CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
520-770-3500
http://www.azgs.az.gov
inquiries@azgs.az.gov

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James Doyle Sell Mining Collection

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PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-244-[illegible]
Page 1 of 1 Pages

Collar Elev. 2665.52 Final Depth 142
Coords. N 35986.98 E 13,158.90
Inclination VERTICAL
Logged by N.R.N
Date: Start 8-14-67 Finish 8-15-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Cu (1) Pitch	Cu (1) Black	Cu (1) Blue Green	Cu (1) UNK. NON SULF.	Cu (1) Cc.	Cu (1) Cpy.	Cu (1) Born	Fe (2) Lim.	Fe (2) Py	Fe (2) Mag.	Fe (2) Hem.	Fe (2) Spec.	Other (2) Galena	Other (2) Sphal.	Other (2) Molyb	Other (2) Calcite	Other (2) Garnet	Other (2) Silicates	Other (2) Sericite	Other (2) Clay	Other (2) Vn. Qtz	Other (2) QUARTZ	Other (2) CHLORITE	Other (2) PHYTIC (?)	(3) Rock Type	Structures (4) Depth	Structures (4) True Dip	Remarks
0.0	22.0	22.0																																	DUMP			
22.0	27.0	5.0		0.07										0.04	0.06			ST	0.2%	-	Wk	-	-	-	-	-	-	-	Wk Mod	Wk Mod	?	25%			Ak (?)			St. Lim.-Hem. Mod-ST Alt. - low qtz. Content.
27.0	32.0	5.0		0.07						0.02				0.04	0.01			Mod	-	-	Sp Wk	-	-	-	-	-	-	-	Wk	Wk Mod	?	35%						
32.0	37.0	5.0		0.06						0.02				0.03	0.01			Mod St	Tr	-	Sp Wk	-	-	-	-	-	-	-	Wk	Wk Mod	?	30%						
37.0	42.0	5.0		0.05										0.02	0.03			Mod St	0.5%	-	Sp Wk	-	-	-	-	-	-	-	Sp	Wk Mod	?	30%			Mz Ck Az'			
42.0	47.0	5.0		0.56	0.02	0.02								0.02	0.53	0.01		Sp	1%	-	Tr	-	-	-	-	-	-	-	Sp	Wk Mod	?	49%	Wk Mod					Fol of Oxidation. Rk is Mod. Alt'd. Mz. - low qtz - 4% fresh sul. - CC. on Fr.
47.0	52.0	5.0		0.16											0.14	0.02		Tr Sp	1%	-	Tr	-	-	-	-	-	-	-	Tr	Sp	?	50%			Ak Cuce Az'			sp-Wk alt. of Ak
52.0	57.0	5.0		0.25											0.23	0.02		Tr Sp	1-2%	-	-	-	-	-	-	-	-	-	Sp Wk	Wk Mod	?	50%			Tr Mz, N Ak			Mod. bleached + Alt'd Ak w/ Tr Mz. Sulfs are v. fine. well disseminated. CC. on Fr.
57.0	62.0	5.0		0.34											0.30	0.04		Tr	2-4%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk	?	50%						Stly. altd. Ak. w/ either sp Mz intermixed or an unusual occurrence of hmy. Sec. in Ak.
62.0	67.0	5.0		0.28											0.26	0.02		Sp	2-4%	-	-	-	-	-	-	-	-	-	Mod	Wk	?	45%						St. Assoc. of Sulfs w/ sec. - only a sp. coat of CC. coating of Total Fr.
67.0	72.0	5.0		0.28											0.22	0.04		Tr	1%	-	-	-	-	-	-	-	-	-	Sp	Wk	?	50%						
72.0	77.0	5.0		0.26											0.22	0.04		Sp	1-2%	-	-	-	-	-	-	-	-	-	Tr Sp	Wk	?	60%						V. low Py. Content.
77.0	82.0	5.0		0.65		N.1									0.57	0.03		-	6%	-	-	-	-	-	-	-	-	-	Mod	Wk	?	60%						probably some qtz - sec. varig. accounting for the high qtz content.
82.0	87.0	5.0		0.77		0.01									0.52	0.25		-	2%	-	-	-	-	-	-	-	-	-	Mod	Wk	?	55%						
87.0	92.0	5.0		0.21						0.04					0.11	0.06		Tr	1%	-	-	-	-	-	-	-	-	-	Tr Sp	Wk	?	50%						Notable decrease in sec. + Total sulfs. CC. is coating only cpy.
92.0	97.0	5.0		0.22											0.18	0.04		Tr	2-3%	-	-	-	-	-	-	-	-	-	Sp	Sp Wk	?	40%		Sp				Somewhat fresher looking rk. CC. apparently coating some salt free fracts.
97.0	102.0	5.0		0.13											0.11	0.02		Sp	1%	-	-	-	-	-	-	-	-	-	Sp	Wk	?	40%		Sp				
102.0	107.0	5.0		0.22											0.18	0.04		Tr	2%	-	-	-	-	-	-	-	-	-	Sp	Wk	?	47%						C.C. forming on py as well as cpy
107.0	112.0	5.0		0.17											0.15	0.02		Tr	2%	-	-	-	-	-	-	-	-	-	Sp	Wk	?	47%						
112.0	117.0	5.0		0.24						Tr					0.20	0.04		Tr	2-3%	-	-	-	-	-	-	-	-	-	Wk	Wk	?	50%						
117.0	122.0	5.0													0.24	0.02		Tr	2%	-	-	-	-	-	-	-	-	-	Sp	Wk Mod	?	50%						Just about all py + cpy coated w/ CC.
122.0	127.0	5.0		0.24											0.22	0.02		Tr	1-2%	-	-	-	-	-	-	-	-	-	Mod	Sp	?	70%						1. high qtz content - notable increase in sec. CC. coating only small portion of total sulf.
127.0	132.0	5.0		0.28											0.22	0.06		-	5%	-	-	-	-	-	Tr	-	-	-	Mod	Sp	?	70%						
132.0	137.0	5.0		0.31											0.25	0.06		-	3-4%	-	-	-	-	-	-	-	-	-	Wk Mod	Sp	?	65%						
137.0	142.0	5.0		0.33						Tr					0.27	0.06		-	4%	-	-	-	-	-	-	-	-	-	Wk Mod	Sp	?	60%						
T.D. Hole																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
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An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER

Hole No. D247
Page 1 of 1 Pages
Collar Elev. 2,695 28
Final Depth 1720
Coords. N 37,289 44 E 14,891 96
Inclination VERTICAL
Logged by RE
Date: Start 8-8-64 Finish 8-11-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Cu (1) Pitch	Cu (1) Black	Cu (1) Blue Green	Cu (1) Unk	Cu (1) NS	Cu (1) Cc.	Cu (1) Cpy.	Cu (1) Born	Fe (2) Lim.	Fe (2) Py	Fe (2) Mag.	Fe (2) Hem.	Fe (2) Spec.	Other (2) Galena	Other (2) Sphal.	Other (2) Molyb	Other (2) Calcite	Other (2) Garnet	Other (2) Silicates	Other (2) Sericite	Other (2) Clay	Other (2) Vn. Qtz	Other (2) QUARTZ	Other (2) CHLORITE	(3) Rock Type	Structures (4) Depth	Structures (4) True Dip	Remarks
37	42	5		Nil															md	-		md											35		AK			wk to md altd AK.
42	47	5		.01											.01				md	-		md											35	SP				
47	52			.01											.01				md	Tr		md								Tr			35 40					
52	57			.01											.01				md	Tr		md											35					
57	62			Nil														Tr	md	Tr		md										1	40					Trace of sulfides in Qtz.
62	67			Nil															md	Tr		md										1	40					
67	72			0.09												.09			md	Tr		wk								SP	1	40					CC on px
72	77			.14												.07	.05	.02	md	SP		SP								SP	1	40					cpx w/ c.c. and/or bornite coatings
77	82			.18									.04			.06	.06	.02	md	SP		SP			Tr					Tr	1	40					carbonates and sulfides occur together in same fragments
82	87			.07												.05	.02		wk	SP		Tr										40	SP				md alt. Xspar appears trach.
87	92			.08												.06	.02		SP	SP												40	SP				
92	97			.11												.08	.03		Tr	SP					Tr							40	SP				Large 2nd biotite, texture definitely AK
97	102			.17												.11	.06		Tr	SP					Tr							40	SP				
102	107			.08												.06	.02		Tr	1%					Tr							40	SP				Pinite (?)
107	112			.13												.10	.03			1%										SP	1	40	SP				most sulfides occur in vein Qtz, slight increase in alt.
112	117			.10												.06	.04			1%										md	md	1	40	SP			
117	122			.13												.07	.06			1%										md	md	1	40	SP			
122	127			.12												.05	.06			1%										SP	md	1	40	SP			
127	132			.19												.13	.06			1%					Tr					SP	SP	1	40	SP			
132	137			.21												.14	.07			2%					Tr					SP	md	1	40	SP			
137	142			.09												.06	.03			2%										SP	md	1	40	md			md alt. Increase in chlorite, pyrite
142	147			.09												.06	.03			2%										SP	md	1	40	md			
147	152			.04												.04	Tr			2%										SP	md	1	40	md			
152	157			.05												.05	Tr			2%										Tr	SP	1	40	SP			
157	162			.09												.06	.03			1%										-	SP	1	40	SP			Bleaching of Fspars.
162	167			.11												.07	.04			1%										Tr	SP	1	40	SP			
167	172	5		.09												.06	.03			1%										Tr	SP	1	40	SP			
E.O.H.																																						

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Tt - Tactite
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Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER

Hole No. D-246
Page 1 of 2 Pages
Collar Elev. 2,825.54 Final Depth 337.0
Coords. N 36,484.73 E 14,651.37
Inclination VERTICAL
Logged by N.R.N.
Date: Start 7-31-67 Finish 8-7-67

