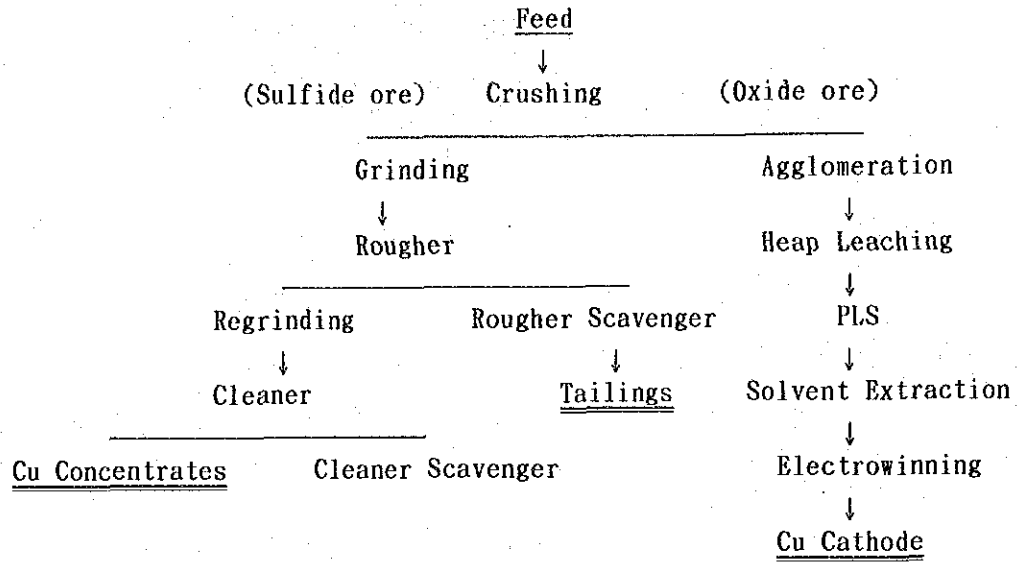


Fig. Ⅲ—1—3—1 Flowsheet of Ore Treatment

1—4 Calculation of ore reserves

Ore reserves of geologically estimated all the ore blocks were calculated by distance inverse square method. The calculated ore reserves are 87,692,000 tons in case of 0.4%(To-Cu) of cut-off grade. According to increasing of cut-off grade, ore reserves decreas and grade increases. Refer to Table Ⅰ-4-5-1 about the relashionship.

Design of open-pit was carried out under the supposition of a given economical conditions, and ore reserves within the open-pit as minable ore reserves was calculated. The minable ore reserves are 33,787,120 tons in case of 0.4% of cut-off grade (To-Cu:0.613%). Regarding minable ore reserves, according to increasing of cut-off grade, ore reserves decrease and ore grade increases. Refer to Table Ⅰ-4-5-1 and Table Ⅱ-3-2-1 about the relashionship.

1—5 Pre-feasibility study

The experts were dispatched in 1993 to collect necessary information about pre F/S. At first design of open pit, calculation of minable ore reserves and flow sheet making of ore treatment were proposed, and then the examination about development by DCF method was carried out with the results of testing and collected information. Major presupposition is the following:

① Minable ore reserves; 33,787,000 tons, To-Cu 0.613% (cut-off grade 0.4%)
breakdown; oxide ore 24,170,000 tons, To-Cu 0.522%

sulfide ore 9,611,000 tons, To-Cu 0.842%
(waste 41,280,000 tons)

The ore is mined by open cut mining. Mining term is 10 years.

② production;

Copper oxide ore minerals (recovery 72%)

-->cathode copper 9,110 tons/year (Cu 99.99%), Copper amount 9,109tons

Copper sulfide ore minerals (recovery 93%)

-->Copper concentrates 21,500 tons/year (Cu 35.0%), Copper amount 7,525 tons

Flow sheet of ore treatment is shown in Fig. Ⅰ-4-4-2 and Fig. Ⅱ-4-3-2. The SX-EW method is selected in treatment of oxide ore.

③ Term of production

Since the longest term of special repayment as the tax privilage is eight years, a term of production activity is ten years. Besides the term, a term of production preparetion is three years.

④ Sales condition

The condition was adjusted the standard sales condition in the dressing plant of Japan.

⑤ Copper price

The standard is 90¢/lb, however, the cases of 110¢ and 130¢ are considered.

Under the above conditions, IRR(before interest) was calculaed by the DCF method. As the result, in cases of 90¢ 110¢ and 130¢ of Copper price, IRR were -6.411%, 1.937% and 7.357%, respectively. The copper price which was calculated back to zero IRR was 104.3¢. IRR before interest of more than 15% is generally considered to be necessary. The copper price which was calculate back to IRR of 15% was 167.5¢.

Total Cu grade 0.70%(breakdown: oxide Cu grade 0.61% sulfide Cu grade 0.97 %) of crude ore grade is necessary in the copper price of 90¢ without any condition change in order to meet zero IRR before interest. 15% of IRR in the same conditions is necessary that the crude ore grade of 1.13% (oxide Cu ore grade 0.97%, sulfide Cu ore grade 1.54% , respectively).

The result of calculation by the DCF method is shown in Table Ⅱ-4-4-1 (1), (2) & (3).

CHAPTER 2 RECOMMENDATION FOR FUTURE

2—1 Drilling survey

Prospecting generally comes after exploration in a large area and it is carried out for the limited target area. However, geological survey and large area exploration was not carried out in this project by reason of the regional development program. Therefore, since the data of geological survey and regional prospecting are insufficient, the survey to clarify the relationship to the surrounding area will be necessary in spite of mine claim.

The methodology of the prospecting should be carried out from geophysical prospecting to drilling survey after the surfase geological survey and geochemical prospecting(including the area covered by the Quarternary) as the survey of surrounding area is carried out. Pre-survey for index elemens and index minerals will be necessary in the geochemical prospecting in the Quarternary covering area. Regarding drilling, it will be necessary to introduce the idea of not only the drilling in order to catch ore deposits but also structural boring.

Since a part of the lower ore body was discovered in this project, prospecting to the deep underground will be necessary as further prospecting.

The intevals of drilling positions were arranged as about 100m in the target area of this survey and were arranged in order to new probale ore deposits in the surrounding area in this project. It is necessary to clearly describe that the drilling position is not decided to clarify the ore reserves of irregular shaped and small amount of high grade part of disseminated ~ reticulated ore bodies. It is extremely difficult to estimate such small amount of high grade part within these ore reserves by drilling survey.

2—2 Geophysical prospecting

Since the ore deposits in this area show high IP/low resistivity, the usefulness of surfase geophysical prospecting was reconfirmed. Therefore, the prospecting to the deeper horizon and to the area of sides(particularly to the direction of the east and west side) is necessary near future. The CSAMT method is effective to the deep underground prospecting.

2 — 3 Metallurgical tests

In future, when the reserves and metal content of Cerro Negro deposit are increased to assure the feasiblity of development, it is necessary to collect hundreds tons of the oxide and sulfide ores by excavation of exploring adit or large dia. boring and to realize the leaching and flotation tests in pilot plant scale (actually possible in CIMM) along with close examination of utilities, lik

ewater and electricity, environmental and other investigations for assuranceof mine development.

2—4 Calculation of ore reserves

Although variogram was made before calculation of ore reserves, the variogram shows impractical features. The reason is considered that the interval of drilling was too wide or occurreences of ore minerals is too complicated. The drilling interval was about 100m. Drilling with 50m interval in the limited site should be carried out for geo-stratistical examination in further drilling. Less interval than 50m is impractical. Therefore, when geo-ststistic features is not obtained by drilling survery with 50m interval, the occurrences of ore minerals is too complicated.

The calculation was carried out with the sphere with 400m radius in ore grade decision in each block. Since the ore reserves may be overestimated in the data insufficient part, further examination should be necessary.

2—5 Pre-Persibility study

Since the lower ore bodies which are composed of sulfide ore minerals are not the target ore deposits in this survey, the details are indistinct. As they are located in deep underground, open pit mining is unsuitable for them. It was recognized in this survey that the minable ore reserves of the sulfide ore deposits slightly decrease when the ore grade becomes higher. The prospecting plan including underground mining should be examined for the west and east ore bodies, and their extension parts, in near future. More practical research for production on commercial basis should be carried out with investigations about water supply, electric supply and supplies of various materials.

2—6 Overall recommendation

The target deposits are the upper ore deposits which are composed of oxide minerals. The minable ore reserves of iron ore minerals are markedly decrease when the ore grade becomes higher. Therefore, the mining of the iron oxide ore body should be in the part of high ore grade on a small scale. Refer to ore grade plan in each block about the position of high ore grade part.

Since the lower ore bodies which are composed of sulfide ore minerals was not the target deposits in this project, the details of the ore bodies are indistinct. As they are located in deep underground, open pit mining is unsuitable for them. Almost all the ore reserves of the lower ore bodies are not include in the minable ore reserves. It was recognized in this survey that the minable ore reserves of the sulfide ore deposits slightly decrease when the ore grade becomes higher. The prospecting plan including underground mining should

be exmined for the west and east ore bodies, and their extension parts, in near future. The prospecting area should be enlarged for the lower partand both side (particularly) with field geological survey, geochemical prospecting (to be necessary to examine index elements and minerals), structural drilling and geophysical prospecting (mainly the CSAMT method). Practical explotation planning should be planned with the pilot test of dressing and investigations about water supply, electric supply and supplies of various materials while prospecting will be carried out.

REFERENCE

Arancibia, C.M. (1991): ENAMI, Gerencia regional III Region, Plano ubicacion de perfiles geofisicos, Yacimiento Cerro Negro-Distrito El Salado. ENAMI internal report.

Bookstrom, A.A. (1977): The magnetite deposits of El Romeral, Chile: Econ. Geol., v.72, p.1101-1130.

Corvala'n, J. (1989): Geologic Tectonic Framework of the Andean Region

Dalziel, I.W.D. (1989): Circum Pacific Orogenic Processes:A View From The andeas and the antarctandes.

David, M. (1977): Geostastical ore reserve estimation.

David, M. (1988): Handbook of applied advanced geostastical ore reserve estimation.

EGM Evaluaciones Geologicos Mineras Ltda. (1991): Evaluacion geologica del yacimiento Cerro Negro, El Salado, III region. ENAMI internal report.

ENAMI (1992): Exploracion geologica del yacimiento Cerro Negro del distrito El Salado - III region, Sondajes estrategicos con aire reverso. ENAMI internal report.

Farias, B.A. (1991): Estudio petrologico - calcografico del yacimiento de Cerro Negro, distrito El Salado, III region. ENAMI internal report.

Forster, H. & Knittel, U. (1979): Petrographic observations on a magnetite deposite at Mishdovan, central Iran: Econ. Geol., v.74, p.1485-1489.

Frietsch R. (1978): On the magmatic origin of iron ores of the Kiruna type: Econ. Geol., v.73, p.478-485

Frutos, J. & Oyarzun, J. (1975): Tectonic and geochemocal evidence concerning the genes is of El Laco magnetite lava flow deposits, Chile: Econ. Geol., v.70, p.988-990.

Frutos, J. et al. (1985): Geologi'a y recursos minerales de Chile.

Fuller, C.R. (1989): Dsitribution and characteristics of Chilean copper deposits.

Fuller, C.R & Peebles, F.L. (1988): Geologia, distribucion y genesis de los yacimientos metaliferos chilenos. pp334. Fundo nacional de desarrollo cientifico y tecnologico.

Gallagher, J.J. (1989): Andean chronotectonics.

Galleguillos, L.G. (1989): Geologia y evaluacion del distrio cuprifero de Cerro Negro, III Region - Chile. ENAMI internal report.

Geodatos (1991): Estudio magnetico terreetre y polarizacion inducida, sector Cerro Negro, distrio El Salado, III region. ENAMI internal report.

Greene, H.G. & Wong, F.L. (1989): Ridge collisions along the plate margins of south america compared with those in the southwest pacific.

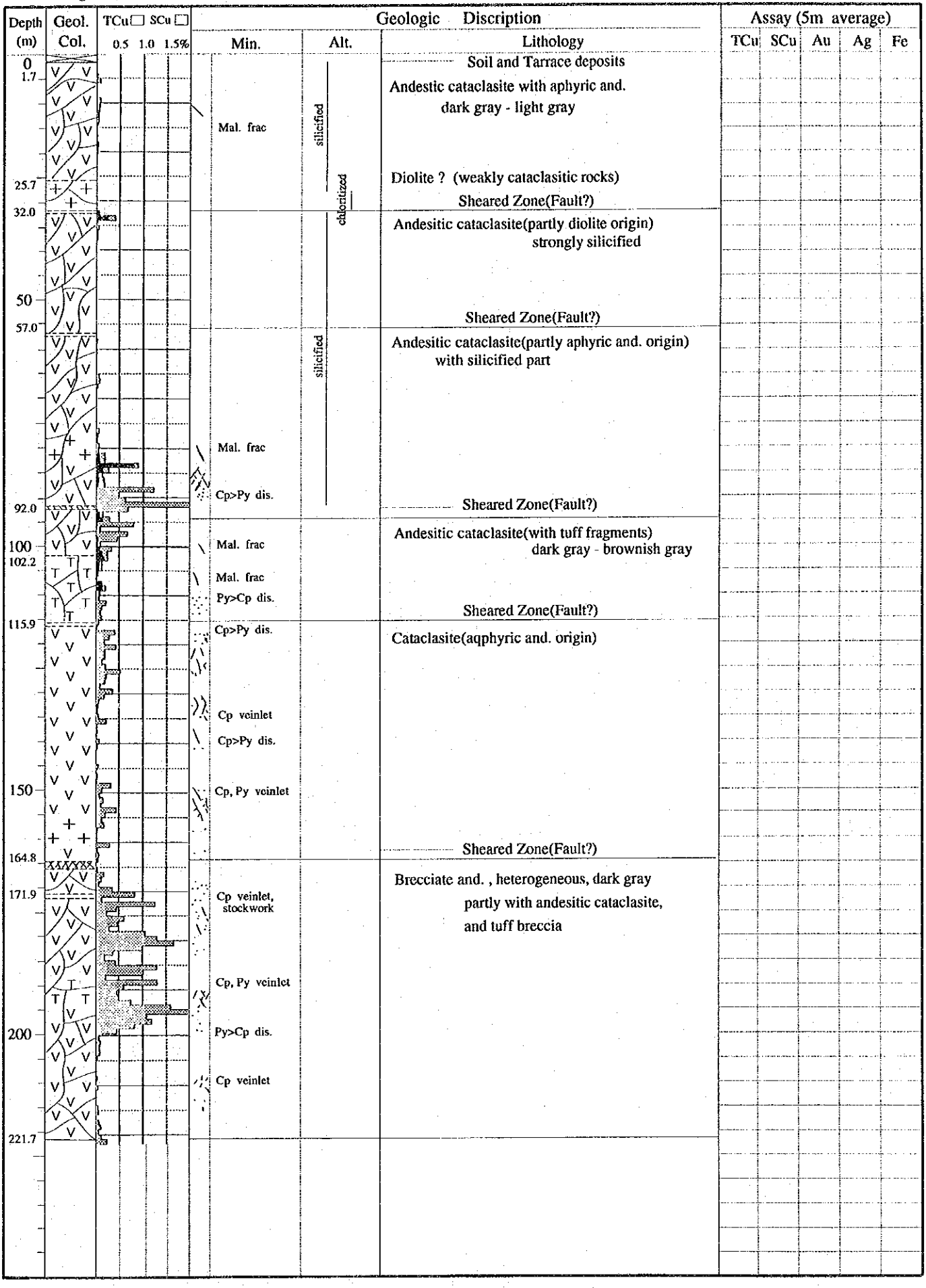
Herrera, E.B. (1990): El yacimiento Cerro Negro - ENAMI, Un prospecto de cobre atractivo para una actividad de mediana mineria metarica, Distrito

Minero El Salado, Tercera Region de Atacama. ENAMI internal report.
Hildebrand, R.S.(1986): Kiruna-type deposits; Their origin and relationship to intermediate subvolcanic plutons in the Great Bear magmatic zone, northwest Canada: Econ. Geol., v.81, p.640-659.
Hunt, J.P.(1991): Porphyry copper deposits.
Koide, H. & Bhattacharji, S.(1975): Formation of fractures around magmatic intrusions and their role in ore localization: Econ. Geol., v.70, p.781-799.
Lowell, J.D.(1991): The discovery of the La Escondida Orebody.
Lyons, J.I.(1988):Volcanogenic iron oxide deposits, Cerro de Mercado and vicinity, Durango, Mexico: Econ. Geol., v.83, p.1886-1906.
MacKenzie, W.S. et al.(1982): Atlas of igneous rocks and their textures: Longman, pp.148.
MacLean, W.H.(1969): Liquidus phase relations in the FeS-FeO-Fe_3O_4-SiO_2 system and their application in geology: Econ. Geol., v.64, p.865-884.
Magri, E.J.(1987): Economic optimization of the number of boreholes and deflections in deep gold exploration.
Mpodozis, C. & Ramos, V.(1989): The andes of Chile and Argentia.
Naranjo, J.A.S.(1978):Zona interior de la cordillera de la costa entre los 26°00' y 26°20', region de atacama, escala 1:100,000. Carta geologica de Chile.
Naranjo, J.(1978): Geologica del Cuadrangulo El Salado. Memoria de prueba para opter al titu lo de Geologo(inedito). Dpto. de Geologia, Univ. de Chile. 117p.
Novillo, H.V.(1991): Estudio fotogeologico del distrito minero Cerro Negro. ENAMI internal report.
Novillo, H.V.(1991): Perfil Geologico en el distrito minero Cerro Negro, El Salado, III region. ENAMI internal report.
Oyarzun, J. & Frutos, J.(1984): Tectonic and petrological frame of the cretaceous iron deposites of north Chile: Mining Geol., v.34, p.21-31.
Parak, T.(1975): Kiruna iron ores are not intrusive-magmatic ores of the Kiruna type : Econ. Geol., v.70, p.1242-1258.
Park, C.F. Jr.(1961): A magnetite "flow" in northern Chile: Econ. Geol., v.56, p.431-436.
Petersen, U.(1989): Geological framework of andean mineral resources.
Proano, J.A.(1989):Prospects for mineral exploration and development in the andes.
Rendu, J.M.(1984): Geostastical methods of ore reserve estimation.
Ricardo, B.P. et al.(1990): Geologia y yacimientos metaliferos de la II region de Antofagasta.
Schofield, N.(1988): Ore reserve estimation at the enterprise gold mine, Pine

Creek, northern territory, Australia.
Shiga, Y. et al. (1988): Caracteristicas mineralogicas y modo de ocurrencia de elementos menores en menas de yacimientos de hierro del norte de chile: V congreso geologico chileno, v. 3, p161-176.
Shiga, Y. et al. (1988): Some iron ore deposites in nothern Chile: V congreso geologico chileno, v. 3, p113-128.
Siddeley, G. & Araneda, R. (1989): Gold-silver occurrences of the El Indio belt, Chile.
Sillitoe, R. H. (1989): Copper deposits and andean evolution.
Sillitoe, R. H. & Camus, F. (1991): A Special Issue Devoted to Gold Deposits in the Chilean Andes.
Stanton, R. I. (1991): Understanding Volcanic Massive sulfides: Past, Present and Future.
Sugaki, A. et al. (1985): Geological studies in the metalloc ore deposits in northern Chile.
Suttill, K. R. (1991): El Teniente:Rockbursts slow the progress at the world's largest underground mine.
Suttill, K. R. (1991): La Escondida:The latest developments from the huge, new copper open pit.
Suttill, K. R. (1991): Maricunga:Is this the world's next great gold province
Suttill, K. R. (1991): Mining in Chile:After a hectic decade, the mining boom enters a new phase.
Suttill. K. R. (1991):Toqui:Zinc orebodies stimulate interest in mining in southern Chile.
Turner, J. C. M. (1972): Diccionario Geologico, Ingres-Espanol Espanol-Ingles.

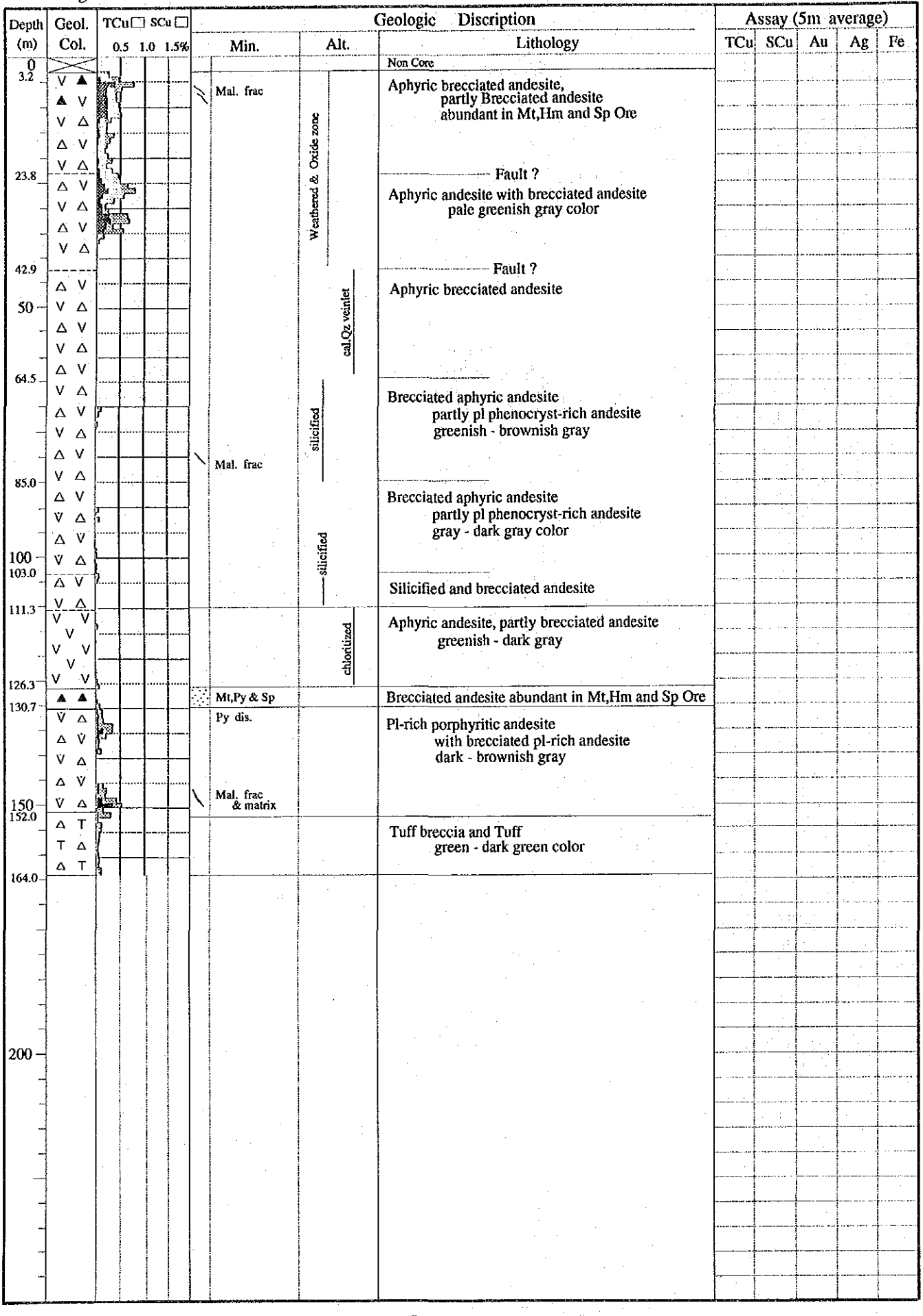
Appendix

Cerro Negro, Chile Drill# MJCC- 1 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m - 221.70 m)



Geologic Column (MJCC- 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 2 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -164.00 m)



Geologic Column (MJCC- 2 1: 1,000)

