identified in the 1st Year Geophysical Prospecting can be correlated to the depth deeper than 230m of this hole, as shown in Figure 145. The hole deeper than 240m mainly comprises pyretic marl, containing abundant framboidal pyrite. Therefore, the cause of the IP anomaly along L2 can be attributed to this marl containing abundant pyrite.

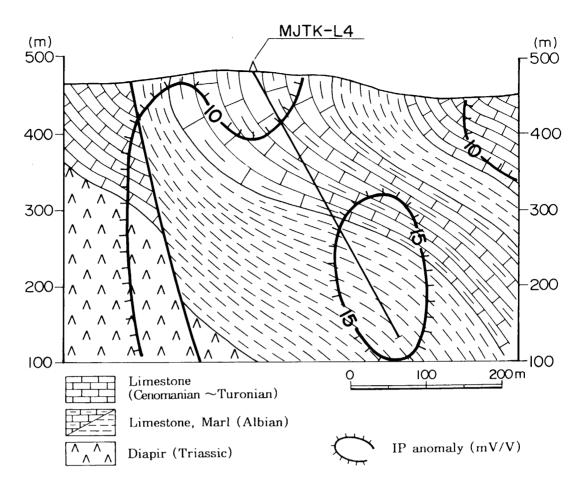


Figure 143 Geological Profile along the Hole, MJTK-L4

Hole : MJTK-B1 Machine Model : RASKA30 Elevation : 557 31m Drilled Length : 216 80m

Site Name : Bou Khil
Period : 2000. 11. 11~2001. 1. 9
Inclination : 70°
Direction : 158°

<u> </u>		Depth	P				0	arade (p	opm)					Depth	Core
Scale	Column	(m)	Description	Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr(%)	Ba	(m)	Rec. (%)
-			Limestone												
-			light grayish white, compact, finely												50.0
-			calcite matrix, weathered and oxicidized, limonite is found in the fissures,			l				٠ ا					
_			ilmonite is found in the lissures,												86.7
5			6.00~6.40m yellowish brown mudstone,												
_		6.00 6.40				ļ									100.0
_			Limestone yellowish brown, weathered, oxicidized,								1				73.3
_			brecciated, brown mud matrix, contains												70.0
10-			a small amount of celestite,												
_						İ									83.3
-						İ									
-		13.70												'	
15		13.70	Mudstone			1									83.3
15 -			yellowish brown, weathered, oxicidized,												
_			·												80.0
_															
-						İ									
20 —												1			23.3
-		21.50													
-			Mudstone												1000
_		23.70	greenish gray, pyrite disseminated,												100.0
25 —	4 4 4 4 4 4  4 4 4 4 4 4  4 4 4 4 4 4		Brecciated zone												
_		i	gray∼dark gray, partially brecciated, dolomite-pyrite matrix,											1	100.0
_			23.70~23.80m, 28.20~28.50m			Ì									
-			celestite-pyrite-(sphalerite) vein~veinlets,						ŀ						
-		28.80	Limestone												100.0
30 —			greenish gray, finely calcite cement,		l										
-		32.00	pyrite disseminated,												100.0
_		33.00	Mudstone, greenish gray,						ŀ						100.0
_		00.00	Brecciated zone												
35			gray∼dark gray, dolomite-pyrite matrix,												100.0
-		36.00	brecciaes are composed of limestone and calcareous mudstone (brecciaes are												
_			as much as 2-3cm in diameter), with						ŀ						
-			calcite-celestite vein,												93.3
-	14141 141414														
40 -	1 A A		33.00~36.00m												93.3
			contains a small amount of celestite,			İ									30.0
_		42.60	42.60~44.30m						ĺ						
-		44.30	contains a small amount of celestite,						ŀ						100.0
45 —															
-		46.60			1										1000
-	77.77	47.50	Mudstone, pale gray.	20 52	25.20	5E 24	4.00	0000	/2.2	250	670	40	140.0	47.50	100.0
_			Mineralized zone gray~dark gray, brecciated, dolomite-	38.52 26.96	25.36 <5.0	55.34 39.25	4.23 2.91	829.3 512.7	<2.0 <2.0	2.50 1.10	6.70 5.30	4.8 13.5	148.9	48.50	
50 -			pyrite matrix, contains a minor amount	19.47	38.69	51.81	4.82	380.4	<2.0	1.00	1.50	20.2	34.55	49.50	100.0
_			celestite and a small amount of sphale-	23.01	9.87	91.07	3.38	779.8	<2.0	1.60	5.40	12.7	16.70	50.50	
-			rite, pyrite and sphalerite are scattered,	40.95	271.8	15.38	4.01	231.2	<2.0	1.00	1.50	25.6	58.69	51.50 52.50	
-			53.50m	49.45	28.70	67.29	4.34	145.1	<2.0	0.80	0.30	3.5	163.6	53.50	100.0
-			celestite-calcite-sphalerite-pyrite veinlets.	17.27	195.0	11.96	2.37	665.4	<2.0	2.10	3.60	23.3	13.20	54.50	
55 -				27.66	6.07	30.33	2.91	410.8	<2.0	1.70	2.50	17.4	95.58	55.50	100.0
-				14.36 55.16	<5.0 <5.0	9.34	1.44 2.85	26.3 177.6	<2.0 <2.0	0.20	0.10 1.20	28.2 18.4	135.5 125.6	56.50	100.0
_		58.00		39.47	78.48	16.72	2.85	290.1	<2.0	1.20	1.50	18.2	127.4	57.50	
_			Mudstone, pale green, partially brecciated,		. 575				1.2					58.50	100.0
60	17777	59.50		48.97	8.49	24.54	3.92	490.8	<2.0	1.40	2.00	19.2	95.19	59.50	

Figure 144 Columnar section of the drill hole, MJTK-B1

Hole : MJTK-B1
Machine Model : RASKA30
Elevation : 557, 31m
Drilled Length : 216, 80m

Site Name : Bou Khil
Period : 2000. 11. 11~2001. 1. 9
Inclination : 70°
Direction : 158°

	<del> 1</del>				<del></del> .			3 4 . ( .			···-		<del></del> -	01	Core
Scale	Column	Depth (m)	Description	Pb	Zn	C.,	Fe(%)	arade (p Mn		NA cr (%)	Ca(%)	Sr(%)	Ba	Depth (m)	Rec.
60	2222			48.97	8.49	24.54		490.8	₹2.0	1.40	2.00	19.2	95.19	60.50	(%) 100.0
-			Mineralized zone	58.27	127.6	7.80	6.57	349.5	<2.0	0.60	1.40	21.6	0.95	61.50	
-			light gray∼gray, brecciated, dolomite-	49.15	221.6	16.15	7.47	305.4	2.47	0.70	1.00	25.4	0.33	62.50	100.0
-			pyrite in breccia matrix, contains a	51.95	102.5	15.34	4.54	122.5	<2.0	0.30	0.18	21.8	61.19	63.50	
-			minor amount of celestite and massive	42.42	<5.0	14.66	2.47	324.6	<2.0	1.40	1.80	17.5	155.1	64.50	
65	<del>XXX</del> .	65.20	pyrite,	29.76	531.9	9.30	2.48	415.9	<2.0	1.70	2.47	16.5	130.9	65.50	93.3
-			Mudstone											00.00	
-			greenish gray, pyrite disseminated, contains calcareous sandstone breccia,		ļ										
-	1/1/1/	67.80	Mineralized zone	41.55	85.77	8.83	1.68	1672.7	<2.0	5.90	14.70	8.4	4.64	67.80	93.3
-			light gray∼gray, brecciated, dolomite-	68.08	107.1	25.38	3.56	849.9	<2.0	3.60	5.70	1.3	338.6	68.80	
70			pyrite in breccia matrix, contains a	38.18	368.3	11.65	2.96	523.2	<2.0	2.80	4.80	8.5	11.9	69.80	
-			minor amount of celestite,	60.80	0.18%	17.03	4.43	415.1	<2.0	1.70	2.50	9.2	52.8	70.80	100.0
-			72.30~72.50m drusy celestite-(calcite) vein	55.73	254.0	23.08	3.43	843.6	<2.0	2.80	4.40	13.9	11.6	71.80	
-			with petrole materials,	99.50	72.87	26.14	5.43	1308.7	<2.0	4.00	6.90	5.3	2.39	72.80	
-	<u> </u>	73.80	Marl, dark gray, brecciated,				1			<u> </u>				73.80	100.0
75 -		75.00						ļ	Ì			ł			
-			Mudstone						Ì					į	
į –			pale green∼pale gray, calcareous,								İ				100.0
-			partially brecciated,												
-				l				1							
80 -	$\Delta = \Delta$	79.70	P					1							100.0
_	444		Brecciated zone dark gray∼gray, contains a small		l										
_			amount of celestite and sphalerite,				1	İ							
_		82.50	Limestone, gray, compact, mostly crushed,		Ì		1								86.7
١ _	\\	83.90				ļ	l								
85 -	I ~ ~ - I		Brecciated zone dark gray∼gray, brecciaes are composed								1				
_	444		of dolomitic marl, calcite-celestite vein,									١.			100.0
l _	-4-	86.50	Limestone			Ì	}	l						1	,,,,,
l _								ļ							
_			light gray, finely crystalline, with pyrite	1											73.3
90-			striation and drusy calcite crystal,					1							70.0
"-	<u> </u>	90.70	limonite is found in the fissures,		ļ	l									
	4 4 4  4 4 4		Brecciated zone	1				1							73.3
	10101		dark gray∼gray, brecciaes are composed					1					1		70.0
_	<u> </u>	94.00	of carbonate rocks, celestite matrix,					l		ļ	i				
			Mudstone, pale green, calcareous,	] .						1					100.0
95-		95.00	Marl, dark gray, dolomitic, celestite matrix,	]		ļ						,			100.0
-		96.00	Limestone, pale gray, finely crystalline,	]	ŀ	l									
-		97.40		1		1									100.0
_			Mari			İ	İ	l		ļ					100.0
-			gray∼dark gray, dolomitic, friable and			1		ļ	İ						
100 -			crumbly, interbeded with thin beded			ł			ł	1					100.0
-			mudstone and limestone, partially				İ	İ							100.0
-			brecciated, pyrite disseminated,	ĺ		Ì							l		
-	000	103.10	Consideration of the constant	1	ĺ						ł				100.0
-	000		Conglomerate	l											100.0
105 -	0000		gray, brecciaes are composed mainly of				1	ŀ	1			1			
-	200		carbonate rocks and fossiliferous sand-				1								
-	°°°		stone (brecciaes are as much as 1-20cm							1	ĺ	ļ			100.0
-	0000		in diameter),					ļ	1	ŀ			l		
-	000	109.40	108.50m with drusy calcite veinlets,		}				1	ŀ	}				
110-	000	110.20	Marl, dark gray.	i	}						ŀ	)			100.0
-	່າດດັ່		Conglomerate gray~brownish gray, with drusy calcite					ļ							
-	000		gray~brownish gray, with drusy calcite veinlets.		1	i .	1		ŀ		l	l			
-	0 0 0	112.70	Sandstone	1	1	1	1	1							100.0
-	l ° °		light greenish white, coarse-grained,	]	1		1								
115-	000		sub-rounded quartz pebble, fossiliferous,			1	1			1	1	1			
-	0 0	116 40	cos rounded quarte people, lossillerous,	]			1	1		1	1			]	100.0
-	<u> </u>	116.40	Mari	1		1	1				1				
-	<u> </u>		dark gray∼greenish gray, arenaceous.					1			Ì	1		l	
-	<del>                                     </del>		interbeded with thin beded limestone,				1	1							100.0
120		119.70		<u> </u>	<u> </u>	1	<u> </u>	L		L	<u></u>	<u> </u>	1	<u> </u>	L

Columnar section of the drill hole, MJTK-B1 Figure 144

Hole : MJTK-B1 Machine Model: RASKA30
Elevation: 557, 31m
Drilled Length: 216, 80m Site Name : Bou Khil

Period : 2000. 11. 11~2001. 1. 9
Inclination : 70°
Direction : 158°

		Depth					(	Grade (	ppm)					Depth	Core
Scale	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)			Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%)
120			Limestone												100.0
		121.80	dark gray~dark brown, compct,					ł		İ					100.0
			Mari												100.0
			dark greenish gray∼dark gray,												-
125			arenaceous, extremly friable and crumbly.							İ					100.0
125			100.00							İ					100.0
			126.00m												
			interbeded with compact limestone,				1								78.6
										•					1
130	0 0	129.50	Sandstone		l									li	
130	0														80.0
	0 0	131.80	dark gray, fine-grained, calcareous,			l				1					i
_			Mudstone		Ì		1		İ						i
			dark gray~gray, very pasty,	į											93.3
135 —						ĺ									
_		135.40	Sandstone					1			ļ	Ì			
_	0		grayish white, fine to medium-grained,	İ					ł	į	1		ŀ		93.3
_	0 0	137.95	sub-angular∼sub-rounded quartz pebble.	İ											
_			Mari								1				
140-			dark gray∼black, arenaceous,												100.0
_				l			1				1				
_				ļ							1				ĺ
_	. 0	142.50	Sandstone	ĺ											100.0
_	0		dark gray~black, fine-grained, sub-					ŀ			1				
145 —	0.		angular quartz pebble, calcareous,	ĺ											l
_	00		glauconite bearing,						1						86.7
_	0	147.10					1	ļ				ļ			
_		148.00	Marl, dark gray, arenaceous,				1	1							
_	0 0.		Sandstone				1	İ							86.7
150 —	0 0	150.00	grayish white, glauconite bearing,	ĺ			1				1				
-	<u></u>		Marl	İ									İ		
_			dark gray, arenaceous, friable and	İ	ĺ					ĺ	1				93.3
-		153.20	crumbly,		1							ļ			
_	000		Conglomerate												
155 —	000	i	gray, brecciaes are composed mainly of							ļ	1				100.0
-	000	156.30	glauconite sandstone and siltstone,								1				<b> </b>
-	0 0		Sandstone	İ			1				İ	ł			000
-	0 0		grayish white, fine-grained, calcareous,							ŀ					83.3
-	0	159.30	glauconite bearing.												
160 —		160.30	Sand, light gray, unconsolidated, Mudstone				İ			ł					100.0
_							ļ	ļ		ŀ					100.0
	. 0	162.20	dark gray~gray, very soft and pasty.	ĺ											
_	0 0	163.20	Sandstone, light grayish white, calcareous, Mudstone			į		1		1	l				100.0
_			dark gray∼gray, very soft and pasty.			1			ŀ						100.0
165 —		165.20				į			1			ļ			
-	0 0	İ	Sandstone												76.7
-	0		reddish brown, fine to medium-grained,					l							/ / / /
-	6		sub-rounded quartz pebble, oxicidized,												$\vdash$
-	0 0		loosely consolidated,							ŀ					50.0
170 —	0														00.0
-				ĺ	1		1								
-				l	1		1				1				3.3
_				l	1					!					5.5
_	7	174.30	Non-core	1	1	1									<del></del>
175 —	1\/	l .	Non core	l	1						1				
_	1 X							1		1		1			0.0
-	1/\			İ			1	1		1		1			1
-		178.30	Sandstone	1		1	1			ł					
_		1	gray, fine-grained, glauconite bearing.	ŀ		1				1	1	1		l	14.3

Figure 144 Columnar section of the drill hole, MJTK-B1

: MJTK-B1 Hole

Machine Model: RASKA30 Elevation: 557.31m Drilled Length: 216.80m

Site Name : Bou Khil
Period : 2000. 11. 11~2001. 1. 9
Inclination : 70°
Direction : 158°

Scale	Column	Depth (m)	Description	РЬ	Zn(%)	C.	Fe(%)	irade (p		Marie	Ca(%)	Sr	Ва	Depth (m)	Core Rec. (%)
180	0 0	(m)	Sandstone dark greenish gray, fine-grained,		21(4)	Cu	F 6(A)	14111	Cu	IVIB(A)	Ca(N)	31	Da	(111)	14.3
-	0 0		sub-angular quartz pebble, glauconite bearing. loosely consolidated,	}											30.0
185 —	0 0 0							:				,			43.3
190 —	0 0 0												i		36.7
-	0 0	193.00	Mudstone												53.3
195 —		196.80	black, loosely consolidated.									í			26.7
- - -		130.00	Sand grayish white∼light brownish white, unconsolidated, sub-rounded quartz												40.0
200			pebble.												33.3
205 -															33.3
- -															26.7
210-															23.3
215-															16.7
-		216.80													25.0
220 -															
-															
225 -															
230 -															
-	1														
235 -	1														
-															

Columnar section of the drill hole, MJTK-B1 Figure 144

Hole : MJTK-B2 Machine Model : RASKA30 Elevation : 454. 81m Drilled Length : 142. 10m

Site Name : Bou Khil Period : 2001. 1. 14~1. 29 Inclination : 90°

Direction :

20 - 37.00		РЬ	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ва	(m)	Rec.
9,00 Sandstone yellowish rounded Sand yellowish loosely pebble.  20 335 37.00 Mud grayish	h brown, coarse-grained, sub- d quartz pebble, weathered, h brown, fine to medium-grained,												
Sandstone yellowish rounded Sand yellowish loosely pebble.	h brown, coarse-grained, sub- d quartz pebble, weathered, h brown, fine to medium-grained,												1 / \
yellowish rounded Sand yellowish loosely pebble.	h brown, coarse-grained, sub- d quartz pebble, weathered, h brown, fine to medium-grained,				1		1			,			
yellowisi loosely pebble.  20													20.0
35 - 37.00 Mud grayish	i												0.0
30- 35- 37.00 Mud grayish													0.0
37.00 Mud grayish													0.0
37.00 Mud grayish													0.0
37.00 Mud grayish					1								0.0
37.00 Mud grayish													0.0
Mud grayish													30.0
Sandstone	black∼black, loosely consolidated,												20.0
oxicidize	e brown, fine to medium-grained, ed, contains breccia,												20.0
45 0 0 Conglomer reddish consolid	brown, oxicidized, loosely dated, brown mud matrix,												10.0
brecciae diamete	es are as much as 0.5-2.0cm in er and composed mainly of calcasandstone and limestone,												30.0
50 - 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0													60.0
55													90.0
						1	1	1	1	i	1	1	1

Figure 145 Columnar section of the drill hole, MJTK-B2

Hole : MJTK-B2 Machine Model : RASKA30 Elevation : 454, 81m Drilled Length : 142, 10m