	Depth From	Depth To	Int'vl	Total Elev.	% Cu Avg. Total	% Cu Avg. N.S.	% Cu Avg. N.S.	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Cu (1) Pitch	Cu (1) Black	Cu (1) Blue Green	Cu (1) Wk. Mod. Sulf.	Cu (1) Cc.	Cu (1) Cpy.	Cu (1) Born	Fe (2) Lim.	Fe (2) Py	Fe (2) Mag.	Fe (2) Hem	Fe (2) Spec.	Other (2) Galena	Other (2) Sphal.	Other (2) Molyb	Other (2) Calcite	Other (2) Garnet	Other (2) Silicates	Other (2) Sericite	Other (2) Clay	Other (2) Vn. Qtz	Other (2) QUARTZ	Other (2) CHLORITE	(3) Rock Type	Structures (4) Depth	Structures (4) True Dip	Remarks
DUMP	0.0	67.0	67.0																																			DUMP MATERIAL
	67.0	72.0	5	0.04											0.02	0.02			Mod ss	-	-	Sp	-	-	-	-	-	-	-	Tr Sp	Wk Mod	?	30%		Ak				NORMAL Ak
	72.0	77.0		0.01											0.01				Wk	-	-	Tr	-	-	-	-	-	-	-	Tr Sp	Wk Mod	?	35%					
	77.0	82.0		0.02											0.01	0.01			Sp	Tr	-	Wk	-	-	-	-	-	-	-	Sp	Mod	?	30%					K-spars are bleached
	82.0	87.0		0.03											0.03				Wk	Tr-Sp	-	Wk	-	-	-	-	-	-	-	Tr	Wk	?	35%					Ak slightly less altd. contains Tr-sp amts of py w/ v. thin c.c. coatings
	87.0	92.0		0.01											0.01				Wk Mod	Sp	-	Tr Sp	-	-	-	-	-	-	-	Tr	Wk	?	37%					Some evidence of qtz-sulf. veining. Some of lim is thick & contains some Box work
	92.0	97.0		0.02											0.02				Sp	Tr	-	Wk Mod	-	-	-	-	-	-	-	Sp	Wk	?	35%					
	97.0	102.0		0.02											0.02				Sp	Tr	-	Wk	-	-	-	-	-	-	-	Tr	Wk	?	30%					
	102.0	107.0		0.02											0.02				Sp	Tr	-	Wk	-	-	-	-	-	-	-	Tr	Wk	?	35%					
	107.0	112.0		0.02											0.01	0.01			Sp-Wk	Sp	-	Sp Wk	-	-	-	-	-	-	-	Tr-Sp	Wk Mod	?	30%					
	112.0	117.0		0.04											0.01	0.03			Sp	Sp	-	Wk	-	-	-	-	-	-	-	Sp-Wk	Wk Mod	?	35%					Hem-lim staining of felds continue.
	117.0	122.0		0.05											0.02	0.03			Sp	Sp	-	Wk Mod	-	-	-	-	-	-	-	Sp	Wk	?	37%		Ak + Ap			Slight amt of intermixed graphic Ap. The sp py has v. thin c.c. coating
	122.0	127.0		0.06										0.01	0.01	0.04			Sp	0.3	-	Tr	-	-	-	-	-	-	-	Tr-Sp	Wk Mod	?	30%		Ak			Much less lim-Hem more c.c.
	127.0	132.0		0.13										0.02	0.02	0.09			Tr-Sp	0.8	-	Tr	-	-	-	-	-	-	-	Sp	Wk	?	30%		Sulf. Pt.	127'		Increase in total sulfs. K-spar has unbleached edges. - Sp c.c., Tr Box
	132.0	137.0		0.12										0.01	0.01	0.10			Tr	0.8	-	Tr	-	-	-	-	-	-	-	Sp	Wk Mod	?	30%		Ak + Ap			Some evidence of qtz-sulf. veining
	137.0	142.0		0.09										0.02	0.01	0.06			Tr	0.5	-	-	-	-	-	-	-	-	-	Tr	Wk Mod	?	38%					
	142.0	147.0		0.11										0.01	0.01	0.09			Tr	0.8	-	-	-	-	-	-	-	-	-	Sp	Wk Mod	?	28%					
	147.0	152.0		0.13							0.02				0.01	0.10			-	Tr	-	Tr	-	-	-	-	-	-	-	-	Sp		?	20%					Ak quite weakly altd. Some box still present
	152.0	157.0		0.12											0.01	0.11			-	0.8	-	Tr	-	-	-	-	-	-	-	Tr	Wk	?	30%					more altd than above, but still wk. Ax is some what propolitic w/ sp epidote & chlor.
	157.0	162.0		0.13										Tr	0.01	0.12			-	0.9	-	-	-	-	-	-	-	-	-	Tr	Sp Wk	?	25%					As Above. In GENERAL THERE IS A LOW Total Sulf. Content in ck
	162.0	167.0		0.05							0.01				0.01	0.03			Tr	0.8	-	-	-	-	-	-	-	-	-	Tr	Sp Wk	?	25%					
	167.0	172.0		0.06							Tr				Tr	0.06			-	0.5	-	-	-	-	-	-	-	-	-	Tr	Wk	?	50%					Slight increase in alt.
	172.0	177.0		0.62							Tr				0.01	0.59	0.02		-	6%	-	-	-	-	-	-	-	-	-	30% ST	Sp	?	50%					INCREASE in total sulf. at same time increase in total quartz
	177.0	182.0		0.31												0.28	0.03		-	6%	-	-	-	-	-	-	-	-	-	30% ST	Sp	?	50%					v. pronounced increase in qtz-ser-py. May be a thick vein zone
	182.0	187.0		0.13										0.02	Tr	0.11	Tr		-	4%	-	Tr	-	-	-	-	-	-	-	10%	Wk	?	45%					Sulfs. well dissem. - Part of sample is still ~~the~~ ST ser-qtz in material
	187.0	192.0		0.14												0.14			-	1%	-	-	-	-	-	-	-	-	-	Sp	Wk Mod	?	40%					Sp TOURMALINE IN SAMPLE
	192.0	197.0		0.33							0.02					0.30	0.01		-	2-3%	-	-	-	-	-	-	-	-	-	Mod	Wk Mod	?	45%					
	197.0	202.0		0.33												0.30	0.03		-	2-3%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk	?	50%					Appears that Cu Content should be higher
	202.0	207.0		0.10												0.10			-	2%	-	Sp	-	-	-	-	-	-	-	Sp	Mod	?	45%	Tr Pinite	Sp		Increase in Pinite Content
	207.0	212.0		0.11												0.11			-	2-3%	-	Tr	-	-	-	-	-	-	-	Tr Sp	Wk Mod	?	48%	1% Pinite	Sp		As Above
	212.0	217.0		0.14							0.01					0.13	0.03		-	2-3%	-	Tr	-	-	-	-	-	-	-	Tr	Wk	?	40%	Tr	Wk-Mod		As Above
	217.0	222.0		0.10												0.10			-	1%	-	Tr	-	-	-	-	-	-	-	Sp	Sp	?	38%		Wk-Mod		P. felds are going to Pinite (?) rather than Kaolin
	222.0	227.0		0.10												0.10			-	1%	-	Tr	-	-	-	-	-	-	-	Sp	Sp Wk	?	40%		Wk		
	227.0	232.0		0.24												0.24	Tr		-	2-3%	-	-	-	-	-	-	-	-	-	Wk	Mod	?	50%		Wk		ST alt. sp-wk amt of c.c. on py
	232.0	237.0		0.29												0.27	0.02		Sp	2%	-	-	-	-	-	-	-	-	-	Tr Sp	Wk	?	38%					Sudden re-occurrance of limonite
	237.0	242.0		0.32												0.30	0.02		Wk	2%	-	-	-	-	-	-	-	-	-	Wk	Wk Mod	?	40%					Orange lim developing Sulfs. - Apparent leaching going on.
	242.0	247.0		0.22												0.16	0.06		Sp	1-2%	-	-	-	-	-	-	-	-	-	Wk	Wk Mod	?	40%					
	247.0	252.0		0.72		0.03									0.03	0.59	0.10		Sp	4%	-	-	-	-	-	-	-	-	-	Mod	Wk	?	45%					Sr. zone of alt. + Min. c.c. is well developed on all sulfs.
	252.0	257.0		0.41		0.01									0.01	0.35	0.5		Tr	3%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk	?	45%					As Above
	257.0	262.0		2.21	35' @	0.02	35' @								0.02	0.50	0.15		-	5%	-	-	-	-	-	-	-	-	-	Mod	Wk	?	50%					SAMPLE DOES NOT SHOW THE Cu Indicated by THE ASSAY
	262.0	267.0		0.27		N.I.		0.01							N.I.	0.17	0.10		-	2-5%	-	-	-	-	-	-	-	-	-	Wk	Wk	?	47%					
	267.0	272.0		0.66	0.68	0.01									0.01	0.50	0.5		-	3%	-	-	-	-	-	-	-	-	-	Sp Wk	Wk Mod	?	40%					
	272.0	277.0		0.18		N.I.									..	0.15	0.03		-	3%	-	-	-	-	-	-	-	-	-	Tr Sp	Wk Mod	?	45%					Evidence of thick qtz veing
	277.0	282.0		0.40		0.01									0.01	0.37	0.02		Tr	3%	-	-	-	-	-	-	-	-	-	Sp	Wk	?	55%					As Above
	282.0	287.0		0.18												0.10	0.08		Tr	3%	-	-	-	-	-	-	-	-	-	Sp	Wk Mod	?	50%					Ak continues to be mod-stly altd + bleached
	287.0	292.0		0.19											Tr	0.16	0.03		Tr	3%	-	-	-	-	-	-	-	-	-	Sp	Wk Mod	?	55%					May be some contamination from above - Tr amts of lim + Non Sulf Cu + Cement

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(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

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Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER Hole No. D-246
Page 2 of 2 Pages
Collar Elev. 2,825 54 Final Depth 337.0
Coords. N 36,484 73 E 14,651 37
Inclination VERTICAL
Logged by N.R.N
Date: Start 7-31-67 Finish 8-7-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
292.0	297.0	5		0.31						Tr					0.25	0.06	Tr	-	2%	-	-	-	-	-	-	-	-	-	sp	wk red	?	A5%			AK			
297.0	302.0			0.22						Tr					0.19	1.03		-	3%	-	Tr	-	-	-	-	-	-	Tr sp	wk red	?	A8%						
302.0	307.0			0.12											0.10	0.02		sp wk	2%	-	-	-	-	-	-	-	-	Tr sp	wk	?	A2%						Re occurrence of lim
307.0	312.0			0.17											0.13	0.04		sp	2%	-	sp	-	-	-	-	-	-	Tr sp	wk	?	A5%						
312.0	317.0			0.07											0.03	0.04		sp wk	1-2%	-	Tr	-	-	-	-	-	-	sp	wk	?	A6%						lim weaker, but still persist.
317.0	322.0			0.07											0.04	0.03		sp	1%	-	-	-	-	-	-	-	-	sp	wk	?	A0%						
322.0	327.0			0.05											0.01	0.03		sp	2%	-	-	-	-	-	-	-	-	Tr	wk	?	A5%						
327.0	332.0			0.04											0.01	0.03		sp	1%	-	-	-	-	-	-	-	-	sp	sp wk	?	A5%						
332.0	337.0	5		0.05											0.01	0.04		sp	1%	-	-	-	-	-	-	-	-	Tr	sp wk	?	A0%	2%					
E.O.H.																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
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Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER

Hole No. D 245

Page 1 of 1 Pages

Collar Elev. 2,746.32 Final Depth 212

Coords. N 37,107.76 E 14,994.18

Inclination VERTICAL

Logged by R.E.