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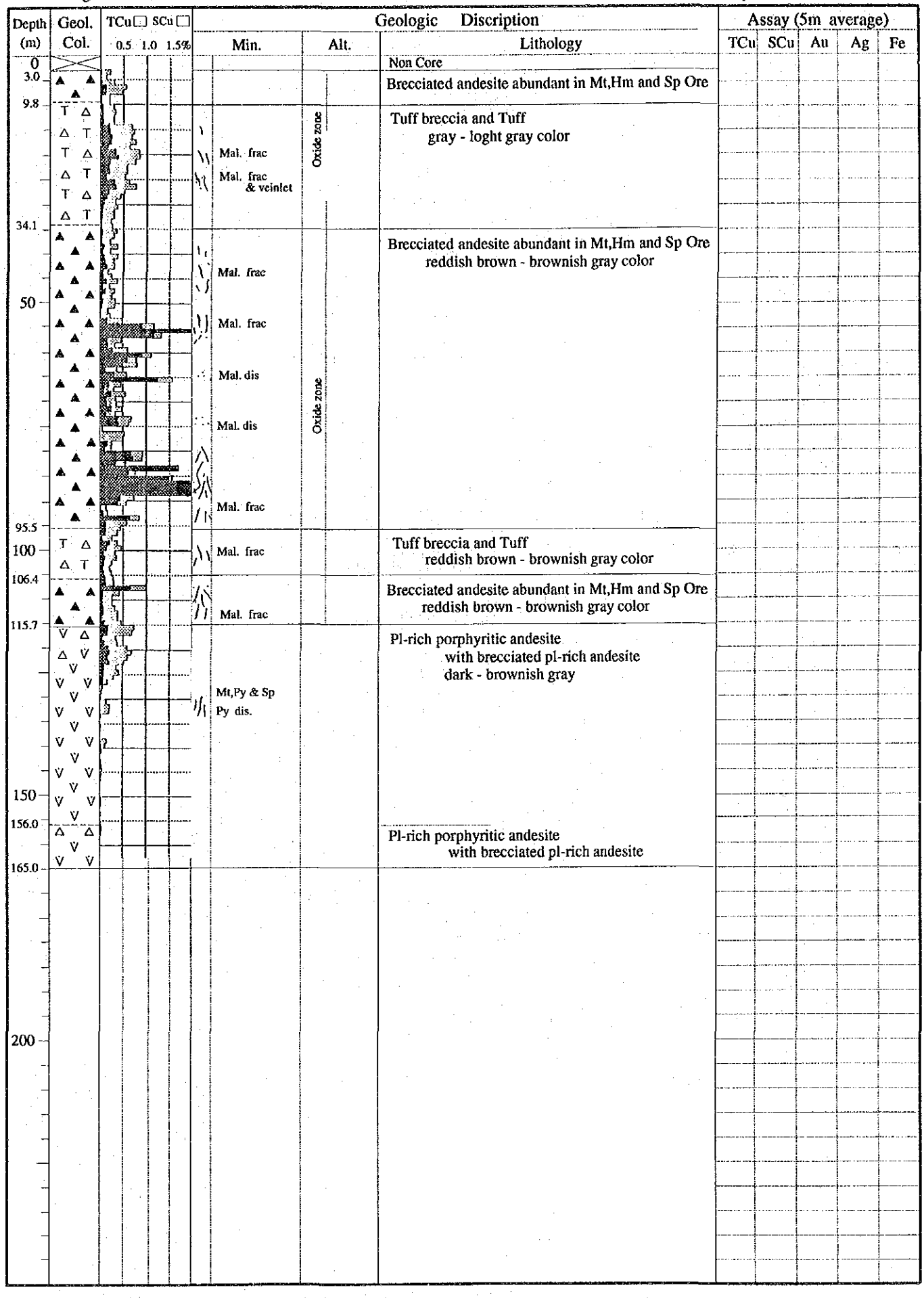
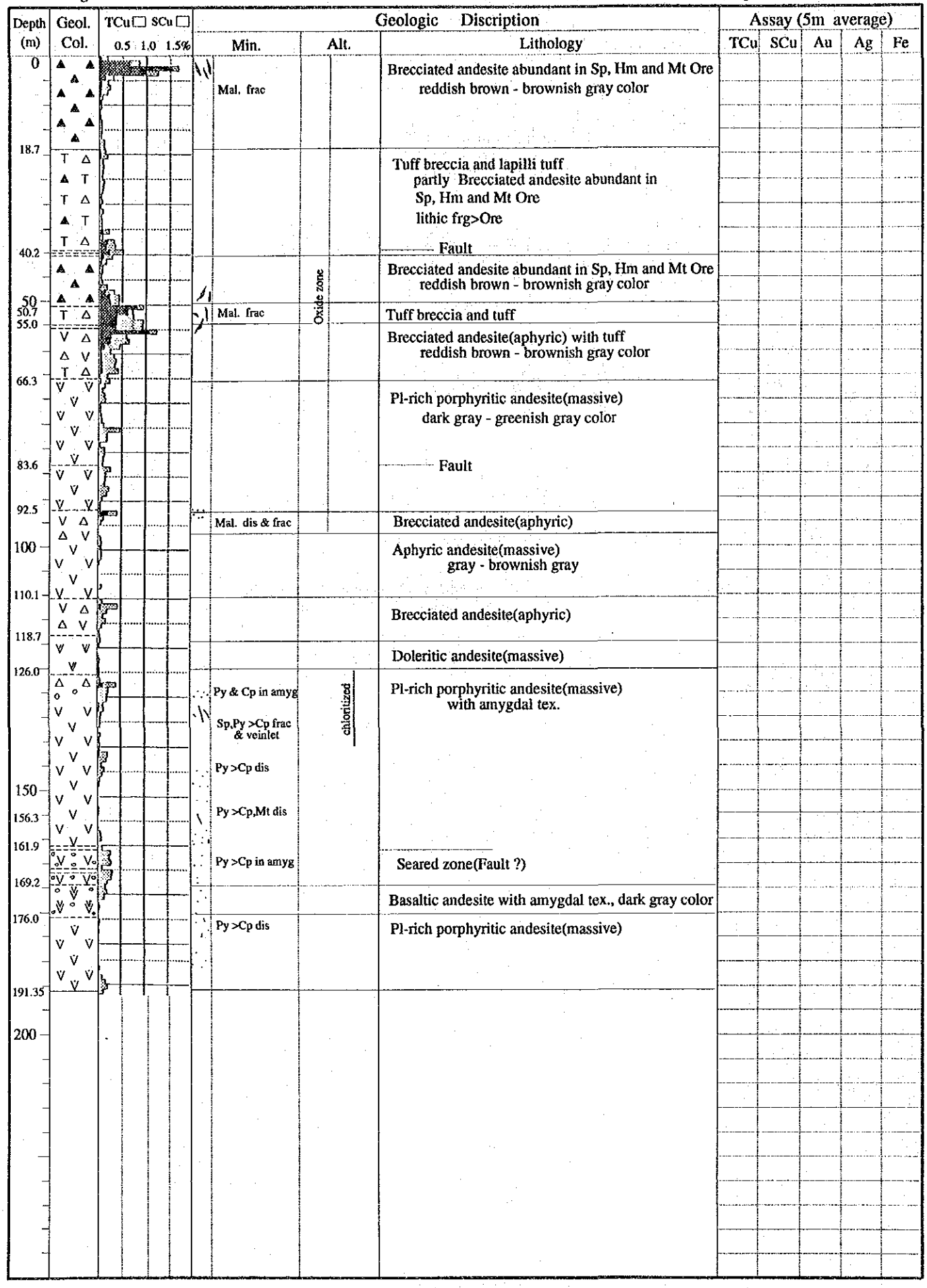


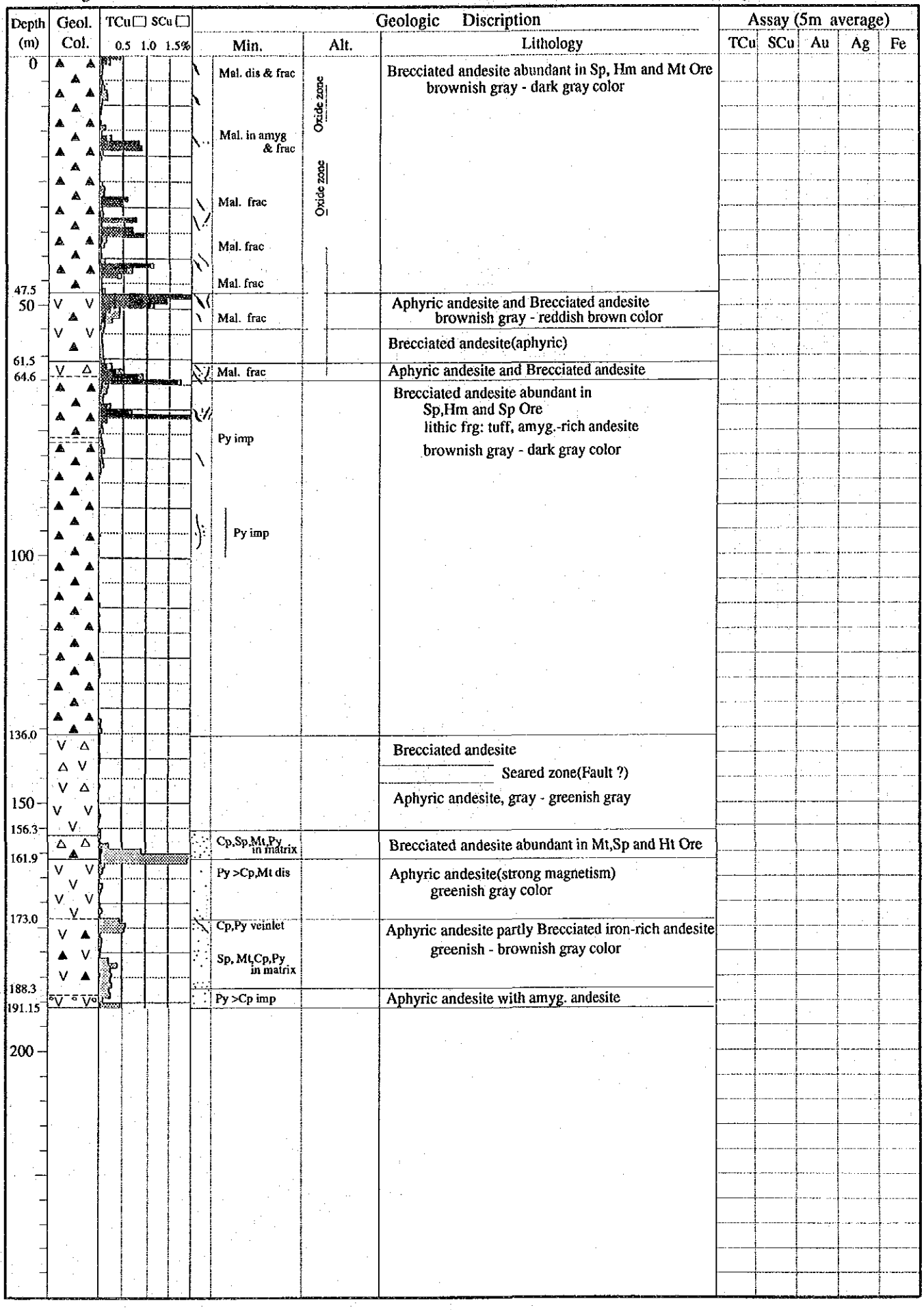
Geologic Column (MJCC- 3 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 4 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -191.35 m)



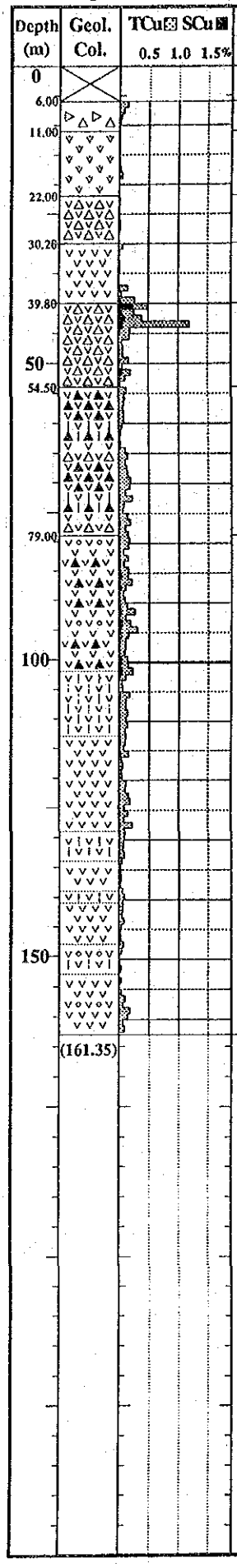
Geologic Column (MJCC- 4 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 5 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -191.15 m)



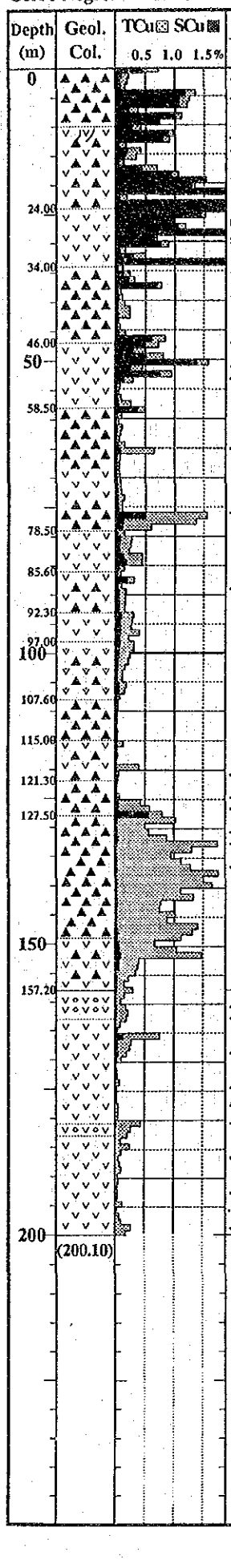
Geologic Column (MJCC- 5 1: 1,000)

Cerro Negro. Chile **Drill# MJCC-06** (Scale 1/1000) (1/1) (Depth: 0.00m- 161.35m)



Geologic Discription				Assay (5m average)				
Min.	Alt.	Lithology	TCu	SCu	Au	Ag	Fe
		Non core					
		Alluvium, soil with Ht rock & Mt rock	0.077	0.011	0.1	< 0.3	25.58
	white clay & Gyp	And lava, pl porphyritic argillitic alteration, fractured brownish color	0.014	0.001	< 0.1	< 0.3	4.55
			0.028	0.002	< 0.1	< 0.3	6.14
			0.016	0.001	< 0.1	< 0.3	6.57
		And lava~tuff breccia, argillitic alteration, fractured	0.018	0.001	< 0.1	< 0.3	6.60
	Silicification	And lava aphanitic, massive, propilitic brownish gray~green	0.029	0.002	< 0.1	< 0.3	7.97
			0.098	0.016	< 0.1	< 0.3	7.34
Mal. in frac.		And Bre & tuff, hydrothermal alteration, fractured	0.502	0.102	< 0.1	< 0.3	8.35
			0.112	0.021	< 0.1	< 0.3	3.58
			0.112	0.032	< 0.1	0.5	9.20
Ht stockwork~veinlet	oxidation	"Hydrothermal breccia" & And lava And lava & brecciated And with Ht stockwork~veinlet~dis. partly with open cavity gray~greenish gray with brownish parts	0.086	0.008	< 0.1	1.0	33.48
			0.051	0.007	< 0.1	< 0.3	29.92
			0.146	0.013	< 0.1	< 0.3	28.76
			0.133	0.013	< 0.1	< 0.3	32.06
			0.152	0.015	< 0.1	< 0.3	20.60
	altered along fracture	And lava, aphanitic, massive altered along fractures partly with Mt stockwork dark gray	0.126	0.016	< 0.1	< 0.3	17.12
			0.127	0.026	< 0.1	< 0.3	17.24
			0.198	0.037	< 0.1	< 0.3	17.12
Mt vt-dis			0.122	0.027	< 0.1	< 0.3	15.44
Ht vt		altered along fractures with open cavities in fractures gray~brownish gray	0.120	0.025	< 0.1	< 0.3	17.30
			0.132	0.020	< 0.1	< 0.3	17.80
			0.105	0.020	< 0.1	< 0.3	17.22
		altered along fractures with Mt veinlets	0.073	0.014	< 0.1	< 0.4	13.66
Py > Cp dis		Py in Mt veinlet Cp dis. in And & Mt veinlet	0.129	0.010	< 0.1	< 0.3	15.34
Mt & Ht veinlet			0.125	0.016	< 0.1	< 0.4	14.44
		same as 110m ±	0.056	0.003	< 0.1	< 0.4	13.68
		same as 120m ±	0.043	0.002	< 0.1	< 0.3	12.32
		same as 110m ±	0.057	0.003	< 0.1	< 0.3	14.94
		same as 120m ±	0.036	0.006	< 0.1	< 0.3	21.52
		same as 110m ±	0.025	0.001	< 0.1	< 0.3	13.18
Cp in frac.		at the top, amig filled with Qz. partly altered along fractures	0.106	0.010	< 0.1	< 0.3	16.60
Cp > Py dis Mt		Cp veinlet~dis. in amig. and And	0.032	<0.001	< 0.1	< 0.3	5.36

Cerro Negro. Chile **Drill# MJCC-07** (Scale 1/1000) (1/1) (Depth: 0.00m- 200.10m)

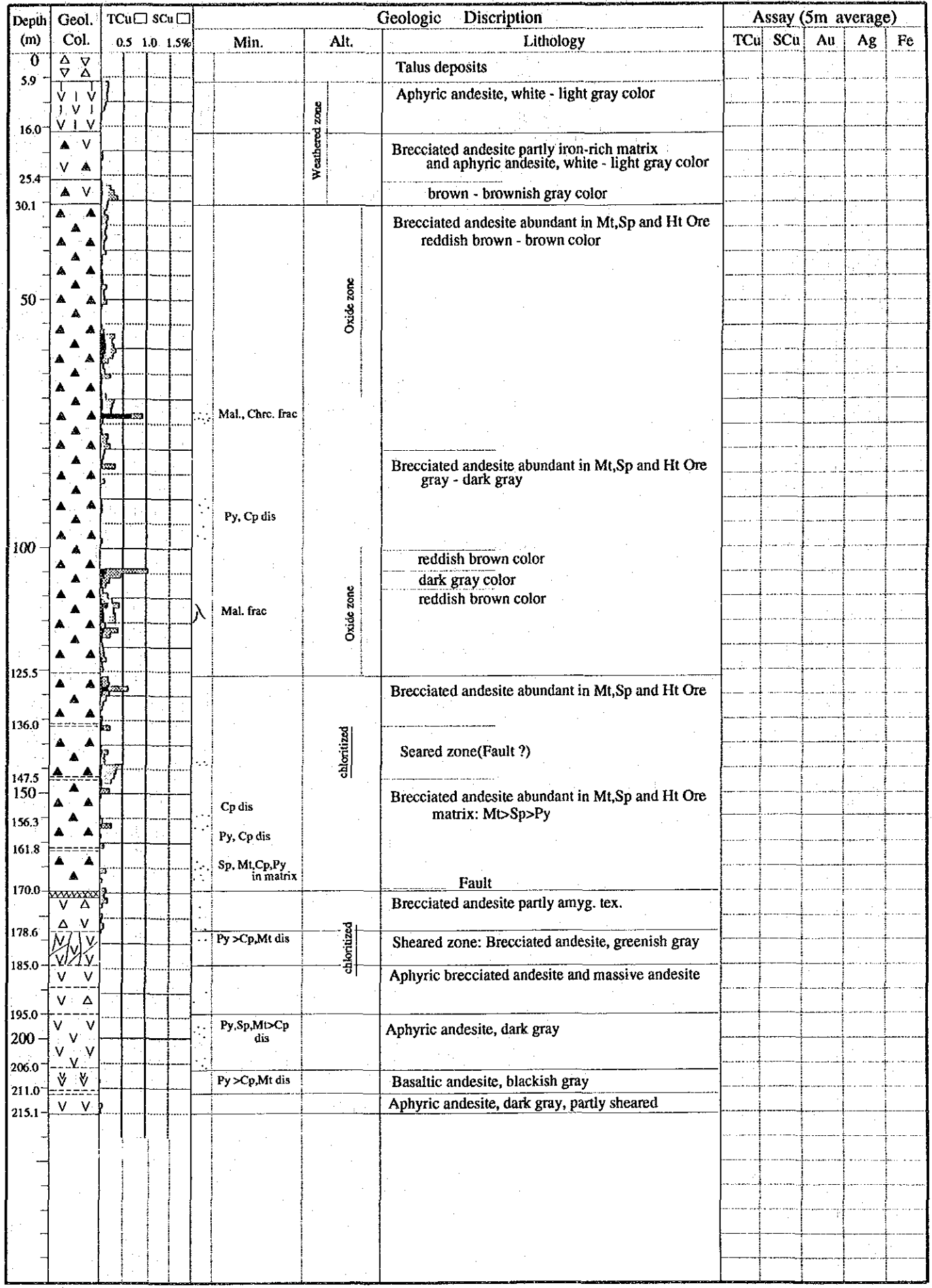


Geologic Discription				Assay (5m average)				
Min.	Alt.	Lithology		TCu	SCu	Au	Ag	Fe
		"Hydrothermal breccia"		0.522	0.368	< 0.1	< 0.3	34.78
Mal. in frac.		Ht(Spec)stockwork > lithic bre., brownish		0.928	0.806	< 0.1	< 0.3	34.12
Mal. in frac.		Brecciated & altered And with Ht stockworks, reddish brown~dark gray		0.570	0.433	< 0.1	< 0.3	27.80
				0.746	0.611	0.1	< 0.5	27.44
				1.610	1.547	0.1	< 0.3	36.74
Mal. in frac. ~dis.	oxidation	And lava , massive, aphanitic, greenish gray with Ht-Mt veinlet		1.308	1.220	< 0.1	< 0.3	19.04
				0.780	0.635	0.2	< 0.3	32.76
Mal. in frac. ~dis.		Brecciated And filled with Ht(Spec), black & reddish brown		0.298	0.219	< 0.1	< 0.3	28.76
				0.140	0.024	< 0.1	< 0.3	41.88
				0.596	0.390	< 0.1	< 0.3	27.84
Mal. in frac. ~dis.		And lava, massive, aphanitic, with Ht veinlet, gray~reddish brown		0.662	0.499	0.6	< 0.3	36.84
				0.193	0.092	0.3	< 0.3	32.52
Mal. dis. (Py)	Ht stockwork	Brecciated And~And lava, with Ht (Spec) stockwork~veinlet black & reddish brown		0.085	0.017	0.3	< 0.3	52.24
				0.179	0.028	< 0.1	< 0.3	34.68
Mal. dis. (Py)				0.093	0.021	< 0.1	< 0.3	27.42
				0.746	0.159	< 0.1	< 0.3	25.74
		And lava, massive, aphanitic, greenish gray		0.316	0.096	< 0.1	< 0.3	17.88
Mal. dis.		Brecciated And filled with Ht(Spec)&Mt black & reddish brown		0.149	0.068	< 0.1	< 0.4	31.68
				0.200	0.062	< 0.1	< 0.4	23.18
		And lava, massive, aphanitic, greenish gray		0.288	0.068	< 0.1	< 0.4	23.82
? Cry ?		Brecciated And, pl porphyritic, with Ht veinlet~stockwork greenish gray~black&reddish brown		0.158	0.030	< 0.1	0.7	29.92
				0.087	0.026	< 0.1	< 0.3	35.04
Py	Ht & (Mt) stockwork	Brecciated And, filled with Ht(Spec) black & reddish brown		0.022	0.003	< 0.1	< 0.3	36.16
		Brecciated And, with Ht stockworks gray~dark gray		0.114	0.008	< 0.1	< 0.4	35.52
				0.038	0.009	< 0.1	< 0.3	41.16
Py ≫ Cp dis		Brecciated And filled with Ht(Spec)& Mt, black		0.662	0.139	0.1	< 0.3	34.64
				1.086	0.023	0.2	< 0.3	36.00
Cp ≧ Py dis				1.464	0.017	0.3	< 0.3	28.98
		filled with Mt&(Ht), black Cp & Py in Mt&(Ht) stockwork		0.986	0.014	0.2	< 0.5	27.98
Cp ≫ Py dis				1.072	0.027	0.2	< 0.3	36.98
		Brecciated And filled with Ht(Spec)~ with Mt veinlet, black~dark gray		0.720	0.052	0.1	< 0.3	38.36
Py > Cp dis	Mt stockwork			0.175	0.012	< 0.1	< 0.3	23.24
		And lava, massive, aphanitic, with amig filled with Qz, Cp&Py		0.135	0.009	< 0.1	0.6	17.56
Cp ≧ Py dis				0.310	0.053	< 0.1	< 0.3	17.82
		massive lava, greenish dark gray		0.032	0.003	< 0.1	< 0.3	14.28
Cp ≧ Py dis				0.038	0.002	< 0.1	< 0.3	15.10
		with amig. filled with Qz, Cp&Py		0.244	0.004	< 0.1	< 0.3	19.78
				0.075	0.001	< 0.1	< 0.3	13.92
Mt dis. in groundmass		massive lava, dark gray		0.057	0.001	< 0.1	< 0.3	12.24
				0.129	0.002	< 0.1	< 0.3	12.20

Cerro Negro. Chile **Drill# MJCC-08** (Scale 1 / 1000) (1 / 1) (Depth: 0.00m- 190.20m)