Site Name : Bou Khil Period : 2001. 1. 14~1. 29
Inclination : 90°
Direction : —

Scale	Column	Depth	Description		12 7			Grade			E 2001			Depth	Core Rec.
		(m)		Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	(%)
-	0,00	61.10	Conglomerate						ļ						86.7
_	0 0		Sandstone yellowish brown, medium-grained,										ì		93.3
-	000	62.70	Conglomerate			ł				i					93.3
_	000		light yellowish brown, brown mud matrix, brecciaes are as much as 3∼4cm in				1							l i	
65 —	000		diameter and composed mainly of Tertiary				ŀ								56.7
	000	1	carbonate rocks, garnet crystal bearing,			l	İ		1	ŀ					
_	0 0	67.20	Sandstone			1	1	i		ĺ			ŀ		
- ا	0		yellowish brown, coarse-grained, sub-			l	1								33.3
70 —	0 0 0	70.00	rounded quartz pebble, contains breccia,			l	1		ļ	1				1	
-	00		Conglomerate reddish brown, oxicidized, loosely			Į	1								40.0
-			consolidated, brown mud matrix,		i	]	ł	l		ł					40.0
-	° ه ۱۰	1	brecciaes are as much as 2-3cm in					ŀ	1				ļ		
7.5	000	l	diameter and are composed mainly of												100.0
75	$\circ$		Tertiary carbonate rocks,												
_	° ° °	1			1								İ		
-	$ ^{\circ}$													1	53.3
-	0 0	1	,												
80-	$\langle \cdot \rangle$				1							ŀ			53.3
-	lo°, o				1										00.0
-	° ه`آ							ł			l				
	ૢ૾૾ૺ૾ૺ૾					l									100.0
85 -	000	1				ļ						ļ			
-	000				1		1								
-	000				1	ł				1					80.0
-		·				l	1		1	1	1	ļ	ł	ļ	
-	ೲಁೲ									1				1	36.7
90 -	000												İ	1	
	٥ • [		·										l		
	ૺૺ૾ૺ૾ૺ			ļ				1	1						100.0
-		1													
95~	ૺૺૼ૰ઁ								ļ	İ			İ		40.7
-									İ				ļ		46.7
-	$\frac{1}{2}$	,							İ						
-	ِ ہ °ہ						1								80.0
100-		1							İ		į .	ì			
100-	ء <sup>م</sup> ر	1									1				
١.	ૢૺ૾ૢ૾૾	1						İ							10.0
-	₽ઁ°ઁ	l													
-	$ ^{\circ}$ $^{\circ}$	,						1	1	İ					100.0
105-	600	,				1	1	1	1			i			100.0
-		106.70					-	ļ				<u> </u>			<b></b>
	0 0	:	Sandstone yellowish brown, fine∼medium-grained,								Ì	Ì	Ì		43.3
]	•		calcareous, sub-rounded~sub-angular	l				1	ļ					1	
110-	.00	109.70		İ								l			
-		1	Mudstone yellowish gray∼brown, weathered, oxici-					1			1				100.0
-		‡	dized, loosely consolidated, contain					1			1			1	<u> </u>
-		1	brecciaes (brecciaes are composed of		1										36.7
-		1	grayish white limestone and are as much							1		1	1		30.7
115-		1	as 2-10cm in diameter,								1	ł			
-		‡												1	20.0
[		117.70		ļ							1			1	
1 .		3	Mudstone						1		1				100.0
120		1	blackish gray, loosely consolidated,			<u> </u>		1	<u> </u>	<u> </u>		<u></u>			1.55.5

Columnar section of the drill hole, MJTK-B2 Figure 145

: MJTK-B2 Machine Model: RASKA30 Elevation : 454. 81m Drilled Length : 142. 10m Site Name : Bou Khil Period : 2001. 1. 14~1. 29 Inclination : 90°

Direction : -

	0.1	Depth	Description					Grade (					Depth	Core
	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)		Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%)
120 —			Mudstone blackish gray, loosely consolidated, very pasty, contain brecciaes of carbo-	-										100.0 80.0
125-			nate rocks.											
1 1		127.10	Sand											36.7
130 —			yellowish brown, unconsolidated, medium-grained, sub-rounded quartz pebble,											16.7
-			·											20.0
135 —														16.7
140-														20.0
-		142.10												<del></del>
145 — —														
150-														
-														
155 -														
160-														
-	1													
165 <del></del>	1													
-														
170-	4													
175 -														
-	-													

Figure 145 Columnar section of the drill hole, MJTK-B2

Hole : MJTK-L1 Machine Model : RASKA30 Elevation : 429.12m Drilled Length : 400.10m

Site Name: El Akhouat
Period: 2000. 9. 27~10. 17
Inclination: 75°
Direction: 118°

Scale Column  (m)  Overburden  Description  Pb Zn Cu Fe(s) Mn Cd Mg(s) Ca(s) Sr  Overburden  21 70  Gypsum-Mudstone complex grayish white~gray (partially reddish brown).  25 10  A A A State of the column of the c		ppm)							l Description	Depth	Column	Saala
20  A A  A A  Sample of the property of the pr	%) Ca(%) 5	Cd Mg(	Co	Mn	Fe(%)	Cu F	Zn	Pb	(m) Description	(m)	Column	Scale
20-  A A  2170  Gypsum-Mudstone complex grayish white~gray (partially reddish brown).  Mudstone blackish gray, calcareous, with gypsum, Gypsum-Mudstone complex Mudstone blackish gray, calcareous, contains gypsum-mudstone-Carbonate rocks complex grayish white, brecciated, Mudstone blackish brown~gray, calcareous, Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex, Mudstone blackish gray, with gypsum, 36.70~37.10m gypsum-mudstone complex, Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in disnater)									Overburden			_
20-  A A  A A  2170  Gypsum-Mudstone complex grayish white~gray (partially reddish brown).  Mudstone blackish gray. calcareous, with gypsum.  Gypsum-Mudstone complex Mudstone blackish gray. calcareous. contains gypsum-Mudstone-Carbonate rocks complex grayish white. brecciated, Mudstone blackish pray. calcareous.  Gypsum-Mudstone-Carbonate rocks complex grayish white. brecciated, Mudstone blackish pray. calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum. 36.72~37.10m gypsum-mudstone complex.  Mudstone blackish gray. with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in disnater)											\ /	-
20-  A A  A A  2170  Gypsum-Mudstone complex grayish white~gray (partially reddish brown).  Mudstone blackish gray. calcareous, with gypsum.  Gypsum-Mudstone complex Mudstone blackish gray. calcareous. contains gypsum-Mudstone-Carbonate rocks complex grayish white. brecciated, Mudstone blackish pray. calcareous.  Gypsum-Mudstone-Carbonate rocks complex grayish white. brecciated, Mudstone blackish pray. calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum. 36.72~37.10m gypsum-mudstone complex.  Mudstone blackish gray. with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in disnater)								1			\ /	-
20-  A A  A A  2170  Gypsum-Mudstone complex grayish white~gray (partially reddish brown).  Mudstone blackish gray. calcareous, with gypsum.  Gypsum-Mudstone complex Mudstone blackish gray. calcareous. contains gypsum-Mudstone-Carbonate rocks complex grayish white. brecciated, Mudstone blackish pray. calcareous.  Gypsum-Mudstone-Carbonate rocks complex grayish white. brecciated, Mudstone blackish pray. calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum. 36.72~37.10m gypsum-mudstone complex.  Mudstone blackish gray. with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in disnater)					ĺ	}					\ /	_
21.70  A A 21.70  Cypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brectiated.  Mudstone  reddish brown~gray, calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum.  38.70~37.10m gypsum-mudstone complex.  Mudstone  blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in dismeter)											1/	»-
21.70  A A 21.70  Cypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brectiated.  Mudstone  reddish brown~gray, calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum.  38.70~37.10m gypsum-mudstone complex.  Mudstone  blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in dismeter)											\	_
21.70  A A 21.70  Cypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brectiated.  Mudstone  reddish brown~gray, calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum.  38.70~37.10m gypsum-mudstone complex.  Mudstone  blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in dismeter)							}				\ /	_
21.70  A A 21.70  Cypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brectiated.  Mudstone  reddish brown~gray, calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum.  38.70~37.10m gypsum-mudstone complex.  Mudstone  blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in dismeter)							1				$\mathcal{M}$	_
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex.  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		1				i					V	10
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex.  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)					1		1				Ĭ	-
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  Mudstone blackish gray, calcareous, with gypsum,  Gypsum-Mudstone complex Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated, Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex, Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)											Λ	_
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex.  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)	-										//	_
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum,  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated,  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum,  36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)					ì						/ \	15-
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum,  Gypsum-Mudstone complex Mudstone blackish gray, calcareous, contains gypsum crystal,  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated,  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 38.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)	1 1										/ \	-
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum,  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated,  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum,  36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		İ			l	İ					1	-
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum,  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated,  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum,  36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)							İ				1	-
Gypsum-Mudstone complex grayish white~gray (partially reddish brown),  25.10  Mudstone blackish gray, calcareous, with gypsum,  Gypsum-Mudstone complex Mudstone blackish gray, calcareous, contains gypsum crystal,  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated,  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 38.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)	1 1						1				/ \	-
Gypsum-Mudstone complex grayish white~gray (partially reddish brown).  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated. Mudstone reddish brown~gray, calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex.  Mudstone blackish gray. with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)											/ \	20 -
grayish white~gray (partially reddish brown),  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum.  36.70~37.10m gypsum-mudstone complex.  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)	1 1	ļ					İ		21.70	21.70	<u> </u>	
brown),  Mudstone blackish gray, calcareous, with gypsum,  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated,  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum,  36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)	1 1	ļ		l					\$ *			_
25.10  Mudstone blackish gray, calcareous, with gypsum.  Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		1					ļ					-
blackish gray, calcareous, with gypsum.  30-28.90  Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous.  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		İ							25.10	25.10		25 —
Gypsum-Mudstone complex  Mudstone blackish gray, calcareous, contains gypsum crystal,  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		ŀ					ļ		<b>∤</b>			-
Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)							ŀ		27.70	27.70		_
Mudstone blackish gray, calcareous, contains gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)							İ		28.90	28.90	^ ^	_
gypsum crystal.  Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)			Ì						Mudstone			30 -
Gypsum-Mudstone-Carbonate rocks complex grayish white, brecciated.  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		İ	-				1		gypsum crystal,			-
33.70  Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		ł							Gypsum-Mudstone-Carbonate rocks complex	31.70	۸۸	-
Mudstone reddish brown~gray, calcareous,  Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)			-						grayish white, brecciated.	33.70	٨	-
36.05  Dolomite  black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)										30.70		25_
Dolomite black~grayish white, finely crystalline, organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)							-		36.05	36.05		- 35
organic material matrix, with gypsum, 36.70~37.10m gypsum-mudstone complex,  Mudstone blackish gray, with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		<u> </u>							Dolomite			_
36.70~37.10m gypsum-mudstone complex.  Mudstone blackish gray. with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)			1				İ			1	. <del></del>	_
Mudstone blackish gray. with grayish white dolomite brecciaes (brecciaes are as much as 2~5cm in diameter)		1							36.70~37.10m gypsum-mudstone complex.		<del></del>	-
blackish gray.  with grayish white dolomite brecciaes  (brecciaes are as much as 2~5cm in diameter)									39.95	39.95		40 -
(brecciaes are as much as 2~5cm in			1						blackish gray,	1		_
diameter)				ŀ					1 -			_
45 diameter),		ŀ	-				İ			1		-
									diameter),	1		45 -
												-
						1	1			1		-
										1		_
50-										1		50 -
51.70~52.80m with gypsum.									51.70~52.80m with gypsum.	1		_
F0.00						- 1			50.00			-
- A A A S 53.50 Gypsum, white, massive,										52.80 53.50	ΑΛΛ	-
Mudstone, gray, calcareous,									Mudstone, gray, calcareous,	1		-
33 ↑ ↑ Mudstone-Gypsum-Dolomite complex				ĺ					Mudstone-Gypsum-Dolomite complex	1		55-
↑									· · · · · · · · · · · · · · · · · · ·			_
57.80 breccia, with gypsum veinlets.									57.80	57.80		-
reddish brown, with gypsum vein,												-

Figure 146 Columnar section of the drill hole, MJTK-L1

Hole : MJTK-L1
Machine Model : RASKA30
Elevation : 429.12m

Site Name : El Akhouat Period : 2000. 9. 27~10. 17 Inclination : 75° Direction : 118°

Drilled Length: 400.10m

		Depth						Grade (	ppm	)				Depth	Core
Scale	Column	(m)	Description	Pb	Zn	Cu	Fe(%)	Mn			Ca(%)	Sr	Ва	(m)	Rec.
60			Mudstone, reddish brown, calcareous,	·			- (/								86.7
-	^ ^	60.70	Gypsum-Carbonate rocks-Mudstone complex						.						100.0
4	٨		grayish white, contains dolomite and		. 1										
_	^		mudstone breccia, with gypsum vein,												83.3
_	$\overline{}$	63.50	Mudatana-Gunaum-Dalamita, campley							ľ		- 1			
25	ا ۸ `` ۸ ا		Mudstone-Gypsum-Dolomite complex			. !									
65 -	1^ <u>^</u> ^ [		grayish white (partially reddish brown),												100.0
-	ام آما		brecciated, composed mainly of calca-			i									
-	_ ^		reous mudstone, gypsum veinlets and												
-	^ ^		brecciated dolomite,			. !			1 1						100.0
-	. ^ .					i I									100.0
70 -	^ <u>,</u> ^				. 1	. !			1 1						
_	\ ^ \ \														
_		71.70													96.7
_			Mudstone												
-		73.70	reddish brown, with gypsum veinlets,												
~	V V V	74.70	Gypsum, grayish white, massive,	l i			1		, ,						100.0
75 -		74.70	Dolomite, gayish black, with gypsum,												
-		76.00	Mudatana						ļ. l						
-			Mudstone			1									
-			reddish brown, with gypsum veinlets,			i '									93.3
-	A . A .	78.70 79.00	78.70~79.00m mussive gypsum,			'			'						
80 -			Dolomite, grayish white, finely crystalline,			l '									
-		80.20	Mudstone			i '				1					93.3
1 -			reddish brown, with gypsum veinlets,			i									
-			82.20~83.40m brecciated,							1				Ι.	h
-		83.40	82.20~83.40m brecciated,		!										83.3
-	┨ぺҳぺҳぺ┃		Gypsum, grayish white, massive,					-	i '					l	00.0
85 -	A A	85.00									ŀ			İ	
-			Mudstone	ì	'					İ	ŀ				
-			reddish brown, with gypsum veinlets,			[			1	ŀ	ŀ				100.0
_			85.00~86.15m		i '										
_				<b>!</b>	'	1		l		ł				1	
			with grayish white dolomite brecciaes	ŀ	1	1		l	ļ	ŀ	İ				96.7
90 -					i '						İ				
1 -															
-				1										ł	93.3
-						1								1	35.5
-			,											i	
95 -		94.70	Mudatana-Gunaum-Dalamita, complex	i		l			1	İ					
-	<b>┤</b> ^ ∧ ^│	ļ	Mudstone-Gypsum-Dolomite complex									l			100.0
_	\ ^ ^ \	1	blackish gray∼reddish brown, brecciated, composed mainly of calca-			l								1	
1 _	_ ^		reous mudstone, gypsum veinlets and				İ		1						
ł	Λ Λ		brecciated dolomite.			1	ŀ		1			ł			100.0
	T, T,	99.30	Limestone	1								İ			
100-		1		1				1		}		ł			
-		1	gray, brecciated, breccia consists of					1		1		!			100.0
-	$H$ $\overline{A}$	ł	Cretaceous carbonate rocks, calcite and		L	<u> </u>	<u> </u>	L	<u> </u>		L	L		102.60	100.0
-		102.00	gypsum cement,	81.54	0.15%	0.98	0.31	159.1	<2.0	5.25	16.00	2972.0	61.1	103.60	
-	<del></del>	103.60	Dolomite	23.05	308.20	8.02	1.18	175.3	<2.0	4.35	10.60	2798.7	112.0	i	
105 -		1	black, finely crystalline, contains	<10	76.09	3.71	0.55	100.1	<2.0	2.50	10.00	2479.2	100.2	104.60	100.0
-			aboundan of hydrozincite,				<del>                                     </del>	<b>†</b>		1				105.60	
	<u> </u>	106.30	Mudstone-Gypsum-Carbonate rocks complex	1	1	1					1	1			
-	^ ^	l	reddish brown (partially grayish black),	1			1			1				1	100.0
-	1.^.		1		1		1			İ	1				
-	1^,^	1	brecciated, composed mainly of calca-			1		i		1	1				<del>                                     </del>
110-	۱,^,		reous mudstone, gypsum veinlets,			1	1	1							100.0
-	<b>┤</b> ` ^		brecciated dolomite and limestone,					ł		i	ł			1	100.0
-	۱۸ <sup>^</sup> ۸							1		1	1		l		L
-	<b>√</b> ^ ``									1	1	1	l		[
-	\ \ \	<b>.</b>								1	1		1		100.0
1		114.10	Dolomite	1						1	1			1	ĺ
115-	++++	1								1	1		1	1	
1 -	+1:1:	1	grayish black, brecciated, with gypsum,							1	1	1			100.0
				7	1	1	1	i	1	ı	I .	ı	ı	1	1 100.0
		116.60	Mudstone-Gypsum-Carbonate rocks complex	ŀ			l	İ	1	1		1	1	į.	1
-	^ ^	116.60	Mudstone-Gypsum-Carbonate rocks complex												
-		116.60	Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish black),												100.0

Figure 146 Columnar section of the drill hole, MJTK-L1

Hole : MJTK-L1
Machine Model : RASKA30
Elevation : 429.12m Drilled Length: 400.10m

Site Name: El Akhouat
Period: 2000. 9. 27~10. 17
Inclination: 75°
Direction: 118°

Soala	Column	Depth	Description					Grade						Depth	Core Rec.
120		(m)		Pb	Zn	Cu	Fe(%)	Mn	Сч	Mg(%)	Ca(%)	Sr	Ba	(m)	(%)
120 -	^ ^		Mudstone-Gypsum-Carbonate rocks complex												100.0
-	^ ^ \		reddish brown (partially grayish black),			İ									
-		123.10								l					100.0
			Mudstone reddish brown, with gypsum veinlets,				ł								
125	^ ^	125.60		ł			1								100.0
_	^ ^ ^		Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish black),				İ			]					
-	^ ^	128.10													
-			Dolomite				İ								96.7
130-	=	130.10	gray, brecciated, with gypsum,												
-	^ ^ \		Mudstone-Gypsum-Carbonate rocks complex												100.0
_	^ ^ ^		reddish brown (partially grayish black), brecciated, composed mainly of calca-	,											100.0
_	^ ^		reous mudstone, gypsum veinlets,				ļ								
135 -	_ ^		brecciated dolomite and limestone,				l								100.0
-	^ ^		135.80∼136.30m massive gypsum,							ļ					
-	^ ^	137.40	, co.so , co.so				[		ļ						00.7
-	ш-		Marl (Aptien age)												96.7
-	$-\pi$		grayish black, calcareous, homogeneous,					1							
140-			lime mud matrix, sparry calcite cement, contains brown limestone breccia,							Ì					93.3
-			vitrinite and peloid bearing, with												
-	-==	•	carbonate network, a small amount												
-	<b>III</b> —		of pyrite is almost invariably present.				1			1					80.0
1	$-\pi$														<b></b>
-	TT -		137.40~142.70m mostly crushed,							ĺ					100.0
[			151.10~151.79m micropyrite rich,						ĺ						100.0
_	— — —		156.50m												
1	- 田		carbonate network dominant,					}							100.0
-	$-\pi$									!					100.0
-	ш_					ļ									
-	— III —			ļ						l					83.3
155-															
	<u></u> 工一					İ									100.0
-	$-\pi$								İ						
-	TT									ļ					
-	<u> </u>														100.0
160-										1	]				
]	ш-						]	1		-					100.0
-							1	1		1					
-	Щ_						1								
165-	— III														100.0
-				l											
-	<u> </u>			1			1								100.0
170-	Ψ		169.10~172.10m	1											
-			carbonate network dominant,							1					100.0
-		1		1						j					<b></b>
-	ш-														96.7
175	ーエ			1						1					30.7
175 -	ш-			1						1					
_	<del>-</del>   -							]							96.7
-	H - H						1								
-	ш-									1					100.0
180	1			L		L	I	L	l	I	L			1	, ,