Date: Start 7-26-67 Finish 7-31-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Unk N.S.	Cc.	Cpy.	Cov. & Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
32	37	5		.03										.03				md	-		wk								Tr	sp	-	40	sp	AK			wkly altd AK.
37	42	5		.02										.02				md			wk			.4					Tr	sp	-	40	sp				yellow-green alt of Pl/Kf
42	47	5		.03										.03				md			wk								Tr	sp	-	40	Tr				
47	52	5		.04										.04				md			wk								sp	md	-	40	sp				increased alt
52	57	5		.01										.01				md			wk								Tr sp	md	-	40	sp				
57	62	5		.01										.01				md	Tr		wk								Tr	md	-	40	sp				
62	67	5		.02										.02				md			wk								Tr	md	-	40	sp				
67	72	5		.01										.01				md			wk								Tr	sp	-	40	sp				
72	77	5		.03										.03				md			wk								Tr	sp	-	40	sp				
77	82	5		.41		.02												wk			wk								Tr	sp	-	40	sp				
82	87	5		.91		.01								.01	.90			sp	1%		sp								Tr	sp	-	40	sp		sulfide contact		Does not appear to have more than a trace of sulfides.
87	92	5		.38		Nil							Tr		.16	.20	.02	Tr	<1		Tr								Tr	Tr	-	40	Tr				c.c. dis and on px
92	97	5		.40		.03							.03		.10	.10	.20	Tr	<1		-								Tr	Tr	-	40	sp				wk alt.
97	102	5		.30		Nil	.65									.10	.20		<1		-								Tr	Tr	-	40	sp				
102	107	5		.43	.65 @ .056	.02	@						.02		.30	.08	.03		<1										Tr	Tr	-	40	sp				Born-Cerulite alternates w/c.c. as a 2nd mineral
107	112	5		.79		.01	Nil						.01		.65	.10	.03		<1										Tr	Tr	-	40	sp				
112	117	5		.56		Nil									.50	.05	.01		<1					Tr					Tr	Tr	-	40	Tr				
117	122	5		.76		Nil									.36	.15	.25		<1										Tr	Tr	-	40	sp md				Increase in green alteration minerals
122	127	5		.78		Nil									.40	.20	.18	sp	1										Tr	sp	-	40	md				Linoite probably added to sample
127	132	5		.62		Nil									.35	.20	.07		1										Tr	sp	-	40	md				md alt. Born coating on Px, Cpx + dis c.c.
132	137	5		.48		.03							.03		.32	.10	.03		1										Tr	sp	-	40	md				Rx appears wkly altd overall gray with pink Kspar.
137	142	5		.37		Nil									.22	.15			1										Tr	Tr	-	40	sp				
142	147	5		.29		Nil									.18	.11			1										Tr	Tr	-	40	Tr				
147	152	5		.14											.02	.12			<1										Tr	Tr		40	sp				wk altd
152	157	5		.22											.07	.5			1										Tr	Tr	-	40	sp				
157	162	5		.03											.01	.02			1										Tr	Tr	-	40	sp				sample appears to contain at least 0.20 Cu
162	167	5		.36											.25	.11			1										Tr	sp	-	40	sp				
167	172	5		.22											.11	.11			2										Tr	sp	-	40	sp				
172	177	5		.17											.10	.07			1										Tr	sp	-	40	sp				
177	182	5		.14											.08	.06			1										Tr	sp	-	40	sp				
182	187	5		.10											.05	.05			1										Tr	sp	-	40	sp				
187	192	5		.04											.01	.03			<1										Tr	sp	-	40	sp				
192	197	5		.04											Tr	.04			<1										Tr	md	-	40	md				
197	202	5		.05											.01	.04			<1										Tr	md	-	40	md				
202	207	5		.08											.02	.06			<1										Tr	md	-	40	md				5% Total green 2nd minerals
207	212	5		.09											.02	.07			<1										Tr	md	-	40	md				

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
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Bx - Breccia
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An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER DRILL Hole No. D-244
Page 1 of ___ Pages
Collar Elev 2,750.00 Final Depth ___
Coords. N 37,113.46 E 14,639.29
Inclination VERTICAL
Logged by N.R.N.
Date: Start 7-22-67 Finish 7

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Mar. Mon. Vein & Sulfides	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	32.0	32.0																																	Dump			
32.0	37.0	5		0.03										0.03				Mod St	-	-	Wk	-	-	-	-	-	-	-	Tr Sp	Wk	?	30%			Ak			Normal Ak. Tex. wk-mod. alt.
37.0	42.0	5		0.08										0.08				Wk Mod	-	-	Wk	-	-	-	-	-	-	-	Sp	Wk	?	30%						wk sulf cast
42.0	47.0	5		0.04										0.04				Wk	-	-	Wk	-	-	-	-	-	-	-	Sp	Wk	?	35%						Slightly less Hem-Lim staining
47.0	52.0	5		0.05										0.05				Sp	-	-	Wk	-	-	-	-	-	-	-	Sp	Wk	?	40%						
52.0	57.0	5		0.03										0.03				Sp	-	-	Sp	-	-	-	-	-	-	-	Tr Sp	Wk	?	35%						
57.0	62.0	5		0.01										0.01				Sp-Wk	-	-	Sp	-	-	-	-	-	-	-	Tr	Wk	?	50%						
62.0	67.0	5		0.02										0.01	0.01			Wk	Tr	-	Sp	-	-	-	-	-	-	-	Tr	Wk	?	30%						
67.0	72.0	5		0.02										0.01	0.01			Wk Mod.	Sp	-	Tr	-	-	-	-	-	-	-	Sp	Wk	?	30%						Mod Lim bearing - probably from Tkt. vns.
72.0	77.0	5		0.02										0.01	0.01			Wk	Tr	-	Wk Mod.	-	-	-	-	-	-	-	Sp	Wk Mod	?	30%						
77.0	82.0	5		0.05										0.01	0.04			Wk	0.2%	-	Wk	-	-	-	Tr (ox-Cu)	-	-	-	Wk	Wk Mod	?	35%						Intermixed Limonite + sulfides. Tr-Sp Py w/ Tkn. cc.
82.0	87.0	5		0.12									0.04	0.01	0.07	Tr		Sp	1-2%	-	Tr-Sp	-	-	-	-	-	-	-	Wk	Wk Mod	?	35%						Increase in alteration. Sp staining of altd. feldsp w/ gen oxides; Rapid increase in sulfs.
87.0	92.0	5		0.11									Tr	0.02	0.09	Tr		Wk	1%	-	Tr-Sp	-	-	-	-	-	-	-	Mod	Wk Mod	?	35%						Increase in ser.
92.0	97.0	5		0.14		0.13							Tr	0.13	0.26	0.05		Sp	2%	-	Wk	-	-	-	-	-	-	-	Mod	Wk	?	40%						Rk mod-str'ly altd. + bleached. Still intermixing of sulfides + oxides
97.0	102.0	5		1.07	35' @ 1.00	0.01	35' @ 0.03							0.01	0.76	0.10		-	3%	-	-	-	-	-	-	-	-	-	Str Intra	Mod	?	40%						All evidence of leaching gone. Str Alt + Min.
102.0	107.0	5		1.02		0.01								0.01	0.91	0.10		-	3%	-	-	-	-	-	Tr	-	-	-	Str	Wk	?	40%						Not too much evidence of Hydrated felds. - altd to ser. for most part.
107.0	112.0	5		0.78		0.01								0.01	0.67	0.10		-	3%	-	-	-	-	-	Tr	-	-	-	Mod	Wk	?	40%						slightly less altd. + bleached
112.0	117.0	5		2.61		0.03								0.03	2.33	0.25		-	7%	-	-	-	-	-	Tr	-	-	-	Str	-	?	45%						str'ly altd. + Min. sc cc in Py + Sp cpy
117.0	122.0	5		0.73		Nil									2.55	0.18		-	3%	-	-	-	-	-	Tr	-	-	-	Wk	Wk	?	40%						Slightly less bleached + altd.
122.0	127.0	5		0.38											0.18	0.20		-	1%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk	?	45%						Rapid decrease in cc.
127.0	132.0	5		0.17											0.07	0.10		-	1-2%	-	-	-	-	-	-	-	-	-	Sp Wk Mod	Wk	?	40%						More kaolin less ser.
132.0	137.0	5		0.12											0.10	0.07		-	2%	-	-	-	-	-	-	-	-	-	Wk	Wk	?	35%						
137.0	142.0	5		0.25											0.20	0.05		+	2-5%	-	-	-	-	-	-	-	-	-	Sp Wk	Wk	?	30%						
142.0	147.0	5		0.37	25' @ 0.63		25' @ Nil								0.10	0.07	0.20	-	3%	-	-	-	-	-	-	-	-	-	Wk Mod	-	?	45%						str alt, mod min. Born-Cpy replacing CPY rather than cc
147.0	152.0	5		0.26											0.05	0.06	0.15	-	3-4%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk Mod	?	45%						As Above
152.0	157.0	5		1.12		0.01								0.01	0.05	0.22	0.85	-	3-4%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk Mod	?	45%						
157.0	162.0	5		1.03		0.01								0.01	0.05	0.22	0.85?		4%	-	-	-	-	-	-	-	-	-	Mod	Wk	?	45%						
162.0	167.0	5		0.37											0.22	0.20	0.15	-	3%	-	-	-	-	-	-	-	-	-	Mod	Str Wk	?	40%						
167.0	172.0	5		0.15											Tr	0.10	0.05	-	3%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk	?	35%						
172.0	177.0	5		0.15											0.10	0.05		-	2%	-	-	-	-	-	-	-	-	-	Wk	Wk	?	45						Rk becoming less bleached. Some evidence of qtz-sulf veining
177.0	182.0	5		0.13											0.03	0.10		-	1%	-	-	-	-	-	-	-	-	-	Sp	Wk	?	30%						As Above
182.0	187.0	5		0.06											Tr	0.06		-	1%	-	-	-	-	-	-	-	-	-	Tr Sp	Wk	?	35%						K-spars have almost natural color.
187.0	192.0	5		0.05												0.05			2-3%	-	-	-	-	-	-	-	-	-	Sp	Wk	?	30%						K-spars again bleached
192.0	197.0	5		0.03												0.03			5%	-	-	-	-	-	-	-	-	-	Tr Sp	Wk	?	30%						
197.0	202.0	5		001												0.01			1%	-	-	-	-	-	-	-	-	-	Tr	Sp	?	30%						
END OF 202.0	207.0	5		0.05												0.05			1%	-	-	-	-	-	-	-	-	-	Tr	Sp	?	30%						
HAMMER → 207.0	210.0	3		0.06												0.06			1%	-	-	-	-	-	-	-	-	-	Tr	Sp	?	30%	3%					Sx. bra. alt. of feldsp beginning to show up. sudden occurrence of chlor.
To be deepened																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