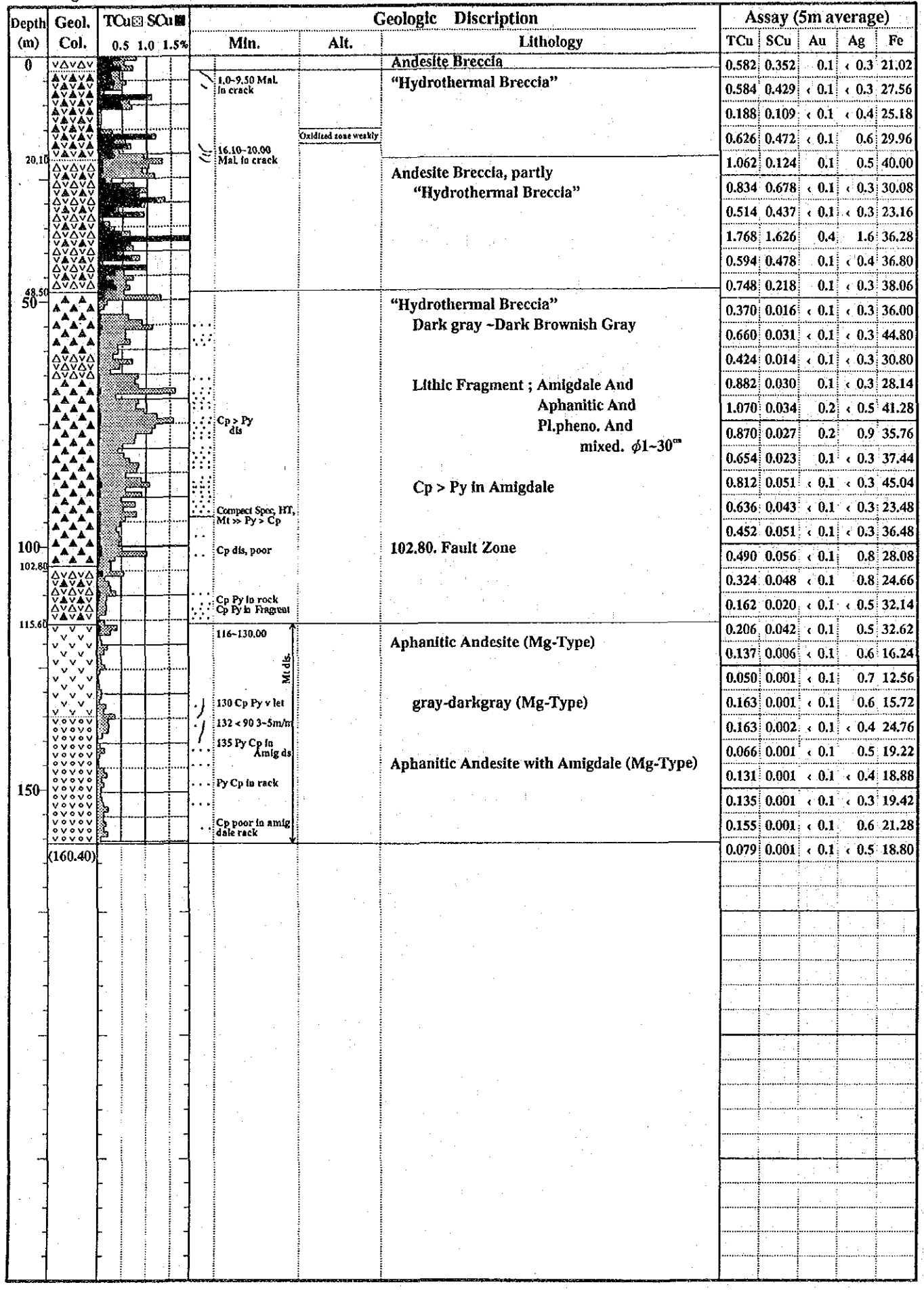
Depth (m)	Geol. Col.	TCu SCu 0.5 1.0 1.5%	Min.	Alt.	Geologic Discription: Lithology	TCu	SCu	Au	Ag	Fe
0					Non core	0.840	0.460	0.6	0.6	32.27
3.35				Weathered zone	"Hydrothermal Breccia", dark brownish gray	0.505	0.313	< 0.1	< 0.3	33.44
7.70			dis mal, cusulfate	Oxidated zone	Tuff, (?) reddish gray~brown	0.398	0.148	< 0.1	1.2	28.54
13.50			mal, dis mal in crack		Aphanitic Andesite, partly with pl pheno	0.306	0.091	< 0.1	< 0.3	23.14
						0.420	0.146	< 0.1	< 0.3	19.62
						0.238	0.053	< 0.1	< 0.3	15.44
						0.138	0.033	< 0.1	0.6	13.36
						0.069	0.003	< 0.1	0.5	13.48
						0.094	0.004	< 0.1	< 0.4	13.28
50						0.176	0.037	< 0.1	1.2	14.36
50.60			Py dis. poor		Tuff / Tuff breccia, partly "Hydrothermal Breccia", gray~brownish gray	0.188	0.031	< 0.1	1.0	14.48
						0.102	0.012	< 0.1	0.9	20.64
			mal, in crack poor		Pl. Pheno. Porphyritic Andesite with Amygdale	0.132	0.018	< 0.1	1.0	22.52
						0.128	0.027	< 0.1	2.0	19.26
						0.142	0.021	< 0.1	1.1	24.28
78.15						0.252	0.072	< 0.1	1.1	23.44
				strongly crushed	Aphanitic Andesite, brownish gray	0.212	0.069	< 0.1	< 0.3	17.48
85.30					Pl. Pheno. Andesite	0.194	0.059	< 0.1	0.8	23.24
						0.132	0.052	< 0.1	< 0.4	11.68
						0.178	0.060	< 0.1	1.2	12.24
100						0.190	0.070	< 0.1	0.9	9.92
						0.067	0.019	< 0.1	0.7	12.34
111.50						0.084	0.015	< 0.1	0.6	22.86
			Py in crack		Aphanitic And.	0.034	0.007	< 0.1	0.6	26.68
						0.047	0.004	< 0.1	< 0.4	19.10
128.00						0.051	0.007	< 0.1	< 0.3	15.36
					Porphyritic Andesite, with pl. phenocryst	0.060	0.005	< 0.1	< 0.5	14.40
137.00						0.063	0.005	< 0.1	< 0.3	13.42
					Fault Breccia Zone					
144.40					Aphanitic Andesite~Andesite Breccia	0.059	0.007	< 0.1	< 0.4	13.78
						0.096	0.018	< 0.1	0.8	12.30
150					Pl. pheno. Andesite gray~blueish gray	0.053	0.005	< 0.1	< 0.3	10.68
						0.034	0.006	< 0.1	< 0.3	10.94
						0.048	0.010	< 0.1	< 0.3	12.12
168.00					168.00 Fanlt (?)	0.036	0.023	< 0.1	< 0.5	15.68
			Cp dis in Amyg, rock		Aphanitic Andesite associated with Amygdale Andesite, gray~greenish gray.	0.112	0.025	< 0.1	0.5	16.38
						0.122	0.017	< 0.1	< 0.3	26.82
						0.095	0.017	< 0.1	< 0.3	26.40
			Cp dis in rock		Pl. pheno+Amyg porphyritic Andesite Gray	0.083	0.012	< 0.1	< 0.3	22.22
(190.20)						0.061	0.001	< 0.1	< 0.5	14.80

Cerro Negro. Chile Drill# MJCC- 9 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -215.10 m)



Geologic Column (MJCC- 9 1: 1,000)

Cerro Negro. Chile **Drill# MJCC-10** (Scale 1/1000) (1/1) (Depth: 0.00m- 160.40m)

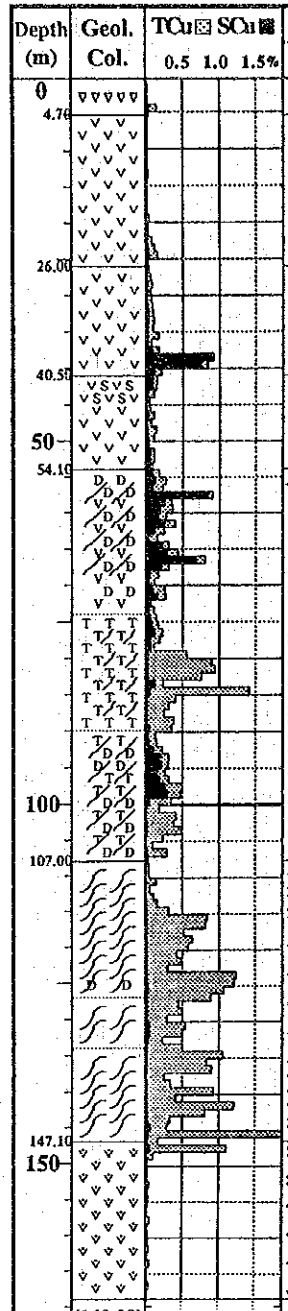


Assay (5m average)				
TCu	SCu	Au	Ag	Fe
0.582	0.352	0.1	< 0.3	21.02
0.584	0.429	< 0.1	< 0.3	27.56
0.188	0.109	< 0.1	< 0.4	25.18
0.626	0.472	< 0.1	0.6	29.96
1.062	0.124	0.1	0.5	40.00
0.834	0.678	< 0.1	< 0.3	30.08
0.514	0.437	< 0.1	< 0.3	23.16
1.768	1.626	0.4	1.6	36.28
0.594	0.478	0.1	< 0.4	36.80
0.748	0.218	0.1	< 0.3	38.06
0.370	0.016	< 0.1	< 0.3	36.00
0.660	0.031	< 0.1	< 0.3	44.80
0.424	0.014	< 0.1	< 0.3	30.80
0.882	0.030	0.1	< 0.3	28.14
1.070	0.034	0.2	< 0.5	41.28
0.870	0.027	0.2	0.9	35.76
0.654	0.023	0.1	< 0.3	37.44
0.812	0.051	< 0.1	< 0.3	45.04
0.636	0.043	< 0.1	< 0.3	23.48
0.452	0.051	< 0.1	< 0.3	36.48
0.490	0.056	< 0.1	0.8	28.08
0.324	0.048	< 0.1	0.8	24.66
0.162	0.020	< 0.1	< 0.5	32.14
0.206	0.042	< 0.1	0.5	32.62
0.137	0.006	< 0.1	0.6	16.24
0.050	0.001	< 0.1	0.7	12.56
0.163	0.001	< 0.1	0.6	15.72
0.163	0.002	< 0.1	< 0.4	24.76
0.066	0.001	< 0.1	0.5	19.22
0.131	0.001	< 0.1	< 0.4	18.88
0.135	0.001	< 0.1	< 0.3	19.42
0.155	0.001	< 0.1	0.6	21.28
0.079	0.001	< 0.1	< 0.5	18.80

Cerro Negro. Chile **Drill# MJCC-11** (Scale 1/1000) (1/1) (Depth: 0.00m- 191.95m)

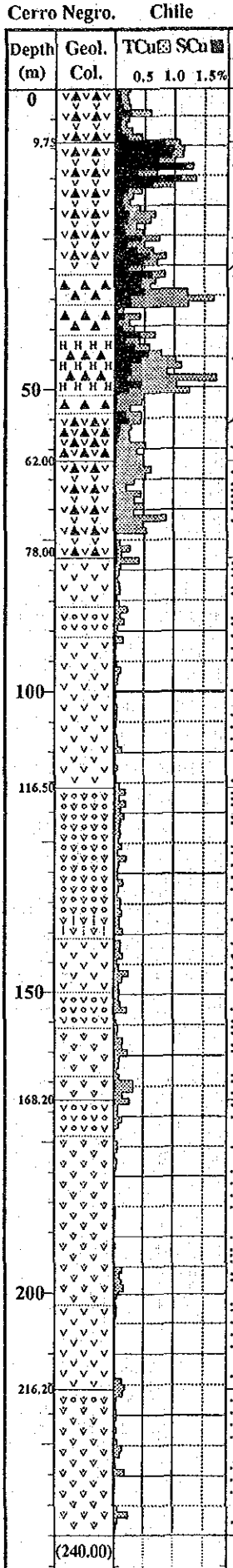
Depth (m)	Geol. Col.	TCu SCu 0.5 1.0 1.5%	Min.	Alt.	Lithology	TCu	SCu	Au	Ag	Fe
0			Spec		"Hydrothermal Breccia", specularite with minor fragment, black reddish brown	0.032	0.002	0.1	< 0.3	43.54
			Py dis			0.033	0.004	0.2	< 0.3	44.16
13.30						0.203	0.020	0.1	< 0.4	32.50
16.60			Py dis		And Lave, Tuff, altenate,	0.047	0.005	< 0.1	0.5	34.60
						0.056	0.010	< 0.1	< 0.4	31.86
						0.038	0.008	0.1	0.6	32.16
			Mal veinlet	oxidized zone	Partly "Hydrothermal Breccia" Texture	0.534	0.428	0.1	< 0.3	33.20
						0.282	0.191	< 0.1	0.5	42.92
			Mal in Fracture			0.076	0.014	< 0.1	1.3	33.94
			mal dis			0.087	0.021	0.1	1.1	31.34
50						0.148	0.039	< 0.1	0.9	35.08
			Mal in frac			0.404	0.245	< 0.1	1.5	34.48
						0.274	0.030	< 0.1	0.7	33.42
65.00										
67.40			Py. dis		Andesite breccia with pl. phenocryst, Partly "Hydrothermal Breccia" Texture, And Tuff breccia Greenish gray	0.062	0.016	< 0.1	< 0.3	27.06
						0.081	0.003	< 0.1	1.9	25.36
						0.052	0.001	< 0.1	1.8	24.00
						0.018	<0.001	< 0.1	1.7	24.18
86.60					Andesite breccia, gray partly amygdale bearing	0.288	0.004	< 0.1	1.3	29.08
			Mt. Cp Py			0.058	0.004	< 0.1	1.8	31.48
100						0.198	0.015	< 0.1	1.7	30.56
						0.140	0.052	< 0.1	1.3	37.30
105.60			Ht >> Mt	Strongly oxidized	Tuff Breccia	0.156	0.063	< 0.1	1.2	21.46
						0.106	0.028	< 0.1	0.7	18.34
115.00				Paryly Silicifide zone		0.274	0.064	< 0.1	0.5	15.56
						0.258	0.074	< 0.1	< 0.3	15.80
			Mal in crack	Weakly Silicifide	Andesite Breccia, gray	0.170	0.018	< 0.1	< 0.3	18.32
						0.113	0.018	< 0.1	< 0.3	19.68
136.60				Oxidized	Tuff~Tuff Breccia reddish brown	0.171	0.067	< 0.1	1.6	22.48
142.10			Spec >> Mt	Oxidized zone	Andesite Breccia, Partly "Hydrothermal Breccia", reddish brown	0.284	0.056	< 0.1	0.9	18.28
			Py >> Cp			0.304	0.039	< 0.1	1.0	15.00
150						0.177	0.034	< 0.1	< 0.4	32.82
156.00			Cp in Matrix		"Hydrothermal Breccia", dark gray light green Tuff or Andsite	0.182	0.037	< 0.1	< 0.3	26.00
						0.622	0.075	< 0.1	1.0	30.12
163.20				Oxidized zone	Tuff, Brown,	0.091	0.023	< 0.1	0.8	26.26
170.33				Oxidized zone		0.140	0.057	< 0.1	1.3	25.44
			Spec. Mt.		Andesite Breccia, Aphanitic And partly Tuff Breccia, (177m ±) partly "Hydrothermal Breccia" Texture, (185m ± , 189.5~ENDS)	0.176	0.099	< 0.1	1.9	24.76
						0.099	0.031	< 0.1	1.2	25.88
			Mal in calcite crack			0.224	0.076	< 0.1	< 0.4	30.28
190.85						0.085	0.027	< 0.1	< 0.3	11.00
(190.85)										

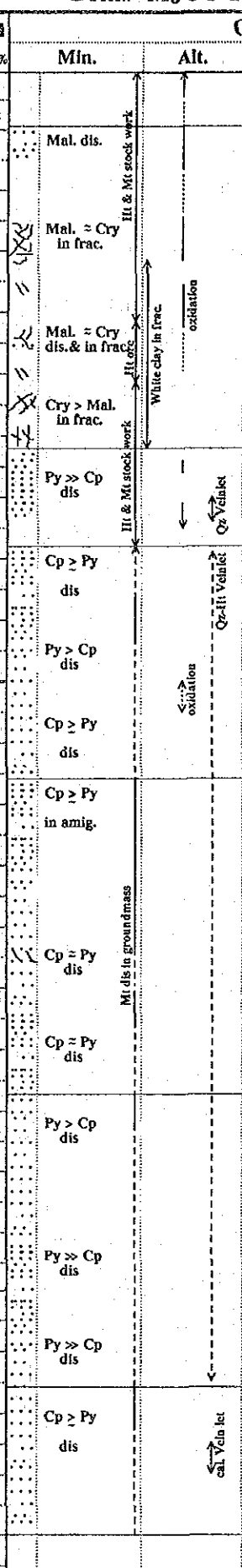
Cerro Negro. Chile **Drill# MJCC-12** (Scale 1/1000) (1/1) (Depth: 0.00m- 169.30m)



Geologic Discription			Assay (5m average)				
Min.	Alt.	Lithology	TCu	SCu	Au	Ag	Fe
		Over burden	0.059	0.014	< 0.1	2.0	7.63
Ht in frac.	white clay in frac. / oxidation	And strongly altered&fractured, pale greenish gray with white veinlets	0.012	0.002	< 0.1	1.3	2.68
			0.015	0.002	< 0.1	0.9	3.42
			0.016	0.002	< 0.1	0.8	3.74
			0.073	0.013	< 0.1	1.5	4.74
Calc. in Gyp		And, massive, pale greenish gray partly altered & fractured with Qz-Cal veinlets	0.045	0.010	< 0.1	< 0.3	5.00
			0.082	0.019	< 0.1	< 0.3	5.92
			0.426	0.345	< 0.1	< 0.3	6.82
Calc. in Gyp		And, pale greenish gray~olivegreen partly silicified, altered & fractured with white veinlets	0.122	0.059	< 0.1	< 0.3	5.11
			0.085	0.015	< 0.1	< 0.3	5.63
Calc. in Gyp			0.096	0.047	< 0.1	< 0.3	3.28
Calc. in frac.	yellowish white clay in frac.	Cataclastic mixture Aplitic diolite & And, strongly sheared pale yellowish green~greenish gray with pinkish part, shear plane ∠ 20° in dip angle Cu sulfate in fracture	0.420	0.298	< 0.1	< 0.3	3.89
Calc. in frac.			0.270	0.156	< 0.1	< 0.4	6.19
Calc. in frac.			0.362	0.249	< 0.1	< 0.3	10.44
			0.157	0.069	< 0.1	< 0.4	5.13
Calc. in frac.		Andesitic tuff, green, partly sheared. Cp dis in tuff & Mt lens	0.242	0.067	< 0.1	< 0.3	5.82
Py ≥ Cp dis			0.844	0.048	0.2	1.4	11.42
Py ≥ Cp dis			0.336	0.011	< 0.1	< 0.3	6.95
Mal. in frac.		Andesitic tuff & Aplitic doilite, pale greenish gray, strongly sheared, shear plane ∠ 20° in dip angle, Mal. veinlets, Cp dis. in matrix.	0.218	0.114	< 0.1	< 0.3	5.33
			0.374	0.182	0.1	< 0.5	6.50
Cp > Py dis			0.344	0.002	< 0.1	< 0.3	5.35
			0.093	0.004	< 0.1	< 0.3	5.79
Cp > Py dis		Mylonitic rock Sheared tuff ?, pale greenish gray shear plane ∠ 20° Mt. Cp & Py dis. in matrix	0.147	0.001	< 0.1	< 0.3	8.38
Mt. dis(~lens)			0.672	0.003	0.2	< 0.3	9.84
			0.724	0.005	< 0.1	0.6	8.28
Cp ≫ Py dis		Sheared tuff ? dark green, pale green & brownish part. Mt. Cp. Py. dis in Matrix	0.630	0.016	< 0.1	< 0.4	12.14
			0.560	0.025	< 0.1	< 0.3	9.89
Cp > Py dis			0.640	0.003	0.2	< 0.3	10.56
Py ≥ Cp dis		Sheared tuff ? grayish green Mt. Cp. & Py dis.~lens in matrix	0.600	0.020	0.1	0.7	19.52
			0.871	0.021	0.2	< 0.3	15.32
Cp ≫ Py dis	White veinlet / Chl-Mt veinlet	And lava, pl. porphyritic, dark greenish gray with high angle white veinlets Cp dis. only in Mt-chl veinlet	0.023	0.001	< 0.1	< 0.3	10.36
			0.021	0.001	< 0.1	< 0.3	9.80
			0.024	0.001	< 0.1	< 0.3	13.40
			0.020	0.001	< 0.1	< 0.3	10.72

Cerro Negro. Chile **Drill# MJCC-13** (Scale 1/1000) (1/1) (Depth: 0.00m- 240.00m)





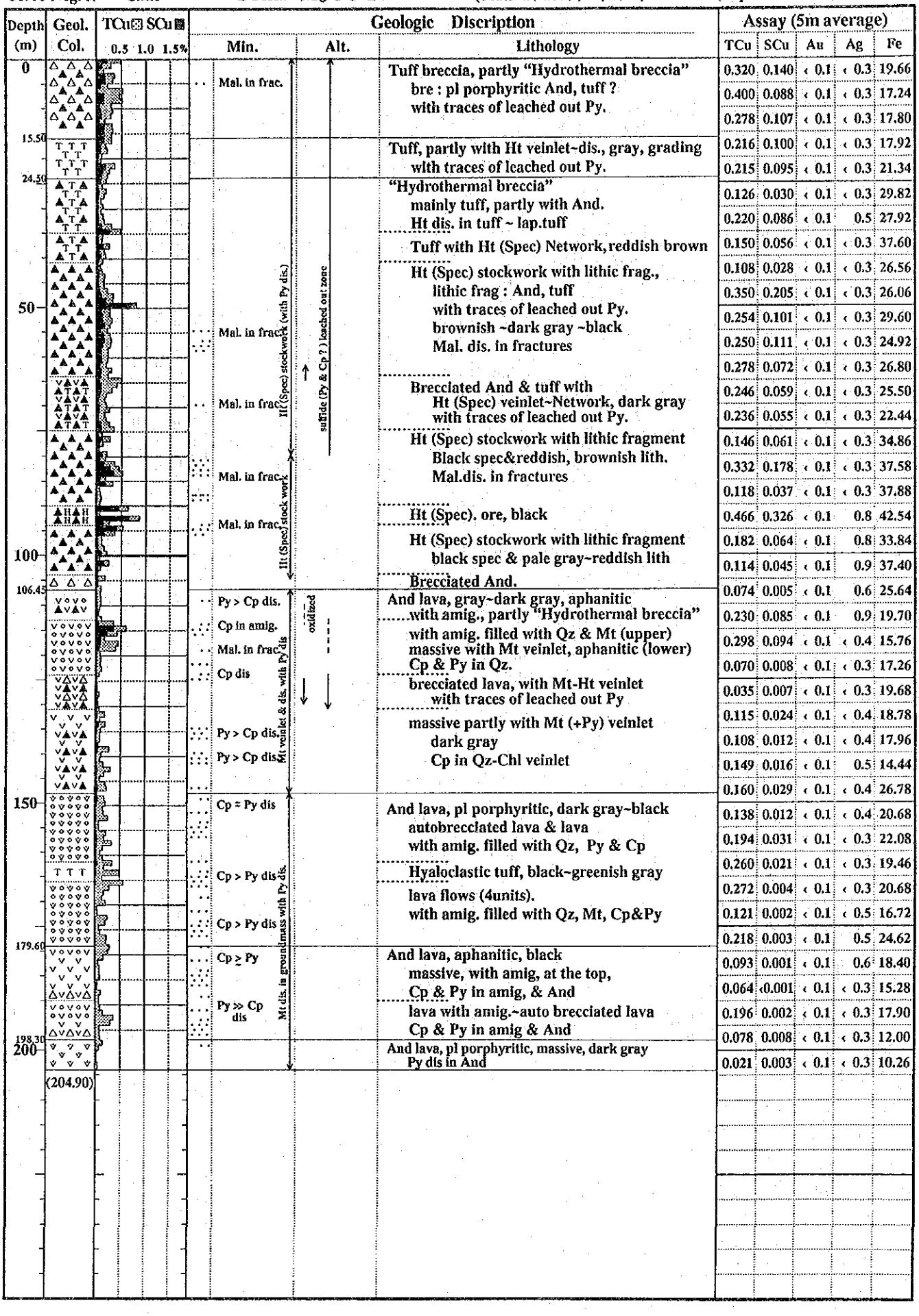
Geologic Discription

Lithology
And massive~hydrothermally brecciated dark gray~reddish brown
"Hydrothermal breccia" Brecciated&altered And with Mt.Ht stockworks, dark gray
Breccia filled wirh Mt. black
Breccia filled with Ht (spec), reddish brown
Fe Ore, Ht (spec) ≫ Mt with minor lithic fragment
Breccia filled with Mt ≈Ht, black
Brecciated&altered Andnd with Ht-Mt stockworks, black~reddish
And, massive~hydrothermally brecciated with Ht-Mt veinlets, greenish dark gray~black
And lava, massive aphanitic, dark gray
with amig. filled with Qz-Cp-Py, black
massive aphanitic, dark gray
And lava, massive, aphanitic, partly with pl. phenocryst.
with amig. filled with Qz-Cp-Py black
massive, dark gray
with amig&pore, black
massive, dark gray
massive, with Mt-veinlet, dark gray
And. lava massive, pl. porphyritic, with amig. filled with Qz-Cp-Py black
massive, dark gray pl(ϕ ≈1 × 3mm)
massive(aphanitic), dark gray
And lava, massive, pl porphilitic, dark gray pl. phenocryst is larger than in upper unit

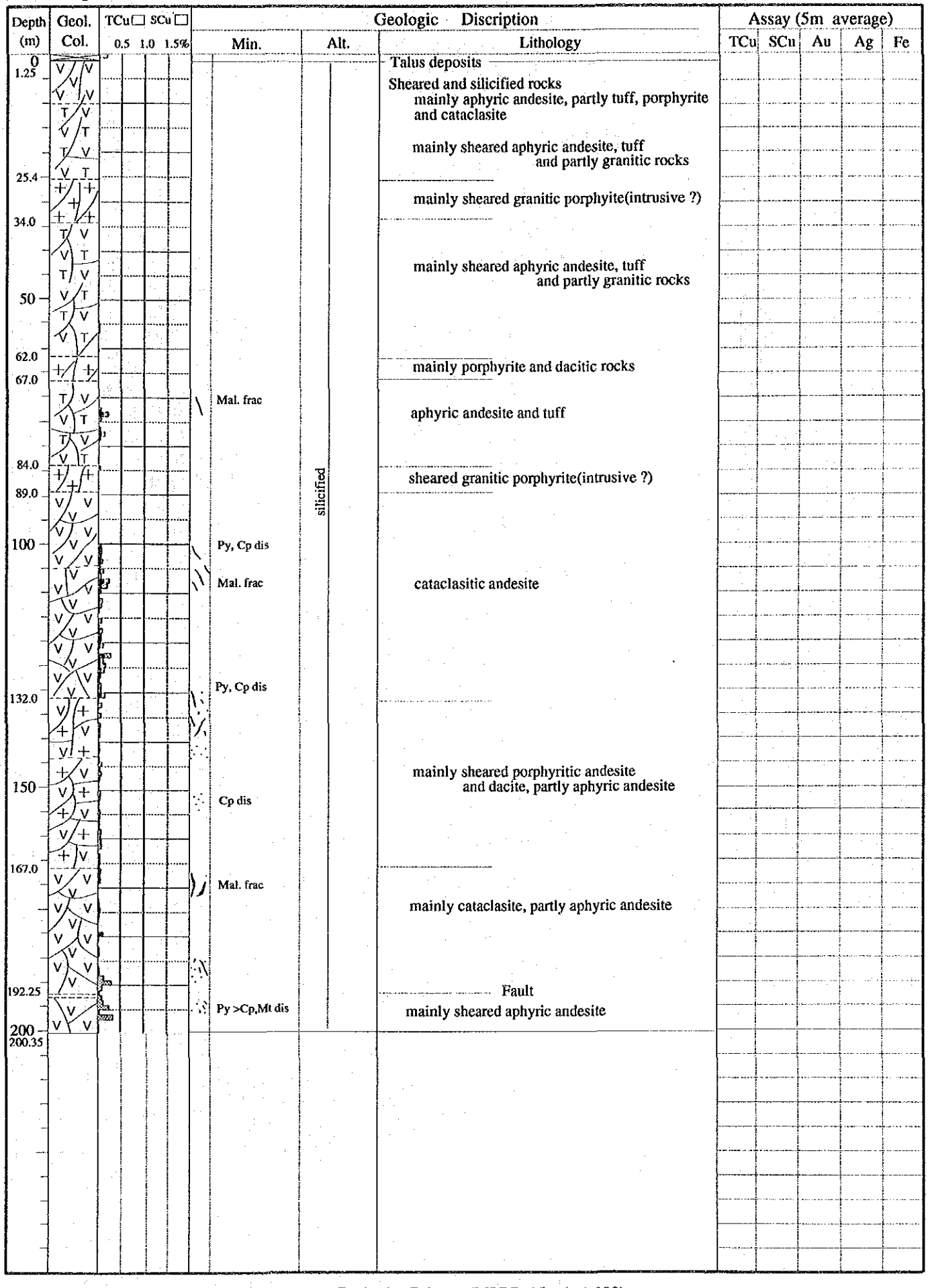
Assay (5m average)