Figure 146 Columnar section of the drill hole, MJTK-L1

Hole : MJTK-L1
Machine Model : RASKA30
Elevation : 429. 12m
Drilled Length : 400. 10m

Site Name: El Akhouat
Period: 2000. 9. 27~10. 17
Inclination: 75°
Direction: 118°

Scale	Column	Depth	Description					Grade		_		_		Depth	Core Rec.
		(m)	· · · · · · · · · · · · · · · · · · ·	Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ва	(m)	(%)
-	<u> </u>		Marl (Aptien age) grayish black, homogeneous, calcareous,			l									100.0
-	一二二		lime mud matrix, sparry calcite cement,							1					100.0
	11		fossiliferous (gasteropodes bearing),				1			-					100.0
185	ш-		contains brown limestone breccia,						ŀ						l
-	$-\pi$		vitrinite and peloid bearing, with							ĺ					100.0
_	エー		carbonate network, a small amount												
-	- II		of pyrite is almost invariably present,			1									
4	H-H		180.00~181.00m												100.0
190 —	H-		carbonate network dominant,												
_	$-\pi$														100.0
	エー														700.0
	$-\pi$		193.60~195.10m						ļ				i		
195 —	II		carcite veinlets with a trace amount of							]					100.0
	— III —		galena and sphalerite.				ļ								
-	-11							ł	İ						
-									Ì	İ					100.0
-	$-\pi$														
200															100.0
	$-\Pi$							İ							100.0
_	ш — — Ш														
_	ш														100.0
205 —	$-\pi$														ļ
	ш-						l								
-	$-\pi$	207.70													100.0
_	ш-		Marl (Aptien age)												
210	-II		grayish black, calcareous, contains												100.0
	エー		limestone nodule and framboidal pyrite,												
_	$-\pi$		with carbonate network, crack dominant,												
_	- 11		209.00m cointains brown limestone,				1								100.0
-	工一		214.10~216.10m calcareous marl,						ł				ĺ		
	$-\pi$		217.20~217.50m							İ					96.7
	ш_		carbonate network dominant,					İ		1			}		90.7
	$-\Pi$														
_															100.0
220 —	ш-		220.10m calcite-(galena) network,											ĺ	
-			_												
-	ш-		218.40m cointains organic materials,				ł								100.0
_	— III								1	İ					
225	— — 工														100.0
1	π-														
_	-11														
_	エー														93.3
-	$-\pi$														
230 —	Π-							1						1	1000
f	$-\pi$				İ				1						100.0
-	-11														
	==	233.20	Marl (Aptien age)	i				[							100.0
235 -			grayish black, argillaceous, contains												
			limestone breccia and framboidal pyrite,												
4			with carbonate network, crack dominant,				1	]							100.0
-	- <u>-</u> -		233.90m contains brown limestone breccia												
			with calcite-(galena) veinlets,			I	1	l	1	1	ıl		ı	1	100.0

Figure 146 Columnar section of the drill hole, MJTK-L1

Hole : MJTK-L1
Machine Model : RASKA30
Elevation : 429.12m
Drilled Length : 400.10m

Site Name : El Akhouat Period : 2000. 9. 27~10. 17 Inclination : 75

Direction : 118°

Scale	Column	Depth	Description	<u> </u>	T _	-		Grade			G (5.3)			Depth	Core Rec
240		(m)		Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	(%)
-			Marl (Aptien age)				ŀ								100.
_			grayish black, argillaceous, contains	ŀ						1					
_			limestone nodule and framboidal pyrite,	•											100.
_			with carbonate network, crack dominant,												
45 —			240.10~244.60m mostry crushed.												
-						1				l			Ì		100
-										l		-			
-													;		400
-															100
250 —															
-															100
-				1											100
-															
-															100
255						İ									100
_						1									<b>-</b>
_						Ì	1		l	İ					73.
-				i	ĺ		1								
	<u> </u>	00000	259.30~260.00m mostry crushed,			}		1							
260 —	ш-	260.00	Marl (Aptien age)			i									60.
_	-II		grayish black, calcareous, lime mud				1			İ					
_	    -		matrix, sparry calcite cement,							Ì					
_	-II		with carbonate network,				1		İ						83.
265 —	エー														
_	-II		262.30~262.50m					i	1						
_	エー		calcite-hydrozinosite veinlets.				1			1					93.
			266.00~266.50m		1		1								
_	<u> </u>		sheared zone,		1	1	İ	1							
270 -	$-\Pi$														100
_	Π_			1					į.						L
-			271.40~273.20m					:							
-			carbonate network dominant,			1	1			1			ŀ		100
-							İ			1					ļ
275 -	<del>-</del> 1						1								
-	π-				1	1									100
-	$-\pi$									1					
-	==	278.00	Marl (Aptien age)	1		1								1	73.
-			grayish black, argillaceous, fossiliferous,			}			l	1		Ì		•	, , ,
280			contains limestone breccia and framboida			ļ							İ		
-	1		pyrite,			1	ŀ		1					İ	100
_					1										
_	<u> </u>		278.00~279.80m sheared zone,		1	ł			1						
- 285	]			1		İ				İ		l			100
265 —	]								ŀ					-	
_		287.00		1	1										
_	<u></u>		Marl (Aptien age)	ŀ											100
_	<del>-</del>		grayish black, calcareous, lime mud	ŀ										,	
290	ш-		matrix, sparry calcite cement,		İ								1		
_	$-\pi$		contains black woody material,				1			1					100
_	工一	}	framboidal pyrite is locally found,		1										
_	$-\pi$		with carbonate veinlets (width 1mm),						1						
_	二一		,							-			ŀ		100
295 —								1	1				ŀ		<u> </u>
_	ΙΞ_						1						}		
_		1		1											100
_	III_											[			<u> </u>
_					1	1	1			1		<u> </u>			100
300	]II —	1		1	1	1	1	1	1	1	1	Ī	l .		٠,٠٠

Figure 146 Columnar section of the drill hole, MJTK-L1

Hole : MJTK-L1
Machine Model : RASKA30
Elevation : 429, 12m
Drilled Length : 400, 10m

Period Inclination

Site Name : El Akhouat
Period : 2000. 9. 27~10. 17
Inclination : 75°
Direction : 118°

C	0-1	Depth	Description					Grade						Depth	Core
	Column	(m)	Description	Pb	Zn	Cu	Fe(%)	Mn	СЧ	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%)
300	二二		Marl (Aptien age)												100.0
_			grayish black, calcareous, lime mud matrix, sparry calcite cement,												100.0
-			contains vitrinite and framboidal pyrite,	·											100.0
305 —	エー		with carbonate veinlets,								-				
303 -	-皿		301.30m											1	100.0
_	ш_		carbonate-pyrite veinlets (width 5mm).												
-			310.00m calcite-(galena) veinlets,												100.0
-									ł						100.0
310 —	ш-														
_	]						ľ						i		100.0
-	一工					İ	1		}					ľ	
-	<u> </u>						1						ļ	1	100.0
315	-II			İ	İ					ļ				1	100.0
-	ш-				ļ				ļ						
_	$-\pi$								ŀ					İ	96.7
-	<u> </u>	318.80	Marl (Aptien age)	1					-						
320 -			grayish black~gray, dolomitic,						1						100.0
-	$ \equiv$		altanating of argillaceous marl and thin						]		İ		ĺ		100.0
_	<u> </u>		beded limeatone, contains vitrinite												
_			fragment and framboidal pyrite,												100.0
325 -			partilly brecciated, cruck dominant,	ļ									l		ļ
-	亚-		323.30m calcite-(galena) veinlets,												90.0
-			324.70m calcite=(sphalerite) veinlets,			}									30.0
-			327.80~328.20m												
330-			calcite-pyrite-(sphalerite) veinlets.		ļ										100.0
-	- II		336.00m calcite-pyrite-(galena) veinlets,												ļ
-	亚—		338.50m calcite-pyrite-(galena) veinlets,	į		İ									100.0
-			338.60m	Ì										1	100.0
335 -		ĺ	a trace amount of galena is found in												
-	<u>III</u> -		the fissures.												100.0
-	-¤								1						
-				l											100.0
340-	I			İ											
340	]-=			1		l									
] -	1111-						1		ļ						100.0
-		-				ŀ							i		
-				ŀ					1						100.0
345 -	]	1		1				ļ							
-	$ -\pi$	1						İ							
-	┦┷╌						1								100.0
-			·												
350 -	-11		Marl (Aptien age)					1							100.0
	]亚-		grayish black~gray, dolomitic, contains												
-		1	vitrinite and peloid (pyrite coating),	1				1					1		
-		1	a minor amount of framboidal pyrite is almost invariably present.						1						100.0
355 -	<u> </u>	1											}		
-		:	356.30~364.10m sheared,									1			100.0
	亚_				1							1	Í		L
-	] — III   III —				1					ľ		1			90.0
360	<u> 1</u> ——	<u> </u>	<u></u>	1	<u> </u>			<u> </u>		1		Ь		1	1

Figure 146 Columnar section of the drill hole, MJTK-L1

Hole : MJTK-L1
Machine Model : RASKA30
Elevation : 429.12m
Drilled Length : 400.10m

Site Name : El Akhouat
Period : 2000. 9. 27~10. 17
Inclination : 75°
Direction : 118°

Scala	Column	Depth	Description					Grade	(ppm	)				Depth	Core
360	Joidinii	(m)	Description	Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%)
360 			Marl (Aptien age) grayish black~gray, dolomitic, contains vitrinite and peloid (pyrite coating), with minor amounts of pyrite,									: ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '			90.0
365 — —	^ ^	364.10	Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish white), composed mainly of calcareous mudstone, gypsum veinlets, limestone,												100.0
370 —	^ ^	368.60	dolomite and marl,  Carbonate rocks-Gypsum complex  gray, calcite and gypsum cement,												100.0
1 1 1	^ ^ ^ ^	373.10	contains Cretaceous marl and limestone breccia.												100.0
375—	\		Mudstone-Gypsum-Carbonate rocks complex reddish brown (partially grayish white), brecciated (brecciaes are composed												100.0
1 1 1	^ ^		mainly of calcareous mudstone, gypsum veinlets, limestone and dolomite,												96.7
380 <del>-</del>	^ ^		379.70~380.50m massive limestone, 380.50~381.10m marl, calcite cement,												100.0
385 —	^ ^		384.00~384.90m dolomitized limestone, 384.90~385.50m marl, calcite cement,								:				100.0
1 1	^ ^		374.20~374.30m contains hydrozincite, 375.20~375.50m contain marl brecciaes,												100.0
390	^ ^ ^														100.0
1 1	^ ^	392.90	Dolomite-Limestone-Mudstone complex gray~grayish white, gypsum cement,												100.0
395 —	^ ^ ^ ^		brecciated (brecciaes are composed mainly of Cretaceous limestone and dolomite,												100.0
400	^ ^	400.10													100.0
		400.10													

Figure 146 Columnar section of the drill hole, MJTK-L1

Hole : MJTK-L2 Machine Model : RASKA30 Elevation : 519.01m Drilled Length : 400.00m

Site Name : El Akhouat
Period : 2000. 10. 21~11. 4
Inclination : 60°
Direction : 118°

		Depth						Grade	(ppm)			•	-	Depth	Core
Scale	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)			Mg(%)	Ca(%)	Sr	Ba	(m)	Rec.
	$\geq \leq$		Overburden												
			Limestone (Coniacian age)												69.4
	1		brownish light gray~yellowish light		1		1								
			brown, compact, finely calcite matrix,										-		
5 —			weekly oxicidized, pyrite are scattered,												93.3
			with calcite-(pyrite) veinlets;												
_	<del>                                      </del>		limonite is found in the fissures,												
_	+ + + +		5.50m, 15.50m				1								100.0
_	+++		drusy calcite vein(width 5cm).			i									
10 —			drusy calcite veni (width och );				1				l				
_							ĺ							1	93.3
-	<del></del>		'								Ì		İ		
-						ĺ	İ		ļ						
_														1	100.0
15—														l	
_															100.0
_		17.70												ł	100.0
			Dolomite (Turonian age)						ļ						
20-			grayish brown~yellowish brown.					ĺ					1		100.0
			compact, finely dolomite matrix,							ļ				ļ	100.0
_			weekly oxcidized, contains organic							1				}	
_	<u> </u>	}	materials, with calcite-(pyrite) veinlets,											1	100.0
_	<u> </u>		limonite is found in the fissures,			1		ł							
25 —	i i i	İ	24.60m drusy calcite vein(width 5cm),			l							ļ	l	
-			26.00~30.60m wholly crushed,		i					1			1		60.0
-	7				l								ļ		
_					1									ļ	
-	1														46.7
30 —											İ			1	
-							1								100.0
-	<del>                                      </del>	32.60			1		1				1		l		100.0
-	1111	1	Dolomite (Turonian age)	ļ		ļ							1	1	
35-	<del>                                     </del>		gray~grayish brown, finely dolomite		1		ļ						l		100.0
"_	li!i!		matrix, with calcite-pyrite veinlets, limonite is found in the fissures,								l		1	1	
_															
-		38.00	32.60~35.30m brecciated, fossiliferous,		·					İ				1	96.7
-	1::1:		Dolomite (Turonian age)						İ						
40 -	1:1:	1	brownish gray, compact, finely dolomite				1	ł			1				
-	Hili	1	matrix, with calcite network,												100.0
-	Hi		40.00m calcite vein(width 7cm),												
-		43.00 43.60	Calcite-limonite-hematite vein		1					1	ļ			1	1000
-		43.00	Dolomite (Turonian age)		1						1			1	100.0
45-		1	brownish gray∼light brownish gray,									1			<del> </del>
-	<del>litit</del>	1	compact, fossilliferous, finely dolomite				1								100.0
-	];;;;	1	matrix, partially brecciated,	1	1						1	1		1	100.0
	1	}	with calcite veinlets∼network,	1		1	1				}				<del>                                     </del>
50-	Hi	}	45.40~47.80m			1					1	1			100.0
"_	<del>!iii</del>	1	with calcite-pyrite-(galena) veinlets.		1	]	1					1			
-	XXX	51.40	Calcite-limonite-hematite-(sphalerite) vein	1		1	1					1			
-	$\bowtie$	53.10	The state of the s										ł		100.0
-		33.10	Dolomite (Turonian age)		1								1		
55 –	<del>i i i I</del>	1	gray∼grayish brown, finely crystalline,		1	1					1	1			
-		1	finily dolomite cement, with calcite		1							1			100.0
-	ļ <u>i</u> ļi.	1	veinlets~network, weakly oxicidized,												
-	<del>                                      </del>	1	53.10~53.70m, 57.80~60.40m								1				1.00 -
-	<del>                                      </del>	1	brecciated, pyrite are scattered,		1						1				100.0
60			contains a trace amount of galena,	<u></u>	<u></u>		1		<u> </u>		<u>L</u>	<u> </u>	<u> </u>		L

Figure 147 Columnar section of the drill hole, MJTK-L2

Hole : MJTK-L2 Machine Model : RASKA30 Elevation : 519.01m Drilled Length: 400.00m Site Name: El Akhouat
Period: 2000. 10. 21~11. 4
Inclination: 60°
Direction: 118°

		Depth						Grade	(ppm)	)				Depth	Core
Scale	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)			Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%)
60		60.40	Delegate (Turnelle 1 - 1 - 1)												(%) 100.0
	Hiii		Dolomite (Turonian age)						i	1					100.0
_	++++		gray~light yellowish brown, finely dolomite matrix, with calcite veinlets,	l											100.0
_	<u>Li i i i</u>		limonite is found in the fissures.												
65	<u> </u>	65.00	ilmonite is lound in the lissures,	ĺ											100.0
_	Hiti		Dolomite (Turonian age)												
_	+; -;		light yellowish brown∼grayish white.							ļ			1		
_	Hili		weakly oxicidized, finely dolomite matrix,	ĺ											90.0
_			contains Mn-oxicide material,	Í											
70 -	Hi		limonite is found in the fissures,	ĺ										1	
_			66.20~66.90m	ĺ					ļ						100.0
_			with calcite-pyrite network,	Į							'				
_	+++		69.80m	ĺ											
_			drusy calcite vein(width 5cm),	i											100.0
75 —			contains a trace amount of galena,	ĺ											
_			75.00~75.20m calcite-hematite vein,	ĺ											
-	<del></del>	76.60	Dolomite (Turonian age)	ĺ				}				ļ			100.0
_			light yellowish brown∼gray, compact,	l											
-			lime mud matrix,	ł					i						
80				ĺ				<u> </u>				İ			100.0
-		81.30		ĺ											
-			Dolomite (Turonian age)	ĺ											ĺ
-			light brown~light gray, pyrite are scattered, with calcite vein,	ĺ											90.0
-		84.00	Dolomite (Turonian age)	ĺ				<b>!</b>							
85 -		85.40	grayish black~grayish brown, organic.	ĺ						:					
-		86.00	lamina is recognized, interbeded with	1											90.0
_			light brown limestone, a minor amount	1											
-			of pyrite is locally found,	1						ĺ					
-		89.00	with calcite-(pyrite) veinlets(width 1~2cm),	1				}							90.0
90 -		90.70											1		<b></b>
-		30.70	85.40~86.00m light brown limestone part,						ł		1		į		1000
-			89.00~90.70m light brown limestone part,						i			l			100.0
-			89.70m									į			<del></del>
-		94.20 94.70	drusy calcite-hematite vein(width 15cm),												100.0
95-	1		94.20~94.70m								į				100.0
	H		light brown limestone part, with calcite-					İ			İ				
			(pyrite) veinlets,	1											100.0
		1	1	1											100.0
100-		ł	100.90~101.00m												
		l	with calcite-(galena) network, 101.00m					1							100.0
_			calcite-galena-(sphalerite) vein(width 10cm),	1	1							İ	l		
l -			Calcite galeria (sprialerite) verificationin,												
_	<del>liti!</del>		104.70m	ĺ					ļ		ł		1		100.0
105-		ĺ	calcite-pyrite vein(width 5cm),				1								
_		ı						ļ							
_	1	1	•	İ					İ						100.0
-	<del>                                      </del>	1		1					1						1
-		ł		1									1		
110-		ł		1								1	1		100.0
-	<del>                                      </del>	1		1				ļ	1				1		L
-	HIII	1					}								
-	H:	1		1											100.0
-	<del>Li ii</del>	i	114.90~115.00m mostly crushed,						1						
115-	<del>  i i i</del>	1	limonite is found in the fissures,		1										
-	<u>Liii</u>	116 00	116.80~117.00m	1		]							1		100.0
-	<del>                                      </del>	116.80 117.00	i e							1					
-			Salake pyrite galaria vali (Wati 20011),	1	1										
-		ł		1											100.0
120			<u> </u>				<u> </u>	L	1		1	1	L	1	L