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Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-243
Page 1 of 1 Pages
Collar Elev. 2,826 38 — Final Depth 403.0
Coords. N 36,789 88 — E 14,819 53
Inclination VERTICAL
Logged by N.R.N., RCE, R.R.C.
Date: Start 7/22/67 — Finish 7-26-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0	122	122																																				Dump
122	127	5		.13									.13					mod													50				Ak			limonite obscures detail
127	132	5		.33									.33					mod			mod										30							as above, apparently wkly altered
132	137	5		.65		.41							.41		.22			mod			wk							Tr	SP		30	SP						few visible sulfides
137	142	5		.74		.35							.35		.39			wk mod			wk								Tr		30	SP						malachite
142	147	5		.66		.47							.47		.19			wk mod			wk								mod		30	SP						increasing alt, mal-chif NS
147	152	5		1.23		1.18							1.18		.04			wk			wk								ST									large amount of gouge, bright green malachite
152	157	5		.80		.76							.76		.09			wk			wk								ST									Very large percent of gouge
157	162	5		.26		.23							.23		.03			wk			wk								wk		40	mod						less glax, more green alt. product - pinite (?), more quartz
162	167	5		.41		.39							.39		.02			wk	Tr		wk							mod	wk		40	wk mod						As above
167	172	5		.69		.60							.60		.09			sp			Tr								wk		60	wk						mostly qtz, sml.
172	177	5		.39		.36							.36		.03	Tr		wk			Tr								wk		50	wk						C.C. on cpx, mostly mal.
177	182	5		.17									.15		0.02			Mod	Tr	-	Mod st	-	-	-	-	-	-	-	wk, wk		?	30%	-					
182	187	5		.31									0.12		0.15	0.04		wk	2%	-	wk	-	-	-	-	-	-	-	Sp	Sp wk		?	35%					
187	192	5		.32									0.10		0.20	0.02		wk	1%	-	Sp	-	-	-	-	-	-	-	Sp	Sp wk		?	35%					Qtz. Qvs still showing folds. CC. on py intermixed w/ limonite
192	197	5		.65		.09							0.09		0.45	0.11		wk	1-2%	-	Tr Sp	-	-	-	-	-	-	-	Sp wk	Sp wk		?	35%					
197	202	5		.23									0.07		0.13	0.03		Mod	1-2%	-	Tr Sp	-	-	-	-	-	-	-	Sp wk	wk		?	35%					increased leaching
202	207	5		.58									0.06		0.30	0.02		wk mod	1-2%	-	Sp	-	-	-	-	-	-	-	Sp	Sp wk		?	35%					SAMPLE S fill shows effects of leak solutions from above.
207	212	5		.22									0.12		0.10			wk	2-5%	-	Sp	-	-	-	-	-	-	-	Sp	wk		?	35%					
212	217	5		.24									0.12		0.12			Sp wk	1%	-	Sp	-	-	-	-	-	-	-	Sp wk	wk		?	35%					
217	222	5		.24									0.08		0.14	0.02		Sp	1%	-	Tr	-	-	-	-	-	-	-	Sp	Sp		?	35%					
222.0	224.5	2.5		.28									Tr.		.23	.05		Tr	1/2	Tr?	Tr	-	-	-	-	-	-	-	-	-		35	5%		AK	min fract	70°	weakly altered, bi + chlor, feldspar unaltered; 3% diff. bi, C.C. on py along fracts, also $SrCO_3$(?) along fract. (NC Core) Ts mod.
224.5	235.0	10.5		.32									1		.30	.02		SP	1/2	-	Tr	-	-	-	-	-	-	Tr	Tr	SP		35	3-5		"			As above, except weak halt. of feldspars
235.0	243.4	8.4		.36									1		.33	.03		Sp	1%	-	Tr	-	-	-	-	-	-	-	Tr	Sp		30%	5%					Rk is only spotty alt. 5% dist non chlor. P. felds sp. alt. to yellow - may be slight sulfates still. Sp Py has v. thin c.c. coating. Sulfs are occurring along v. thin fracts. + in alt. Biot.
243.4	251.9	8.5		.34									1		.29	.05		Tr-Sp	1-2%	-	Tr	-	-	-	-	-	-	-	Tr	Sp		30%	5%					As Above. - Rk still shows effects of dump leaching above. - Sulfates + New Sulfs Cu occasional zones (?)
251.9	261.4	9.5		.93		.07							.07		.72	.14		Sp	1-2%	-	Tr	-	-	-	-	-	-	-	Tr	Sp	1%	30	3%		Ap. Vn @ 260.8	qtz-sulf Vn ⅛"	70°	As Above. Aplite Vn. 1½" thick 10° dip
261.4	270.3	8.9		.58		.15							.15		.41	.02		Sp	1-2%	-	Tr	-	-	-	-	-	-	-	Tr-Sp Sp	wk	1%	35%	3%	2% Pinite	AK			Less biot. Some has leafy form. 2% of Rk is a lt gray alt of P. felds. which may be pinite
270.3	281.9	11.6		.61		.03							.03		.40	.18		Sp-Tr	2%	-	Tr	-	-	-	-	-	-	-	2%	Wk-Mod	2%	35%	2%	7% Pinite	4" Ap Vn @ 275.7	Qtz-Sul-Sulf Vn - 1"	65°	Rk becoming more fracd + more alt'd. Still some orange tint on fracs. Pinite(?) Composes 7-10% of Rk. Increase in total sulfs. C.C. coating also increasing.
281.9	288.6	6.7		1.38		.06							.06		1.31	.01		Sp	20%	-	Tr	-	-	-	-	-	-	-	20%	wk Mod	?	45%				Fx. o Vn 285 → 294	85°	Rk is stly alt'd. adjacent to Ell. zone. Rk also increases towards fanc. St Py + Tr Sp off. Coated w/ v. thin c.c. coating.
288.6	297.6	9.0		1.17		.01							.01		1.12	.04		Sp	25%	-	Tr	-	-	-	-	-	-	-	30%	wk Mod	?	40%						V. Stly alt'd + mineralized Qtzd. C.C. on Py + Cpy.
297.6	304.1	6.5		.49		Nil							.25		.24			1	5%	-	-	-	-	-	-	-	-	-	Sp	-		41%	1	-				Good mineralization of sulfides. C.C. on Py & Cpy in areas. Cpy. tarnished elsewhere.
304.1	315.9	11.8		.70		Nil							.58		.12			1	4%	-	-	-	-	-	-	-	-	-	1	-		1	35%	-	Ap Vn @ 309.0-313.3		50°	C.C. coating appears throughout. Py % in Aplite may be as high as 10% As Above
315.9	322.7	6.8		.34		Nil							.25		.09			tr	1%	-	tr	-	-	-	-	-	-	-	1	wk Mod	-	25%	Biot 3% Sp	Pinite 4%	AK	1" Ap Vn 317.7		50°	Biot appears w/ slight alt. Plag. is alt. to Pinite
322.7	332.2	9.5		.22									.18		.04			sp	sp	-	tr.	-	-	-	-	-	-	-	tr	Mod-Sp	-	10%	3% Biot 1%				20°	Biot alt. to chl. w/ less alt. of Plag.
332.2	340.9	8.7		.14									.09		.05			1	1	-	1	-	-	-	-	-	-	-	Sp.	wk Mod	-	20%	1	1		1" Ap Vn - 335.4 2" Ap Vn - 339.1		20°	As Above
340.9	351.0	10.1		.13									.07		.06			tr.	tr.	-	-	-	-	-	-	-	-	-	-	-	-	40%	1	Biot Sp.		9" Ap Vn 350.1 - 351.0	30°	As Above
351.0	359.5	8.5		.05									.01		.04			-	sp	-	-	-	-	-	-	-	-	-	-	-	-	45%	1%	Biot 2%		9" Ap. Vn. - 361.8 3" Ap Vn - 359.4	30° 30°	As Above
359.5	368.3	8.8		.05									Sp.		.05			-	Sp.	-	tr	-	-	-	-	-	-	-	-	-	-	35%	Sp.	Biot Sp.				Extensive alt. of plag. to pinite & even further alt. to yellowish mineral. C.C. coating Still present.
368.3	376.1	7.8		.18									.13		.05			-	<1%	-	tr.	-	-	-	-	-	-	-	-	-	-	30%	tr	-				As Above. Py. occupies min. fract. Rk is slightly broken but becomes very broken from 374.1 on.
376.1	384.4	8.3		.11									.08		.03			Tr-Sp	1-2%	-	-	-	-	-	-	-	-	-	1-2%	Sp	2%	35%	c.c.	Pinite 20%		6" Ap. Vn - 380.8 2" Qtz-Sr-Sulf Vn.	70° 45-50	P felds stly Alt'd to lt. gray Pinite. K felds fresh. Mod. stain + fract filling w/ orange min. sulfs present along micro fracs. + in Biot. sp Py + Cpy are coated w/ c.c. Also at least Tremolite in fracs.
384.4	393.6	9.2		.06									.01		.05			Sp	5%	-	-	-	-	-	-	-	-	-	Tr	Tr-Sp	-	38%	Sp	1	Ap. 386.4 - 387.8 Tr c.c. Ak	Ap. Vn		As Above. Rk shows strong micro fracturing. The Pinite (?) is strong. Sp Mal.
393.6	403.0	9.4		.11									.03		.08			Tr-Sp	1%	Tr	Tr	-	-	-	-	-	-	-	Tr	Tr-Sp	-	38%	c.c.	1				As Above. Sp Py + Tr Cpy have some c.c. coating
	E.O.H.																																					