TCu	SCu	Au	Ag	Fe
0.306	0.125	< 0.1	0.5	21.34
0.444	0.263	< 0.1	0.8	22.23
1.056	0.844	< 0.1	1.0	23.72
0.670	0.436	< 0.1	0.8	23.50
0.504	0.176	< 0.1	< 0.3	22.90
0.690	0.414	< 0.1	< 0.4	24.81
0.760	0.444	< 0.1	< 0.4	22.25
0.734	0.150	< 0.1	0.8	34.10
0.552	0.318	0.1	0.8	39.90
1.152	0.326	0.1	0.8	38.70
0.584	0.104	< 0.1	0.5	25.36
0.348	0.092	< 0.1	1.0	22.86
0.498	0.012	< 0.1	2.1	34.02
0.368	0.012	0.2	0.6	26.58
0.450	0.015	0.2	< 0.3	25.44
0.190	0.025	< 0.1	< 0.3	18.48
0.062	0.001	< 0.1	< 0.3	12.82
0.118	0.002	< 0.1	0.7	15.32
0.046	0.002	< 0.1	1.0	13.24
0.053	0.002	< 0.1	0.9	12.88
0.034	0.002	< 0.1	0.7	11.30
0.056	0.002	< 0.1	< 0.4	12.92
0.024	<0.001	< 0.1	< 0.3	13.44
0.125	0.002	< 0.1	< 0.3	16.82
0.103	<0.001	< 0.1	< 0.3	16.80
0.101	0.002	< 0.1	< 0.3	18.90
0.089	0.001	< 0.1	< 0.5	17.96
0.110	<0.001	< 0.1	< 0.3	24.04
0.082	<0.001	< 0.1	< 0.3	21.86
0.127	0.002	< 0.1	< 0.3	18.26
0.094	<0.001	< 0.1	< 0.5	18.50
0.122	0.002	< 0.1	< 0.3	13.48
0.124	0.005	< 0.1	< 0.3	16.24
0.174	0.006	< 0.1	< 0.3	21.82
0.061	<0.001	< 0.1	< 0.3	17.64
0.036	<0.001	< 0.1	< 0.3	12.42
0.011	<0.001	< 0.1	< 0.3	14.60
0.013	<0.001	< 0.1	< 0.3	13.02
0.011	<0.001	< 0.1	< 0.3	13.78
0.113	0.004	< 0.1	< 0.3	20.34
0.021	<0.001	< 0.1	< 0.4	18.36
0.004	<0.001	< 0.1	< 0.3	16.90
0.034	0.001	< 0.1	0.5	17.88
0.090	0.003	< 0.1	< 0.3	18.82
0.038	0.002	< 0.1	< 0.3	15.28
0.099	<0.001	< 0.1	< 0.3	19.96
0.017	<0.001	< 0.1	< 0.3	17.28
0.077	0.002	< 0.1	< 0.3	18.16

Cerro Negro, Chile　　Drill# MJCC-14　　(Scale 1/1000) (1/1)　　(Depth: 0.00m- 204.90m)



Cerro Negro. Chile Drill# MJCC- 15 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -200.35 m)

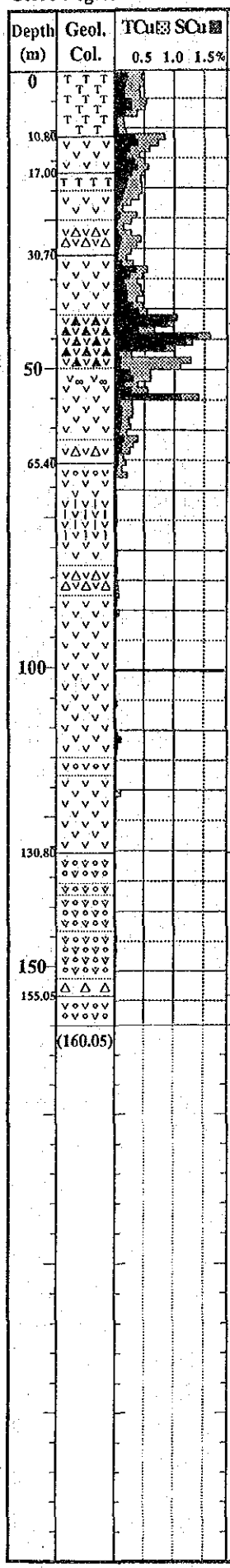


Geologic Column (MJCC- 15 1: 1,000)

Cerro Negro. Chile **Drill# MJCC-16** (Scale 1/1000) (1/1) (Depth: 0.00m- 216.75m)

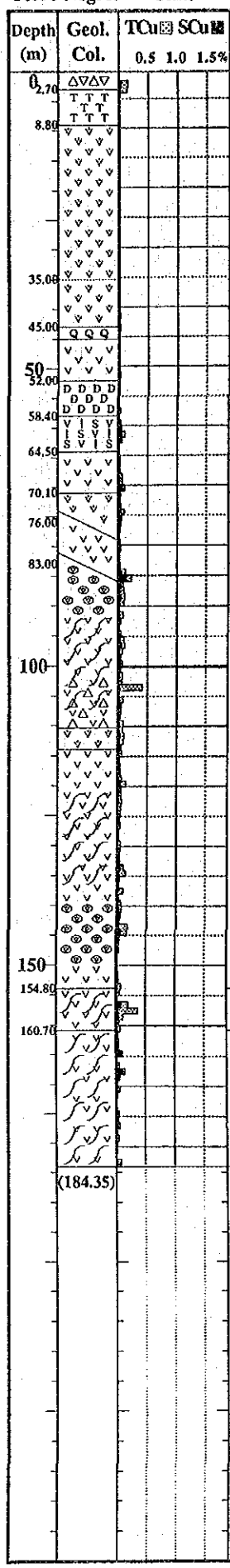
Depth (m)	Geol. Col.	TCu SCu 0.5 1.0 1.5%	Min.	Alt.	Lithology	TCu	SCu	Au	Ag	Fe
0				Weathered and Evaporate	Origine is andsite, with Qtz Network partly Silicfide	0.004	<0.001	0.1	< 0.3	1.70
						0.003	<0.001	0.1	< 0.3	1.91
						0.003	<0.001	<0.1	< 0.3	1.14
15.00				Silicified, clay Gypsum	Andsite Lava, greenish gray	0.027	0.004	< 0.1	< 0.4	4.07
						0.008	<0.001	< 0.1	< 0.4	1.81
						0.009	<0.001	< 0.1	< 0.3	2.14
						0.011	0.001	< 0.1	< 0.3	2.11
						0.005	0.001	< 0.1	< 0.3	3.14
					Lower part, Andesite/Tuff	0.026	0.003	< 0.1	< 0.3	5.86
				argillitic	Andsite Tuff, Brownish gray	0.205	0.044	< 0.1	1.0	7.58
50			mal in frac	argillitic, gyp in frac.	Andesite Lava~Andesite Tuff greenish gray	1.130	0.621	< 0.1	3.0	16.62
			mal in frac			0.688	0.306	< 0.1	1.4	14.00
						0.422	0.200	< 0.1	1.8	15.84
						0.456	0.133	0.1	1.8	17.50
				oxidized		0.292	0.072	< 0.1	1.2	17.60
						0.330	0.090	< 0.1	0.9	15.28
80.70			mal in frac		Andesite Tuff & Brownish gray brown	0.626	0.418	0.2	3.5	15.90
84.30			(Mt)		Mylonitic Andesite with calcite Veinlets Dark greenish gray	0.356	0.129	0.1	0.7	13.18
			mal in frac			0.662	0.194	0.1	1.9	13.86
			Mt Py > Cp (Bor ?)			0.328	0.004	< 0.1	1.5	8.92
100						0.474	0.009	0.2	1.7	13.82
						0.428	0.009	0.2	2.3	12.24
			Cp dis in rock			0.274	0.004	0.2	1.9	10.46
						0.100	0.001	< 0.1	1.9	8.80
			Mt Cp dis poor > Py		Mylonitic Texture	0.386	0.006	< 0.1	2.1	11.60
						0.161	0.006	< 0.1	1.2	11.96
						0.085	0.001	< 0.1	1.3	7.66
						0.183	0.002	< 0.1	1.5	9.82
						0.054	0.001	< 0.1	1.3	11.36
			1360 Cp veinlet let Cp dis. very poor			0.036	0.001	< 0.1	3.5	13.00
150					Mt very common	0.110	0.001	< 0.1	2.0	12.58
			partly Cp dis			0.002	<0.001	< 0.1	1.9	8.60
						0.002	<0.001	< 0.1	1.7	8.64
						0.001	<0.001	< 0.1	0.6	8.80
						0.001	<0.001	< 0.1	< 0.3	10.36
						0.017	0.004	< 0.1	< 0.3	9.28
						0.007	<0.001	< 0.1	< 0.3	11.60
			Cp dis in rock			0.025	<0.001	< 0.1	< 0.3	10.16
						0.020	<0.001	< 0.1	< 0.3	8.88
						0.049	<0.001	< 0.1	< 0.3	12.82
200			Cp veinlet		partly Aphanitic Andesite	0.120	0.002	< 0.1	< 0.4	12.36
						0.262	0.004	< 0.1	< 0.4	12.74
			Op veinlet			0.119	0.002	< 0.1	< 0.5	12.80
(216.75)						0.034	<0.001	< 0.1	< 0.4	4.64

Cerro Negro. Chile **Drill# MJCC-17** (Scale 1 / 1000) (1 / 1) (Depth: 0.00m- 160.05m)



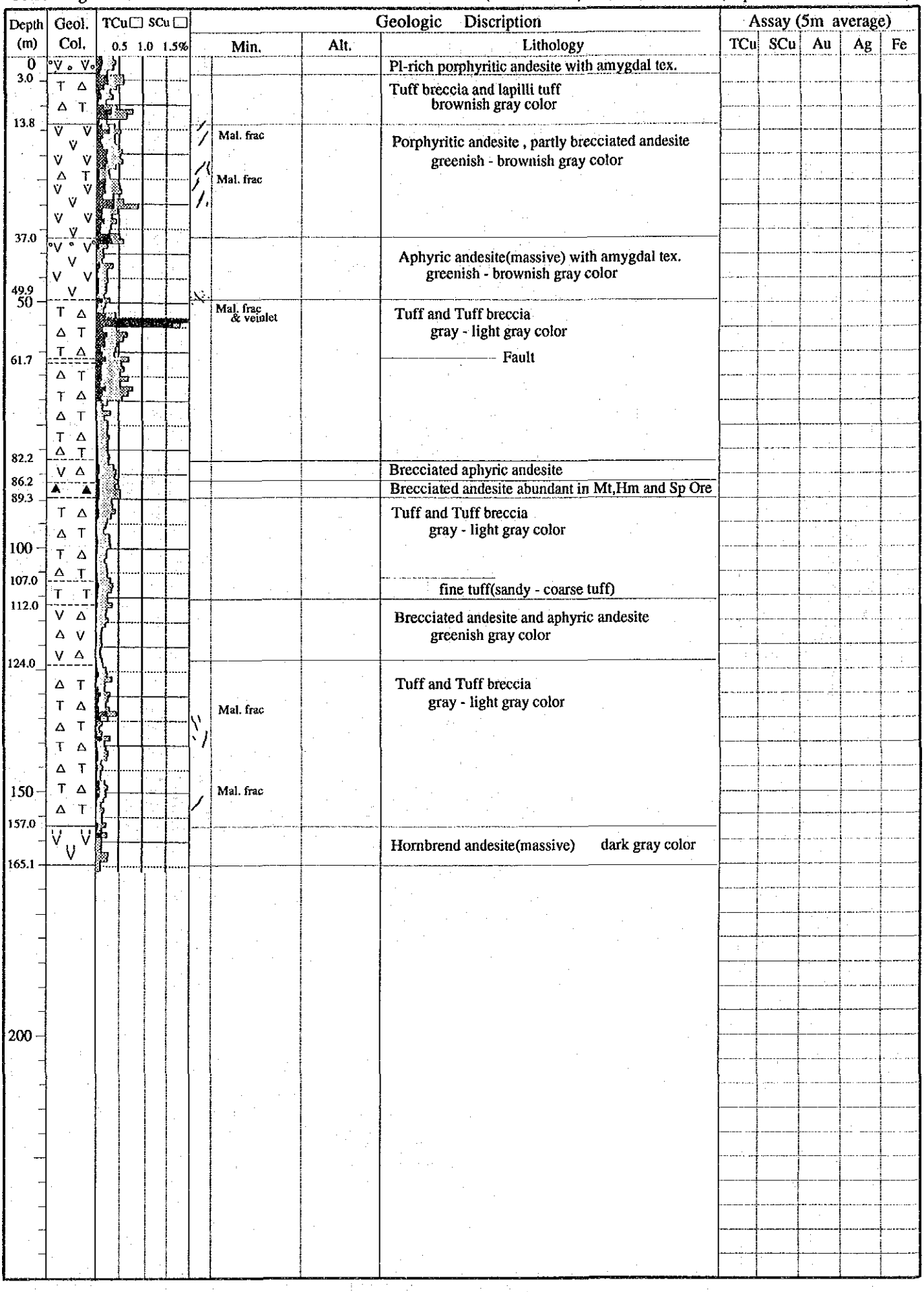
Min.	Alt.	Geologic Discription: Lithology	TCu	SCu	Au	Ag	Fe
		Andesitic tuff : greenish gray, partly with Ht veinlet, showing grading & banding (grading)	0.456	0.176	< 0.1	< 0.3	13.54
			0.346	0.161	< 0.1	< 0.3	20.54
Mal. in frac		And, aphanitic, partly with Ht (Spec) veinlet, gray mal. in frac. & Ht veinlet	0.548	0.239	< 0.1	< 0.3	23.94
			0.488	0.274	< 0.1	< 0.4	23.20
	Mt dis.~veinlet	And lava, breccia & tuff, greenish gray, And is pl porphyritic or aphanitic, Mt dis. is porphyritic.	0.318	0.088	< 0.1	< 0.3	19.42
			0.294	0.053	< 0.1	< 0.4	14.46
	oxidation	And lava, aphanitic, dark gray, Massive, altered along fructure, leached out Py.	0.358	0.161	< 0.1	< 0.3	16.40
			0.428	0.208	< 0.1	0.8	17.54
Mal & Cry dis~veinlet	Ht	Brecciated, with Ht (Spec) network network with traces of leached out Py.	0.972	0.822	0.1	1.2	27.80
			0.986	0.451	0.1	0.6	24.94
Mal. in frac	Mt & Ht	Massive, with Ht & Mt dis. ~veinlet mal. in frac.	0.704	0.414	< 0.1	< 0.4	17.68
			0.270	0.099	< 0.1	< 0.3	14.92
		Auto brecciated lava	0.254	0.098	< 0.1	0.5	13.64
		And lava, aphanitic, dark gray Massive, with many pores after passes of fluid, no mineralization.	0.102	0.018	< 0.1	< 0.3	15.88
			0.025	0.005	< 0.1	< 0.4	12.34
			0.020	0.004	< 0.1	< 0.3	12.18
		Auto brecciated lava. ~ hyaloclastic tuff	0.023	0.004	< 0.1	< 0.4	14.50
			0.038	0.009	< 0.1	< 0.4	13.10
		Massive, partly with high angle cal veinlets Cp dis. along cal. veinlet Mal. in cal veinlet	0.019	0.010	< 0.1	1.3	11.84
Cp film in frac	white clay veinlet		0.004	0.001	< 0.1	1.2	12.42
Mal. in frac			0.010	0.002	< 0.1	0.7	9.92
Cp dis			0.024	0.008	< 0.1	< 0.4	10.06
			0.042	0.022	< 0.1	< 0.3	11.98
	Mt dis. in And & amig.	Massive, with amig., white clay veinlet	0.007	0.002	< 0.1	< 0.3	10.08
Cp in Qz veinlet		Massive, with Qz veinlet Cp rarely in Qz veinlet	0.027	<0.001	< 0.1	< 0.3	9.44
			0.003	<0.001	< 0.1	< 0.3	7.92
		And lava, pl porphyritic, dark gray ~ black several thin lava flows with amig. at the top & bottom parts of each flows. Cp dis. in amig. and Qz-chl veinlet at the bottom, hyoloclastite (∠ 10°)	0.012	0.002	< 0.1	< 0.3	11.18
Py >> Cp in Qz			0.012	0.001	< 0.1	< 0.3	12.34
			0.020	0.003	< 0.1	< 0.3	12.70
Cp >> Py dis			0.011	0.003	< 0.1	< 0.3	15.56
			0.008	<0.001	< 0.1	< 0.3	12.40
		And lava, aphanitic, with amig. filled with Qz, Mt, & Py	0.002	<0.001	< 0.1	< 0.4	9.52

Cerro Negro. Chile **Drill# MJCC-18** (Scale 1/1000) (1/1) (Depth: 0.00m- 184.35m)



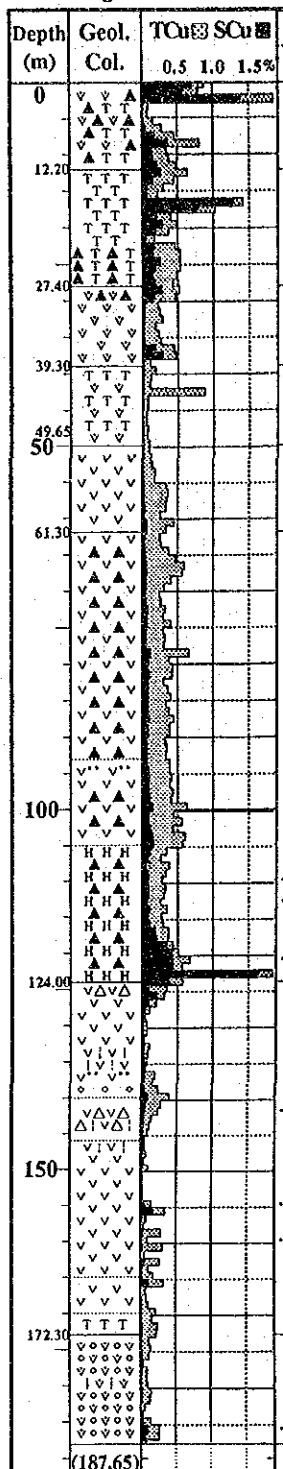
Min.	Alt.	Lithology	TCu	SCu	Au	Ag	Fe
		Alluvium Ht rock ≫ Mt rock	0.106	0.024	< 0.1	< 0.3	30.00
		And tuff, pale yellowish green	0.005	<0.001	< 0.1	< 0.3	1.95
	White clay	And lava, pl porphyritic, argillitic alteration, greenish gray with white veinlets	0.006	0.001	< 0.1	< 0.4	2.06
			0.005	<0.001	< 0.1	< 0.3	4.48
	Qz-Cal veinlet.		0.009	0.002	< 0.1	< 0.3	6.76
			0.005	<0.001	< 0.1	< 0.3	3.97
			0.007	0.001	< 0.1	< 0.3	3.42
		altered greenly, without white veinlet gray~greenish gray	0.002	<0.001	< 0.1	< 0.3	5.64
	vit		0.013	0.004	< 0.1	< 0.3	4.60
		Qz, Fd, Cal vein					
	Qz	And, massive, aphanitic, grayish green	0.003	0.001	< 0.1	< 0.3	8.76
		Diolitic And, Fd porphyritic, massive gray~pale gray	0.008	0.003	< 0.1	< 0.3	3.78
	Network		0.022	0.011	< 0.1	< 0.3	5.87
(Cp, Chry)	Silicified	And? deformed strongly, greenish gray~dark gray	0.050	0.028	< 0.1	1.5	7.24
(Cp, Chry)	Qz	And, aphanitic, massive, dark green	0.041	0.017	< 0.1	< 0.3	9.38
		And, pl. porphyritic, massive, dark green	0.064	0.032	< 0.1	0.6	10.16
		And, dyke, aphanitic, massive, greenish gray	0.033	0.013	< 0.1	< 0.5	10.92
			0.045	0.019	< 0.1	< 0.3	8.04
(Mal)		And. pl. porphyritic, deformed	0.120	0.059	< 0.1	0.7	9.38
(Mal)	Qz veinlet.	And, aphanitic, massive, greenish gray partly with Qz veinlet in fracture	0.045	0.014	< 0.1	0.5	9.46
			0.075	0.032	< 0.1	< 0.3	7.13
(Chry)			0.119	0.015	< 0.1	0.8	11.94
			0.058	0.016	< 0.1	1.2	9.64
			0.072	0.024	< 0.1	0.6	9.64
		(And. pl. porphyritic, dark greenish gray)	0.055	0.016	< 0.1	1.8	8.18
			0.048	0.011	< 0.1	2.6	9.00
			0.026	0.004	< 0.1	1.4	9.42
		with Qz-network { white veinlet	0.067	0.018	< 0.1	1.1	11.56
	Qz-Fd veinlet.	pinkish veinlet }	0.041	0.008	< 0.1	1.1	9.28
		(*And, pl. porphyritic, dark greenish gray*	0.096	0.027	< 0.1	1.9	12.16
		brecciated fragments filled with aph. And.)	0.027	0.006	< 0.1	1.7	10.00
			0.042	0.012	< 0.1	2.2	10.99
(Chry)	Qz-Net	And, Shear fault zone, with Qz-network	0.153	0.037	< 0.1	1.9	10.74
			0.062	0.033	< 0.1	1.7	4.85
		And, aphanitic, massive, greenish gray	0.068	0.044	< 0.1	1.6	4.73
		with Qz-Fd vein & network	0.038	0.018	< 0.1	0.6	4.97
	Qz-Fd veinlet.	{ white veinlet	0.043	0.020	< 0.1	0.6	3.01
		{ pinkish veinlet	0.038	0.014	< 0.1	< 0.3	6.90

Cerro Negro. Chile Drill# MJCC- 19 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -165.10 m)



Geologic Column (MJCC- 19 1: 1,000)

Cerro Negro, Chile **Drill# MJCC-20** (Scale 1/1000) (1/1) (Depth: 0.00m- 187.65m)



Geologic Discription				Assay (5m average)				
Min.	Alt.	Lithology	TCu	SCu	Au	Ag	Fe
Mal.dis		And lava & tuff, gray~reddish brown with Ht veinlet, lava is pl. porphyritic	0.736	0.542	< 0.1	< 0.3	27.76
			0.412	0.151	< 0.1	< 0.3	20.62
Mal.dis		And tuff, mid~fine, greenish gray , partly "Hydrothermal breccia" with Ht (Spec) Network	0.450	0.174	< 0.1	< 0.3	16.84
			0.708	0.524	< 0.1	< 0.3	31.42
Mal.frac			0.414	0.165	< 0.1	< 0.3	24.16
			0.488	0.194	< 0.1	< 0.3	21.74
Mal.frac		And pl. porphyritic, gray~reddish brown strongly fractured	0.230	0.028	< 0.1	< 0.4	18.18
Mal.frac			0.292	0.105	< 0.1	0.5	19.48
		And lava, gray~reddish brown strongly fractured	0.247	0.007	< 0.1	< 0.3	21.40
			0.068	0.007	< 0.1	< 0.3	22.34
	oxidation	And lava ?, yellowish brown ~reddish brown strongly fractured (∠ 30°)	0.139	0.012	< 0.1	< 0.3	20.82
			0.324	0.031	< 0.1	< 0.3	27.72
			0.330	0.045	< 0.1	< 0.3	27.12
		"Hydrothermal breccia" And with Ht (Spec) & Mt, dark gray~reddish brown strongly fractured (∠ 30°~ 40°)	0.466	0.057	< 0.1	< 0.3	18.40
			0.302	0.060	< 0.1	< 0.4	29.36
			0.390	0.073	< 0.1	0.6	26.28
			0.382	0.084	< 0.1	1.0	32.64
			0.390	0.084	< 0.1	0.7	31.78
			0.356	0.069	< 0.1	0.9	31.40
		And, aphanitic, massive, gray with Ht (spec) veinlet~network with	0.452	0.107	< 0.1	0.6	34.10
			0.522	0.124	< 0.1	0.7	23.88
			0.318	0.092	< 0.1	< 0.5	34.64
Mal.frac		Ht (Spec) stockwork with And. fragments, black (Spec) & yellowish brown (lith), Mal. dis. in fractures.	0.300	0.087	< 0.1	0.7	32.72
Mal.frac			0.392	0.252	0.2	0.6	47.48
			0.798	0.594	0.1	0.8	30.62
Cry in frac		And lava, aphanitic, Massive, dark gray browish gray, hydrothermally altered along fractures.	0.140	0.069	< 0.1	< 0.4	13.62
			0.060	0.016	< 0.1	< 0.4	13.36
			0.194	0.037	< 0.1	< 0.4	15.76
Mal in frac		auto brecciated, dark gray~brownish gray altered along fractures.	0.162	0.032	< 0.1	0.5	15.90
			0.052	0.011	< 0.1	< 0.3	12.66
		Massive, dark gray~browish gray, hydrother wally altered along fractures, Mal. in fractures, Cp dis. in Qz Py dis. in Ht veinlet.	0.042	0.013	< 0.1	< 0.3	11.76
Mal in frac			0.164	0.043	< 0.1	< 0.3	12.24
Cp, Mal dis.			0.180	0.026	< 0.1	< 0.3	13.44
		fractured, brown~brownish gray.	0.155	0.027	< 0.1	< 0.3	17.36
		auto brecciated lava ~hyaloclastic tuff	0.176	0.020	< 0.1	< 0.4	17.90
		And lava, pl porphyritic, massive, dark gray with brown parts partly with amigs filled with Qz & Py	0.087	0.015	< 0.1	< 0.3	14.52
			0.102	0.020	< 0.1	< 0.3	15.52
Mal in frac			0.122	0.040	< 0.1	< 0.2	11.36