Figure 147 Columnar section of the drill hole, MJTK-L2

Hole : MJTK-L2
Machine Model : RASKA30
Elevation : 519.01m
Drilled Length : 400.00m

Site Name : El Akhouat
Period : 2000. 10. 21~11. 4
Inclination : 60°
Direction : 118°

cale	Column	Depth	Description		1- 60		I= ()		(ppm		G ./a/S		-	Depth	Rec
120		(m)	· · · · · · · · · · · · · · · · · · ·	Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	(96)
' <u>`</u>			Dolomite (Turonian age)												
4	111		dark gray∼dark brown, lamina is								1				100.0
4	T T		recognized, organic, lime mud matrix.												
	7 7 7		with calcite vein∼veinlets, a minor				ļ			1					
125	7 7 7		amount of pyrite is locally found,												93.3
			121.60~123.00m				1								
			with calcite-(pyrite) vein∼network,										l		
٦	1111		, , , , , , , , , , , , , , , , , , ,												100.
٦										1					100.
1									1						
30 -	1:1:							l	1						100
	<del>                                      </del>							l						ľ	100
-	1 1 1 1						ļ		ľ					1	
٦		1	132.70∼132.90m calcite vein (width 20cm),							1	Ì				
-	itit	1	133.60~133.75m calcite vein (width 15cm),				1		ļ	1					100
35 —	11:11	1	138.10~138.60m with calcite network,		1	İ			Ì	1				1	
-	<del>                                     </del>	1	139.10m					1	ł	İ					Ì
_	$\overline{\cdots}$	}	drusy calcite veinlets(width 2cm) with		1									l	100
_		}	I -		i					ł					
_	777	1	petorole nodule,						ŀ		1				
40 —		1	140.00m calcite-(pyrite) veinlets(width 3cm).					1			1			į	100
_		1	140.20m drusy calcite veinlets(width 2cm),											Ì	
_		1	142.80m calcite veinlets(width 3cm),								-	ŀ			
_		1	142,90m calcite veinlets(width,3cm),						1					1	100
		1						1						}	
45		1				ļ		1					,		<u> </u>
45		1				ŀ		1			ì				100
_	1::::	1			1										100
-	1	1										}			<u> </u>
-	<u> </u>	1													
-	1	}			i			ĺ	1		}	ł	}		100
50	$H_{i}$	}						ł			1	1			<u> </u>
-	Hili	-			1		ŀ	ł							
_	Hiii	}				ĺ	İ					ļ			100
_	T : : :	1			1			]		1		İ			
_	1	1				1							1		
55 <b>—</b>	1:::	1				l									100
_		1	155.60m calcite vein (width 10cm),			1				1					l
_		1					1			1	1				
_		1								1	l	i			100
_		1										]	1	1	
60 —		1		ļ	1			1		1	1		1		
-	بنبا	1			1		1	1		1	1			1	100
	<del>ji:i:</del>	1		1			1			1					'
_	لنننا	1			1				1		1	<b>,</b>			<b></b>
_	لننز	1	163.80~164.00m			1	1			1	1	i			100
-	<del>li i i</del>	1	with calcite veinlets,		1		1	1					1		'``
65 —		‡	167.10~168.10m			1	1			1					<b>—</b>
_	<del>li!i!</del>	1	brecciated, calcite-pyrite matrix,				1		1	1				1	00
-	<u>                                     </u>	1			1	l	1	l							90
-	1:1:	1					1		1	1			1	1	<u> </u>
-	<del>                                      </del>	169.40					1			İ		1			
70 –	<del>                                      </del>	1	Dolomite (Turonian age)			1	1		1	1			1	1	100
-	i i i	1	grayish white∼gray, altanating of		1			l	1		1				<u></u>
-		1	grayish white compact dolomite and		1	1		1	1		1		1	1	
-	<del>                                      </del>	]	brownish gray lamina dolomite,			ł	-		1					1	100
_	0.0	173.50	Sandstone (Turonian age)	1		1			1	1	1				L
75 –		P	grayish white~gray, fine-grained, cal-		1				1						
_	. 0	1	careous, with coarse-grained calcite		1				}-	1	1		1	1	100
_	0 0	1	pebble, interbeded with thin beded			1			1						
_	َ ، ° ، ا		l '						1						-
_	، ، ا		dolomitic black marl, with calcite-pyrite			1			1					1	100
_		1	veinlets~network, pyrite are scattered,	l .		1	1	1	1	1	1	1	1	1	1

Figure 147 Columnar section of the drill hole, MJTK-L2

Hole : MJTK-L2 Machine Model : RASKA30 Elevation : 519.01m

Drilled Length: 400.00m

Site Name: El Akhouat
Period: 2000. 10. 21~11. 4
Inclination: 60°
Direction: 118°

	-	Depth	Desirition					Grade	(ppm)					Depth	Core
	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%) 100.0
180	0		Sandstone (Turonian age)												100.0
_	000		grayish white~light brownish white,												1000
_	0 0		calcareous, fine to medium-grained,												100.0
_	0 0		interbeded with thin beded dolomitic												
-	0 0		marl, pyrite are scattered, with												
185 —	. 0		calcite-(pyrite) network.												100.0
-			Calcite (pyrite) Hetwork,				i								
-	0		179.50~180.60m		1										
_	0		calcite-(pyrite) veinlets,												100.0
_			181.80~181.90m												
90	0 0		calcite-pyrite_vein(width 10cm),												
_	. 0		184.80~184.95m												100.0
_			calcite-pyrite-spharelite_vein(width 15cm).			·									,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
_	0 0		· · ·												
	0		189.60~189.80m												100.0
	0	1	calcite-pyrite-(galena) vein(width 20cm),		ŀ			1							100.0
95	0 0			ľ							,				
_	0														
-	0														100.0
-	0				l										
-	0					ŀ									
200 –															100.0
-			201.50m			ŀ									
-	о о		calcite-galena veinlets (width 1cm).		1										
_	0		_	ŀ			İ								100.0
_	0 0		204.70~205.10m												
05 —	0		with calcite-(pyrite) veinlets(width 1cm),		İ										
_	0 0		208.00m drusy calcite veinlets(width 2cm),		Ì			İ							100.0
		1													100.0
_			212.00m calcite vein,												
	о о		212.50m calcite vein,		1	•									100.5
_	• о				1										100.0
210 —	o . °														
-					İ										i
-	0									ł					100.0
-	0 0	213.50					ŀ								
-		213.30	Limestone (Turonian age)		l		ŀ		ŀ						
215 —		<b>.</b>	gray∼dark gray, finely crystalline,		1										100.0
_			organic, dolomitized, weakly mineralized,	•		1									
_	1	l l	213.80m calcite-pyrite-(galena)-(sphalerite)												
_			veinlets (width 3cm),		ŀ										100.0
_			216.80~217.00m		ŀ										''
20 –			with calcite-pyrite-(galena) network.	Ì											<del></del>
	1		217.60~218.00m, 218.90~219.30m calcite-pyrite-(galena) veinlets(width 1-3cm),		Į.										100.0
_	$\Box$		219.70~223.00m		Ī										100.0
_	T-1-1-		with calcite veinlets∼network,				-	10100	00.50			2054		222.50	
_	XXX	223.00	Mineralized zone	186.9	2.00	6.26	1.41	1318.9	83.58		24.20	395.1	11.15	223.50	
-	$\times\!\!\times\!\!\times$		limestone-hosted, brownish dark gray,	566.5	1.82	8.93	1.59	1203.5	73.62	8.00	20.70	435.8	13.58	224.50	100.0
25 —	$\bowtie$	1	dolomitized, lime mud-organic material	330.5	2.45	12.18	2.03	1441.4	101.41	8.00	18.70	441.1	30.20	225.50	
-	$\times\!\!\times\!\!\times$	]	matrix, 223.00∼225.50m	691.2	2.35	13.95	2.43	1164.9	88.53	11.93	24.92	828.1	60.47	226.50	l
-	$\bowtie$		with calcite-(pyrite)-(sphalerite) network,	1772.1	4.62	7.02	2.55	1318.4	189.9	6.79	35.70	518.4	64.47	227.50	100.0
-	$\times\!\!\times\!\!\times$	}	225.50~226.50m calcite-pyrite-sphalerite-	1.53%	3.52	1.40	2.05	1277.7	138.3	3.31	44.10	127.5	7.19		l
_	$\bowtie$		galena veinlets and network.	1053.1	3.07	7.05	1.59	1583.9	124.0	13.51	35.00	328.0	25.91	228.50	
30 –	$\bowtie$		226.50~227.10m	2451.3	2.82	6.43	0.94	1191.6	124.5	12.43	31.22	269.8	37.48	229.50	100.0
_	$\times\!\!\times\!\!\times$	] .	calcite-pyrite-sphalerite-galena matrix, 227.30~231.65m calcite-pyrite-sphalerite-	3252.9	3.70	11.61	2.73	1160.8	99.13	9.04	31.60	452.0	151.8	230.50	
_	$\times\!\!\times\!\!\times$		galena veinlets and network,	103.7	1.54	13.55	0.93	764.6	56.94	14.42	28.00	463.2	31.88	231.50	<del></del>
_	$\bowtie$		232.50~235.00m calcite-sphalerite-	115.8	3.30	7.38	0.98		161.88	8.30	21.60	319.4	30.45	232.50	1007
_	$\bowtie$		-(pyrite)-(galena) veinlets~network,					912.1						233.50	100.0
-	$\otimes \otimes \otimes$	1	235.00~235.20m	303.6	2.30	14.32	1.22	1049.7	41.97	7.30	21.10	570.3	53.39	234.50	<u> </u>
35 -	$\times\!\!\times\!\!\times$		calcite-(pyrite)-(sphalerite) veinlets. 236.05~237.45m	137.6	1.40	7.55	1.11	1054.6	29.19	8.30	21.20	493.6	13.32	235.50	
-	$\times\!\!\times\!\!\times$		calcite-sphalerite-pyrite-(galena) vein,	209.0	1.70	11.52	2.09	1010.6	16.47	7.00	20.50	633.1	14.51	236.50	100.0
-	$\bowtie$		237.45~238.40m	1321.7	8.42	9.11	5.14	677.8	57.17	1.32	35.42	511.3	26.28	237.50	
-	$\Diamond \Diamond \Diamond$		massive pyrite and sphalerite ore,	6988.0	20.00	61.79	21.00	373.0	132.8	0.08	11.62	69.1	113.3	1	
_	0 0	238.60	Sandstone (Turonian age)	120.3	0.68	8.82	1.22	644.8	9.92	0.33	44.10	1257.5	25.22	238.50	100.0
	0 0		via via via ugo/		-	<del></del>	<del>-</del>							239.50	1

Columnar section of the drill hole, MJTK-L2 Figure 147

Hole : MJTK-L2 Machine Model : RASKA30 Elevation : 519.01m Drilled Length : 400.00m Site Name: El Akhouat
Period: 2000. 10. 21~11. 4
Inclination: 60°
Direction: 118°.

		Depth						Grade	(ppm)					Depth	Core
	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%) 100.0
240	0 0		Sandstone (Turonian age)												100.0
_	0 0		brownish white∼light gryish brown.											i	100.0
	0		fine to medium-grained, calcareous,											l l	
_	0 0		interbeded thin beded dolomitic black marl, with calcite-(pyrite) veinlets,												
245 —	0 0		pyrite are scattered.												100.0
_	0													ŀ	
	0 . 0		242.00~243.00m calcite-pyrite matrix.  243.40~243.50m calcite cavity sediment.												100.0
_	0 0		245.20~246.60m pyrite-calcite veinlets,												
250 —	0		,												
_	o . o		250.50m pyrite-calcite veinlets.												100.0
-	0		252.20m pyrite-calcite veinlets,												
-	0		254.60m calcite-pyrite-galena brecciae,		·										100.0
255	0 0						İ								100.0
255	0	<b>i</b>													
_	。		258.80~258.90m						ŀ						100.0
_	0	1	calcite-(galena)-(sphalerite) network.												
-			262.70m												
260			sphalerite-calcite-pyrite veinlets (width 3cm).												100.0
-	° . °	261.70													
-	┟┼╁┼		Dolomite (Turonian age)												100.0
	ļ <del>i i i</del>		brownish gray∼gray, finely crystalline, lamina is recognized, with calcite∽pyrite					1							
265 —	[iiii		-(galena) veinlets and sphalerite-calcite				1								
-	XXX	266.80	-pyrite veinlets (width 3cm), Mineralized zone	776.7	0.81	11.03	2.27	824.5	12.08	6.70	22.70	489.9	74.70	265.80	100.0
-	$\bowtie$		limestone-hosted, brownish gray~gray.	516.5	9.46	22.79	2.75	744.1	103.1	5.33	32.20	346.1	111.0	266.80 267.80	
-	$\langle \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$		lime mud-organic material matrix,	518.8	0.79	13.35	3.35	672.4	15.48	0.91	38.50	825.7	393.6	268.80	100.0
-	Ⅸ⋙	•	265.80~266.80m, 270.30~270.60m	874.9	0.69	11.68	4.67	798.0	10.90	3.81	37.10	693.7	328.3	269.80	100.0
270 —	$\bowtie$		calcite-pyrite-sphalerite-galena network, 266.80~267.80m with calcite-sphalerite-	5314.9	1.21	16.64	8.55	560.6	32.03	0.41	34.62	582.9	394.3	270.80	
_	$\bowtie$		pyrite veinlets (width 1cm±)∼network,	3064.3 1061.5	0.58	19.82	5.49 1.39	765.7 822.4	34.03 15.77	1.40	39.20 31.08	432.9 685.7	71.91 338.8	271.80	100.0
-	$\bowtie$		271.40∼271.70m massive pyrite. 272.60∼275.40m with calcite-sphalerite-	677.7	1.79	16.67	1.30	889.9	43.22	11.61	33.04	628.6	85.68	272.60 273.60	
-	₩₩	•	pyrite veinlets (width 0.5-1.0cm), 275.40~277.10m	1871.2	3.47	28.68	3.09	965.0	43.14	7.21	33.60	805.5	182.1	274.60	
275 —	$\bowtie$	}	sphalerite-galena massive ore,	5089.4	3.59	43.85	5.53	822.7	61.40	6.47	31.22	503.1	113.8	275.60	96.7
-	$   \!                                 $	•	277.20~277.60m calcite-pyrite-sphalerite vein,	1.92%	36.00 11.30	281.5 50.87	7.50 6.60	292.1	506.8	0.66	11.20 33.46	83.07 524.0	7.91 46.70	276.60	
<u>-</u>	ХХХ	277.60		2622.0 144.4	0.59	14.09	1.64	532.8 346.6	156.7 3.92	0.16	39.90	991.5	58.65	277.60	100.0
	0 .		Sandstone (Turonian age) light gray∼brownish white, calcareous,	. 77.7	1	1.,,,,,,,	† · · · · ·	5 75.5	5.52	1			23.50	278.60	. 55.0
280			fine-grained, altanating of compact												
-		ł	sandstone and dolomitic black marl,		1										100.0
-	0 0		with calcite-(pyrite) veinlets∼network,												
-	۰ ،	1	marl, pyrite are scattered,												100.0
285 -	0 0	1	. 280.20m. 280.90m			1			ŀ						100.0
205-	۰ ،		calcite-pyrite-sphalerite-(galena) veinlets,												
-	. 0		286.70m				1								100.0
-		1	calcite-(pyrite)-(sphalerite) vein(width 7cm).												
-	. 0	1	288.40~286.80m, 289.00~290.60m		]		1			1					
290 —			interbeded with thin beded black marl,		1										100.0
-	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	291.60								ļ				291.60	<b></b>
	<b>Y</b> ///	1	Mineralized zone	1812.0	1.50	18.00	+	612.0	14.00	+	27.14	954.0	225.0	292.60	100.0
		1	limestone-hosted, light brown, partially	2049.3	0.89	16.32 7.86	3.46 1.54	560.2 529.5	20.45 16.34	0.10	20.90	801.2 615.3	109.7	293.60	, 50.0
295 -	<i>\///</i>	1	dolomitized, pyrite are scattered, 291.60~293.60m	805.22 186.59	1.28	8.90	1.50	712.8	23.51	0.10	33.00	423.6	270.4	294.60	-
-	<i>\///</i>	1	calcite-(pyrite)-(sphalerite) veinlets~vein,	1690.4	0.59	12.74	+	579.9	13.93	0.10	30.30	799.1	322.8	295.60	100.0
-	<b>\</b> ///	}	294.10~296.70m		<b> </b>		<b> </b>	1		<b>†</b>	<b> </b>			296.60	
-	1///	1	calcite-pyrite-sphalerite-(galena) matrix,				1								100.0
300	<b>\</b> ///	1	calcite vein with massive pyrite,				L	<u> </u>	<u>L</u>			<u> </u>			, 55.0
500								-							

Figure 147 Columnar section of the drill hole, MJTK-L2

Hole : MJTK-L2 Machine Model : RASKA30 Elevation : 519.01m

Drilled Length: 400.00m

Site Name : El Akhouat
Period : 2000. 10. 21~11. 4
Inclination : 60°
Direction : 118°