Core Drilled

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb- Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig- Undif igneous

Hole No. D-242
Page 1 of 2 Pages
Collar Elev. 2733 60 Final Depth 722.9
Coords. N 38,504 73 E 14,584 24
Inclination VERTICAL
Logged by N.R.N., R.C.H., R.R.E
Date: Start 7-18-67 Finish 8-3-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Chrys.	Pitch	Black	Blue Green		Cu (1) Cc.	Cu (1) Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
8.5	19.2	10.7		0.04										UNK NS 0.04	–	–		Sp-pk	–	–	tr	–	–	–	–	–	–	–	Tr-Sp	Tr	<1%	36%	3%	MOD Sp	Ak			wkly altd. As w/ sp-wk lim on fracts w/sp mod assoc.
19.2	28.9	9.5		0.04										UNK NS 0.04	–	–		Sp	–	–	–	–	–	–	–	–	–	–	Tr	Tr	–	35%	3%	1				As Above – Rk has a slightly bleached appearance from weathering
28.9	38.0	9.3		0.04										UNK NS 0.04	–	–		Sp	–	–	Mod 1%	–	–	–	–	–	–	–	Tr-Sp	Tr	–	45%	1%	1				Hem. occurs in this hand as dissem. grains + probably derived from magnetite
38.0	46.9	8.9		0.05										UNK NS 0.05	–	–		Sp	–	Tr	Tr	–	–	–	–	–	–	–	Tr-Sp	Tr-Sp	–	55%	–	1		Shear Zone 40 + 50.5	≈80°	Rk becomes stly sheared at high angle + quite close spaced.
46.9	54.3	7.4		0.04										UNK NS 0.04	–	–		Sp-wk	–	–	Tr	–	–	–	–	–	–	–	1	1	1%	55%	Tr Sp	Tr Mod	Aplite Dike 251.7			Rk continues to be sheared to 50.5. Sp lim. salt & pep lesion + on fracts
54.3	63.8	9.5		0.03										UNK NS 0.02	0.01	–		wk	Sp	–	Mod	–	–	–	–	–	–	–	Sp	Sp	3%	50%	–		Ak	Min. Fract 1/2"	90°	Rk has pervasive hem staining of felds., Tr-Sp lim, wk lim.
63.8	74.0	10.2		0.26										–	0.21	0.05		Sp-wk	3-4%	–	Sp-pk	–	–	–	–	–	–	–	Sp	Sp	4%	50%	Sp		Ak	Min Fract 1/4	70°	Intermixed sulfs + lim. locally Sp Py on fracts wk-mod C.C. coating on Py + Sp Cpy
74.0	82.9	8.9		0.12											0.10	0.02		wk	2	–	Tr	–	–	–	–	–	–	–	Sp	Sp	1	45	Sp		Ak	Min. Fract <1/4	≈90°	Rk still looks only wkly alto. loss px, wk cc on cpx, wk alt, wk lim on fract
82.9	92.3	9.4		0.11											0.11	0.01		wk	1	–	Tr	–	–	–	–	–	–	–	Sp mod	Sp	<1	40	Sp mod		Ak	lim. on fracts	65°	Fracturing and rounding of minerals, overall loss of Md. Alt., Px texture, Fspars bleached-alt to sericite, silicified
92.3	100.8	8.5		0.06											0.04	0.02		wk	3	–	Tr	–	–	–	–	–	–	–	mod	Sp	<1	35	Sp			Min fract <1/4	50°	destruction of texture and bleaching around sulfides As above, epidote or Biite (?)
100.8	109.2	8.4		0.07											0.04	0.03		–	3-4	–	–	–	–	–	–	–	–	–	Sp	Sp	–	35	Sp			Py fract 1/4	50°	As above, Texture varies from nearly unaltered to indistinguishable
109.2	121.7	12.5		0.22											0.18	0.04		–	3-4	–	–	–	–	–	–	–	1	–	Sp	Sp	–	35	Sp			Min fract 3/8 & 1/10"	60°	As above, vein qz, px, cpx, c.c. on cpx, dis. fvein py veins of green
121.7	131.1	9.4		0.08											0.05	0.03		–	2	–	–	–	–	–	–	–	–	–	Sp	Sp	2	35	Tr		Ak	Py fract 1/4"	50°	Fspar altered green, some sericite, alteration product - chlorite, sericite (?)
131.1	140.0	8.9		0.23											0.20	0.03		–	4	–	–	–	–	–	–	–	–	–	Sp	Sp	1	40	Sp			"	"	more dis. and veined px, also increasing alteration of fspars
140.0	148.7	8.7		0.08											0.06	0.02		–	1	–	–	–	–	–	–	–	–	–	Tr Sp	Sp	3	35	Sp					little alteration of fspars, Tr-cpx, px is now dark green alt and other veins
148.7	157.8	9.1		0.10											0.09	0.01		–	3	–	–	–	–	–	–	–	Tr	–	Sp	Sp mod	3	30	Sp			min fract 1/4"	60°	Bleaching, silicification, irregular destruction of texture small amounts of cpx, mal., fine dis. py
157.8	166.3	7.5		0.06											0.05	0.01		–	3-4	–	–	–	–	–	–	–	–	–	Sp	Mod	3	30	Sp					highly fractured: 164-165, limey gouge on fractures dis. sulfides
166.3	175.6	9.3		0.05											0.04	0.01		–	4	–	–	–	–	–	–	–	–	–	Sp mod	mod	3	30-35	Sp		Ak			st alt from 173-175, vertical fractures, gouge increasing cpx, dis. py
175.6	183.3	7.7		0.04											0.01	0.03		–	Sp	–	–	–	–	–	–	–	–	–	Sp	mod	1	35	Sp					decrease in sulfides fine grained splitic texture over most of interval
183.3	190.8	7.5		0.19											0.04	0.15		–	Sp											mod	mod-st	1	35	Sp			Min. fract <1/4"	70°	strongly alt. to clay. Possibly small amt of cpx
190.8	192.8	8.0		0.61		Nil									0.01	0.40		–	2-3							5			–	–	–	–	mod		Sed. 188.1-192.8	min veins <1/4"	80-90	Sediments in Ak. Alt. to chlorite, stringers of py and 1/4" veins of calcite
192.8	200.3	7.5		0.27											0.01	0.26			1-2							2				mod	mod-st	–	30	Sp		Ak			St. Alt., Possibly contains small fragments of sed., garnet (?) calcite veins and steeply dipping py stringers
200.3	208.6	8.3		0.16											tr.	0.16			1-2							2				mod	mod-st	–	30	Sp					As above, except no xenoliths, small C.C., cpx near 206'
208.6	217.5	9.9		0.06											Sp.	0.06			1-2							1				mod-st	mod-st	1	30	Sp					St Alt, occ vertical fracturing, Px, C.C. 1/8" calcite veins
217.5	221.7	4.2		0.10											–	0.10			1							Tr				Sp mod	Sp mod	1-	35	Sp			min vein	70°	alt. decreases to 221, increases again to 221.7 resulting of sed of 220.2. 1/2" QTZ vein at 221 w/ mod sulfides, C.C.(?), mal., cpx
221.7	230.1	8.4		0.11											–	0.11			1-2							Tr				Sp mod	mod-st	1	40	Sp					St. Alt, becomes fine grained and silicified ~228' Px, cpx, minor C.C.
230.1	238.5	8.4		0.09											–	0.09			1-2							Tr				Sp mod	mod-st	2	45	Sp					alt varies from mod. to st., highly silicified over most of interval px, cpx, C.C.
238.5	247.1	8.6		0.09											–	0.09		–	<1%	–	–	–	–	–	–	Tr-Tr	–	–	Sp	wk.	?	55%	–					Mod silicified, Mod-Stk bleached, total sulf cont ≈ 1% slightly more Py than cpx Wk C.C.
247.1	255.4	8.3		0.09											–	0.09		–	1%	–	–	–	–	–	–	1	–	–	<1%	Sp	2%	50%	1%			See-section 1/4"	55°	As Above. Rk has a pale washed out appearance.
255.4	263.6	8.2		0.08											–	0.08			1							Tr				Tr-Sp	Sp	1%	45%	1%					As above
263.6	272.4	8.8		0.07											–	0.07			1							Tr	–	–	Sp	Sp	–	45	Sp					wk alt., wk-Mod sil., low sulfides
272.4	281.3	8.9		0.06											–	0.06			1-2							Tr			Sp	Sp	–	40	Sp			Shear Zone 278-Py vein	50°	Shear zone at 275', otherwise as above
281.3	290.1	8.8		0.06											Tr.	0.06			2							Tr			Sp	Sp	1	45 50	Sp				50°	Increasing sil., px, no cpx, fractures dip 60°-90°.
290.1	298.3	8.2		0.03											–	0.03			1							Tr			Sp	Sp	–	40	Sp					Rk appears less bleached + altered, bio + chl. ≈ 2% minor C.C. (?) wk-mod alt, thin vuggy QTZ veins w/ Px, cpx.
298.3	307.4	9.1		0.08											–	0.08			2							–			Tr Sp	Sp	3	40	Sp			1/8" min veins	50°	veins average spacing of 2"
307.4	316.1	8.7		0.08											–	0.08			1-2										Sp	Tr	Tr	4	40	Sp			min. veins	40°-90°	appears wkly alt., mod. silicified. Vuggy QTZ veins increase to ± 1/2" Px, moly. occur in veins
316.1	324.6	8.5		0.09											–	0.09			1										Tr	Tr	2	40	Sp			Min Veins	50°-90°	close spaced thin veins w/ Px, cpx. Also Vertical shears w/ only Trace of sulfides. Alteration as above
324.6	333.4	8.8		0.09											–	0.09			2										Tr	Tr	4	40	Sp			min Veins	60°	Generally as above. Gradational zone with medium grained splitic texture.
333.4	342.5	9.1		0.18											–	0.18			3										Tr	Tr	3	40	Sp					Vuggy QTZ veins - some with high cpx-to-Px ratio From 333 + To 335' highly sheared and silicified with 0.7% cpx along vertical fracture. Rest of interval is wk-mod alt with less cpx.
342.5	351.6	9.1		0.14												0.14			1							Tr			Sp	Sp	3	2-10	mod			Min fract	50°	Alternating zones of altered, st. Ak and fine grained dark (Da?) Px, cpx.
351.6	358.8	7.2		0.11												0.11			Sp							Sp			Sp	Tr	1/2	5-10	mod st		Dp? 351.6			Fine grained, St. Chlorite Da (?), numerous steeply dipping min. fractures thin calcite veins ≈ 60°
358.8	366.9	8.1		0.06												0.06			1							2%			1	Wk-Mod	–	25%	st					As above but more highly altered.
366.9	375.9	9.0		0.15												0.15		tr.	2%		tr				sp.	1%			1%	–	sp.	7%	>10%	Biot. <5%				Fine-grained biot & chl. throughout. Sulf. min. evenly disseminated. Also w/ small veins at usually ≥ 45° dip. Lim. there appear after sulfs.
375.9	384.8	8.9		0.14												0.14		1	<1%		1				tr.	sp.			2%	–	–	9%	17%	Biot. 10%				Rk is as above except it has much secondary orthoclase enrichment. Zones of fine grained biot & chl. intersect (i.e. 377.9-378.8 and 380.5-383.5)
384.8	389.3	3.5		0.08												0.08		–	Sp		–				–	–			–	–	1%	30%	2%	Biot. 5%	Ak 384.8			Some alt. of plag. to pinite. Also Rk intersected by two zones, first which is orthoclized Ak (386.1-386.4) and the second which is like the above type (387.4-388.0)
389.3	395.1	6.8		0.13												0.13			1%						–	Sp.			Sp	–	–	10%	20%	Biot. 4%	Dp 389.3			Interval is broken by small alteration zone (sulfides (in & crypt. chlorite?) separating orthoclized Da from the non-orthoclized Da.