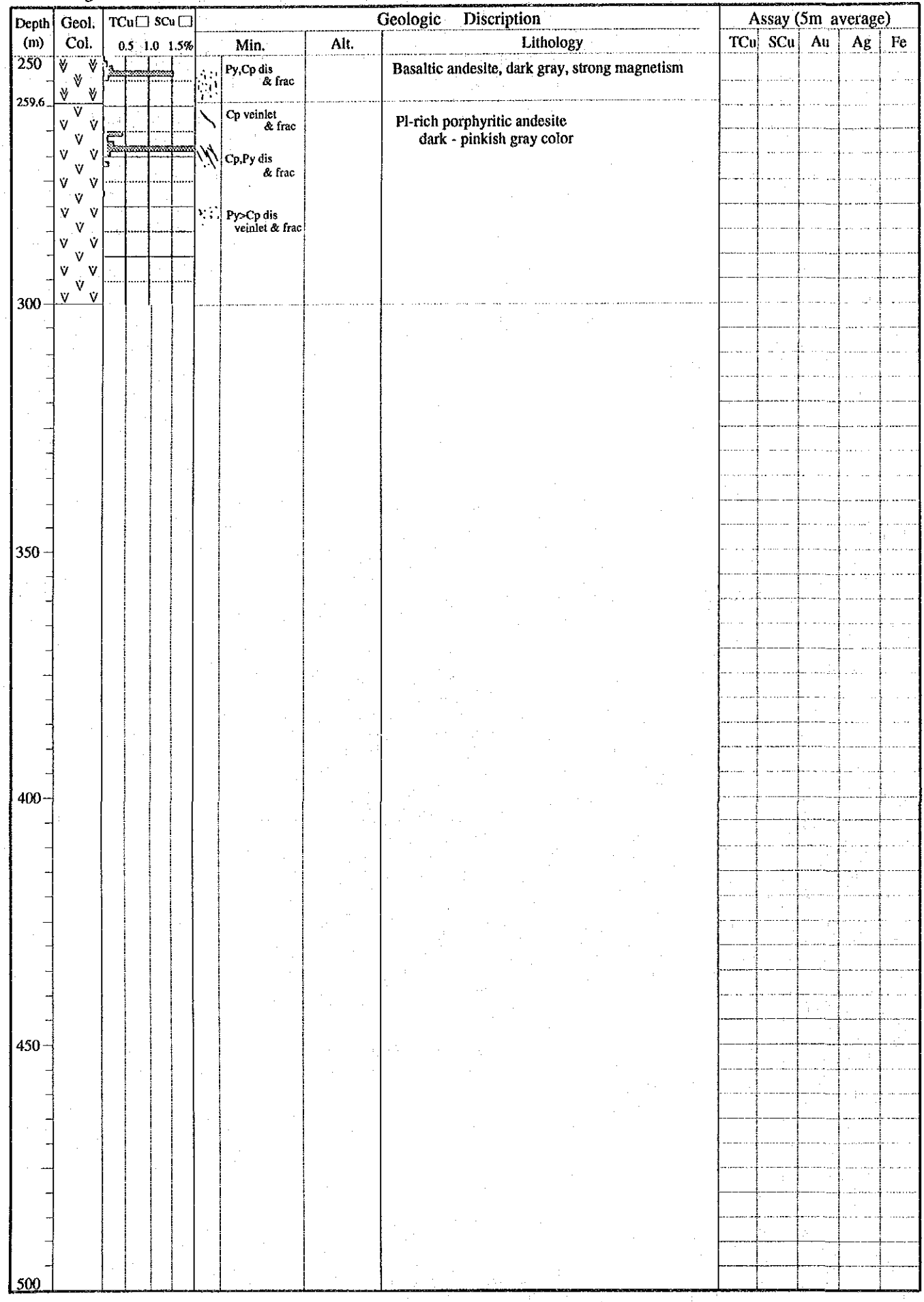
Mt (Spec) veinlet ~ stockwork
Mt
oxidation
Ht (Spec) veinlet ~ stockwork
Mt dis. in groundmass
oxidation

Cerro Negro. Chile Drill# MJCC- 21 (Scale 1/ 1000) (1 / 2) (Depth : 0.00 m -250.00 m)

Depth (m)	Geol. Col.	TCu□ SCu□ 0.5 1.0 1.5%	Min.	Alt.	Geologic Discription: Lithology	Assay (5m average) TCu	SCu	Au	Ag	Fe
0					Basaltic andesite, dark gray					
2.8					Breccited andesite abundant in Mt,Hm and Sp Ore					
15.5			Mal. frac		Aphyric basaltic andesite, brecciated andesite dark - blackish gray					
32.0					Fault(with fault clay)					
48.8			Mal. dis							
50			Mal. frac		Fault Porphyritic andesite, with brecciated andesite dark - brownish gray color					
			Mal. frac & veinlet							
88.0			Mal. frac & veinlet		Porphyritic andesite(massive) partly amygdal tex.					
97.6										
100			Mal. frac		Aphyric andesite(massive), partly amygdal tex. browniah - greenish gray					
122.0					Porphyritic andesite(massive) dark - brownish gray					
133.0			Py>Cp veinlet		Aphyric andesite(massive), partly amygdal tex. browniah - greenish gray					
150										
152.1			Py>Cp dis & frac		Basaltic andesite dike?, blackish gray color					
152.6			Cp veinlet		Brecciated aphyric andesite and aphyric andesite (massive)					
162.1			Mal. frac		Pl-rich porphyritic andesite, partly amygdal tex. and very strong magnetism dark gray color					
182.2			Cp, Py veinlet Cp, Py veinlet		Basaltic andesite, partly brecciated andesite and amygdal tex. dark - brownish gray color					
197.1			Mal. frac		Porphyritic andesite, partly amygdal tex. and very strong magnetism dark gray color					
200			Py,Cp frac & dis							
246.9					Basaltic andesite(massive), blackish gray color					
250										

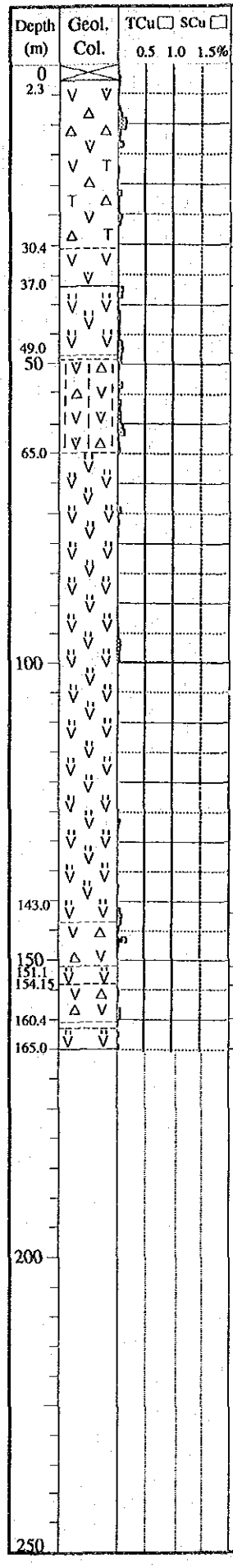
Geologic Column (MJCC- 21 1: 1,000)

Cerro Negro, Chile Drill# MJCC- 21 (Scale 1/ 1000) (2 / 2) (Depth : 250.00 m -300.00 m)



Geologic Column (MJCC- 21 1: 1,000)

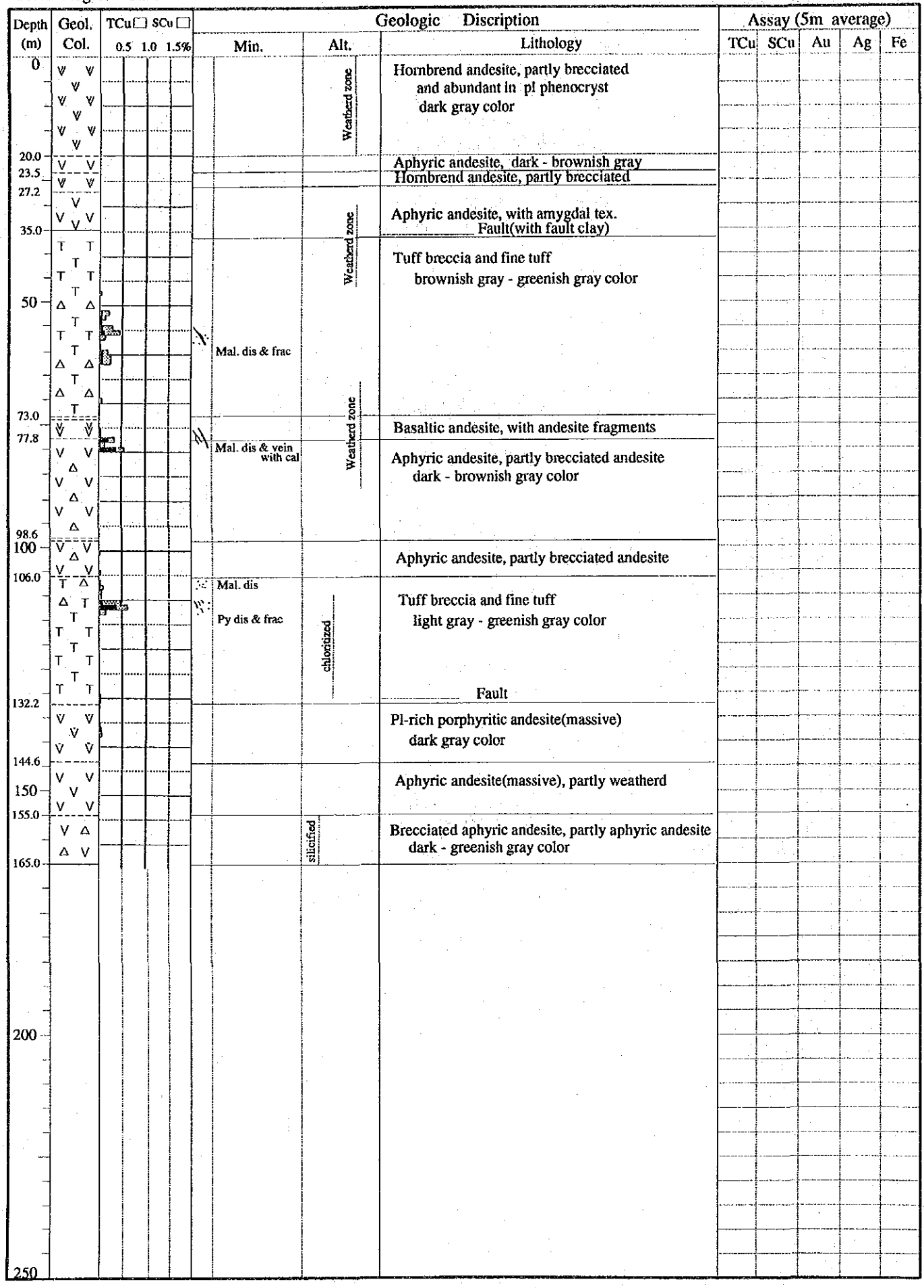
Cerro Negro. Chile Drill# MJCC- 22 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -165.00 m)



Geologic Discription			Assay (5m average)				
Min.	Alt.	Lithology	TCu	SCu	Au	Ag	Fe
		Non Core					
	Weathered zone	Aphyric andesite, pl-rich porphyritic andesite and brecciated andesite, with tuff breccia brownish gray - brown color					
		Aphyric andesite, with amygdal tex.					
		Fault(with fault clay)					
		Hornbrend andesite, with brecciated andesite					
		Fault					
		Brecciated andesite, aphyric andesite and pl-rich porphyritic andesite dark - brownish gray color					
		Hornbrend andesite(homogeneous) dark - greenish gray color					
		Aphyric andesite, partly brecciated andesite					
		Hornbrend andesite,dark gray color					
		Aphyric andesite, partly brecciated andesite					
		Hornbrend andesite,dark gray color					

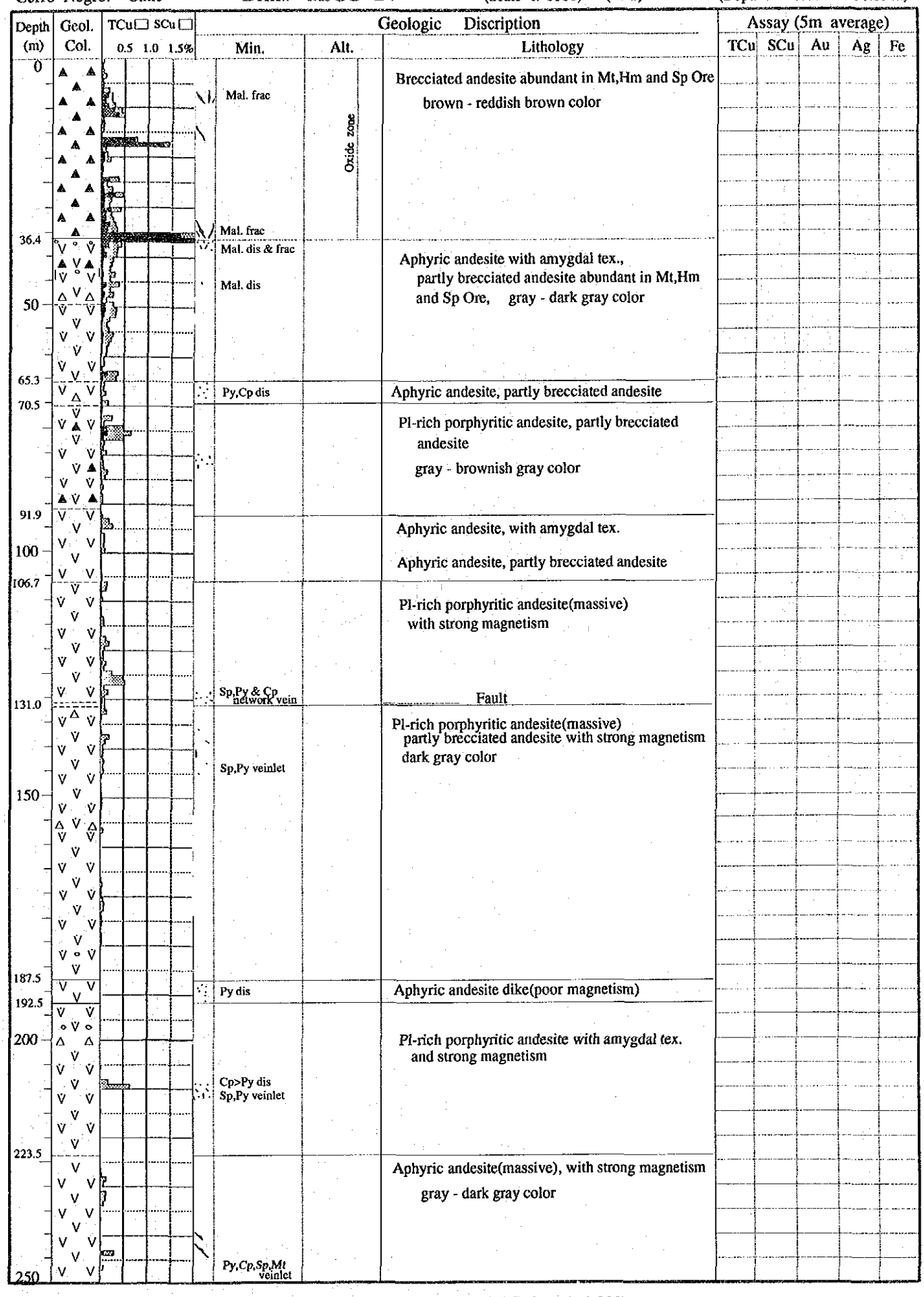
Geologic Column (MJCC- 22 1: 1,000)

Cerro Negro, Chile Drill# MJCC- 23 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -165.00 m)



Geologic Column (MJCC- 23 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 24 (Scale 1/ 1000) (1 / 2) (Depth : 0.00 m -250.00 m)



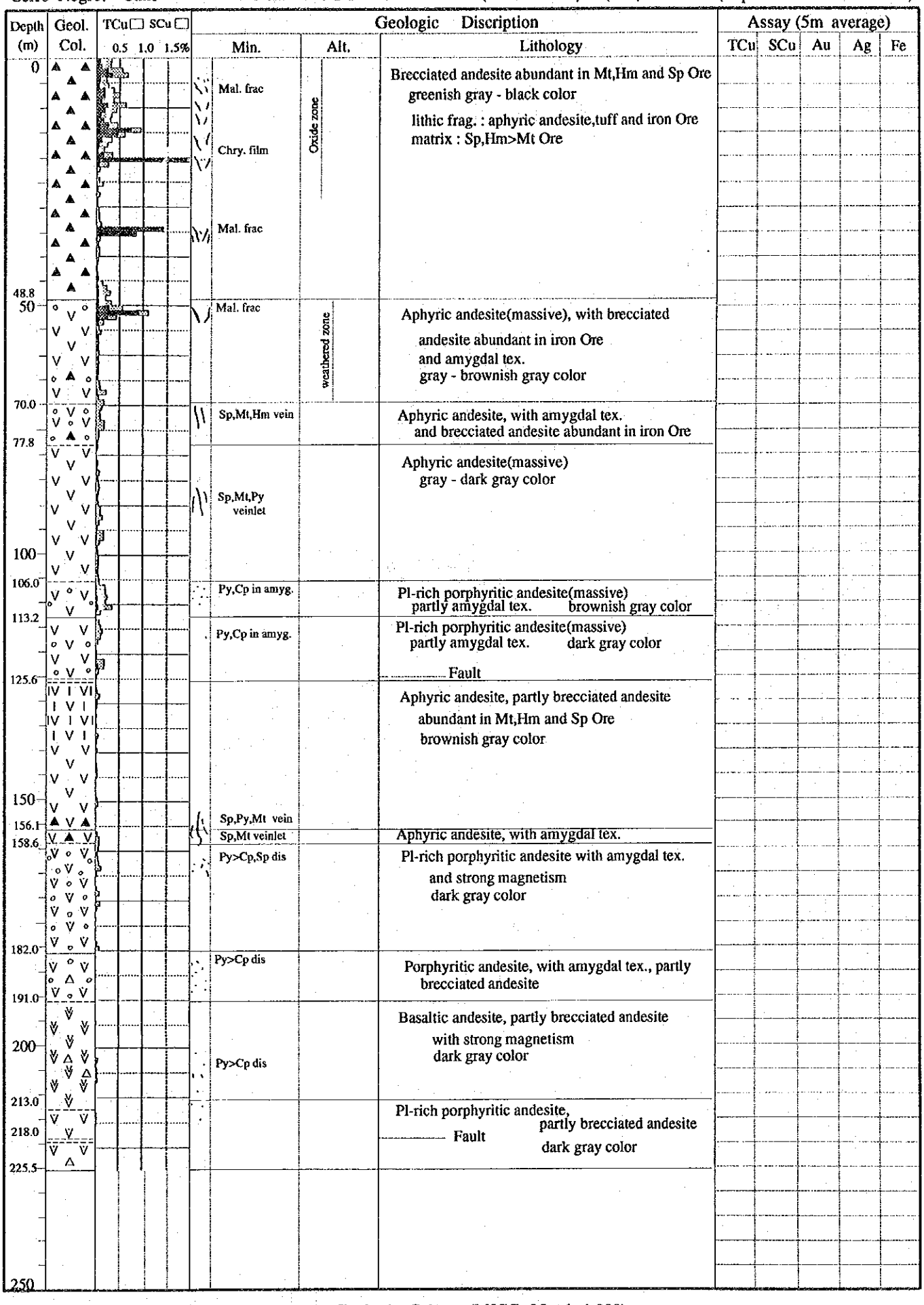
Geologic Column (MJCC- 24 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 24 (Scale 1/ 1000) (2 / 2) (Depth : 250.00 m -388.30 m)

Depth (m)	Geol. Col.	TCu□ SCu□ 0.5 1.0 1.5%	Min.	Alt.	Geologic Discription: Lithology	Assay (5m average) TCu	SCu	Au	Ag	Fe
250			Mt, Py, Cp veinlet		Aphyric andesite with amygdal tex., gray - dark gray color					
259.5					Pl-rich porphyritic andesite with amygdal tex. and strong magnetism, dark gray color					
270.6			Cp veinlet		Holocryst. porphyrite, partly basaltic andesite injected into porphyrite gray - dark gray color					
			Cp network veinlet		Fault					
300										
302.1			Cp,Py dis Cp,Py veinlet		Pl-rich porphyritic andesite, with amygdal tex.					
329.5					Basaltic andesite, partly brecciated andesite blackish gray color					
			Py,Cp veinlet		Fault					
344.5					Porphyritic andesite					
348.0					Holocryst. andesite,partly porphyritic andesite dark gray color					
350										
355.5					Pl-rich porphyritic andesite(massive) partly holocryst. tex. and amygdal tex. dark gray color					
			Cp,Py dis							
			Py>Cp dis							
388.3										
400										
450										
500										

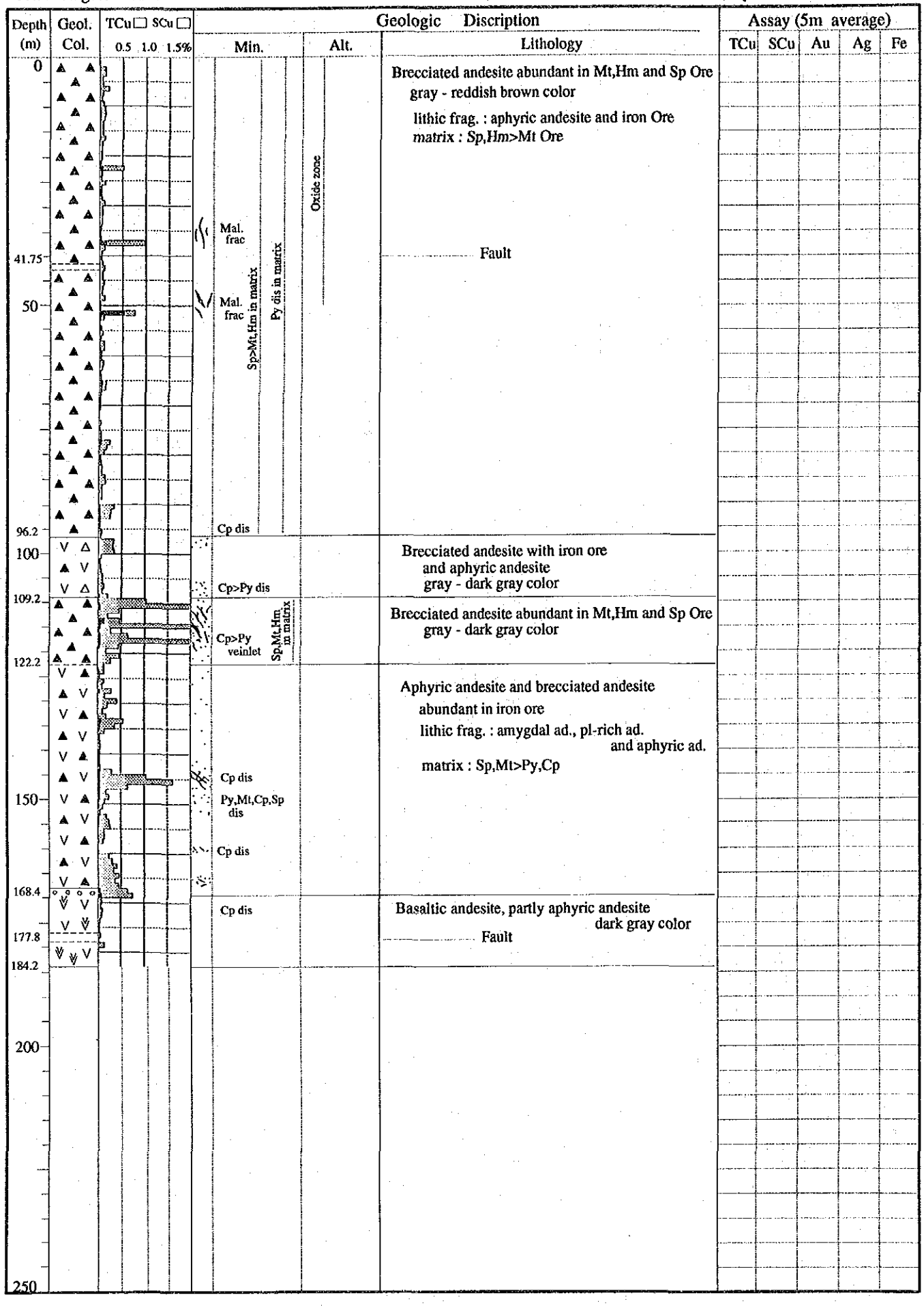
Geologic Column (MJCC- 24 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 25 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -225.50 m)