		Depth						Grade (	ppm	)				Depth	Core
Scale	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%) 100.0
300	7///		Mineralized zone											300.60	100.0
_			limestone-hosted, light brown, partially	132.00	0.54	9.24	1.36	505.6	5.29	0.20	31.30	903.6	227.5	301.60	100.0
			dolomitized, pyrite are scattered,	131.21	0.51	10.24	1.32	496.0	5.11	0.20	30.30	877.3	216.7	302.60	100.0
_			299.85~304.00m	327.53	0.31	7.84	1.69	592.7	6.32	0.30	31.80	494.2	130.0	303.60	
205	////	304.60	calcite-sphalerite-pyrite-(galena) vein,	418.05	1.65	19.37	3.06	542.2	10.17	0.90	26.40	732.8	53.01	304.60	100.0
305			Dolomite (Turonian age)	1											,
_	بتبلينا	306.20 306.30	brownish gray∼gray, lime mud matrix,												
_			lamina is recognized, with calcite-pyrite												100.0
_			-(sphalerite) veinlets∼network.												
-	1111		306.20~306.30m fault												
310	<del>! : ! : !</del>														100.0
_				i											
_	<u> </u>		314.20~315.30m												
			brecciated, calcite-pyrite cement,	1			i								100.0
-													1		
315-		1		ł											
-			·	l		1	1			l					100.0
_						1	1								
_					Ì	ł	ł								
	1						ŀ								100.0
320		}													
_	1														-
_	1		322.60m calcite-pyrite vein (width 10cm),		ĺ										100.0
_				1											
-				]	ŀ								ļ		
325					ļ										100.0
_		}			1	l									
_		}			į .								1		
-												l	ŀ		100.0
-	1111	}			•										
330 -										Ì					
_		1							ļ						100.0
_						]		1						,	
_	hiii							1				ł			
	H	334.80		1											100.0
335 -	ii;;;		Dolomite (Turonian age)		ŀ			1				ŀ			
_	11:11	1	brownish gray, weakly mineralized,									ŀ			
	H	1	organic, lime mud matrix,	1.89%	0.87	30.02	3.07	1709.2	27.92	0.25	30.52	933.7	76.66	337.60	100.0
-	1	1	with calcite-pyrite-(sphalerite)-(galena)	4969.2	1.49	15.00	1.92	955.2	27.87	0.25	34.44	1348.2	67.13	338.60	
-	Hi	1	network, contains calcite-sphalerite	751.4	0.55	24.11	2.55	709.8	12.88	0.25	32.90	992.1	225.9	339.60	
340-	1111	1	breccia, with pyrite striation,	751.4	0.55	24.11	2.00	703.0	12.00	0.20	32.30	332.1	225.5	340.60	100.0
-	1111	1	335.10~337.60m									İ			
_	Hir	}	brecciated, with calcite breccia,					İ							
-		}	337.60~339.30m									[			100.0
	Hili	}	calcite-galena-(sphalerite) veinlets.						į		l				
345-	Hili	1	<u>-</u>	433.4	0.39	17.99	1.98	538.9	8.13	0.83	30.80	1150.6	162.2	345.30	
-	XXX	346.30	Mineralized zone	401.4	1.44	23.33		502.9		0.25	23.94	1631.9	72.94	346.30	100.0
-	XXX	1	limestone-hosted, dark brownish gray,	3628.0	4.56	18.34	+	431.2		0.16	21.28	1181.0	35.96	347.30	
-	$\bowtie$	1	dolomitized, brecciated, finely crystalline,	1944.3	8.95	15.59	-	<del> </del> -	58.03	0.25	17.92	989.7	55.22	348.30	<del></del>
	$\times\!\!\times\!\!\times$	1	lime mud-organic material matrix.	1537.6	4.01	6.16	4.30	845.6	47.21	0.16	40.60	840.2	30.20	349.30	100.0
350-	1	4	mine mod-organic material matrix,	2994.3	0.67	12.88	+	855.4	6.71	0.33	36.40	833.3	163.8	350.30	
-	<b>1</b>	1	346.40~357.30m	1291.6	2.21	16.95	+	677.2		0.74	26.04	1396.6	211.5	351.30	
-	$\mathbb{K}$	1		2735.1	0.63	22.51	3.18	372.6	9.09	0.74	21.98	1920.9	167.0	352.30	100.0
-	1	4	brecciated, sphalerite-pyrite matrix,	1.74%	1.08	16.80	+	429.9		0.83	20.36	1573.7	69.61	353.30	
-	<b>1</b> XXX	1	357.30~360.30m	1882.1	0.70	15.71	<del></del>	600.7	4.41	0.74	33.60	1771.9	165.9	354.30	<u> </u>
355 -	$\mathbb{X}\!$	1	calcite-sphalerite network~veinlets and	1026.5	+	12.39	+	697.6	14.32	0.41	39.90	1291.2	111.3	355.30	100.0
-	1	4	sphalerite-galena-pyrite matrix.	2752.5	+-	23.70	+	417.0	+	<b>├</b>	22.12	1867.9	238.0	356.30	.55.5
-	₩₩	1		662.5	1.13	17.08	+	535.2	17.01	3.80	17.08	1635.2	104.5	357.30	<del>                                     </del>
-	$\bowtie$	1		6637.1	5.94	26.26		251.1	62.10	0.82	10.92	1637.8	72.98	358.30	100.0
-	₩₩	250 30		2818.7	3.37	26.28			36.96		12.32	1678.2	108.6	359.30	
360	$\infty$	359.70		,		,0	<u> </u>		122.00						·

Figure 147 Columnar section of the drill hole, MJTK-L2

## **GEOLOGIC**

LOG

: MJTK-L2 Machine Model: RASKA30 Elevation : 519.01m Drilled Length : 400.00m

Site Name : El Akhouat Period : 2000. 10. 21~11. 4

Inclination : 60°

Direction : 118°

		Desti						Grade (	DE:- \					Destel	Core
Scale	Column	Depth (m)	Description	Pb	Zn(%)	Cu	Fe(%)	Grade (		) Mg(%)	Ca(%)	Sr	Ba	Depth (m)	Rec.
360	XXX	(11)	Mineralized zone	775.1	1.22	24.43	2.96	248.7	12.69	0.33	10.92	2025.5	81.34	360.30	(%)
-			limestone-hosted, brownish gray.	6130.8	3.65	28.35	6.37	196.8	40.32	0.33	7.80	1523.9	77.07	361.30	100.0
-	$\bowtie$		dolomitized, organic material matrix,	945.8	1.61	26.95	4.09		20.22		14.84	1318.8	244.7	362.30	100.0
_	$\otimes \otimes$		with sphalerite-calcite-pyrite-galene vein-	1190.2	1.72	35.18	4.61		27.89	0.16	12.32	1695.0	173.3	363.30	
365-	$\bowtie$		lets.	1216.5	1.42	60.77	4.08	221.4	26.89	0.33	10.08	2673.0	117.6	364.30	100.0
_	$\otimes \otimes$		361.20~361.40m, 365.30~367.20m	7677.6	2.30	76.15	3.22	328.4	32.15	0.20	7.20	3388.3	69.8	365.30 366.30	
_	$\times\!\!\times\!\!\times$		brecciated, sphalerite-galena-pyrite matrix,	2342.1	4.30	45.83	2.67		51.53		19.90	978.2	111.9	367.30	
-	$\otimes \otimes$		364.50~365.00m	1.92(%)	1.02	28.84	2.65		70.51	0.20	17.00	1124.0	49.0	368.30	83.3
-	XXX	369.30	calcite-sphalerite-pyrite vein.	1.69(%)	1.06	39.71	2.78	747.6	86.35	0.20	14.00	934.2	41.9	369.30	
370 —		220.00	Cavity												13.3
-	iii	370.80	Dolomite (Turonian age)											. [	93.3
_			light brownish gray, finely calcite												
			matrix, lamina is recognized, with											373.90	100.0
375 —	$\vdots$ $\vdots$ $\vdots$	375.05	calcite-pyrite veinlets.	3798.3	0.73	48.36	4.40	523.7	12.58	0.16	12.88	1267.4	46.67	374.90	
	$\bowtie$	2.3.00	Mineralized zone	2.45%	8.23	40.62	2.36	840.3	236.7	1.24	26.32	638.4	94.51	375.90	
_	$\bowtie$		limestone-hosted, brownish gray~brown,	3.45%	8.78	41.84	2.49	704.9	382.9		24.78	816.9	71.64	376.90	100.0
_	₩₩		dolomitized, partially brecciated,	2.89%	1.74	21.70 16.06	2.90	1007.9	48.22		31.36	832.5	81.90	377.90	
_	$\langle \rangle \rangle$		375.10~377.10m, 382.00m	1.65% 3701.6	0.24	28.47	1.51 2.91	829.6 588.9	14.19 17.65		34.30 21.00	1042.9 969.2	141.2 173.9	378.90	105.5
380 —	₩₩		sphalerite-galena-pyrite matrix, 377.10~378.50m	3,45%	16.00	68.99	5.22	1003	208.6	0.08	25.34	355.1	45.20	379.90	100.0
-	$\langle\!\langle\!\langle\!\rangle\rangle$		calcite-galena-pyrite-(sphalerite) veinlets,	3.46%	8.86	64.41	2.39	848.2	229.9	0.16	24.08	346.4	59.31	380.90	
-	₩₩		379.90~381.40m sphalerite-galena massive ore,	694.1	1.15	28.05	2.96	899.8	23.43		35.42	1565.1	323.9	381.90	100.0
-		383.60												382.90	
385	1		Cavity												
365 -	]														
_															
_															
_															
390 –	ł														
-	ł			ŀ	1	1									
-	{					į									ŀ
-	1			İ	l										
-	†														İ
395 —	1														
-	1					1	1	ŀ							
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400 -		400.00				<u> </u>	ļ				L				
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ı	L	L			L	1	1	I	l	l	1	1	l .	l l	

Figure 147 Columnar section of the drill hole, MJTK-L2

Hole : MJTK-L3
Machine Model : RASKA30
Elevation : 419.25m
Drilled Length : 374.50m

Site Name : El Akhouat
Period : 2000. 12. 30~2001. 1. 30
Inclination : 70°
Direction : 298°

		Depth						Grade	(ppm	)				Depth	Core
Scale	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%)
	$\geq \leq$	0.60	Overburden												
			Limestone				İ								93.3
}	┯┵┯┵┫		light brownish white, compact,												
]			homogeneous, finely calcite matrix.							1					70.0
5_			weathered and weakly oxicidized,												78.6
<u> </u>	$+_{\Gamma}+_{\Pi}$		limonite and pyrite are scattered,												100.0
]			with pyrite striation and a small amount												100.0
]			of calcite veinlets,							İ					022
}	$T^{\prime}T^{\prime}$		limonite is found in the fissures,												93.3
10			4.60∼4.80m coarsely calcite cement.								1				
								ŀ							000
]									ł		:				93.3
]	1,1,1								ŀ	1					
	ЦЦ				1				İ	İ					007
15							1								86.7
'"]	++++														
٦	<del>, </del>				1										
٦	1-1														100.0
٦	┸┯┸┯┫						Ì								
7															
20							ì		1						100.0
٦							1								
٦															
٦	<u> </u>						1								100.0
٦	4-4-1														
25 –															
٦			•				1								96.7
	$T^{1}T^{1}$				1										
7															
							İ	l			i	1			86.7
30			30.60~32.80m crushed,	}					ł	1					
-	$\perp$				1				1		1				
	$\Gamma_{+}^{\dagger}\Gamma_{+}^{\dagger}$	ĺ		ŀ	l						ļ				96.7
_	<del>                                     </del>							1			ł				<u> </u>
		34.30	Limentana	ł	1										
35 —	+		Limestone light brown∼light brownish gray.		1	ĺ	1		l		1	i			93.3
_			compact, homogeneous, finely calcite		1				l	1	1				
			matrix, weekly weathered, altanating of		1			Ì		1	1				
٦	┸┯┸┯				1			Ì	İ	1					93.3
٦		1	light brown limestone and thin beded		1				i		1			1	
40-			black marl, limonite is found in the	Ì	1			1	ł	l		!			
_			fissures,	İ				l	l		ł				100.0
٦			34.30~34.90m crushed.	1	ĺ			1			1		İ		
-	<u> </u>			!											
				1			.			1		ļ			100.0
45 —		1				İ	1	1	1	1		}			
-											1				
-	<del>                                     </del>	i													93.3
-		48.60		ļ		1							1		
-		1	Limestone		1				1	1			1		
50			grayish white, finely calcite matrix,										1		96.7
-	<u> </u>	1	altanating of grayish white limestone		1			1					1		
-		1	and thin beded black marl,						1		1	1			
-		1	with pyrite striation and calcite-limonite		1		1	1	1				1		100.0
-		1	veinlets∼network.	1	1						1		1		L
55 —	<u> </u>	1	50.50~50.80m				1		1		1				
-		1	limonite-hematite-calcite are found in		1	1	1							1	93.3
-	<u> </u>	1	the fissures,			1	1		1						
	11-1-	ł			1			1	1	1		1	1	1	
-		1	57.80~58.00m coarsely calcite cement,						,	1		i	i	1	100.0

Figure 148 Columnar section of the drill hole, MJTK-L3

Hole : MJTK-L3 Machine Model : RASKA30 Elevation : 419. 25m Drilled Length : 374. 50m

Site Name : El Akhouat

Period : 2000. 12. 30~2001. 1. 30
Inclination : 70°
Direction : 298°

	[	Depth	<b>D</b>				- (	Grade	(ppm	)				Depth	Core
	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)			Mg(%)	Ca(%)	Sr	Ва	(m)	Rec. (%) 100.0
60			Limestone												100.0
-			grayish white, finely calcite matrix,				<b> </b> .			'					100.0
-			homogeneous, partially interbeded with thin beded black marl, with calcite-												
-			(pyrite) veinlets, limonite is found in the												
65 —			fissures,												80.0
-															
_			61.00∼61.20m black marl, 61.30∼61.90m black marl,											,	96.7
_			61.30~61.90m black mari,												90.7
70-	<del>                                     </del>														
-									ĺ						96.7
-										1					
-															
							1								90.0
75 –						İ	1								
		,			Ì					1				Ì	93.3
-							1						i	ļ	00.0
-			·		1			İ			]				
80 -			80.80~80.90m calcite-(pyrite) vein,	İ	ŀ					1					96.7
-	-	81.10		ł						.					
-			Limestone whitish gray, compact, finely calcite					ļ			ļ				
-			matrix, homogeneous, altanating of												96.7
85 -	]		limestone and thin beded black marl,								ļ				
- "			with calcite network~veinlets.		}		١.		-						100.0
-	+	ļ	83.30m calcite-(pyrite) vein (width 2cm),		Ì			}			1				100.0
-			88.80~88.90m					1	İ	İ					
-			with calcite-(pyrite) veinlets (width 3cm),								1			İ	90.0
90-								1					ļ. 1		
-		91.00	Mari	1									1		1000
	]- <u></u> -		gray∼blackish gray. lime mud matrix,								1				100.0
_		1	partially interbeded with dark gray mud-					1							
95-			stone, with calcite veinlets~network,	1				1							100.0
-	<del></del>	1	91.00~91.80m crushed,				1		1.						
-		ł	94.70~95.20m crushed,												
-	====		95.20~96.40m with calcite veinlets.							ì			:		100.0
100-	]===	1	98.80~99.30m												
100-	<u> </u>	1	with calcite veinlets~network,	1											96.7
-	<u> </u>	-	102.00~102.10m with calcite-(pyrite) veinlets,						1						55.7
-	<del> </del>	1	with calcite (pyrite) vernets,	1				1					1	1	
-	<del></del>	1					1								100.0
105-	===	1			İ				Ì						
	1===			1			ł								100.0
1	<u></u>	1													100.0
:		1													<del></del>
110-	ļ- <u>-</u>	1								1	}				96.7
1 .	<del> </del>	1					1					1			
.	<del>-</del>	1													
.	<del> </del> -	1	113.60~113.80m with calcite veinlets,											1	100.0
1	<u> </u>	-									1	}		1	
115	]-[-[	1	116.20m calcite veinlets (width 5cm).										1		100.0
	]	]	117.20m calcite (pyrite) veinlets (width 5cm),							1					100.0
.		1	118.20~118.50m with drusy calcite vein,					1							<b>—</b> —
.		1		1				1							100.0
120			<u> </u>	1		ــــــــــــــــــــــــــــــــــــــ		ь				ــــــــــــــــــــــــــــــــــــــ			ــــــــــــــــــــــــــــــــــــــ

Figure 148 Columnar section of the drill hole, MJTK-L3

Hole : MJTK-L3 Machine Model : RASKA30

Site Name : El Akhouat

Elevation : 419. 25m Drilled Length : 374. 50m

Period : 2000. 12. 30~2001. 1. 30 Inclination : 70° Direction : 298°

	Cel	Depth	Description					Grade	(ppm	)				Depth	Cor
	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec (%)
120			Mari		ļ		1								100.0
-	1		dark gray∼black, lime mud matrix,					1						1 1	
_	[	-	partially interbeded with mudstone.					į	l						100.
-	1	1	with calcite-(pyrite) veinlets~network,	1				1							
-		1	with calcite (pyrite) verifiets Thetwork,	1					ļ						
125 -		1	123.00~128.00m dark gray mudstone,	1					İ				1		100.
-			126.40m calcite veinlets (width 2cm),				1	ļ							
_	<u>├</u>	1 1	128.00m calcite veinlets (width 3cm),	1								-	ł		
_	<u></u>		129.60~129.80m with calcite-(pyrite) vein.	l					l				İ		100
_	<u> </u>	-	120.00 120.00m with balone (pyrite) vent,	1	l		]	j					l		100.
30 –		1 1			l			ļ.	į				ł		
30-		1													
_	}	]	132.70m calcite veinlets (width 2cm),		1		İ								100
-	<b>†_</b>	1						1		i				1	L
-	t	-	133.10~133.50m with calcite-(pyrite) veinlets,	i	į			1							
-	[	1	134.30~135.90m dark gray mudstone,		1				ļ						100
35 -		1		ļ		l	1	i						1	
-	<del> </del>	1		1				ŀ							
-		]													100
-	<del> </del>	1		1										1	
_	[	-		1		İ									<u> </u>
10 -		1 1			١.	l				ŀ					100
_	ļ- <u>-</u>	1 1	141.35~141.50m					ĺ		ĺ					100
_		]	with calcite-(pyrite) network,	1	1			l				i		i i	<u> </u>
_	<u></u>	4	, ,	1	İ		1						İ	i	
	]	-		}			1								100
. <b>-</b>	<u> </u>	1		1			i .								
15 -	1	1		1				ŀ							
-	<b> </b> -	1 !		1	1										100
-	<u> </u>	]	145.20~145.50m dark gray mudstone,		1										
-	<del> </del>		147.00~147.20m with calcite veinlets,												
-	<del>[-</del>	{	147.80~151.40m mostly crushed,	1		}	1			į					100
50 -		1	150.80m calcite-(pyrite) vein (width 7cm),	ļ						İ					
-	<del> </del>	1	153.30~153.70m with calcite network,												
-	<del> </del>	]		1							1				100
_	ŧ_=			1		l									'
-		154.00		-							İ				<del> </del>
5 -	<del> </del>	1	Mari	1		ŀ						ļ			100
_	<b>∤</b>	]	dark gray, lime mud matrix, fossili-	Ì										i	'``
_	<u> </u>		ferous, altanating of black marl and	1		İ	ł								$\vdash$
_	ļ	-	gray limestone, with calcite network∼				1			}					100
_		1 !	veinlets.	1	Ì			ļ						1	100
0 -	<u> </u>	1						Ì				1			
٠_	<u> </u>	]													. ا
_	<u> </u>										1				100
_	[-]-	1	·			1	1			I	l				<u> </u>
	]	1	l												İ
_	<b>]</b>	1 1	164.20m ammonite bearing,				1								100
5 -	<del></del>	]	165.80~168.80m mostly crushed,	ļ		l									
-	†	-					1							1	
-	[	1 1				l	1					ļ			80
-	<u> </u> -	1			İ	•		1			1	1		1	
-		1							1			1		1	
0-	+	]								l				)	53
-	<del> </del>														
-		171.90	Limestone	1			1							1	
-		-					l					}			46
-		1	light brownish white, compact, finely	1	1			1							📆
5 -	╂┲┵┯┵	1	calcite matrix, lamina is recognized,			ĺ	1							1	<u> </u>
٠_		]	with pyrite striation and calcite veinlets~												
_	H	1	network,		1	l		1		1			{		13.
-		}	174.90∼175.10m sphalerité network,	1									1		<u> </u>
-		1	178.40~180.80m calcite-(pyrite) veinlets with	1	l	l				1					66.
-	1 1 1	1	a trace amount of galena,	I	1	l	1	1	l	l	!	l	1	I	ەن ا