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-242
Page 2 of 2 Pages
Collar Elev 2,733.60 Final Depth 722.9
Coords. N 38,504.73 E 14,584.86
Inclination VERTICAL
Logged by N.R.N., R.C.H., R.R.F.
Date: Start 7-18-67 Finish 8-3-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
395.1	404.0	8.9		0.08												0.08		-	1%	-	-		-	-	-	sp.	-	-	-	-	20%	14%	Biot. <1%	Dp			Rk is of a slight green hue w/ several small orthoclase veins and some small biotized areas. Calcite fills most of the small fractures.
404.0	408.7	4.7		0.04												0.04		-	0.5%	-	-		-	-	-	Tr. sp.	-	-	sp.	-	1% 20%	8%					Rk appears to have a light gtz. grnd. mass. well diss. lt. grn chlor. throughout Rk. Sp. Py, tr. sp. Cpy
408.7	413.0	4.3		0.03												0.03		-	<1%	-	-		-	-	Tr	Tr	-	-	sp.	sp. wk	-	15%	8%	Biot. 8%	Mz (?) + Dp 408.7-413.0 Dp @ 413.0			Completely intermixed Dp (?) + Mz (?). Mz (?) is lor. in gtz + high in Bot. Biot. Dp (?) has vague graphic apatite tex. of grnd mass.
413.0	420.8	7.8		0.06											.01	0.05		-	Sp	-	-		-	-	-	Tr. sp.	-	-	sp.	sp.	35%	4%					This rk is quite fine grained and siliceous appearing only vague tex. Almost no sulfs.
420.8	429.9	9.1		0.02												0.02		-	<1%	-	-		-	-	Tr	sp	-	-	Tr. sp.	Tr. sp.	?	30%	3%					As Above. Slightly better text. Sp Tourmaline.
429.9	438.1	8.2		0.02												0.02		-	1.5%	-	-		-	-	sp	sp	-	-	Tr. sp.	Tr	?	20%	10%	Biot. <1%				Slightly less altd. w. fine. clear grains throughout grnd mass. gitter of plag. into original. has bot. but altering to chlor. slight increase in sulfs. pk + lade
438.1	447.7	9.6		0.05												0.05		-	2%	-	-		-	-	Tr	sp. wk	-	-	sp.	sp	-	15%	10%					As Above. Fabrics is sulfs. fold. controlled. - slt. increase in chlor along faults. Spec. & hem. appear in calcite vein. Sp Tourmaline. Orthoclized areas appear throughout
447.7	455.2	7.5		0.04												0.04		-	<1%	-	tr.	tr.	-	-	tr	sp	-	-	1	-	-	20%	7%	Biot. sp.				As Above
455.2	463.2	8.0		0.12												0.12		-	Sp.	-	-		-	-	tr.	1	-	-	1	-	-	15%	10%	Biot. 2%				Decrease in orthoclized areas, otherwise as above
463.2	471.6	8.4		0.04												0.04		-	1	-	-		-	-	1	1%	-	-	tr.	-	-	10%	17%	Biot. 3%				As Above
471.6	479.4	7.8		0.03												0.03		-	tr.	-	-		-	-	1	Sp.	-	-	tr.	-	-	5%	1	Biot. <1%				Biotite is altered to chlorite which is going to hydromica. Tourmaline still sp.
479.4	488.6	9.2		0.03												0.03		-	<1%	-	-		-	-	-	1	-	-	sp	-	-	20%	14%					Rk is very broken. As Above
488.6	493.4	4.8		0.06												0.06		-	1	-	-		-	-	tr.	1	-	-	1	-	-	1	8%					
493.4	500.8	7.4		0.49		Nil									0.47	0.02		-	<1%	sp	Tr		-	-	0.02	Tr. sp.	Tr	Tr	Sp	Tr. sp	0.5%	20%	4%		Hf (?) 493 - 494.5 Dp			Hf (?) per guide questionable. Fgrained - med. green colored & contains Tr - sp. V. fine. diss. Mag. The Dp is highly alt'd to a pale green (chlorite-sericite) and lgr. gtz. intruded. Sp. fresh tourmaline present
500.8	508.7	7.9		0.02												0.02		-	0.5%	-	-		-	-	0.02	1%	-	-	Sp.	Tr. sp.	-	10%	?					Dp As Above. Rk has been shattered + recrystallized. There has been some relative move. of frags
508.7	521.0	12.3		0.01												0.01		-	0.3%	Tr.	-		-	-	Tr	sp.	-	-	Tr. sp.	Tr. sp.	-	15%	?					Dp becoming somewhat less altd.
521.0	530.4	9.4		0.18											.08	0.10		-	0.5%	-	Tr		-	-	-	sp	-	10%	-	-	-	30%	15%	chlor. - orthoclase (?) 519.55 - 519.6 Tr 521.0 Tr 521 - 522.3 Silic. Sh. Sl. 522.3 - 522.5 very Dirty. M 524.5 -	orthoclase (?) banding	40-50°		Fgr. grained w. hard. Silic (?) rk. Mag. v. fine. chlor. and bands of pink orthoclase (?). Banding is similar to that seen in D-236 & D-233. May indicate a fault argument, or low hd angle. Tr is med. brn + compared primarily of hard. Sulfs are wk. occurring along faults + in vns. Silic. Sil. Sl. Similar to above. Much more sulfs than in Tr, but not much Cu.
530.4	537.4	7.0		0.26											.14	0.12		-	3%	-	Tr.	-	-	-	Sp	Mod 20%	20%	-	-	-	20%	sp					
537.4	546.2	8.8		0.34		Nil									0.22	0.12		-	2%	Tr.	Tr.	-	-	-	Sp	Sp 3%	pink orthoclase 15%	-	-	-	20%	Tr					Silic. Sh. Sl. Mz above. Med. red pink orthoclase (?). Dp. Mz is Lr Tan, slightly vuggy and has sparse epidote. Sulfs are wk. Py w/ Sp only. Small areas w/ dark green actinolite. Spec. & hem. occupy calcite veins.
546.2	553.9	7.7		0.09												0.09		-	1%	-	Sp.	tr.	tr.	-	Sp.	sp.	50%	20%	-	-	Sp.	15%	-					As above
553.9	563.0	9.1		0.24												0.24		-	1	-	1	-	tr	-	1	1	6%	60%	-	-	1	<5%	Sp?					Most tx appears in a segment which contains sphene ? (Sp) and actinolite ? [562.5 - 565.1]
563.0	570.8	7.8		0.28												0.28		-	<1%	-	1	tr.	tr.	-	tr.	1%	1%	90%	-	-	-	Sp.	-					Hematite appears in zones w/ larger grained chlorite. Sulfide veining a random.
570.8	580.5	9.7		0.64	14.7'	Nil										0.64		-	1	sp.	tr.	-	-	-	-	1%	-	70%	sp	-	sp.	sp.	10%					
580.5	585.5	5.0		0.58	10' 0.62	Nil										0.58		-	1%	tr.	1	-	-	-	tr.	sp.	-	10%	15%	-	1	10%	15%		Mz 580.5			Mz has assimilated sediments & there is a decreasing amount of silicates w/ depth. Small blebs of fine grained chl., hydromica, w/ & sericite decrease in size w/ depth.
585.5	591.0	5.5		0.27												0.27		-	2%	-	-	-	-	-	-	1%	-	-	sp	-	-	2%	7%		Mz T.D. 591.0			Small blebs of chl. are altering to hydromica & sericite. Rk has poikilitic texture
591.0	602.5	11.5		0.17												0.17		-	5%	-	-	-	-	-	sp	1	-	-	1	Mod. sp.	-	40%	sp		Rk 591.0 - 602.5			Latter part of interval has Mz fingers protruding into it @ 597.0 on. Secondary feldsp result from fingers & some as large as 1" x 1". Sulfides are dissem. throughout fingers but are concentrated in some spots.
602.5	609.6	7.1		0.15												0.15		-	5%	-	-	-	1%	-	-	tr.	2%	-	-	6%	Mod.	-	7%	1%	Sp. 1% 1%	Mz 602.5 -			Interval is broken. Plag. is mostly altered to pinite and the chl, hydromica, ser. series appears also to be going to pinite. Barite & Galena occuring together. Some poikilitic texture shown.
609.6	617.1	7.5		0.04												0.04		-	2%	-	-	-	tr.	-	-	1%	-	-	3%	Mod.	-	9%	<1%	Bar. sp.				Interval is less broken but otherwise as above
617.1	623.8	6.7		0.05												0.05		-	1	-	-	-	1%	tr.	-	sp.	-	-	sp	Mod.	-	3%	sp.	1				As Above
623.8	632.3	8.5		0.18												0.18		-	<1%	-	-	-	1%	-	-	Tr	-	-	SP	Tr	-	10%	SP		Mz			Mz with green altd Fspar and 2nd QTZ
632.3	640.5	8.2		0.04												0.04		-	<1%	-	-		-	-	-	Tr	-	-	SP	Tr	-	10%	SP					As above w/ 2nd K spar and 2nd Bi (?) dis. Px long
640.5	652.0	11.5		0.05												0.05		-	<1%							1	-	-	SP	Tr		8%	SP		Mz to 652.0			Mz continues with 2nd Kspar xtals up to 1" long. Thin calcite veinlets dis. Px
652.0 652.9	662.9	10.9		0.11												0.11			2%							2	sp	-	Tr	Tr		30 mod		Bx 652.0 - 662.9			Complex sequence of Mz, AK, sed. Sed appear mainly with AK. dis. Px
662.9	665.8	2.9		0.32												0.32			1%							Tr	-	-	Tr	Tr	5	40	Tr		AK 662.9 - 665.8	Dark vein	80°	AK free of fragments of sed. contains large amount of cpy along QTZ veins. Appears mod altd and silicified.
665.8	674.5	8.7		0.25												0.25			3%					Tr		Tr	Tr	Tr	-	25	Tr			Bx 665.8			AK and sed fragments with a large amt. (1") of intact sed. large blebs of cpy.
674.5	684.2	9.7		0.10												0.10			3							SP	SP	SP	Tr	-	25	Tr		Bx			Bx continues with calcite veinlets, large amount of dis. Px.
684.2	689.6	5.4		0.21												0.21			2							Tr	Tr	Tr	-	1	30	Tr		Bx	Contact w/ AK at 687.5		AK & sed. Fragments with Px
689.6	693.0	3.4		0.11												0.11			<1						Tr	-	-	SP	Tr SP	-	35	mod		AK 689.6			Mod to str. altd AK with no sed, Texture partially destroyed. Tr of moly on fracts.
693.0	701.3	8.3		0.12												0.12			<1						Tr	-	-	Tr	Tr SP	-	40	mod					less altd than above. Texture remains indistinct. Tr of cpy, moly on fracts.
701.3	709.7	8.4		0.12												0.12			<1						Tr	-	-	Tr	Tr	Tr	40	mod					As above with 1% pinite (?)
709.7	718.6	8.9		0.12												0.12			<1						Tr			Tr	Tr SP	<1	40	mod					As above, cpy & Tr of moly on fracts.
718.6	722.9	4.3		0.06												0.06			<1						Tr			Tr	Tr	5	45	mod			QTZ vein w/ small AK	90°	As above
	EOH																																					