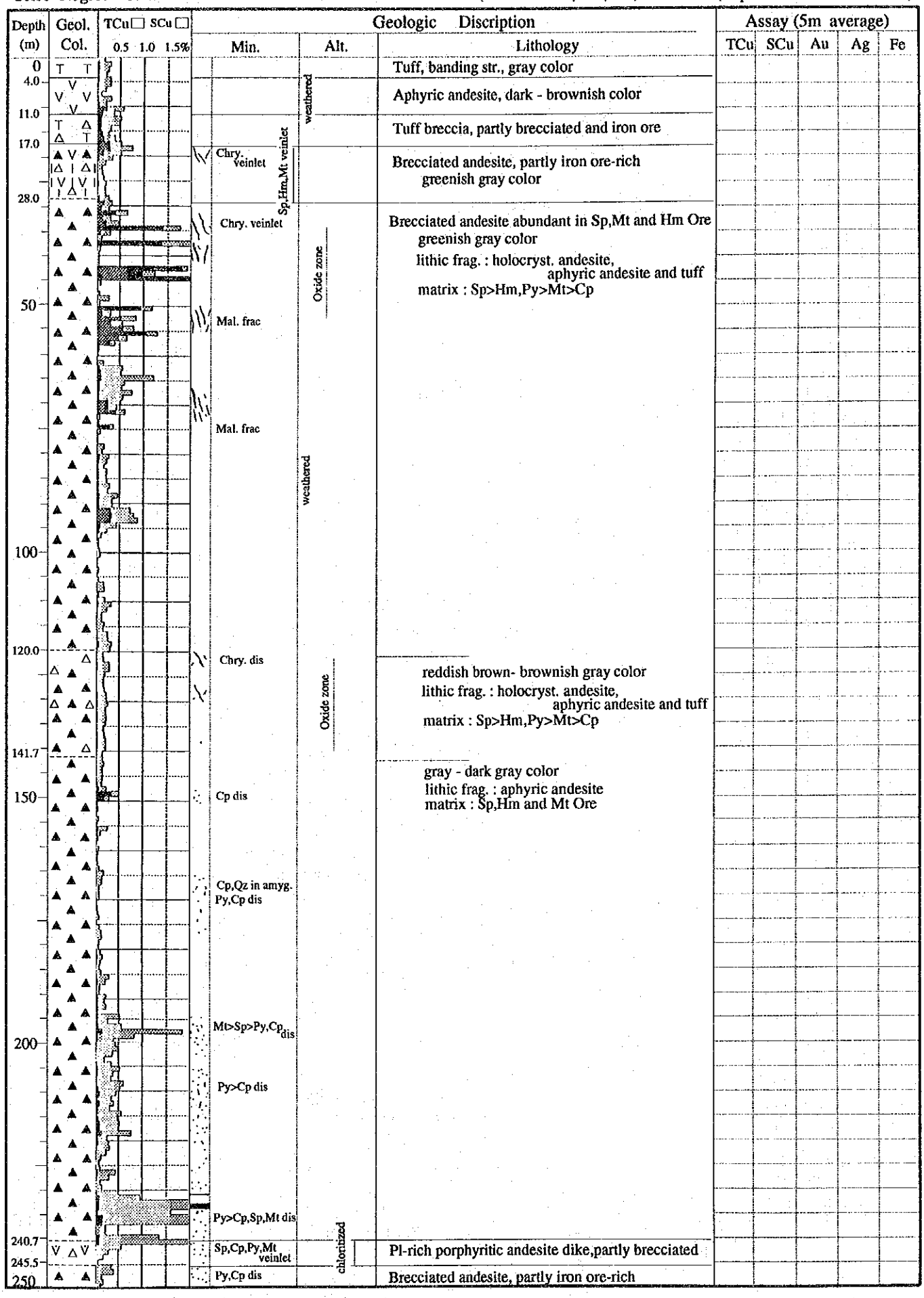
Geologic Column (MJCC- 25 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 26 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -184.20 m)



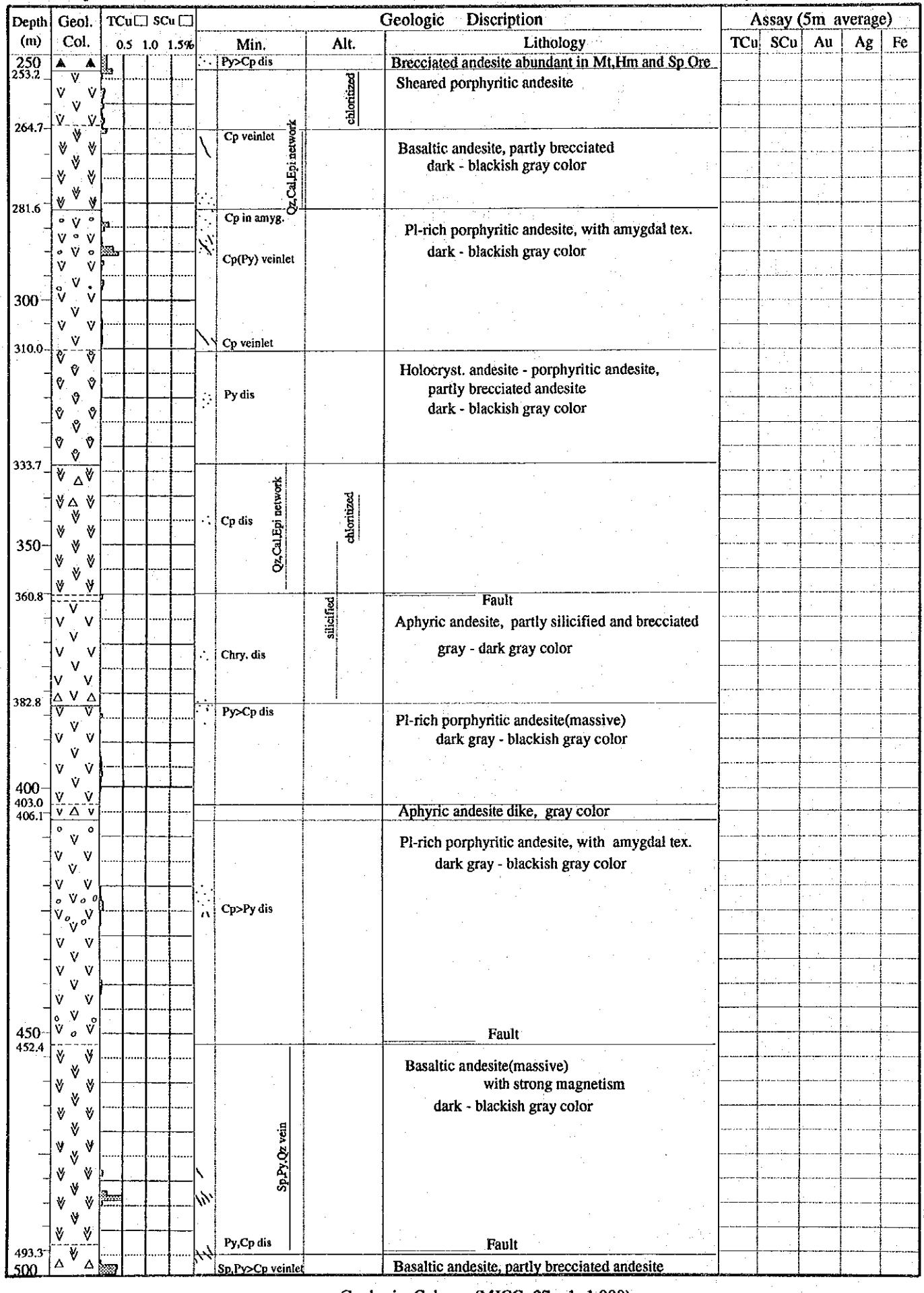
Geologic Column (MJCC- 26 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 27 (Scale 1/ 1000) (1 / 2) (Depth : 0.00 m -250.00 m)



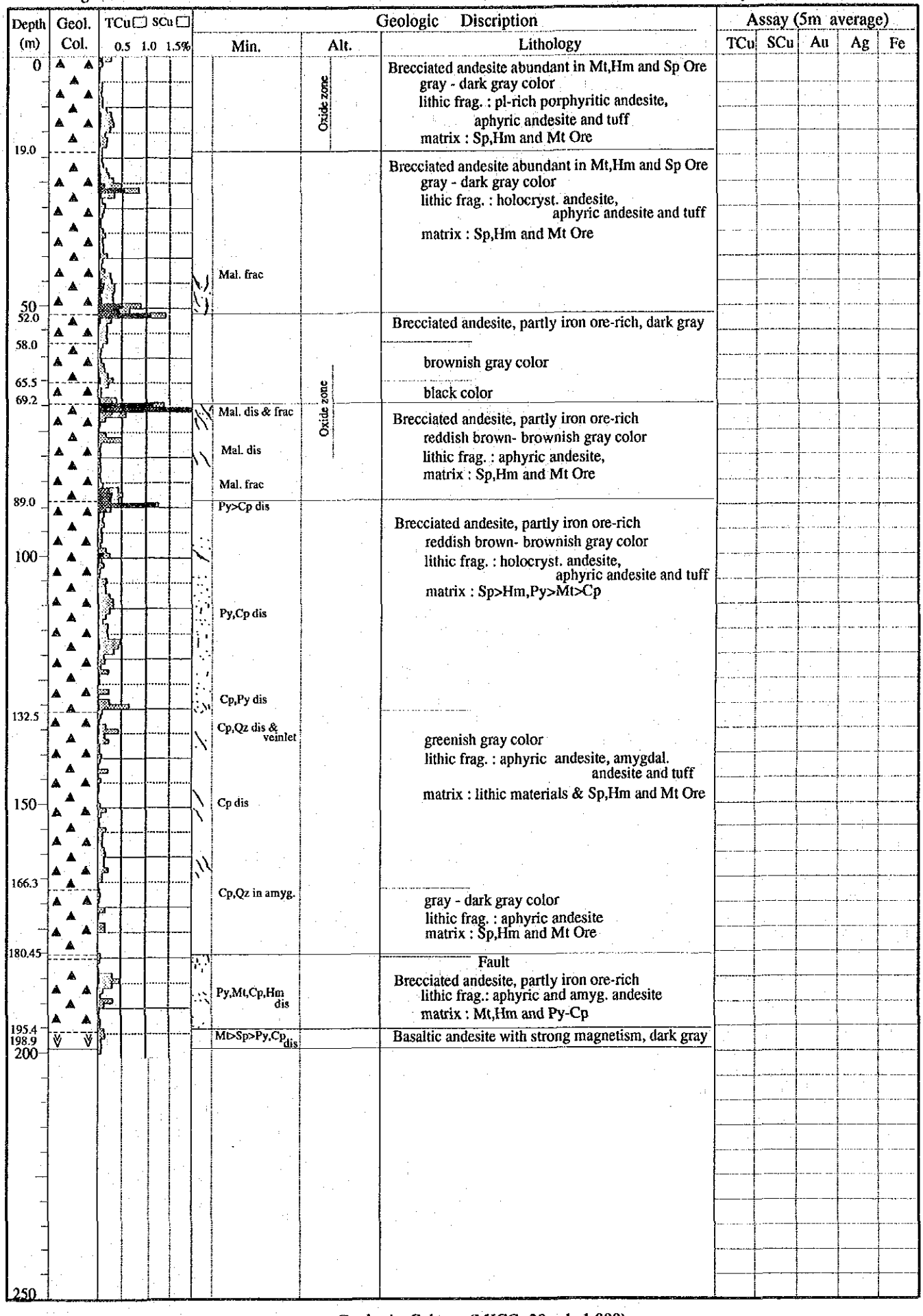
Geologic Column (MJCC- 27 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 27 (Scale 1/ 1000) (2 / 2) (Depth : 250.00 m -500.00 m)



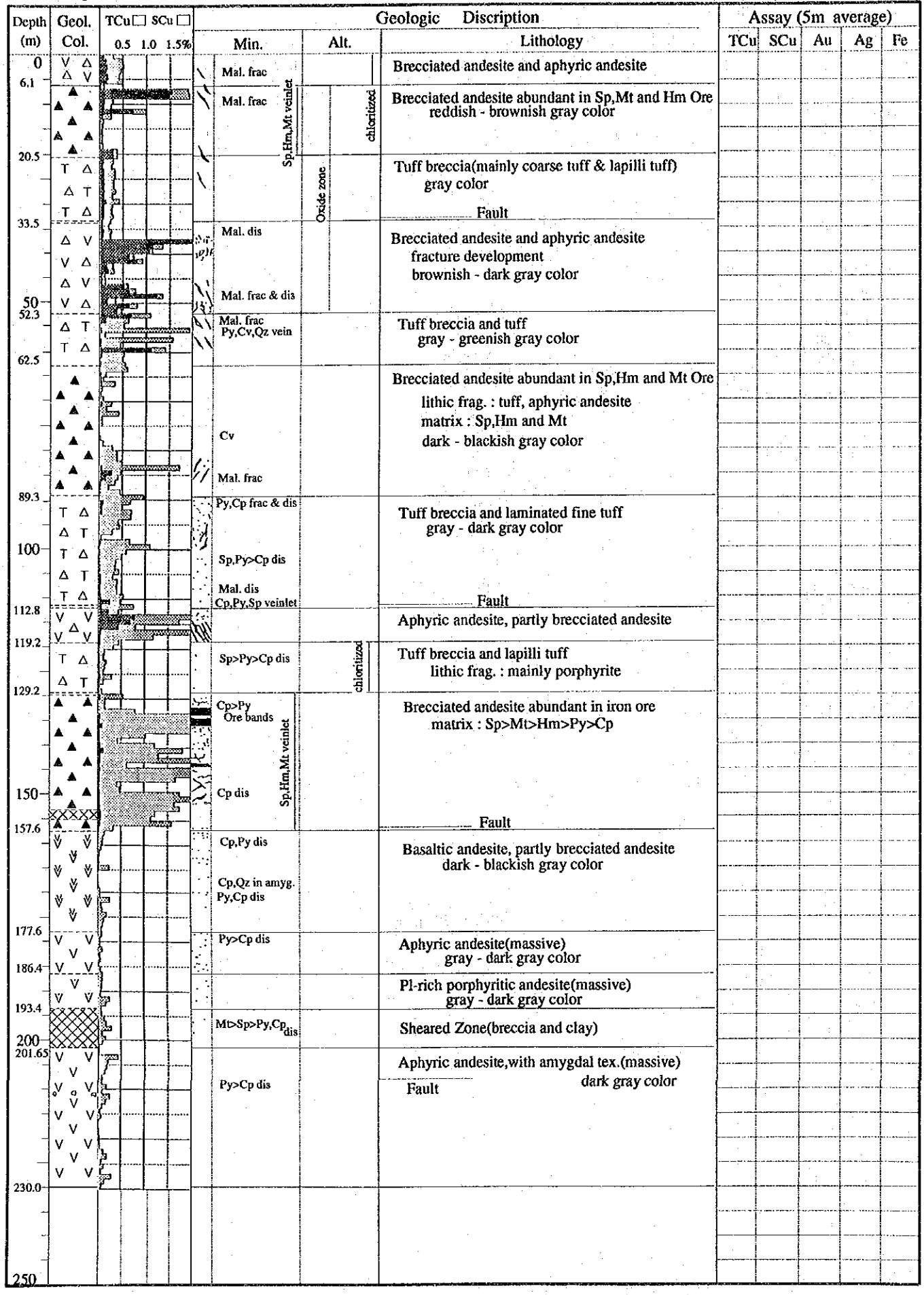
Geologic Column (MJCC- 27 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 28 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -198.90 m)



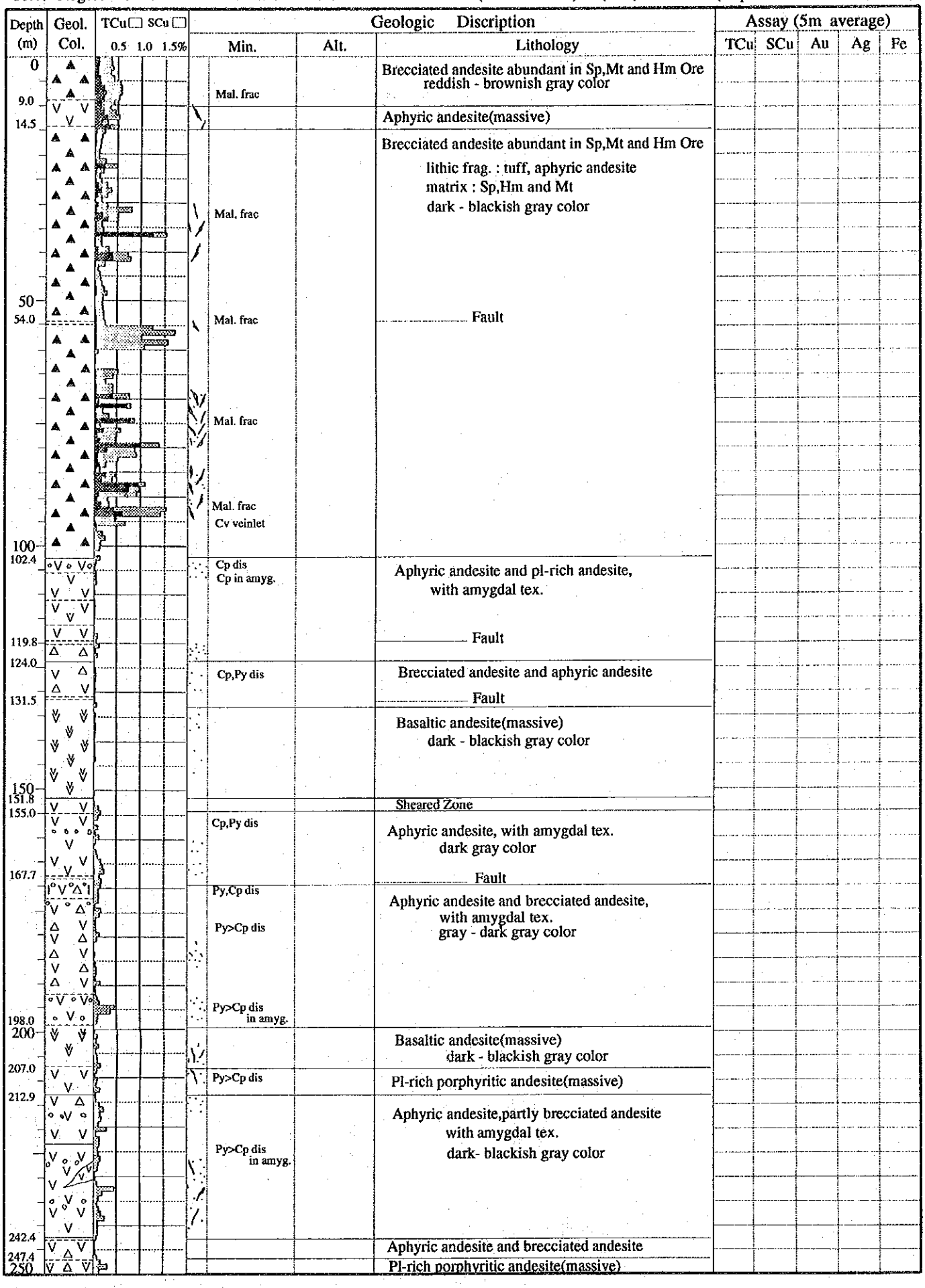
Geologic Column (MJCC- 28 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 29 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -230.00 m)



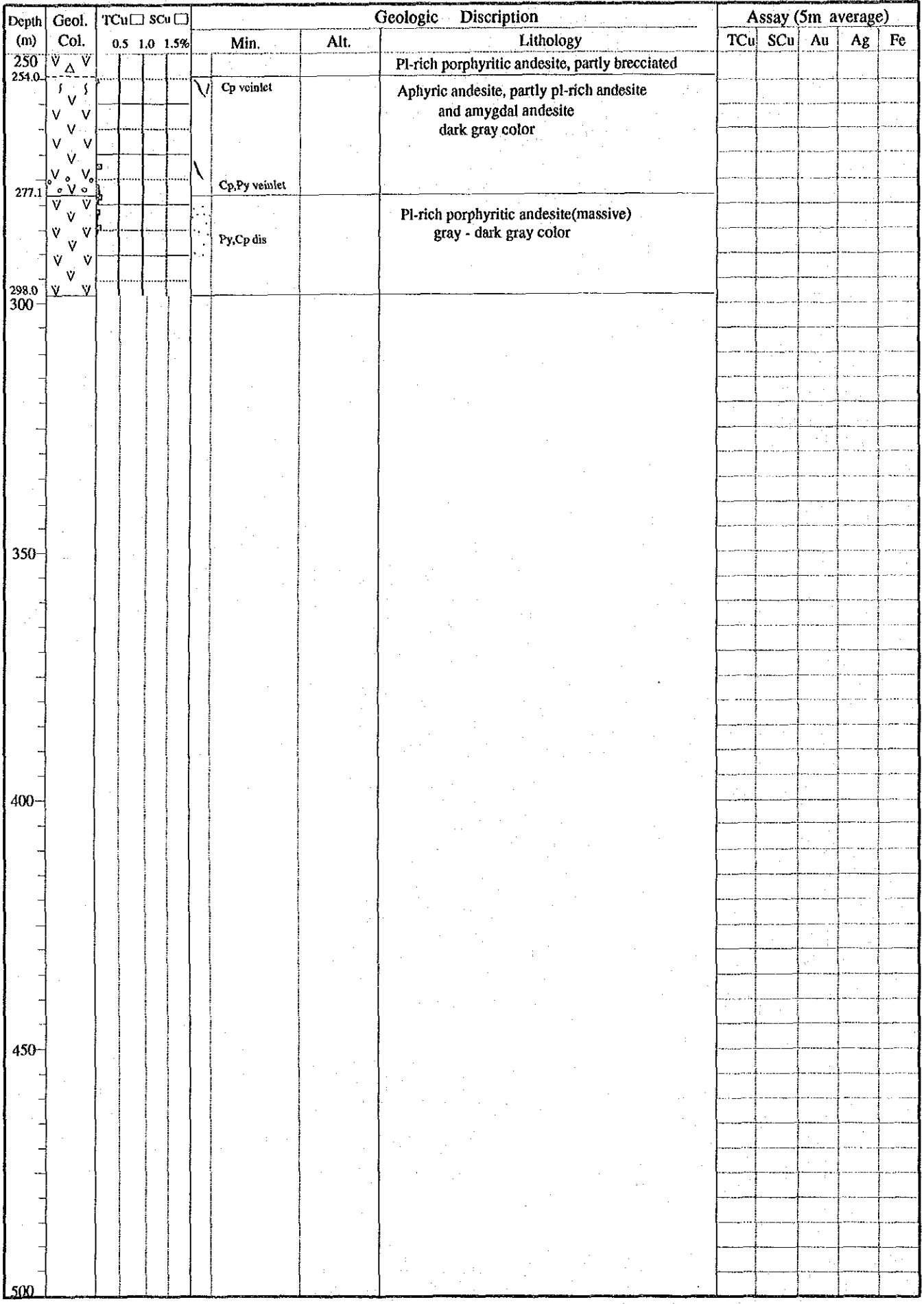
Geologic Column (MJCC- 29 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 30 (Scale 1/ 1000) (1 / 2) (Depth : 0.00 m -250.00 m)



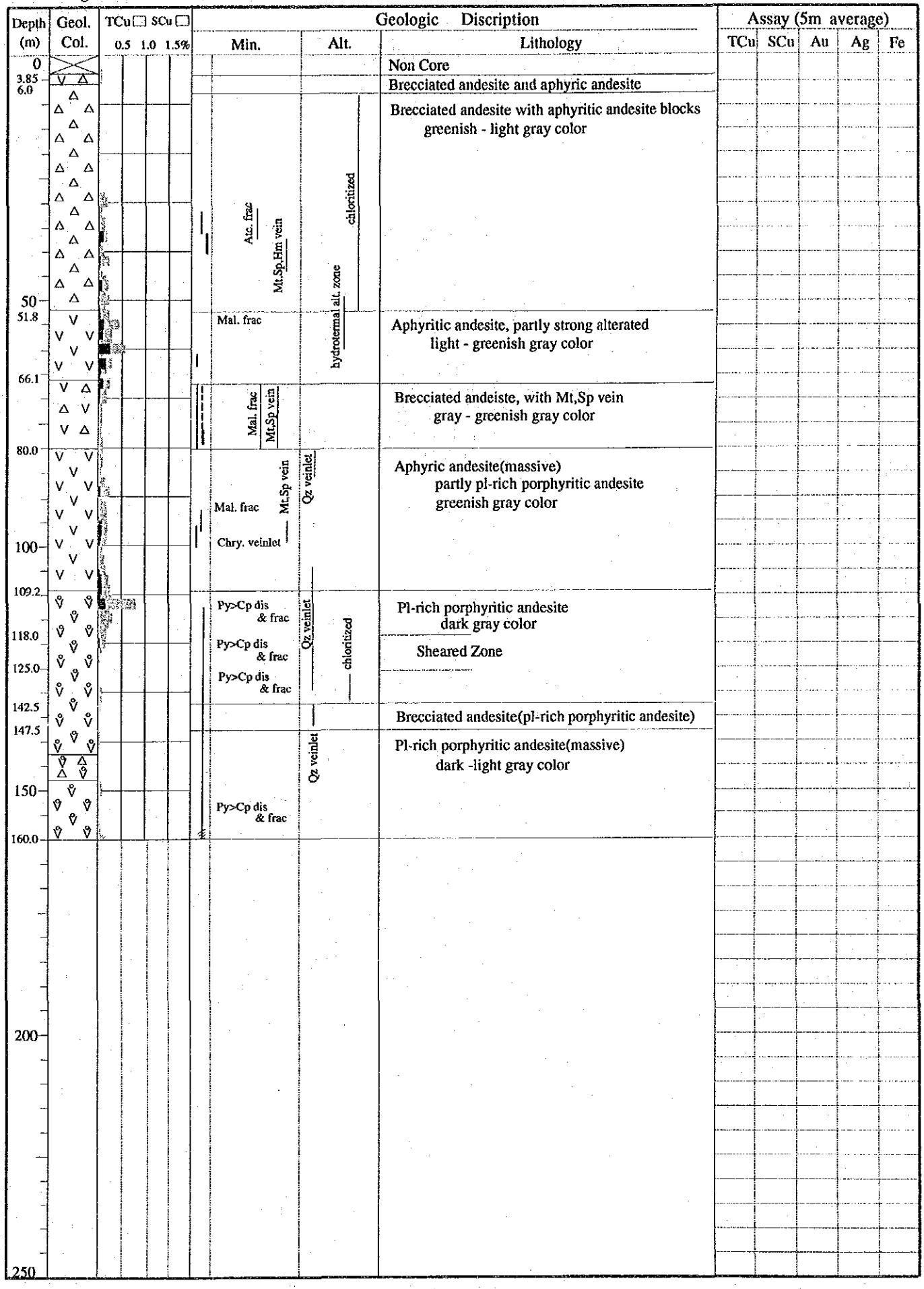
Geologic Column (MJCC- 30 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 30 (Scale 1/ 1000) (2 / 2) (Depth : 250.00 m -298.00 m)