Figure 148 Columnar section of the drill hole, MJTK-L3

: MJTK-L3 Hole Machine Model: RASKA30

Site Name : El Akhouat
Period : 2000. 12. 30~2001. 1. 30
Inclination : 70°

Elevation : 419. 25m Drilled Length : 374. 50m

: 298° Direction

		Depth						Grade	(ppm	).				Depth	Core
Scale	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)		_	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec.
180			Limestone						-					,	66.7
_		ŀ	light brownish white∼light brownish gray.												
_			compact, finely calcite matrix, partially						]						100.0
_			• • •												
_	┟┷┷┪		interbeded with thin beded black marl,				ļ		İ					l 1	
185 -			lamina is recognized, with pyrite striation						]						100.0
_			and calcite veinlets∼network, pyrite are	ł											
_			scattered,			l								ŀ	
_			181.20~181.40m				1								90.0
_	┠┷┰┷┰┪		with calcite network~veinlets.												90.0
100			182.70m	1											
190	<del>┞┈┈</del> ┤		calcite-pyrite veinlets (width 3cm).	ļ			İ			1					
-			•		1	1	ļ								76.7
-			187.80~190.40m, 192.80~193.80m			[			ŀ						
-	<b>┧</b> ┷┯┷┯┤		mostly crushed, calcite-pryite network,			1			1	Ì	'		·		
-			192.70m	ĺ	i				Į	ŀ			ļ		93.3
195 –	╅┯┸┰┸		calcite-(pryite) veinlets (width 5mm) with a	1	1			i				1	ļ		
-			trace amount of galena,			ĺ									
-	╂		198.40~201.60m	1		1						1			100.0
-	$\Pi$		calcite-pyrite vein~network with a trace											i	
_			amount of sphalerite and galena,						1	1					
200 -	<del>┋┍┸┍┸</del>			!									ĺ		86.7
_ ا			202.00~203.40m	1											00.7
_	┟╵┰╵┰		with calcite-(pryite) veinlets,	ļ			1			Ì	ļ	l			<del></del>
_ ا	耳耳			İ	1	ŀ	1						i	l	100.0
		204.00		_		1	1	}	1						100.0
		204.00	Brecciated zone	1		ļ					ł				
205 -			dark gray∼blackish gray, black mud	1		1				-		1		l	
-			and pyrite matrix, brecciaes are com-	1	1							l			90.0
-		ĺ	posed mainly of Cretaceous and Triassic		İ.				]						
-	\[ \frac{1}{2} \frac{1}{2} \]	ĺ	carbonate rocks (brecciaes are as much			Ì				İ			1		
-	4 4		as 2-20cm in diameter),	1											73.3
210-	<u> </u>			1			l					1			
-			209.60m	l		Ì			:			l	İ		
-	1		limestone breccia with calcite-pyrite-				1			1					73.3
-			(sphalerite) veinlets.						1				}	1	
-			212.30~214.20m									-			
215-			contains brownish gray limestone breccia						l		İ			1	76.7
١.		İ	with small amounts of celestite.	ļ											'0.,
_ ا	A	216.70		┨											
_	^ ^		Gypsum-Carbonate rocks complex											1	100.0
	\ \ \ \		whitish gray∼gray, gypsum-calcite matrix,	1	İ						1				100.0
- مم	<b>1</b> ^		brecciated (brecciaes are composed mainly	1						1			1	i	
220 -	1^ ^		of Cretaceous limestone and Triassic cart	4	1					ł					
-	1. ^ .	ļ	nate rocks), dolomitized,		İ	İ	1			1			1		100.0
-	┪^_、^		218.10~220.00m mussive gypsum,		1	1	1		1	1			1		
-	1, ^ ,		210.10 - 220.00m massive gypaum,				i								
-	1 ^ ``			1	1	1		1	1	1	1				100.0
225 -	$\forall \lambda $	ļ			1		1			1	1				
-		226.50		1		İ								1	
-	^ ^	220.00	Gypsum-Mudstone-Carbonate rocks complex		1				1	1		1			63.3
-	┥、^、		purpule~purpulish gray brecciated	1			1		1	1	1				1
١.	<b>-</b>  ^_^	1	(brecciaes are composed mainly of Triass	i	1	i	Ì	1	1						<u> </u>
230-			limestone, dolomite and calcareous mud-		1			1	1						86.7
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		stone), with gypsum vein,			1		1	1						30.7
	^ ^		atone/, with gypouth veill,		1			1	1			1	1		<b></b>
	].^.			1	ŀ	1		1	1				1		
-	4	233.30	Mudstone-Gypsum-Carbonate rocks complex	1	1				1	1	1				80.0
-			I		1				1	1		1			<u> </u>
235 -	1		grayish white~pale greenish white.				1							1	1
-	۱,^,		brecciated (brecciaes are composed mainly										1	1	86.7
-	<b>┤</b>		of Triassic limestone, dolomite and calca	1	1			1	1	1		1		1	<u></u>
-	- ^		reous mudstone), with gypsum vein,					1	1	1	1				4
-	_ ^					1		1							100.0
240	I ^ ^			<u> </u>		ــــــــــــــــــــــــــــــــــــــ		1	1		Ь	<u> </u>			L

Figure 148 Columnar section of the drill hole, MJTK-L3

Site Name : El Akhouat Period : 2000, 12, 30~2001, 1, 30 Inclination : 70°
Direction : 298°

Hole : MJTK-L3 Machine Model : RASKA30 Elevation : 419. 25m Drilled Length : 374. 50m

Scale	Column	Depth	Description					Grade			G (6)			Depth	Core Rec.
240	Λ Λ	(m)		Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	(%) 100.0
	^ ^		Mudstone-Gypsum-Carbonate rocks complex light greenish white, brecciated (brecciaes are composed mainly of calcareous sandstone, mudstone, limestone and												100.0
245—	^ ^ ^ ^		dolomite, with gypsum vein∼veinlets,												100.0
	^ ^														100.0
250 —	^ ^ ^ ^														100.0
255—	^ ^ ^ ^														100.0
-	^ ^ ^ ^														100.0
260 —	^ ^	260.80	Dolomite-Gypsum-Mudstone complex												93.3
	^ ^ ^ ^		gray~blackish gray, strongly dolomitized and pyritized, brecciated (brecciaes are composed mainly of dolomite, calcareous												100.0
265	^ ^ ^ ^		sandstone and mudstone, with gypsum vein~veinlets, contains hydrozincite,												100.0
270-	^ ^ ^		267.40~268.40m contains pyrite crystal,												100.0
-	^ ^	271.80	Mudstone-Gypsum-Carbonate rocks complex pale green~gray, brecciated (brecciaes												100.0
275 —	^ ^ ^		are composed mainly of mudstone, dolomite and calcareous sandstone, with gypsum vein~veinlets, contains												100.0
280 —	^ ^		hydrozincite,												100.0
-	^ ^ ^ ^														100.0
285 —	^ ^ ^ ^														100.0
-	^ ^ ^ ^														100.0
290 —	^ ^ ^ ^		291.80~292.80m wholly crushed,												100.0
205 -	^ ^		294.80~296.20m massive gypsum,												53.3
295 — —	^ ^ ^														100.0
_	^ ^	298.90	Mudstone-Carbonate rocks-Gypsum complex												100.0

Figure 148 Columnar section of the drill hole, MJTK-L3

Hole : MJTK-L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

Site Name: El Akhouat
Period: 2000. 12. 30~2001. 1. 30
Inclination: 70°
Direction: 298°

		Depth						Grade	nnm	)	-			Depth	Core
Scale	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)			, Мg(%)	Ca(%)	Sr	Ва	(m)	Rec.
300			Mudstone-Carbonate rocks-Gypsum complex	<del></del>	† · · · · · ·	<u>ٽٽ</u>	- 3()		<del>                                     </del>		22(3)	<del></del>		,,,,,	(%) 100.0
-	^ ^													i	
-	^ ^ ^		dark gray, gypsum cement, brecciated	}						1					83.3
_	٨٨		(brecciaes are composed mainly of	İ			l								
	^		dolomite and limestone),	l	Ì	ŀ								. }	
305	Λ Λ			Ī	1	l	l	ļ						1	70.0
303	. ^ .			ŀ		ŀ	İ								73.3
-	^ ^ ^			İ	ŀ	l	l								
-	^ ^	007.00		l		ŀ									
-	^	307.80	Gypsum-Mudstone-Carbonate rocks complex	]		•									96.7
_	Λ Λ		dark gray∼gray, brecciated (brecciaes are												
310 -	Λ		composed mainly of dolomite, mudstone,												
_	Λ Λ		·	l			i	1							100.0
_ ا	. ^ .		calcareous sandstone and Ccretaceous												100.0
_ ا	\		limestone), dolomite matrix and gypsum				i	i					i		
	١, ^ , ا		cement,		ŀ				ŀ		}		l		400.0
	^ ^ _				1		1						ĺ		100.0
315 —	^ ^						1		1						
-	^ ^ ^									ĺ				1	
-	Λ Λ				İ					į		l			100.0
-	^	1					1								
-	Λ Λ		*	1		1									
320 -	l. ^ .				1		İ								100.0
_	<b> </b> ^ ^ ^			1								i			100.0
_	<b> </b> ^^^			1											
_	^ ^ ^			1			ļ								1000
	^ ^	l						i	ŀ						100.0
l <sup>-</sup>	^								ļ						
325 -	Λ Λ			1		1									
-	^			1	İ										100.0
-	^ ^								İ						
-	. ^ .				1		į								
-	<b> </b> ^			1		1									100.0
330 -	\ ^ \				1										
_	^						l		Ì						
_ ا	\ \ \					Ì									100.0
l _	_ ^			İ						1					100.0
	Λ Λ	}				l									
l		334.20	Brecciated zone	1										l i	
335 -	<u> </u>				İ			ĺ							100.0
-			dark gray~gray, brecciaes are composed	1			1				1	1			
-		}	mainly of marl and limestone (with calcite	1	1	1			İ	İ					
-			pyrite veinlets∼network), marl matrix,	1		l	1	l	į						76.7
-				ł	1						İ				
340-	-			1	1										
-	<u> </u>				1						Ì				83.8
_ ا		341.40	Limestone	1	1	1		l						i '	00.0
_	<del>╟┯└</del> ┯	ł	gray~brownish gray, finely calcite matrix,		1										
_	1	l			1		1		1		ł				667
345			partially interbeded thin beded black marl,		1	1		1							66.7
343-		]	with calcite-pyrite veinlets~network,	ļ		ŀ	1					1			
-	1	1	341.50~341.70m		1				1						
-		ł	with calcite-pyrite-sphalerite veinlets,		1	l	1						1		100.0
-		1					1	1	1	1	1				
-	$H^{\perp}$	-	342.40~342.80m		1		1				1		1		100.0
350 ~	<del> </del>	1	with calcite-pyrite-sphalerite veinlets,				1				1		1		
-	$\mu_{\tau}$	ł	348.70m calcite vein (width 5cm),		1	1		1				İ	1		100.0
-		1	351.70m			1	1	i			1				
۔ ا	+		calcite-massive pyrite vein (width 50cm),			ł					ł	i			46.7
	广广	1			1	1									46.7
	$\mu_{+}$	1	355.90∼356.50m		1	1	1				1	1			
355 -		1	with calcite-pyrite vein,	1			1			1			ŀ		
-	┨┰┵┯┸	1	358.80~359.00m with calcite veinlets,						1			}			100.0
-		1	1												
-	╂┸┯┷╤	ł	360.30~360.80m with calcite vein,						1	1		1			
1 -		1							1				-		100.0
					1	1	1	ı	1	1	ı	1	i		

Figure 148 Columnar section of the drill hole, MJTK-L3

Site Name : El Akhouat
Period : 2000. 12. 30~2001. 1. 30
Inclination : 70°
Direction : 298°

Hole : MJTK-L3
Machine Model : RASKA30
Elevation : 419. 25m
Drilled Length : 374. 50m

		Depth						Grade (	ppm)	)				Depth	Core
	Column	(m)	Description	Pb	Zn(%)	Cu	Fe(%)			Mg(%)	Ca(%)	Sr	Ba	(m)	Rec. (%)
360			Limestone												100.0
_	++		gray∼brownish gray, finely calcite matrix,												100.0
4	$I_{\perp}I_{\perp}$		partially interbeded thin beded black												100.0
4	ПH		marl, with calcite−pyrite veinlets∼network,				ļ								
65 –															53.3
٦			361.20~363.40m sheared zone,	ĺ			l								
			366.80∼367.00m contains massive pyrite,	İ											
4							1					:			43.3
70-J														1	66.7
-														}	-
-		372.80													61.1
٦	Λ . Λ	072.00	Mudstone-Carbonate rocks complex	İ											100.0
,5	^	374.50		<b></b>	$\vdash$		<del>                                     </del>								
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Figure 148 Columnar section of the drill hole, MJTK-L3

Hole : MJTK-L4
Machine Model : RASKA30
Elevation : 487, 53m
Drilled Length : 400, 00m

Site Name : El Akhouat
Period : 2001, 2, 5~2, 27
Inclination : 60°
Direction : 118°

			Length : 400.00m											<u> </u>	0
Scale	Column	Depth (m)	Description	Pb	Zn	Cu		irade ( Mn			Ca(%)	Sr	Ba	Depth (m)	Core Rec. (%)
<del> </del>	J , J		Limestone		2.11	Cu	F e(n)	IVIII	Cu	IVIE(A)	Ca(n)	31	Da	- (111)	66.7
-			gray, compact, finely calcite matrix,				ĺ								00.7
_			weathered, with calcite-(pyrite) veinlets,												38.9
			limonite is found in the fissures,								:				
5-					İ										53.3
-			•												
-										ļ					F0.0
-								ŀ							53.3
10-		11.00								ŀ					76.7
_			Limestone												
-		}	yellowish brown, weathered, altanating				İ			İ					
-	<del>                                     </del>		of limestone and marl, with calcite-hema												80.0
15-			tite veinlets~network and pyrite striation.  limonite is found in the fissures.		Ì							ŀ			
-			informe is found in the heading,	ļ				ļ							80.0
_		1													00.0
		]								İ		Ì			
20-					ł	1									66.7
-	+++												Ì		
-		1 1													00.7
-															66.7
	1														
25 -		]				i									66.7
_															
-	-	1 1													
-		]													96.7
30 -		27.90	Limestone	1											
-		1	light gray~gray, argillaceous, altanating												86.7
-	1	1	of limestone and marl, crack dominant,												00.7
		i i	limonite is found in the fissures,												
35 -												Ì			66.7
-											]				
-		]													00.0
-				1		1									23.3
40-		39 00	Limestone	1		1									
40-			brownish gray∼gray, finely calcite matrix,												83.3
-			with calcite veinlets~network and pryite		ļ										
-			striation, limonite is found in the fiss-												
-	++		ures.							1					83.3
45 -		1 1	46.30m calcite vein (width 2-3cm),										İ		
-			46.70m calcite vein (width 5cm) with a									1	[		100.0
1 -	<del>╏</del> ┸╬┸╬		trace amount of galena,		1						1		Ì		
-	鬥	48.80	Limestone	1		]				l					
50-	╁┸┼┸		light brownish gray∼light gray, finely					}		-		1	ļ		90.0
-		51.40	calcite matrix,					1							
1 -			Breciated zone		1			ł					1		70.0
-			brecciaes are composed mainly of lime-		1					1					, 0.0
55-			stone, calcite and limonite, with oxici- dized vein,												
"-	4 - 4			ł		1									46.7
-	╁┸┼┸┼		Limestone  hrownish gray~gray finely calcite matrix												
-	<del></del>		brownish gray~gray, finely calcite matrix, with calcite veinlets~network and pryite										1		067
		]	striation,				}								96.7
<u> 60</u>	11.1.		<u> </u>	<u></u>	1	—-	٠	Ь					·		

Figure 149 Columnar section of the drill hole, MJTK-L4

Hole : MJTK-L4 Machine Model : RASKA30 Elevation : 487, 53m Drilled Length : 400, 00m

Site Name : El Akhouat Period : 2001, 2, 5~2, 27 Inclination : 60°

Direction : 118°

		Dooth				•	G	rade (p	nm)					Depth	Core
Scale	Column	Depth (m)	Description	Pb	Zn	Cu	Fe(%)			Mg(%)	Ca(%)	Sr	Ba	(m)	Rec.
60		(m)								*****		<del></del>	-		(%)
- "			Limestone	i	ł		1					1	ł	l	400.0
-		]	brownish gray~gray, finely calcite matrix.	-	i		.		1				- 1		100.0
_		1	with calcite veinlets~network,		l					1				L	
_		1	limonite is found in the fissures,										Ì		
05		1	62.20m calcite vein (width 10cm),	l						- 1		1	1	i	90.0
65 —	$\prod$			İ					l			l	i		
_			67.10m calcite veinlets (width 3cm).	ĺ					ł			1		Ī	
-			68.00m calcite veinlets (width 2cm),	I					i			l			100.0
-		1			]						ŀ		- 1		
-	十二二	1									1	l	- 1		
70 -		1							1	ŀ					100.0
-		1	71.80~72.00m with calcite-(pyrite) vein,	1					l	- {	1	ļ	ł	l	100.0
· -	┢╍┼╍┼	71.80	1.										l		
_		1	Limestone										l	ļ	
_		1	light gray~light brownish gray, alta-						.		-		ŀ	- 1	100.0
75		1	nating of limestone and very thin beded		ľ									1	
/5-		1	black marl, with calcite veinlets∼net−										- 1	ſ	
l -	H	}	work and pyrite striation,								i			-	100.0
-		1	74.20 ~ 74.90 m. calaita naturali with a											. 1	
-	<del>                                     </del>	1	74.30~74.90m calcite network with a										1	<u> </u>	
-	1	1	trace amount of galena,												100.0
80 -		1	77.50~82.70m												. 50.0
-		1	calcite veinlets∼network dominant.			1									
-		1													4000
-		-													100.0
١.		1													
85-		1													
"		4							'						100.0
•		1													
-		1													
٠ .		Ⅎ					1								100.0
-	17171	-	·												
90 -		7					1								
-	<del></del>	7	91.50m calcite vein (width 20cm),	1								·			100.0
-	++++	1	92.90m calcite vein (width 3cm) with a				1					i			100.0
-		1	trace amount of sphalerite,							'					
١.		1	·			1									
95-		1	95.30~95.70m calcite veinlets with a trace						i						93.3
Ι.		_	trace amount of galena,											ł	
		1	_												
	$\mathcal{V}_{\mathcal{V}}$	-	96.70~97.80m calcite veinlets dominant,					ł							80.0
•		}	98.90~99.30m calcite vein (width 20cm).									İ			
-		99.30		i		1	1				l				
100 -	1	1	Limestone					]	1	l					100.0
! .		1	brownish gray~gray, altanating of		1		1				l				
		d	limestone and very thin beded marl,	1			1	l						l '	
-		Н	with calcite veinlets and pyrite striation,					1	}		1			1	100.0
.		A	106.70m calcite vein,			1	1		1						100.0
105	4.7.	Ä	106.90m calcite vein with a trace amount	1				]							ļ
Ι.		7	of galena,			1							ļ	1	
.		Ä		1	1		1								100.0
1		1	109.20~110.00m calcite-(barite)-(galena)		1				<b> </b>	ļ		1	1	1	
		4	matrix,			<u> </u>	<u> </u>	ļ	<u> </u>		<u></u>		<u> </u>	109.10	
l'		4	113.00~113.30m brecciated, calcite-(barite)	2338.2	371.9	8.63	1.09	1599	2.63	0.30	31.0	1268.8	20000	110.10	93.3
110-		4	matrix with a small amount of galena,	6732.9	553.1	21.9	1.72	1217	<2.0	0.86	22.8	1397.7	20000	1	1
'	<b>-</b>	4	113.80m calcite-(galena) network,	379.27	216.3	22.8	0.72	2222	<2.0	0.20	20.0	2175.7	20000	111.10	
'	+	4	114.40m calcite-(galena) veinlets (width 1cm),	704.09	511.7	5.61	0.69	1183	<2.0	0.22	19.2	1797.1	20000	112.10	100.0
.	+	Ц	<u> </u>	1713.5	1657	8.42	0.91	1853	5.14	0.29	27.5	1917.0		113.10	130.0
.	-	d	115.60m calcite-(galena) veinlets (width 1cm),								}			113.70	ļ
115	-	Д	117.30m calcite veinlets with a trace	1					1						
		Н	amount of galena.	1		1									100.0
1	J.	$\exists$	119.30m calcite vein,	1		1				1			1		L
'	上二	Ħ	119.50m calcite vein with a trace amount			1						1		1	
'		#	of galena,	1											100.0
120	1	#				1_		<u>L_</u> .	<u></u>	<u>L</u>	<u>L</u>				
120		ч	A												