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER DRILL Hole No. D-241
Page 1 of 4 Pages
Collar Elev 2,870 ±1 Final Depth
Coords. N 38,062 ±2 E 15,230 ±2
Inclination VERTICAL
Logged by N.R.N., R.C.E.
Date: Start 8-7-67 Finish

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	·	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	5.0	5.0		0.03										UNK. NS. 0.03				Sp-wk	-	-	Sp	-	-	-	-	-	-	Sp	Sl-wk	?	35%		Ak			
5.0	10.0	5.0		0.04										UNK. NS. 0.04				Sp	-	-	Tr	-	-	-	-	-	-	Sp-wk	Sp-wk	?	35%					Rk has a whitewed appearance w/ Sp. Lim + Hem staining
10.0	15.0	5.0		0.05										UNK. NS 0.05				Sp	-	-	Tr	-	-	-	-	-	-	Wk-Sp	Sp-wk	?	35%					Lim. is Lt yellow brn. - Jarositic
15.0	20.0	5.0		0.02										UNK. NS. 0.02				Sp-wk	-	-	Tr	-	-	-	-	-	-	Wk-Sp	Sp	wk	?	35%				Increase in Lim. All felds bleached.
20.0	25.0	5.0		0.02										UNK. NS. 0.02				wk	-	-	Sp	-	-	-	-	-	-	wk	wk	?	35%					The principle feld. all. appears to be v. fine Sec.
25.0	30.0	5.0		0.02										UNK. NS 0.02	Tr			Sp-wk	-	-	Tr Sp	-	-	-	-	-	-	Sp-wk	Sp-wk	?	35%					Alt. slightly weaker.
30.0	35.0	5.0		0.02										UNK. NS. 0.01	0.01			Sp-wk	-	-	Sp	-	-	-	-	-	-	Sp	Sp	?	35%					K-felds are becoming much less bleached.
35.0	40.0	5.0		0.01										UNK. NS 0.01				Sp	Tr	-	Tr-Sp	-	-	-	-	-	-	Sp	Sp-wk	?	35%					
40.0	45.0	5.0		0.04										UNK. NS 0.02	0.02			Sp	Tr	-	Sp-wk	-	-	-	-	-	-	Tr-Sp	Sp-wk	?	50%					Noticeable increase in quartz and hem staining
45.0	50.0	5.0		0.03										UNK. NS 0.02	0.01			Sp	Tr	-	wk	-	-	-	-	-	-	Sp	Sp-wk	?	45%					
50.0	55.0	5.0		0.01										UNK. NS 0.01				Tr-Sp	Tr	-	Sp-wk	-	-	-	-	-	-	Sp-wk	wk	?	40%					
55.0	60.0	5.0		0.02										0.01	0.01			1	Sp	-	Sp-wk	-	-	-	-	-	-	Sp	Sp	?	40%					Less altered appearing. K-felds have only slightly bleached color
60.0	65.0	5.0		0.01										0.01				Sp	Tr	-	wk	-	-	-	-	-	-	Tr	Sp	?	35%					
65.0	70.0	5.0		0.01											0.01			Sp	Tr	-	Sp	-	-	-	-	-	-	Tr	Sp	?	35%					
70.0	75.0	5.0		0.02										0.02				Tr Sp	Tr	-	Tr-Sp	-	-	-	-	-	-	Sp	wk-mod	?	35%					Much more alt'd than above.
75.0	80.0	5.0		0.07										0.05	0.05			wk-Mod	-	-	Sp	-	-	-	-	-	-	Tr	wk	?	35%					"
80.0	85.0	5.0		0.01										0.01				Mod	-	-	Mod	-	-	-	-	-	-	Sp	wk	?	35%					Lim predominately Jar. w/ lesser Goethite. Some small bornite grains from v. silicic
85.0	90.0	5.0		N.I														Mod	-	-	wk Mod	-	-	-	-	-	-	wk	wk-mod	?	35%					
90.0	95.0	5.0		0.02										0.02				wk	-	-	Mod	-	-	-	-	-	-	Sp	wk	?	35%					
95.0	100.0	5.0		0.01										0.01				Sp	-	-	Sp-wk	-	-	-	-	-	-	Sp	wk	?	35%					
100.0	105.0	5.0		0.01										0.01				Sp	-	-	wk	-	-	-	-	-	-	Sp	wk	?	35%					
105.0	110.0	5.0		0.01										0.01				Sp	-	-	wk	-	-	-	-	-	-	Sp	wk	?	35%					
110.0	115.0	5.0		N.I										N.I				Sp	-	-	Sp-wk	-	-	-	-	-	-	Sp	wk	?	35%					
115.0	120.0	5.0		0.01										0.01				Sp	Tr	-	Sp-wk	-	-	-	-	-	-	Sp-wk	wk	?	35%					
120.0	125.0	5.0		0.01										0.01				Sp	-	-	wk Mod	-	-	-	-	-	-	Sp-wk	Sp-wk	?	35%					Increase in Hem - Lim. Some Cpy visible - Also a slight increase in alt.
125.0	130.0	5.0		0.03										0.03				Tr Sp	-	-	wk	-	-	-	-	-	-	Sp	Sp-wk	?	35%					
130.0	135.0	5.0		0.06										0.05	0.01			wk	Tr	-	Mod	-	-	-	-	-	-	Mod	wk	?	35%					Increase in alt. + salt cavities
135.0	140.0	5.0		0.11										0.06	0.05			wk	0.02%	-	Mod Sp	-	-	-	-	-	-	Mod	wk Mod	?	30%					St. Hem - Lim Combination w/ intermixed salt (Cpy w/ the Cc. coating)
140.0	145.0	5.0		0.05										0.04	0.01			wk	0.02%	-	wk	-	-	-	-	-	-	wk Mod	wk Mod	?	30%					
145.0	150.0	5.0		0.03										0.02	0.01			wk	Tr	-	wk Mod	-	-	-	-	-	-	wk Mod	wk	?	30%					Still a lot of Hem - Lim w/ only Tr - Sp salts.
150.0	155.0	5.0		0.12										0.03	0.08	0.02		Sp-wk	0.03%	-	wk	-	-	-	-	-	-	Sp-wk	Sp-wk	?	30%		Mixed Ap + Ak			Hem-Lim Decreasing + salts increasing. Cc. coating Py + Cpy.
155.0	160.0	5.0		0.22										Tr	0.20	0.02		Tr-Sp	1%	-	Sp	-	-	-	-	-	-	wk	Sp-wk	?	30%		"			Approximate Salt CONT. @ 157'. Fine grained Py + CPy. Coated w/ Cc.
160.0	165.0	5.0		0.29										Tr	0.20	0.09		Sp-wk	2%	-	Sp	-	-	-	-	-	-	wk Mod	Sp wk	?	35%		"			As above. Approx. 3% epidote present.
165.0	170.0	5.0		0.40	0.08									0.08	0.25	0.07		-	1-2%	-	-	-	-	-	-	-	-	wk	Sp	?	30%		Ap			Salt generally fine grained. All coated w/ Cc. - Rk appears to be all Ap.
170.0	175.0	5.0		0.24										0.02	0.18	0.04		-	1%	-	-	-	-	-	Tr	-	-	Sp	Sp	?	35%		Ap			
175.0	180.0	5.0		0.29										0.01	0.25	0.03		Tr	3%	-	Tr	-	-	-	Tr	-	-	Mod	Sp-wk	?	40%		Ak			Significant increase in salts appears that should go + 0.4% Cu. - Mod. qtz.-ser.-Salt unit
180.0	185.0	5.0		0.24										0.01	0.19	0.04		Sp	3%	-	Tr	-	-	-	0.02%	-	-	wk Mod	Sp	?	40%		Ap + Ak			As Above
185.0	190.0	5.0		0.50	0.04									0.04	0.40	0.06		Tr	4%	-	-	-	-	-	0.02%	-	-	wk Mod	Sp	?	35%		"			Salts assoc. w/ qtz-ser.-Hem.
190.0	195.0	5.0		0.20										0.03	0.16	0.01		Sp	3%	-	Tr	-	-	-	0.02%	-	-	wk Mod	Sp	?	30%		"			Ap has fine gr. graphic tex. Salts v. fine gr. - Cc. occurring as thin coatings of fracts + salts
195.0	200.0	5.0		0.23										0.02	0.19	0.02		-	2%	-	-	-	-	-	Tr	-	-	wk	Tr	?	30%		"			
200.0	205.0	5.0		0.28										0.01	0.25	0.03		-	3%	-	-	-	-	-	Tr	-	-	wk	Tr	?	30%		Ak			Tr. of Torbernite
205.0	210.0	5.0		0.26										0.01	0.23	0.02		Sp	2%	-	-	-	-	-	-	-	-	wk	Sp	?	30%		Ak			Reappearance of Lim + Sp epidote. Salt still assoc. w/ ser-qtz.
210.0	215.0	5.0		0.20										0.01	0.15	0.04		Tr	2%	-	-	-	-	-	Tr	-	-	Sp-wk	Sp-wk	?	35%		Ak			Mixed Ak Tex.
215.0	220.0	5.0		0.33										0.01	0.28	0.04		Tr	3%	-	-	-	-	-	Tr	-	-	Sp-wk	Sp	?	30%		Ak			
220.0	225.0	5.0		0.25										0.01	0.22	0.02		Sp	2-3%	-	-	-	-	-	Tr	-	-	Sp	Sp	?	30%		Ak			
225.0	230.0	5.0		0.28										[illegible]	[illegible]	[illegible]		Tr	1%	-	-	-	-	-	-	-	-	Sp	Sp	?	30%		Ak			