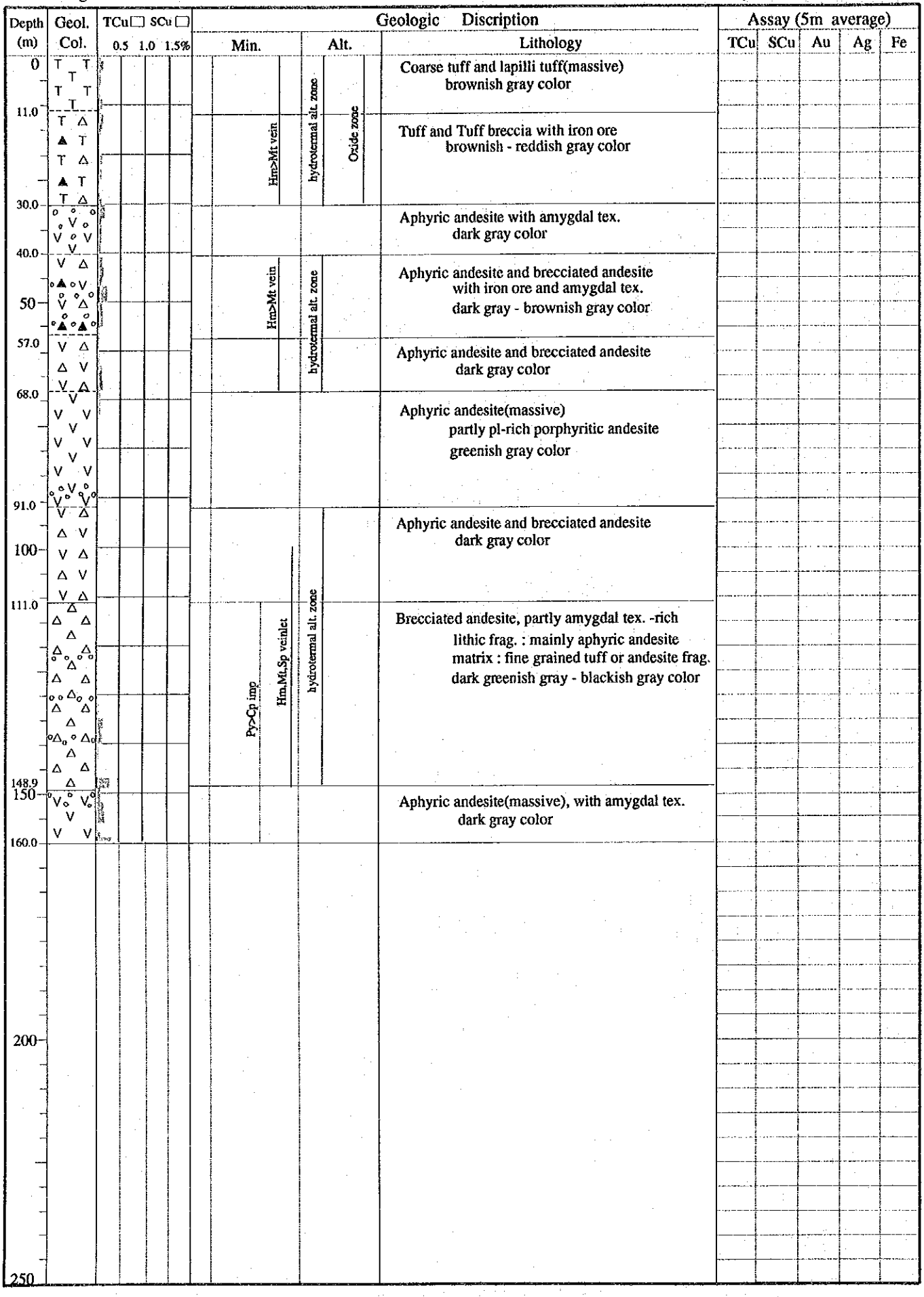
Geologic Column (MJCC- 30 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 31 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -160.00 m)



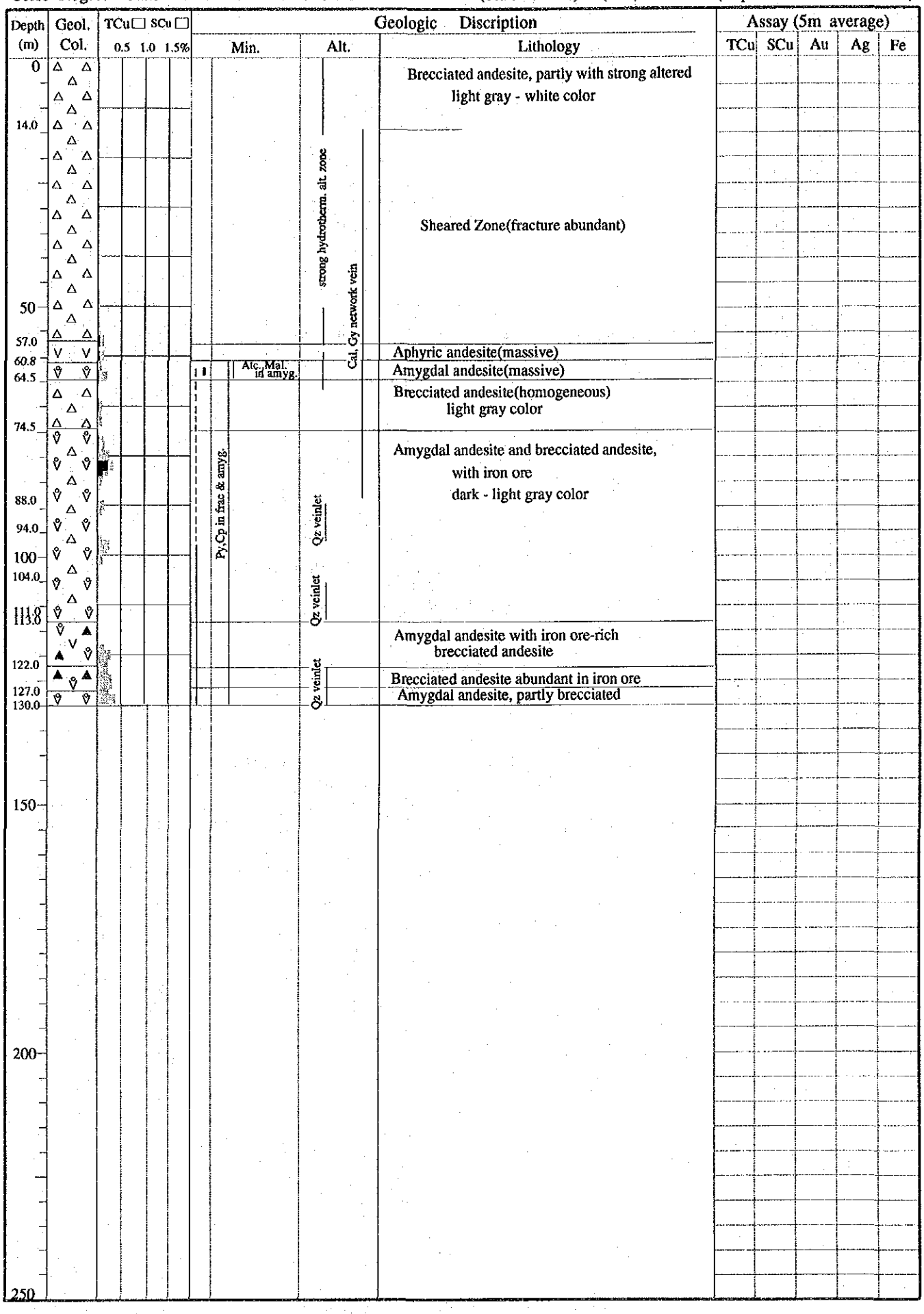
Geologic Column (MJCC- 31 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 32 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -160.00 m)



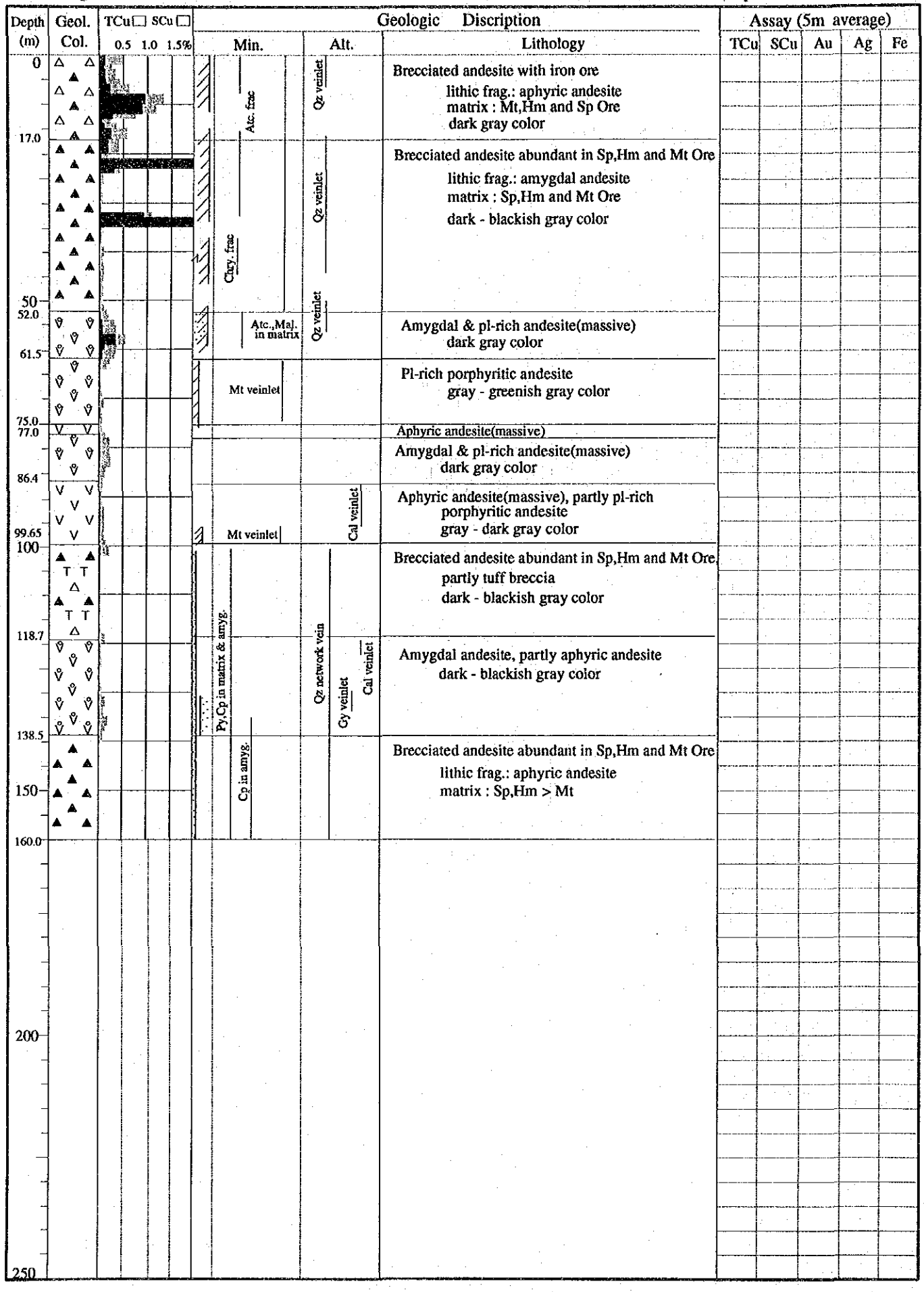
Geologic Column (MJCC- 32 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 33 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -130.00 m)



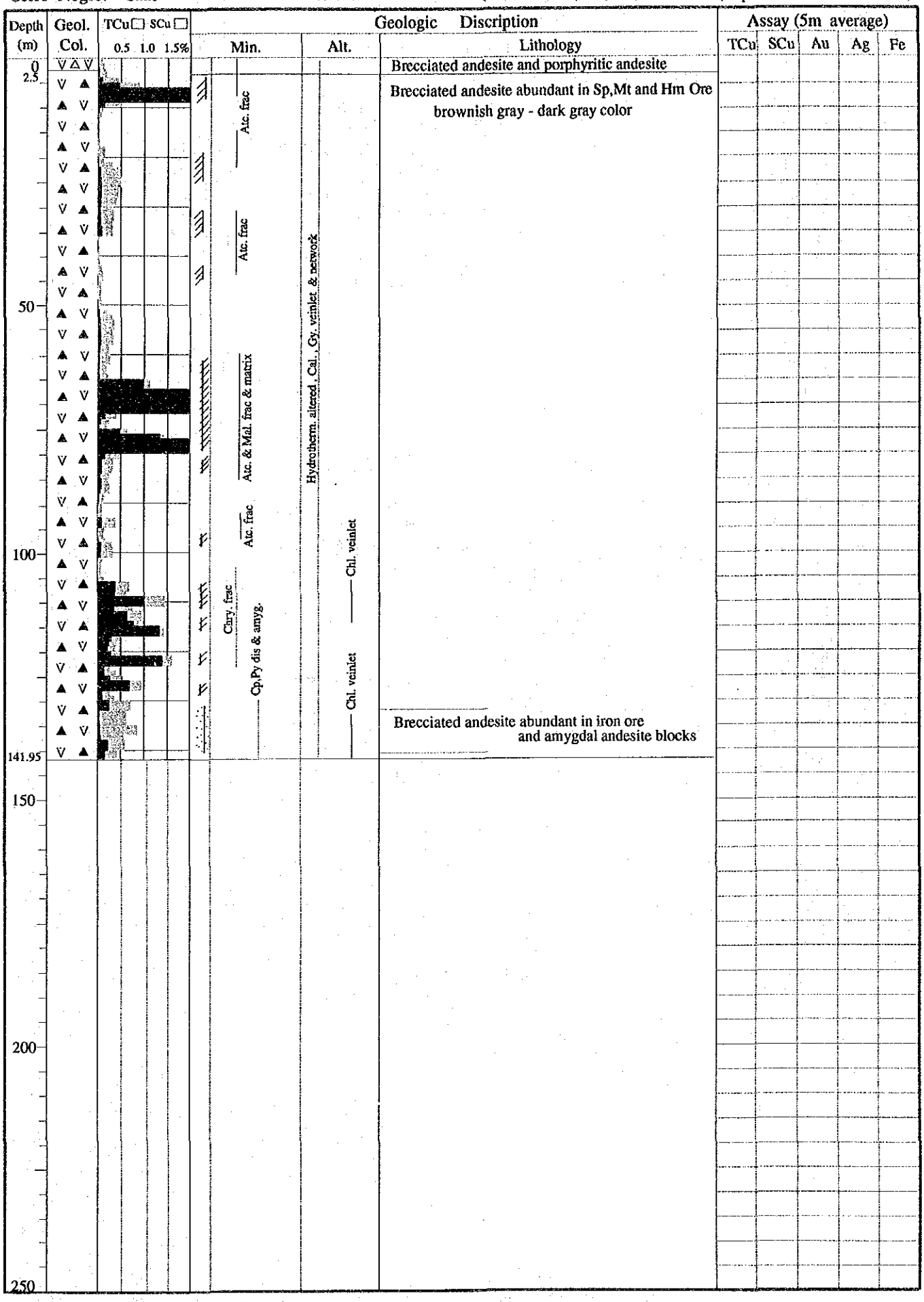
Geologic Column (MJCC- 33 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 34 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -160.00 m)



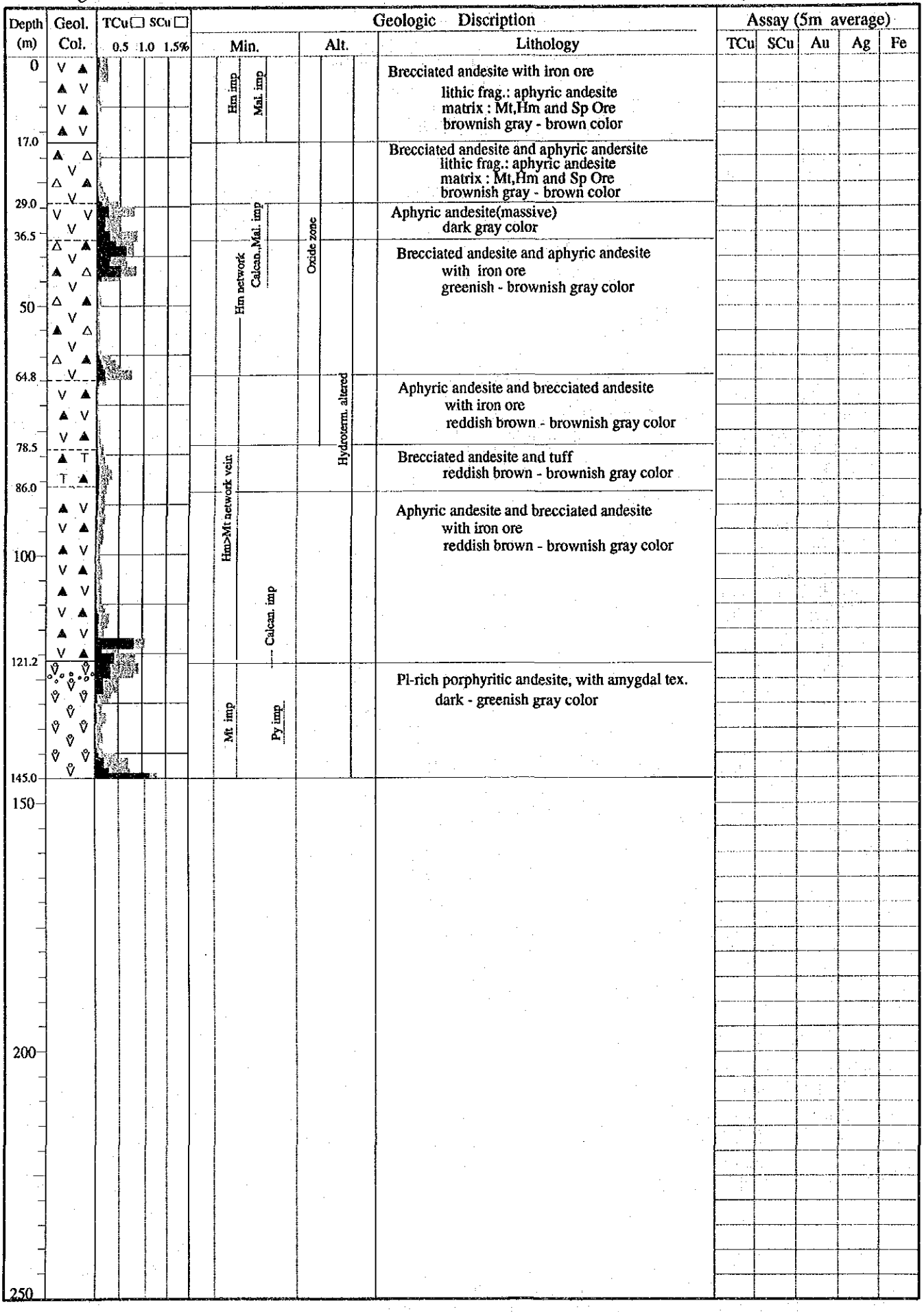
Geologic Column (MJCC- 34 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 35 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -141.95 m)



Geologic Column (MJCC- 35 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 36 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -145.00 m)



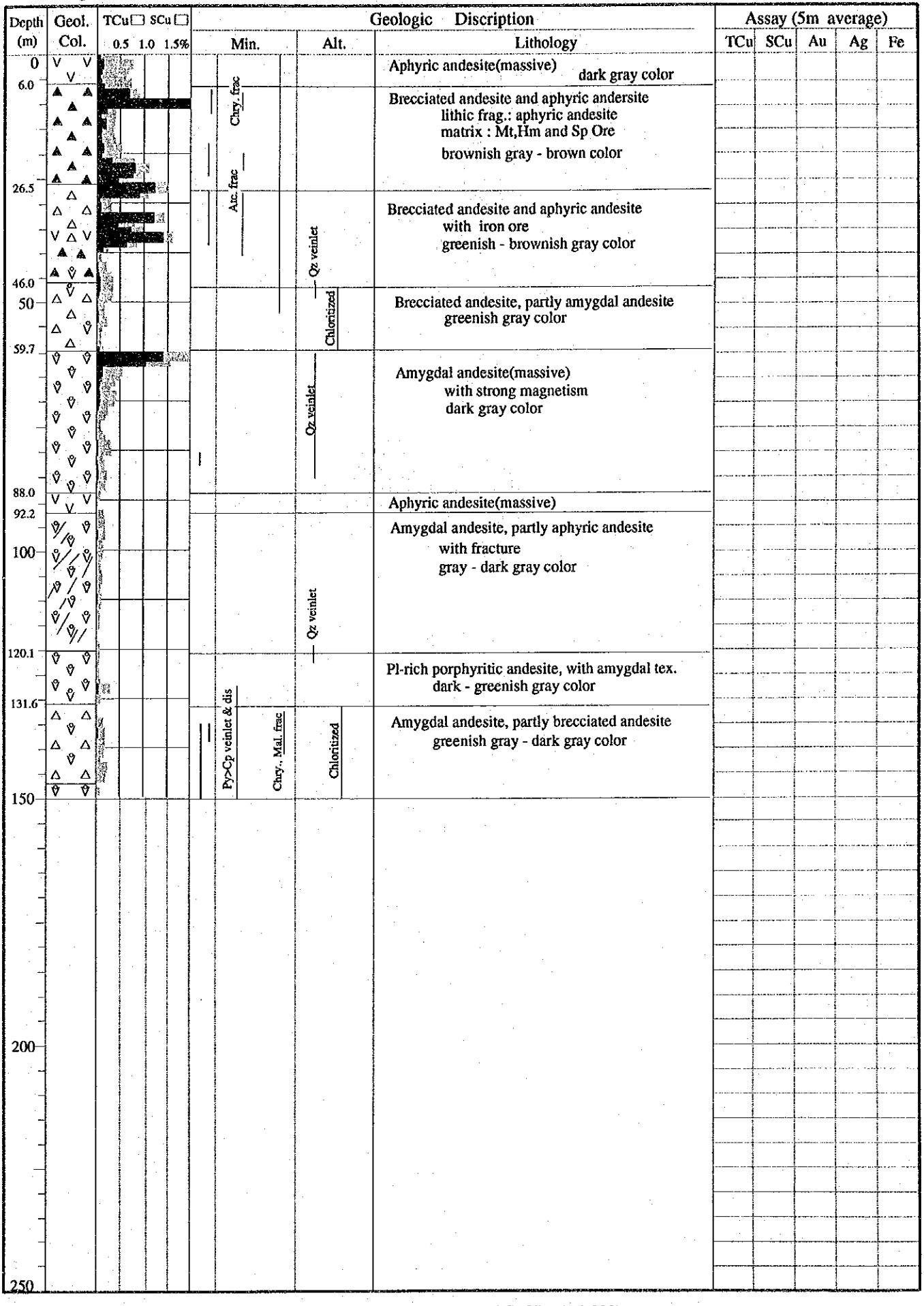
Geologic Discription

Assay (5m average)

TCu	SCu	Au	Ag	Fe

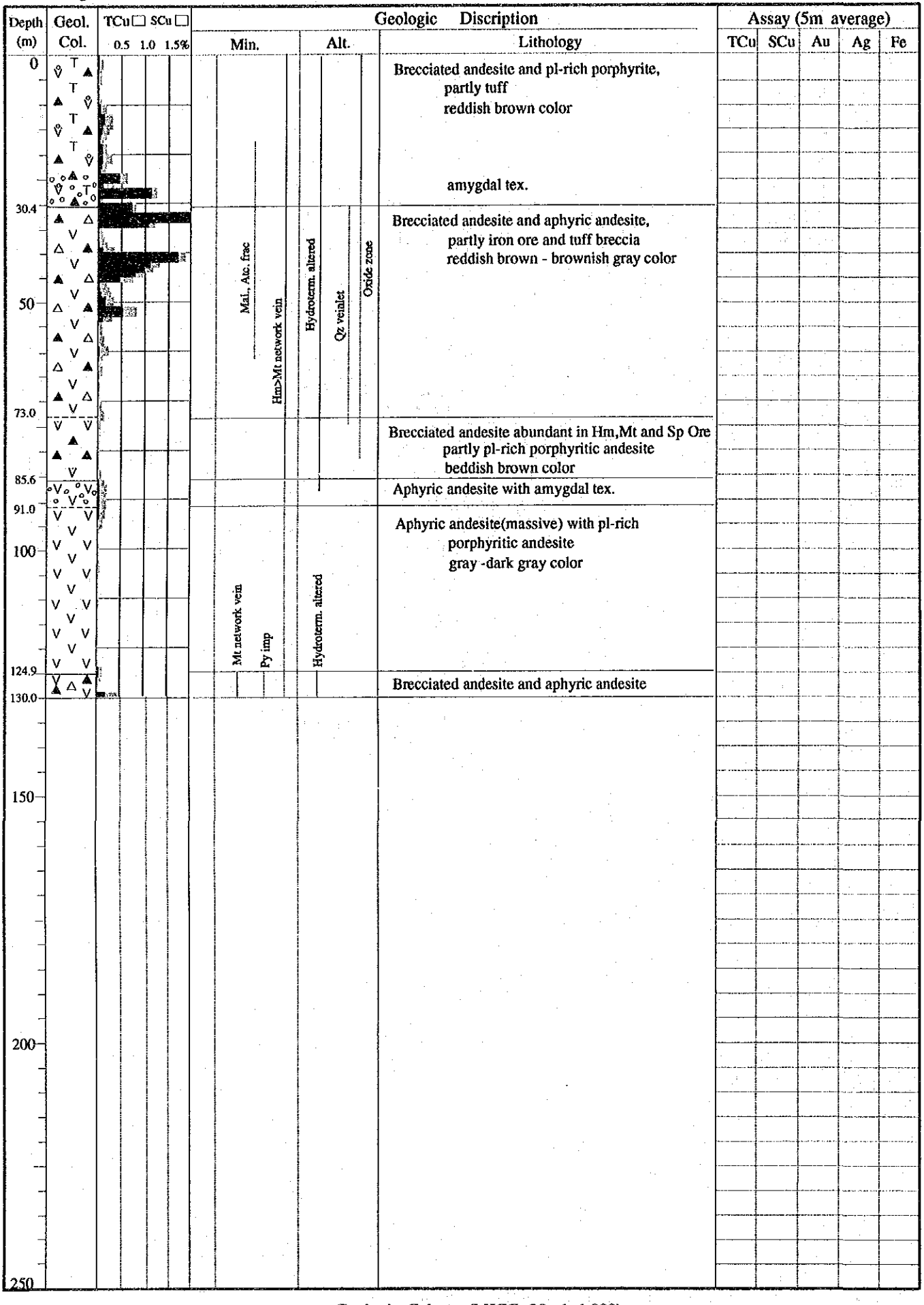
Geologic Column (MJCC- 36 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 37 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -150.00 m)



Geologic Column (MJCC- 37 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 38 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -130.00 m)



Geologic Discription

Brecciated andesite and pl-rich porphyrite,
partly tuff
reddish brown color

amygdal tex.