Columnar section of the drill hole, MJTK-L4 Figure 149

Hole : MJTK-L4
Machine Model : RASKA30
Elevation : 487, 53m
Drilled Length : 400, 00m

Site Name : El Akhouat Period : 2001. 2. 5~2. 27 Inclination : 60° Direction : 118°

Description			Depth					G	rade (p	(mag					Depth	Core
Limestone prownish gray~gray, argillaceous, with calcite veinlets and pyrite striation.  123 00 calcite veinlets and pyrite striation.  123 00 calcite veinlets and sphalerite, 123 00 124 00 calcite-(pyrite) vein with a trace amount of galena and sphalerite, 126 80 - 127 20 milet with a small amount of sphalerite and galena, 128 10 - 128 20 calcite veinlets with a trace amount of sphalerite and galena, 128 10 - 128 20 calcite veinlets with a trace amount of sphalerite, 137 0 - 138 30 m calcite veinlets with a trace amount of sphalerite, 137 0 - 138 30 m calcite veinlets with a trace amount of sphalerite, 137 0 - 138 30 m calcite vein with a trace amount of sphalerite, 137 0 - 138 30 m calcite veinlets with a trace amount of sphalerite, 137 0 - 138 50 m calcite vein with a trace amount of sphalerite, 138 0 - 138	Scale	Column		Description	Pb	Zn	Cu				Mg(%)	Ca(%)	Sr	Ва	(m)	Rec. (%)
105	120			Limestone									1		Ī	
1219				brownish gray~gray, argillaceous, with			ĺ							l		100.0
of galena and schalerite.  122 80°-122 30m calcite-fypyrite) vein with a trace amount of galena and sphalerite.  128.80°-127 30m calcite vein with a small amount of sphalerite and calonate professor calcite-typyrite veinlets with a small amount of sphalerite and calonate professor calcite vein with a trace amount of sphalerite.  132.20  Marl dark gray, calcareous, lime mud matrix, with calcite veinlets retwork, 137.70°-138.90m calcite vein with a trace amount of sphalerite.  133.80  Limestone light brownish gray~prownish gray, finely calcite matrix, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with calcite veinlets retwork, with a trace amount of galena.  152.20 ~ 152.70m with calcite vein retwork, with a trace amount of galena, 155.50 ~ 154.70m calcite-fypyrite) vein retwork with a trace amount of galena, 155.50m calcite-fypyrite) vein retwork with a trace amount of galena, 157.80m calcite-fypyrite) vein retwork with a trace amount of galena, 157.80m calcite-fypyrite) vein retwork with a trace amount of galena, 157.80m calcite-fypyrite) vein retwork with a trace amount of galena, 157.80m calcite-fypyrite) vein retwork with a trace amount of galena, 157.80m calcite-fypyrite) vein retwork with a trace amount of galena, 157.80m calcite-fypyrite) vein retwork and professor and retwork with a trace amount of galena, 157.80m calcite-fypyrite) vein retwork and professor and retwork and professor and retwork and professor and retwork and professor and retwork and professor and retwork and professor and retwork and professor and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and retwork and	ال			1-2	. 1		l									
102-90-124.20m calcite-(pyrite) vein with a trace amount of galena and sphalerite. 128 80-127.30m calcite-pyrite veinlets with a small amount of sphalerite and galena. 128.10-128.30m calcite veinlets with a trace amount of sphalerite. 132.70 Mark gray. calcareous. lime mud matrix, with calcite veinlets—retwork. 137.70-138.90m calcite vein with a trace amount of sphalerite. 148.80 Limestone light brownish gray—brownish gray. finely calcite matrix, with calcite veinlets—retwork and pyrite striation. Mark dark gray. calcareous. lime mud matrix, with calcite veinlets—retwork with calcite veinlets—retwork. 152.30-152.70m with calcite veinlets with a trace amount of galena. 152.80-154.70m calcite vein-veinlets. 154.50-154.70m calcite vein-veinlets with a trace amount of galena. 157.60m calcite-pyrite matrix, 156.40-156.70m calcite pyrite matrix, 156.40-156.70m calcite vein matrix, 156.40-156.70m calcite vein matrix, 156.40-156.70m calcite vein matrix, 156.40-156.70m calcite vein matrix, 156.40-156.70m calcite vein matrix, 156.40-156.70m calcite vei	_				ı İ	}	Ì						ŀ		i	100.0
trace amount of galens and sphelerite, 128 80~127.30m calciter-pyrite veinlets with a small amount of sphalerite and galens. 128.10~128.30m calcite veinlets with a trace amount of sphalerite.  Mard dark gray. calcareous, lime mud matrix, with calcite veinlets rework, 137.70~38.90m calcite vein with a trace amount of sphalerite.  Limestone light brownish gray—brownish gray, finely calcite matrix, with calcite veinlets rentwork and pyrite striation.  Mard dark gray. calcareous, lime mud matrix, with calcite veinlets rentwork and pyrite striation.  Mard dark gray. calcareous, lime mud matrix, with calcite veinlets rentwork, with calcite veinlets rentwork, 154.50~154.70m calcite veinlets with a trace amount of galena.  159. 150. 150. 150. 150. 150. 150. 150. 150	125 —			_		ŀ										100.0
130   132   133   134   135   135   135   137   139   840   0.55   300   891.5   200000   130   137   135   137   139   840   0.55   300   891.5   200000   130   137   135   137   139   840   0.55   300   891.5   200000   130   137   135   137   139   840   0.55   300   891.5   200000   130   137   135   137   135   137   139   130	لـ				. 1	ŀ	l						ł	l		
calcite-pyrite veinlets with a small amount of sphalerite and galona.  128.10-128.30m calcite veinlets with a trace amount of sphalerite.  Medidak gray, calcaraous, lime mud matrix, with calcite veinlets veinlets with a trace amount of sphalerite.  Limestone light brownish gray—brownish gray. finely calcite matrix, with calcite veinlets veinlets veinlets with calcite veinlets veinlets with calcite veinlets veinlets with calcite veinlets vei	-			_	. 1			1				1				100.0
100	_				1								}	1		
122.00   128.10 - 128.30   128.10 - 128.30   128.10   128.10 - 128.30   128.10   128				· -	i l	İ		İ								
132.20   Marl   dark gray. calcareous, lime mud matrix, with calcite veinieta~network.   137.70~138.90m calcite vein with a trace amount of sphalerite.     138.80	130 -			128.10∼128.30m calcite veinlets with a	i l		ĺ		ļ					ľ		100.0
Mar    dak gray, calcareous, lime mud matrix, with calcite veinlets~network,   137,70~138,90m calcite vein with a trace amount of sphalerite,   138,80	_		122 20	trace amount of sphalerite.		ļ							İ		1	
with calcite veinlets~network.  137.70~138.90m calcite vein with a trace amount of sphalerite.  Limestone light brownish gray~brownish gray, finely calcite matrix, with calcite veinlets ~network and pyrite striation.  Marl dark gray, calcarsous, lime mud matrix, with calcite veinlets~network.  152.30~152.70m with calcite vein~veinlets. 154.50~154.70m calcite vein~veinlets with a trace amount of galena.  155	_			Marl		Ì						i				06.7
137,70~138,90m calcite vein with a trace amount of sphalerite.   Limestone light brownish gray-brownish gray, finely calcite matrix, with calcite veinlets ~network and pyrite striation.   Marl dark gray, calcareous. lime mud matrix, with calcite veinlets ~network, with calcite veinlets ~network,   152,30~152,70m with calcite vein~veinlets, 154,50~154,70m calcite vein~veinlets with a trace amount of galena.   159,20~160,40m brecciated, excidized, wholly crushed, calcite-pyrite matrix, 160,40~164,90m calcite-(pyrite) vein~ network with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.   167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.   167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.   167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, 167,50m calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm) calcite-(pyrite) vein(width 3cm)	-	<del></del>			1 1	İ						1				86.7
138.50   Limestone   light brownish gray~brownish gray, finely calcite matrix, with calcite veinlets ~network and pyrite striation.   Marl dark gray, calcareous, lime mud matrix, with calcite veinlets ~network.	135 —	<del> </del> -		with calcite veinlets~network,	i !							1			1	
138.80   Limestone   light brownish gray~brownish gray, finely calcite matrix, with calcite veinlets ~network and pyrite striation.     143.30   MarI   dark gray, calcareous, lime mud matrix, with calcite veinlets ~network.     152.30~152.70m with calcite veinlets swith a trace amount of galena.     159.20~160.40m brecciated, oxcidized, wholly crushed, calcite-pyrite matrix, 150.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.     167.80m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.     172.80   Limestone	_		}	137.70∼138.90m calcite vein with a trace								-				100.0
143	_	1	1	amount of sphalerite,								l				
143.30   light brownish gray~brownish gray, finely calcite matrix, with calcite veinlets	_	]	138.80					ľ								
finely calcite matrix, with calcite veinlets ~network and pyrite striation.  Marl dark gray, calcareous, lime mud matrix, with calcite veinlets ~network.  152.30~152.70m with calcite vein~veinlets, 154.50~154.70m calcite vein~veinlets with a trace amount of galena.  155 ——————————————————————————————————	140-		1									Ì				100.0
143.30  Marl  dark gray, calcareous, lime mud matrix, with calcite veinlets ~ network.  152.30 ~ 152.70m with calcite vein ~ veinlets, 154.50 ~ 154.70m calcite vein ~ veinlets with a trace amount of galena.  159.20 ~ 160.40m brecciated, oxcidized, wholly crushed, calciter-pyrite matrix, 160.40 ~ 164.90m calcitet-pyrite matrix, 160.40 ~ 164.90m calcitet-pyrite matrix, 160.40 ~ 164.90m calcitet-pyrite matrix, 160.40 ~ 164.90m calcitet-pyrite matrix, 160.40 ~ 164.90m calcitet-pyrite) vein ~ network with a trace amount of galena,  167.80m calcitet-(pyrite) vein (width 3cm) with a trace amount of galena,  172.80  Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barkter-calcitet-(pyrite) / (galena) veinlets ~  172.80  Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barkter-calcitet-(pyrite) / (galena) veinlets ~  173.50  173.20  173.20  173.20  173.20  174.20  175.2	-		]	_												
14330   Marl   dark gray, calcareous, lime mud matrix, with calcite veinlets~network,	-	╂┸┼┸╬	1	-												100.0
152	-		143.30													100.0
with calcite veinlets~network.  152.30~152.70m with calcite vein~veinlets. 154.50~154.70m calcite vein~veinlets with a trace amount of galena.  159.20~160.40m brecciated, oxcidized, wholly crushed, calcite-pyrite matrix, 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena, 167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena,  172.80  Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~  173.20  446.3 2549.5 15.6 1.37 1339 8.40 0.56 30.0 891.6 220000 174.20 175.0 133.1 1	-	<del> </del>		l e e e e e e e e e e e e e e e e e e e												
152.30~152.70m with calcite vein~veinlets. 154.50~154.70m calcite vein~veinlets with a trace amount of galena.  159.20~160.40m brecciated, oxcidized, wholly crushed, calcite-pyrite matrix, 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  172.80  Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~  173.20	145 –		4	1												100.0
152.30~152.70m with calcite vein~veinlets. 154.50~154.70m calcite vein~veinlets with a trace amount of galena.  159.20~160.40m brecciated. oxcidized. wholly crushed. calcite-pyrite matrix. 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  172.80  Limestone brownish gray. argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~	-	<u> </u>	1	With calcite veinlets hetwork,												
152.30~152.70m with calcite vein~veinlets. 154.50~154.70m calcite vein~veinlets with a trace amount of galena.  159.20~160.40m brecciated. oxcidized. wholly crushed. calcite-pyrite matrix. 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  172.80  Limestone brownish gray. argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~	_		}													
152.30~152.70m with calcite vein~veinlets. 154.50~154.70m calcite vein~veinlets with a trace amount of galena.  159.20~160.40m brecciated. oxcidized. wholly crushed. calcite-pyrite matrix. 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  172.80  Limestone brownish gray. argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~	_	<u> </u>	:													100.0
154.50~154.70m calcite vein~veinlets with a trace amount of galena.  159.20~160.40m brecciated. oxcidized. wholly crushed. calcite-pyrite matrix. 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  165 ————————————————————————————————————	150-	<u> </u>	1													
159.20~160.40m brecciated, oxcidized, wholly crushed, calcite-pyrite matrix, 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena, 167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~	-		]	152.30∼152.70m with calcite vein∼veinlets,												100.0
159.20~160.40m brecciated, oxcidized, wholly crushed, calcite-pyrite matrix, 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena,  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena,  170	-		-	154.50∼154.70m calcite vein∼veinlets with												100.0
159.20~160.40m brecciated, excidized, wholly crushed, calcite-pyrite matrix, 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena, 167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, with a trace amount of galena.  172.80 Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~ 1131.1 2776.2 15.0 1.53 907.6 650 1.00 29.0 780.8 200000 173.2	-	t	1	a trace amount of galena,												
159.20~160.40m brecciated, oxcidized, wholly crushed, calcite-pyrite matrix, 160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena, 167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena, with a trace amount of galena.  170	-	1==-	}													100.0
wholly crushed. calcite-pyrite matrix.  160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  170	155-	1														
wholly crushed. calcite-pyrite matrix.  160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  170		]:	1					İ								
wholly crushed. calcite-pyrite matrix.  160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  170			1					ĺ								73.3
wholly crushed. calcite-pyrite matrix.  160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  170	-	-														
160.40~164.90m calcite-(pyrite) vein~ network with a trace amount of galena.  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  170	160-	<del> </del> -	1	159.20~160.40m brecciated, oxcidized,				ļ	Ì							86.7
network with a trace amount of galena,  167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena,  170	-	<del>[</del>	1	wholly crushed, calcite-pyrite matrix,				1	l							00.7
167.60m calcite-(pyrite) vein(width 3cm) with a trace amount of galena.  Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~  173.20 1	-	[-]-	1		ļ '											
with a trace amount of galena.    170	-	<b>1</b>	1	network with a trace amount of galena,					]							93.3
with a trace amount of galena.    172.80	165-	<u> </u>	]	167.60m calcite-(pyrite) vein(width 3cm)												
Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~    172.80			-]	with a trace amount of galena.												
Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~    172.80	.	<u> </u>	4	·												100.0
Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~    172.80	.	<del>[</del>	3								1					ļ
Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~    172.80	.	<del>[</del>	-			1			1							100.0
Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~    175	170-	<del> </del>	=				1									100.0
Limestone brownish gray, argillaceous, interbeded with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~    175	-	<u> </u>	172 80		1	ł									1	
with black thin beded mudstone, with barite-calcite-(pyrite)-(galena) veinlets~    446.3   2549.5   15.6   1.37   1339   8.40   0.56   30.0   891.6   20000   174.20   175.20	•		d											<u> </u>	172 20	90.0
with black thin beded mudstone. With barite-calcite-(pyrite)-(galena) veinlets~   1131.1   2776.2   15.0   1.53   907.6   6.50   1.00   29.0   780.8   20000   175.20		++	4	l .	446.3	2549.5	15.6	1.37	1339	8.40	0.56	30.0	891.6	20000	ıl .	
	175		9		1131.1	2776.2	15.0	1.53	907.6	+	1.00	29.0			175 20	
176.20	.	H	4		734.9	1059.0	15.0	1.07	1213	2.95	0.81	39.5			176.20	90.0
1349.4 1285.0 4.94 2.19 2703 3.83 1.28 39.0 785.6 20000 177.20		╁┸┼┸	H	network,	<del></del>	<del></del>	<b>├</b>		+	+	-				177.20	
174.00m calcite-pyrite vein with a trace 455.2 1006.2 9.76 0.98 792.1 < 2.0 0.69 35.0 718.4 20000 178.20 174.5 1790.5 11.8 0.94 960.8 < 2.0 0.67 32.0 1013.7 20000 178.20		1	Ä			<del></del>	-	+		+	+	-	——		178.20	100.0
amount of galena, 2105.4 2061.1 10.0 0.27 2378 4.15 2.15 31.0 590.2 220000 179.20	180		3	amount of galena,	2105.4		10.0	0.94	2378	4.15	2.15	31.0	I .		170 20	1

Columnar section of the drill hole, MJTK-L4 Figure 149

Hole : MJTK-L4
Machine Model : RASKA30
Elevation : 487.53m
Drilled Length : 400.00m