Brecciated andesite and aphyric andesite,
partly iron ore and tuff breccia
reddish brown - brownish gray color

Brecciated andesite abundant in Hm,Mt and Sp Ore
partly pl-rich porphyritic andesite
beddish brown color

Aphyric andesite with amygdal tex.

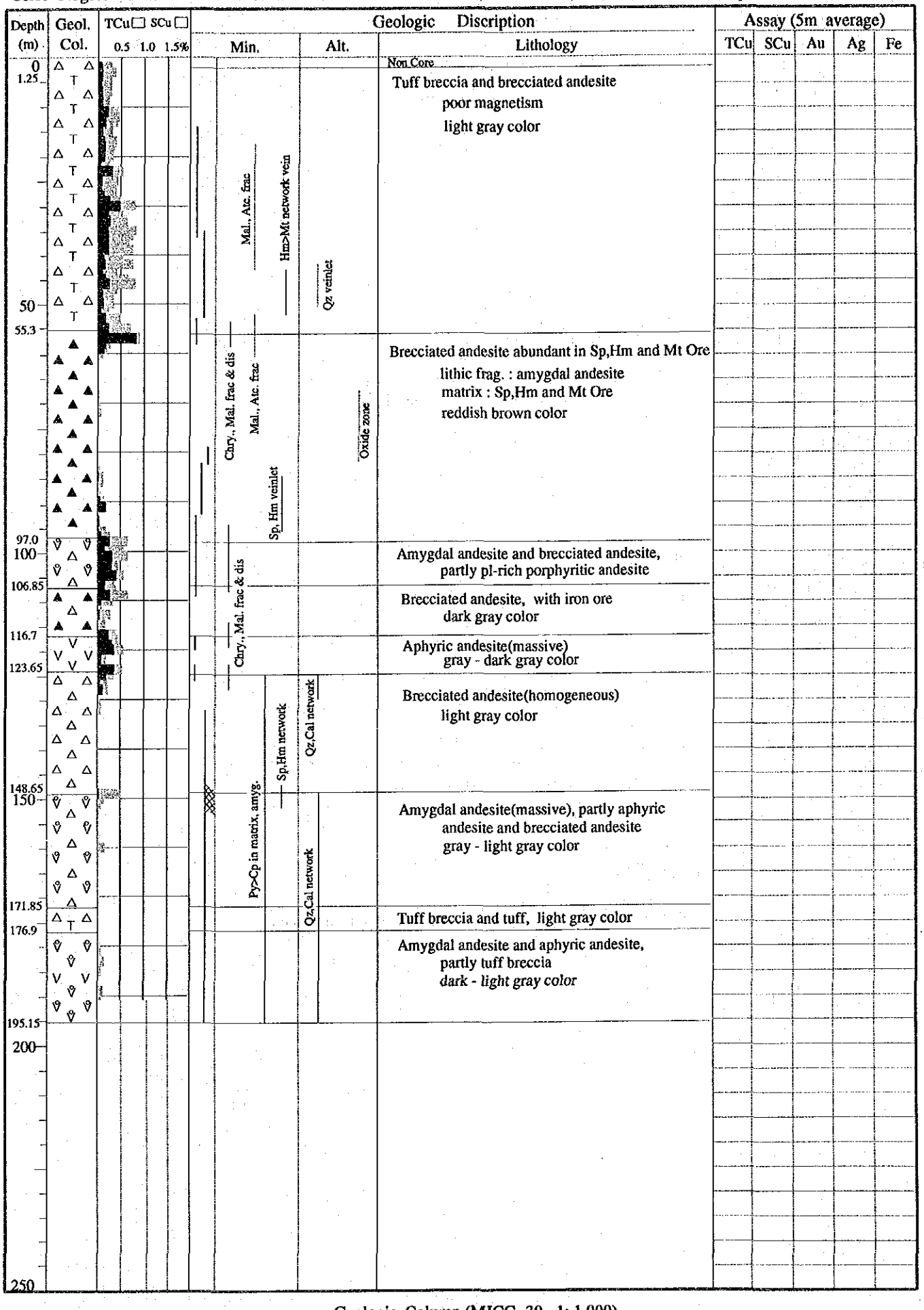
Aphyric andesite(massive) with pl-rich
porphyritic andesite
gray -dark gray color

Brecciated andesite and aphyric andesite

Assay (5m average)				
TCu	SCu	Au	Ag	Fe

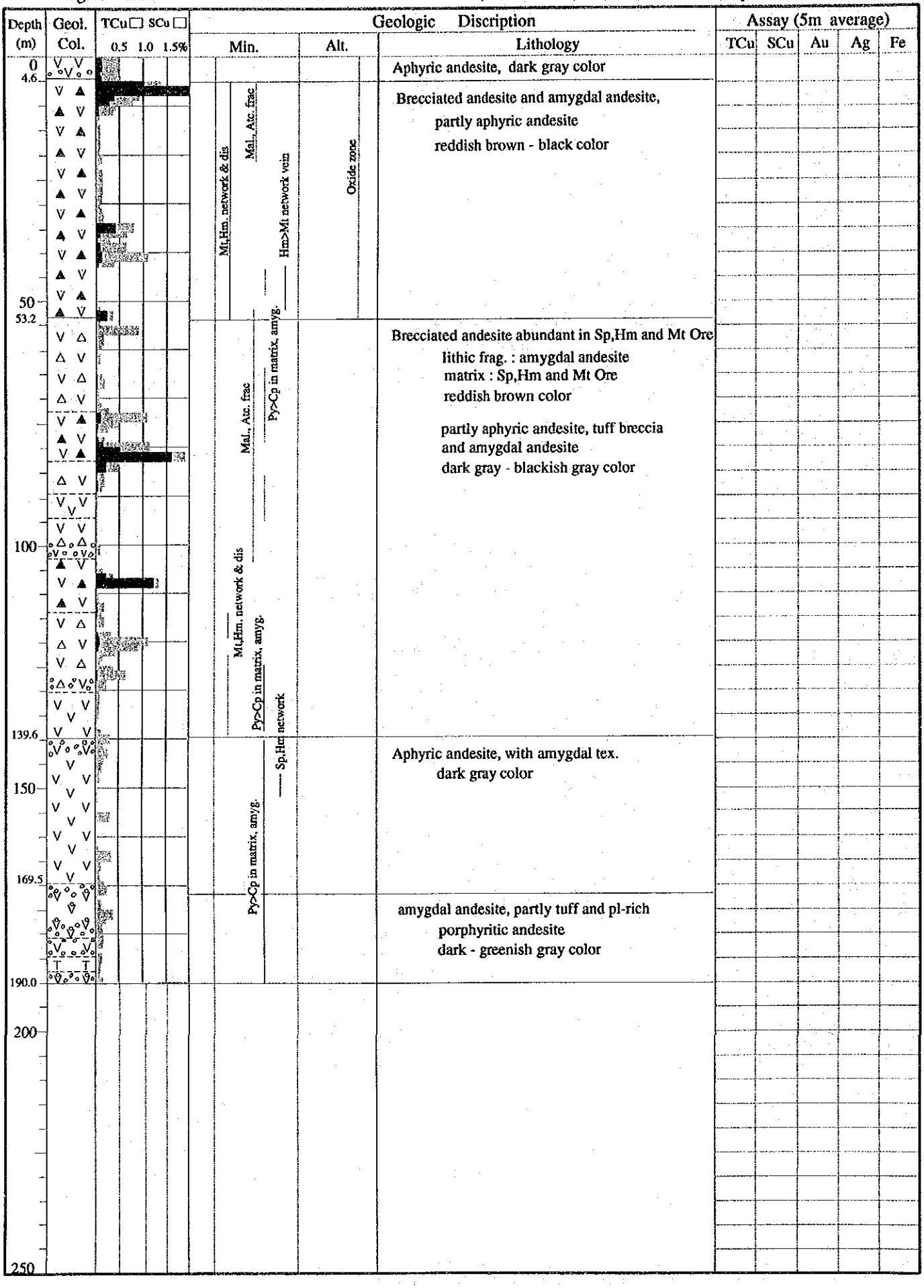
Geologic Column (MJCC- 38 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 39 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -195.15 m)



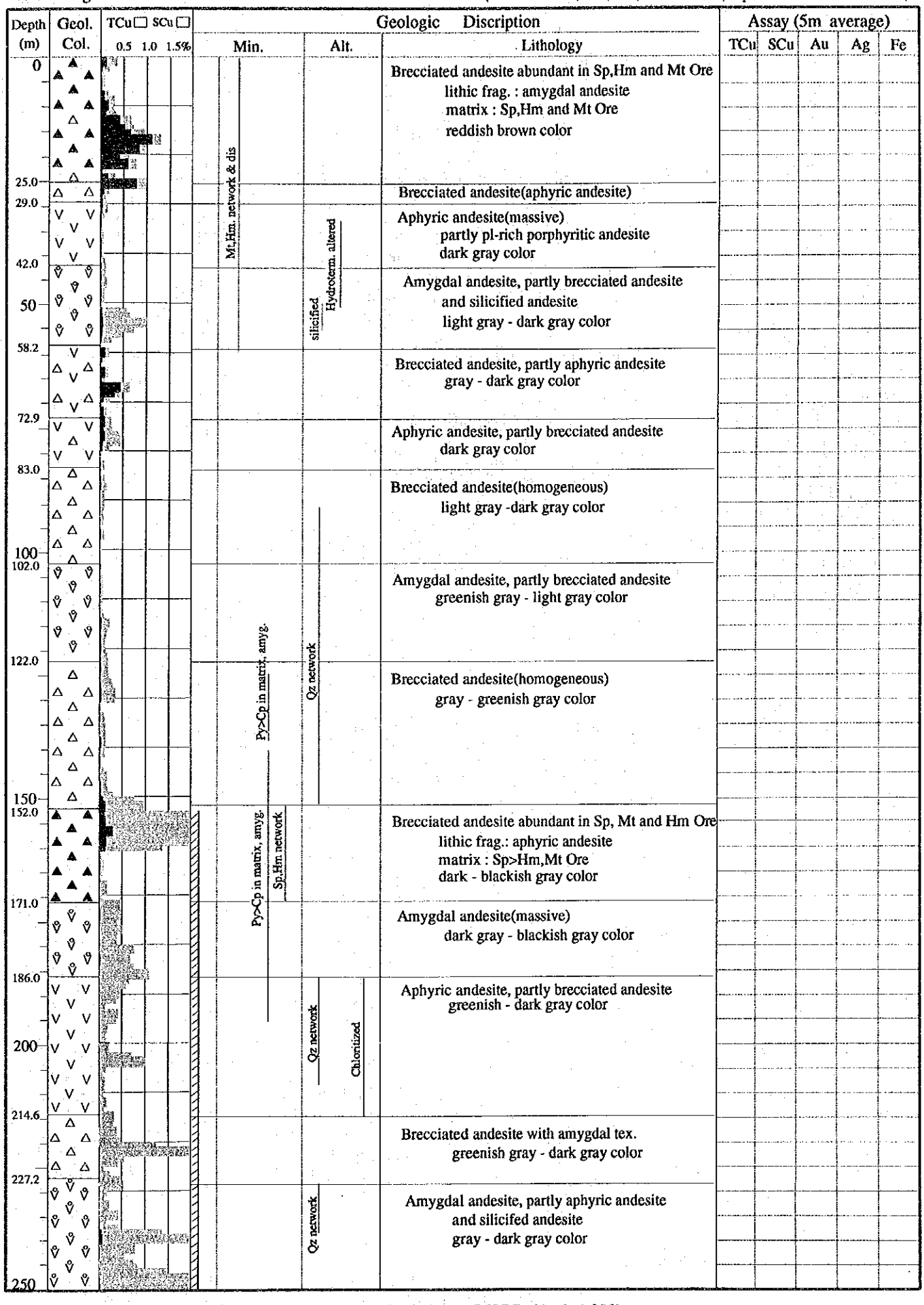
Geologic Column (MJCC- 39 1: 1,000)

Cerro Negro, Chile — Drill# MJCC- 40 — (Scale 1/ 1000) (1 / 1) — (Depth : 0.00 m -190.00m)



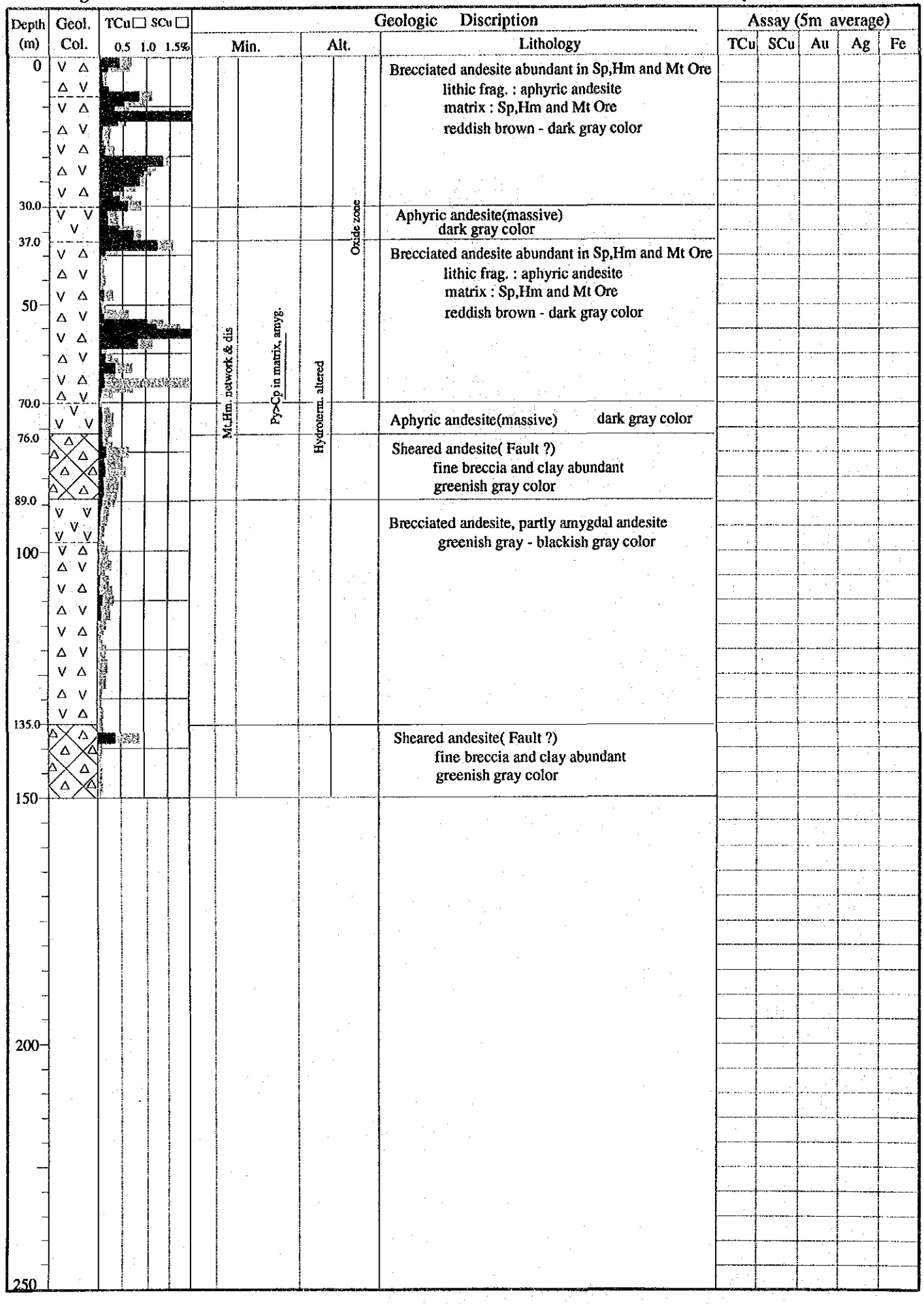
Geologic Column (MJCC- 40 1: 1,000)

Cerro Negro. Chile **Drill# MJCC- 41** (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -250.00m)



Geologic Column (MJCC- 41 1: 1,000)

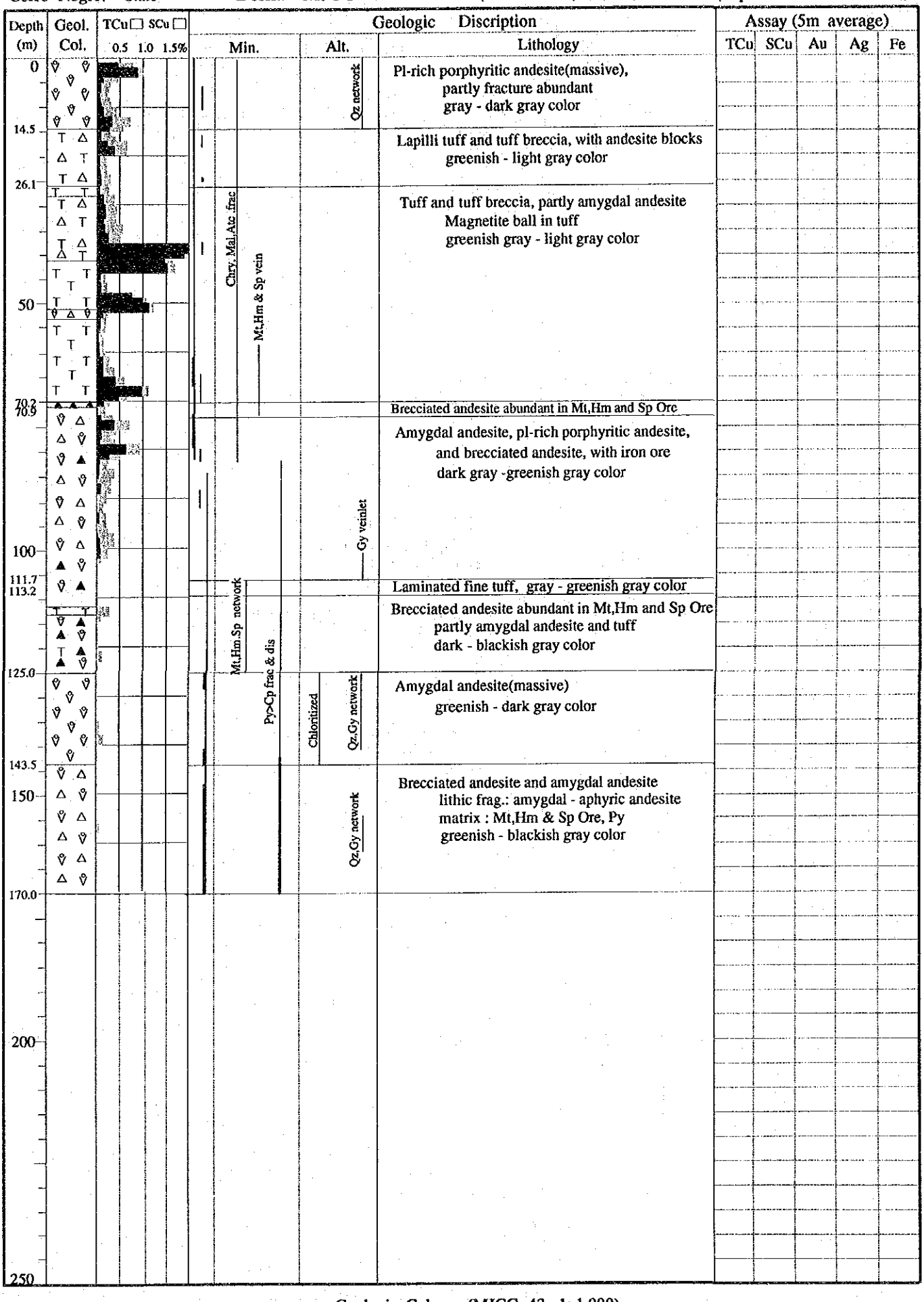
Cerro Negro. Chile Drill# MJCC- 42 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -150.00m)



Assay (5m average)				
TCu	SCu	Au	Ag	Fe

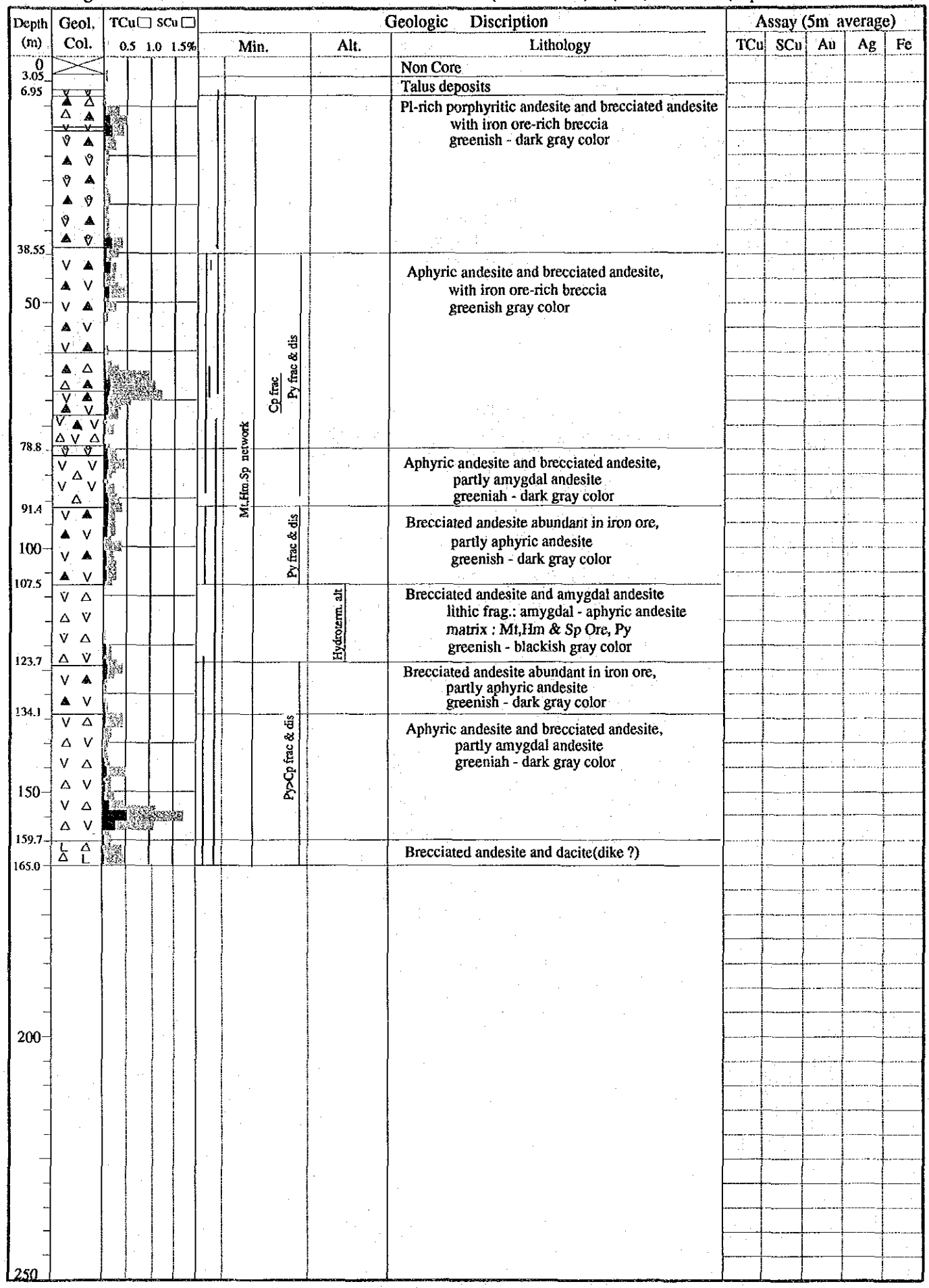
Geologic Column (MJCC- 42 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 43 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -170.00m)



Geologic Column (MJCC- 43 1: 1,000)

Cerro Negro. Chile Drill# MJCC- 44 (Scale 1/ 1000) (1 / 1) (Depth : 0.00 m -165.00m)



Geologic Column (MJCC- 44 1: 1,000)