Site Name : El Akhouat Period : 2001. 2. 5~2. 27

Inclination: 60° Direction: 118°

Part   Part			Depth			-		(	arade (	ppm)					Depth	Core
1822   1822	Scale	Column		Description	Pb	Zn	Cu			_	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec.
182   Mart   M	180			Limestone	662.1	2201.4	123	-	_			=	745.6	>20000	180.20	
18-2   Mart   dark gray partially brecciated.   barita-calcite-galene-spherelite matrix.   mostly   18-3   18-4   28-8   20.2   50.8   50.9   18-5   20.9   18-5	-														181.20	967
18	-		182.20	brownish gray, arginaceous,			-			-					182.20	60.7
140K   1802   261   385   385   382   420   42000   1820	-			Marl		<del></del>		<del></del>	-						183.20	
1-00.0   1	-			dark gray, partially brecciated, barite-				<del> </del>				-			184.20	
140k   131   568   625   3460   250   3460	185 -	<u> </u>		calcite-galena-spharelite matrix, mostly		1380.9	26.1	3.85	<del></del>		1.60	—			185.20	73.3
1970	_			crushed,	1,40%	1381.5	66.8	6.25	3480	2.06	1.65	13.7	806.5	>20000		
1930   1930	_ ا		186.70		5807.0	1949.0	19.5	0.39	2966	<2.0	3.50	18.0	1125.0	>20000	1 1	
195-20   1	1 _				736.0	1549.1	22.9	1.34	1182	2.70	1.00	37.0	1182.5	>20000		100.0
191-90   191-90   Madrik gray, calcareous, lime mud matrix, with calcite veinlets	İ														] 100.20	
100.0   100.				of limestone and marl, with calcite	İ	ŀ	1	ļ					1	ļ	] [	
1815   Mark   dark gray, calcareous, lime mud matrix, with calcite veinlets.   100.0	190-	لطظ		veinlets∼network and pyrite striation.	l									l		100.0
195-   195-0	-	P + P + P	101.00					1	1						1 1	
with calcite veinlets.    195.40	-		191.90	Mari											1 1	
195	-			dark gray, calcareous, lime mud matrix,			ŀ	1								100.0
185.60	-			with calcite veinlets,		1	l		1			l		1	l i	100.0
Limestone   brownish gray, argillaceous, altanating of limestone and marl, with calcite   veinlets ~ network and pyrite striation.   100.0	195 -		105.40		]								ì			
200   200	i -	1-1-1-	195.40	Limestone	i											
of limestone and marl, with calcite veinlets—network and pyrite stristion.  205.10m calcite vein(width 5cm) with a trace amount of galena.  205.20s day 207.80  205.20 and 207.80  207.80  Adark gray, calcite—pyrite matrix.  Marl dark gray, lime mud matrix, with calcite veinlets—vein	-			brownish gray, argillaceous, altanating			ļ							ł		100.0
200-1	-	1														
205.10m calcite vein(width 5cm) with a trace amount of galena.  205.10m calcite vein(width 5cm) with a trace amount of galena.  205.20	_								1					1		
205.10m calcite vein(width 5cm) with a trace amount of galena.  Breccisted zone dark gray, calcite-pyrite matrix.  210	200_			Vennets Hetwork and pyrite striation,	l	1				1			l	1		100.0
205.10m calcite vein(width 5cm) with a trace amount of galena.  Breacisted zone dark gray, calcite-pyrite matrix.  Marl dark gray, lime mud matrix, with calcite veinlets—vein.  214.30~214.40m brecciated, calcite matrix. 219.30~219.00m mostly crushed.  96.7  90.0  86.7  2225  227.30m calcite vein (width 10cm),  100.0  233.90~234.70m brecciated. 233.90~234.70m brecciated. 234.90~235.40m calcite-pyrity vein with a trace amount of galena.	100												ł			
205.10m calcite vein(width 5cm) with a trace amount of galena.  Breacisted zone dark gray, calcite-pyrite matrix.  Marl dark gray, lime mud matrix, with calcite veinlets—vein.  214.30~214.40m brecciated, calcite matrix. 219.30~219.00m mostly crushed.  96.7  90.0  86.7  2225  227.30m calcite vein (width 10cm),  100.0  233.90~234.70m brecciated. 233.90~234.70m brecciated. 234.90~235.40m calcite-pyrity vein with a trace amount of galena.	-				ŀ		ļ									
205.10m calcite vein(width 5cm) with a trace amount of galena.  Breacisted zone dark gray, calcite-pyrite matrix.  Marl dark gray, lime mud matrix, with calcite veinlets—vein.  214.30~214.40m brecciated, calcite matrix. 219.30~219.00m mostly crushed.  96.7  90.0  86.7  2225  227.30m calcite vein (width 10cm),  100.0  233.90~234.70m brecciated. 233.90~234.70m brecciated. 234.90~235.40m calcite-pyrity vein with a trace amount of galena.	-				į				1							100.0
205.5	-			205 10m calcite vein(width 5cm) with a	į		1						1			
200	-		1			ļ					1		1	1		
Marl   dark gray, lime mud matrix, with calcite value   valu	205 -		205.20		┨				1		1					100.0
Marl   dark gray, lime mud matrix, with calcite value   valu	I -			Brecciated zone		ŀ			ļ							100.0
Marl   dark gray, lime mud matrix, with calcite value   valu	-			dark gray, calcite-pyrite matrix,				1	1						]	
dark gray. lime mud matrix, with calcite veinlets~veinlets~veinlets~vein.  214.30~214.40m brecciated. calcite matrix. 219.30~219.00m mostly crushed.  96.7  90.0  86.7  225-  227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated. 234.90~235.40m calcite-pyriye vein with a trace amount of galens.	-		207.80	INAI	1					1					1	
veinlets~vein.  214.30~214.40m brecciated, calcite matrix. 219.30~219.00m mostly crushed.  96.7  90.0  86.7  225	-			i	1	]	1		1		İ	1				96.7
218-220-2219.00m mostly crushed.  219.30~219.00m mostly crushed.  96.7  90.0  86.7  222-225-225-227.30m calcite vein (width 10cm).  233.90~234.70m brecciated. 234.90~235.40m calcite-pyriye vein with a trace amount of galena.	210-	[ <del></del> -					l		1		ļ					
219.30~219.00m mostly crushed.  96.7  90.0  86.7  225  227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated. 234.90~235.40m calcite-pyriye vein with a trace amount of galena.			ļ	veinlets~vein.	1	1	1		1		İ	1		İ	i '	
219.30~219.00m mostly crushed.  96.7  90.0  86.7  225  227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated. 233.90~235.40m calcite-pyriye vein with a trace amount of galena.			1	214.30~214.40m brecciated calcite matrix		1										96.7
220———————————————————————————————————	-			1					1			ļ		1		
220———————————————————————————————————	-	<u> </u>		215.30 - 213.00m mostly crosmod,	1					1				1		
220———————————————————————————————————	-	<u> </u>				1			1					1	i	96.7
227.30m calcite vein (width 10cm),  227.30m calcite vein (width 10cm),  233.90~234.70m brecciated, 234.90~235.40m calcite-pyriye vein with a trace amount of galena.	215-	<u> </u>								•		1				00.7
227.30m calcite vein (width 10cm),  227.30m calcite vein (width 10cm),  233.90~234.70m brecciated, 234.90~235.40m calcite-pyriye vein with a trace amount of galena.	-	+											1	1		<u> </u>
227.30m calcite vein (width 10cm),  227.30m calcite vein (width 10cm),  233.90~234.70m brecciated, 234.90~235.40m calcite-pyriye vein with a trace amount of galena.	-	+			1						1			1		000
227.30m calcite vein (width 10cm),  227.30m calcite vein (width 10cm),  100.0  233.90~234.70m brecciated, 234.90~235.40m calcite-pyriye vein with a trace amount of galena.	-	ļ			ĺ	1							1			90.0
227.30m calcite vein (width 10cm),  227.30m calcite vein (width 10cm),  100.0  233.90~234.70m brecciated, 234.90~235.40m calcite-pyriye vein with a trace amount of galena.	-	<del> </del> -				İ		İ	ļ					i		
227.30m calcite vein (width 10cm).  227.30m calcite vein (width 10cm).  230	220-	<del> </del>								1				1	1	
227.30m calcite vein (width 10cm).  227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated.  234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0	.		1		1	]	1		1	1						86.7
227.30m calcite vein (width 10cm).  227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated.  234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0	1 .		1		1			1						1	ĺ	
227.30m calcite vein (width 10cm).  227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated.  234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0	1		1			1			1		1					I
227.30m calcite vein (width 10cm).  227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated.  234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0	-	<u> </u>	1		1	1			1	1	1	1		1		96.7
227.30m calcite vein (width 10cm),  100.0  233.90~234.70m brecciated, 234.90~235.40m calcite-pyriye vein with a trace amount of galena.	-	1	1			1	1	İ		1					1	
227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated.  234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0  100.0	225-	† <i></i> -	ł		1	1			1		Ì			ļ	1	
227.30m calcite vein (width 10cm).  100.0  233.90~234.70m brecciated.  234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0  100.0	-	<del> </del>	1			1	1						1	1.		100.0
230————————————————————————————————————	-	t		227.30m calcite vein (width 10cm),		1	ŀ		1						1	100.0
230————————————————————————————————————	1 -	<del> </del>	1			1	1		1			1		1		ļ
230————————————————————————————————————	-	<del> </del> -	1			1		1			1	1			1	
233.90~234.70m brecciated. 234.90~235.40m calcite-pyrive vein with a trace amount of galena.  100.0  100.0	230-	<u> </u>	]			İ	1		1		1			1	1	100.0
233.90~234.70m brecciated. 234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0	Ι.	<u> </u>	ŀ						1						1	
233.90~234.70m brecciated. 234.90~235.40m calcite-pyriye vein with a trace amount of galena.  100.0	1.	<u></u> -	1			1	1		1		1				1	
234.90~235.40m calcite-pyriye vein with a trace amount of galena.			1		1	1		1	ı	1			1	İ		100.0
235——— trace amount of galena. 100.0	1	<u>}</u>	1	i i					1	1			1		1	
100.0	•	1	1	234.90~235.40m calcite-pyriye vein with a	1		ŀ		1		1				ł	
	235 -	1	1	trace amount of galena,	1	1							1	1	1	100.0
	.	<del></del> -	}			1									1	100.0
	.	<del></del>	1			1		1		1			1		1	
	.	<del> </del>	1			1					1		1			
240	1.		1								1	1	1		1	100.0
	240	<u> </u>	<u> </u>						1	<u></u>	1	<u> </u>	1			<u> </u>

Figure 149 Columnar section of the drill hole, MJTK-L4

Hole : MJTK-L4 Machine Model : RASKA30 Elevation : 487. 53m Drilled Length : 400. 00m Site Name : El Akhouat Period : 2001. 2. 5~2. 27 Inclination : 60°

Direction : 118°

ماجم	Column	Depth	Description		,			irade (						Depth	Core
	Column	(m)		Pb	Zn(%)	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec (%)
240			Marl						1						
_			dark gray, lime mud matrix, with calcite							İ					100.0
_			veinlets∼vein, pryite is found in the		]										
	<u> </u>		fissures.						ĺ		ļ				
_															100.0
245 -							1								100.
_		246.00	Marl											1	
-		ľ													100
_		l	brownish gray∼dark gray, homogeneous,												100.0
_			calcareous, with calcite−pyrite veinlets~												
250 —		1	vein,												
_							l	j	l						93.3
_			050 00 - 051 50		1		ļ		İ						
_		ļ	250.60~251.50m			l	ĺ	ĺ			1				
-	<u> </u>	1	calcite-pyrite vein∼veinlets,		ł							1			100.0
-	1											1			100
255 –		]			Ì				Ì	1				i i	
-	<del> </del>	1	i		1			1				l		1	
_	<u> </u>	1			l				i		1	l			100.
_	<u> </u>	1			1			1	1		1				
_	ļ	1				}	1				1		1		
260 -		1								1					100.
200-	I	1							ł	Ì	İ		Į.	1	1
_	T	1			l										
-					İ				l	1	1				100.
-					İ			1		1					100.
-	<del> </del>							1		İ					<b></b>
265 -					İ								l		
_		]			İ	1		l				1	İ		100.
_		1			ì					l		1			
		1				1									
_		1								1	Į.				100.
-	1	1						}						Ì.	'
270-	[	ł												1	├
-	<del></del>	1					1	1					1		
-	<del></del>	1		i			l		Ì			1			100.
-	<del> </del>			ļ								į			
-	<u> </u>	<u> </u>		1	1			}		ì	1	1			
275-	J	-]				İ	1	ľ							100.
		.]	275.3m calcite veinlets,					1				ļ			
_		.]	276.5m calcite veinlets,			1		1							
-	1	1				Į.	1	ľ			1	i			100
-	1	1					į	}		1				l	''
-	1	1			1	1	1		1		1		1	1	
280 -	<u></u>	1			1				1		1		1		
-	{ <del></del>	-				ŀ				1					100
-	[ <del></del> -	4			1	1	1		1		1				
_	<del> </del>	4			1	[			1		1		1		
_	<u> </u>	1		l					į	Į.					100
- - 285		]		1	1	1			1				1		1
- 60	}	-			1		1		1	1			1		
-	1	1	288.10~288.70m				1		1	1			1	1	100
-	<del> </del>	1	calcite-(pyrite) network~veinlets,			1				1	1			1	'00
-	<del> </del>	1	291.30~291.70m	l	1	1				1				1	
-	<del></del>	1	calcite-(pyrite)-(chalcopyrite) veinlets,			1	1		1	1	1		1	1	l
290 -	<del></del>	1	· · · · · · · · · · · · · · · · · · ·				1	1		1	1				100
-	<u></u>	-		1			1			1	1	1		1	L_
_	J	1		Ì		l			1	1					
	<u></u>	292.30	Mari	1		1				1					76.
-	<u> </u>	1		1					1	1					
-	1	1	dark gray, lime mud matrix, calcareous,	1			1			1	1				<b></b>
295 -	1	1	with calcite veinlets, pyrite is found in			1				1					00
-	<del></del>	4	the fissures,					1			1	1			83.
-	<del> </del>	1		l					1						<u> </u>
-	<u> </u>	}		}			1	1							
	J	-		1		1		1	1	1	1			1	96.
-	7	1	1		1	l	1	1	1	i	I	I	1	1	t

Figure 149 Columnar section of the drill hole, MJTK-L4

Hole : MJTK-L4 Machine Model : RASKA30 Elevation : 487.53m Drilled Length: 400.00m Site Name : El Akhouat Period : 2001. 2. 5~2. 27 Inclination : 60° Direction : 118°

		Depth	Di-ti				-	Grade	(ppm	)				Depth	Core
	Column	(m)	Description	Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ba	(m)	Rec.
300			Marl		Ţ										
_	]		dark gray, lime mud matrix, calcareous,		Ì										90.0
_			with calcite veinlets, pyrite is found in		}									'	
_	]		the fissures,												
305 —						İ			ł						100.0
303 —															
	]							İ			1				
	]								<b>j</b>						100.0
_	]					l									
- -310	]														
310-	]				1	İ		}		i					100.0
_	]		·			[					ľ				
_							1			i '		İ			
_	]				Į.		l		l						100.0
315-	]- <i>-</i>		215 00												
313	]		315.00m calcite vein (width 3cm),					1			l				
_	<u> </u>		315.30m calcite veinlets.	}		ŀ	i					1			100.0
	F		315.60m calcite veinlets,		,										
_			318.30m calcite vein (width 3cm),			ĺ									
320 -	<u> </u>					ļ	1								100.0
_			321.30m calcite vein,		ĺ			ŀ	į						
_			326.20m calcite vein, 326.20m calcite vein (width 5cm),									ļ			
_		ľ	320.20m calcite vein (width 3cm),												100.0
_							l	•		l				Ì	
325 -	<u> </u>							İ						ł	
_	<u>}</u>					1									96.7
	<u> </u> -														
_	]	į			1	İ	i	1							
	]					l				1		l			100.0
330 -			220 50 - 221 00		1										
330 -		ļ	330.50~331.90m						Ì	1					
_	]		with calcite network∼veinlets,					1				1	ļ	1	100.0
_	]											ļ	ŀ		Ì
_	]	-		ļ											
335 -	]	-													100.0
333 -	]	1						1	ĺ				Ì		1
_		336.40	Marl			İ				1					
_	<u> </u>														100.0
_	<u> </u>		dark gray, lime mud matrix, calcareous,												
340 -	<u> </u>		with calcite veinlets,												
-	<u></u>	1	336.40~337.40m							1					100.0
_			calcite-(sphalerite) veinlets with a trace	ļ	1					1	1				
_	<u>                                     </u>		amount of galena.						1		1			1	
_	<u> </u>	1	339.30~340.50m							1				1	100.0
345 -	}		with calcite-(sphalerite) veinlets,								1				ļ
_	<u>}</u> _		341.90~342.00m						1		ŀ				
		ļ	with calcite network~veinlets,			ļ	1		İ		l				100.0
	]	1	344.20~347.10m		İ	İ	İ							İ	
_	]	1	brecciated, with a trace amount of	l		ļ		1							
- - 350		1	galena,		1								1		100.0
- OC		-	347.50~348.30m with calcite veinlets.			1			1				1		
_	]	1							1					1	455.5
-	]	1	352.40m calcite vein (width 2cm),		1					1	1				100.0
-	]	-			1										91.7
- - 355	]	1	257.00		1										
-	<u></u>	1	357.00m calcite veinlets,											}	93.3
-	]	1													
-	]	1		1		1			1	1					
-	1	1										1		1	100.0
_	<del>-</del>	1		í	1	1	1	1	1	1	1	1	1	1	1

Figure 149 Columnar section of the drill hole, MJTK-L4

Hole : MJTK-L4 Machine Model : RASKA30 Elevation : 487. 53m Drilled Length : 400. 00m

Site Name : El Akhouat Period : 2001. 2. 5~2. 27
Inclination : 60°
Direction : 118°

Ca-le	Calum	Depth	Description					Grade (	ppm)	)				Depth	Core Rec.
	Column	(m)	Description	Pb	Zn	Cu	Fe(%)	Mn	Cd	Mg(%)	Ca(%)	Sr	Ва	(m)	(%)_
360			Marl												
			dark gray, lime mud matrix, calcareous,							1	- 1				100.0
			365 60 poloito-purito voia (width 10cm)												
			365.60m calcite-pyrite vein (width 10cm),												
365 -															100.0
305-															
_														Ī	
			369.50m calcite network,												100.0
			370.10m calcite-(pyrite) veinlets,												
														Ī	
370 —		370.40													90.0
			Mari								İ				
			dark gray, lime mud matrix, with												
_		1	calcite veinlets,												93.3
		]	373.80m calcite-(pyrite) veinlets,			İ									
375 -		]					1								
_				ļ											80.0
_	<u> </u>	j													
-	}	]			}		1	1			ļ				
							ĺ				.				100.0
380 -	1		380.50∼380.70m with calcite veinlets,												2.3
-	<u> </u>	]	381.30m calcite veinlets (width 1cm),												
_	<u> </u>			l			1	1							86.7
-	1	]	384.10~384.30m with calcite veinlets.				İ								••••
	<u> </u>		386.10~386.40m with calcite veinlets.			ł		l							
385 –	1		386.70∼386.90m with calcite veinlets,												96.7
-	1	1			i										00.7
-				<b>!</b>	1										
_	t			1									1		84.0
-	t				1										
390 –	t	1			1	į			'						
-	<del> </del>			Į.	-									. 1	76.7
-	<del> </del>			ł											
-	<del> </del>		393.30m calcite veinlets,		1		İ								
-		1	393.70∼398.50m with calcite veinlets,		i										100.0
395 –		1		l	ļ	}									
-		1			1		ĺ		]					-	
-	<del> </del>	1	397.90~398.50m mostly crushed,		1		İ								100.0
-	t	1	399.10~400.00m mostly crushed,		ŧ										
-		:				1			1						100.0
400 -		400.00			<del> </del>	$\vdash$	_		<del>                                     </del>						
-	1				i										
-	1									l					
-	┪					İ				l					
-	┨	1		l											
-	1			1		Ì	1								
-	┨				1				İ					1	
-	1				ĺ		1			l					
-	1	İ		1	[		1	1	1	l					
-	┪				[					ļ ·					
-	1	1			1					ļ					
-	-			1	1	1									
-	-					1							1		
-	1	1			1										
-	4			1											
-	4								1				1		
-	4										1				
_	1				1	1									
_	4				1					1					
_	1						1				1	1			
_	1	I		ì	1	1	1	1	1	I	l	l	ı	1	

Figure 149 Columnar section of the drill hole, MJTK-L4