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D 241
Page 2 of 4 Pages

Collar Elev. 2,870 51 Final Depth
Coords. N 38,062 12 E 15,230 22
Inclination VERTICAL
Logged by RCE N.R.N.
Date: Start 8-7-67 Finish

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Mal. Azu. Vivian. Wad. Sulf.	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn Qtz	QUARTZ	CHLORITE Sp. Mag. Plag. Sp.	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
230	235	5.0		0.36										0.01	0.23	0.12		—	1%	—	—	—	—	—	—	—	—	Tr	Sp	?	30%	—	Aplite Ak			Rx is not typical Ak.. Appears to be a graphic tex in felds. 1% epidote present
235	240	5.0		0.60		0.01								0.01	0.54	0.15		—	1-2%	—	—	—	—	—	—	—	—	Sp	Tr Sp	?	30%		"			As Above. Sp. TORBERNITE. C.C. coating CPY + Tr-sp PY.
240	245	5.0		0.50		0.17							0.17		0.23	0.10		Sp	2%	—	—	—	—	—	Tr	—	—	Tr	Tr Sp	?	25%		"			Sudden reoccurrence of Lt. orange-brn. Lim. - Thin C.C. on Sp PY
245	250	5.0		0.30											0.18	0.12		Sp	1%	—	—	—	—	—	—	—	—	—	Tr Sp	?	35%		Ak			As Above
250	255	5.0		0.47		0.02								0.02	0.32	0.13		Sp	2%	—	—	—	—	—	—	—	—	—	Sp-Wk	Sp	?	35%	Ak			More sil'd altd. shows some evidence of zoning.
255	260	5.0		0.79		0.01							0.01		0.65	0.13		Sp-Wk	2%	—	—	—	—	—	—	—	—	—	Sp	Sp-Wk	?	40%					Still some leaching
260	265	5.0		0.51	1.18	0.16	1.18						0.02	0.14	0.25	0.10		Sp	4%	—	—	—	—	—	Tr	—	—	—	Sp	Sp-Wk	?	40%					Rx look a little more bleached
265	270	5.0		0.48	0.53	0.01	2.05							0.01	0.37	0.10		Sp	4%	—	—	—	—	—	Tr	—	—	—	Sp	Sp-Wk	?	37%					
270	275	5.0		0.36		Nil								0.00	0.14	0.22		Sp	2%	—	—	—	—	—	—	—	—	—	Sp-Wk	Wk	?	40%					
275	280	5.0		0.27		Nil									0.10	0.17		Tr-Sp	2%	—	—	—	—	—	—	—	—	—	Tr-Sp	Wk	?	35%					Ak Now has quite typical tex. C.C. becoming quite thin
280	285	5.0		0.73		0.01								0.01	0.50	0.27		Sp	2%	—	—	—	—	—	Tr	—	—	—	Sp-Wk	Sp-Wk	?	40%					Increase in size of sulf. Sp. TORBERNITE
285	290	5.0		0.38											0.26	0.12		Sp-Wk	2%	—	—	—	—	—	—	—	—	—	Sp	Sp	?	35%					
290	295	5.0		0.51		0.02								0.02	0.31	0.18		Sp-Wk	2%	—	—	—	—	—	—	—	—	—	Sp-Wk	Sp	?	35%					Sulfs are principally assoc. w/ ser.
295	300	5.0		1.03		0.05								0.05	0.70	0.28		Sp-Wk	3-4%	—	Tr	—		—	—	—	—	—	Wk-Mod	Sp-Wk	?	40%					Lim. Continues to be present.
300	305	5.0		0.63		0.02								0.03	0.45	0.16		Sp-Wk	3%	—	—	—	—	—	—	—	—	—	Wk-Mod	Sp	?	35%					C.C. Coating becoming thinner.
305	310	5.0		0.16		0.01								0.01	0.01	0.14		Sp	3-4%	—	—	—	—	—	—	—	—	—	Mod	Sp-Wk	?	35%					Rapid decrease in Lim and C.C. while PY remains high. St. assoc. of Ser. w/ Sulfs.
310	315	5.0		0.34											0.04	0.30		Tr-Sp	4%	—	—	—	—	—	—	—	—	—	Wk	Sp	?	30%					Felds are moderately bleached, but without st. Kaolin development.
315	320	5.0		0.28											0.01	.27		Tr	3%	—	—	—	—	—	—	—	—	—	Sp-Wk	Sp	?	35%					
320	325	5.0		0.15											—	0.15		Tr	3-4%	—	—	—	—	—	—	—	—	—	Wk	Wk	?	30%					K. felds. bleached. P. felds. going to Ser + Kaolin.
325	330	5.0		0.83		001								0.01	0.05	0.15		Tr	2%	—	—	—	—	—	—	—	—	—	Wk	Sp-Wk	?	35%					SAMPLE DOES NOT SHOW SULFS. CAPABLE OF GIVING 0.83 ASSAY
330	335	5.0		0.29										0.01	0.03	.25		Tr	2%	—	Tr	—	—	—	—	—	—	—	Sp-Wk	Wk	?	35%					
335.0	338.0	5.0		0.12											0.02	.10		—	2%	—	—	—	—	—	—	—	—	—	Sp-Wk	Sp	?	35%					
338.0	344.7	6.7		0.13											0.03	0.10			1%										Tr	SP	3	50	Tr	AK	Qtz Fract.	70-90	md altd AK. Plagioclase has pale yellow-green color, soft green alteration products. Rx, CPY, C.C.
344.7	355.8	11.1		0.20											0.05	0.15			1%	Tr.									Tr SP	SP	3	50	Tr				Highly fractured w/ epidote, hem. slightly increased alt.
355.8	363.4	7.6		0.12											0.02	0.10			<1										Tr SP	SP	3	50	Tr		QTZ Veins 361.0	60°	As above with sulfides along steep fractures and QTZ veins. Wk mod altd dark green alteration minerals.
363.4	373.0	9.6		0.26											0.04	0.22			<1										Tr Tr	SP	1	40 50	Tr				CPY + C.C. along thin random fractures
373.0	382.7	9.7		0.43		Nil									0.08	0.35			2										Tr SP	SP	2	45	Tr		min vein 377.6	50°	Fracture becomes fine stained 373-377. Strong CPY + C.C. in QTZ. Diffusion from wk to md. fine stained bone ends at 386.
382.7	392.7	10.0		0.24											.12	12			1										SP	SP	1	45	SP SP				Minor thin sulfides.
392.7	401.5	8.8		0.17											.08	.03													Tr Tr SP		1	45	SP SP				md altd highly fractured. Py, CPY, C.C. on CPY
401.5	410.1	8.6		0.20											.03	.17													Tr Tr		2	50	SP SP		CPY in Veins	60°	wk to altd. several steep ¼"-½" QTZ veins with large amounts of CPY and C.C., green and minerals along fractures.
410.1	418.4	8.3		0.32											0.02	0.30					Tr								Tr Tr		4	55	SP Tr SP		2" QTZ Veinlets 412	≈ 45°	Wk to altd rk - becomes stly altd near vertical QTZ veins containing Py, CPY, C.C., molyb.
418.4	425.3	8.4		0.19											sp.	0.19													SP Tr		2	50	SP SP				Thin vertical veins and thicker veins at about 60° w/ CPY filling openings in vein, few Xtals of CPY
426.8	435.7	8.9		0.19											sp.	0.19													SP Md	SP md	1	45	SP SP md				
435.7	443.6	7.9		0.27											sp.	0.27													Tr SP		1	45	md md				Increased alt. fracturing. Vertical veins continue. Fractures spaced ¼"-6". md-st alt. mineralization
443.6	452.3	8.7		0.14											tr.	0.14			1%										SP md		1	50	SP Tr		min Veins	60-90	Continues in vuggy, vertical quartz veins. md-sp alt of plag. to clay. Veinlets intersect each other.
452.3	459.5	7.2		0.07											tr.	0.07			<1%										SP md	<1%	50	SP	SP md				Average spacing about 2". Contain CPY, molyb, C.C. Texture remains same but veining and mineralization decrease.
459.5	466.4	6.9		0.80		Nil									tr.	0.80			<1%										SP md	1%	50	SP	SP md		min Veins	60-90	Slight increase in alt of fspars. Increase in QTZ veining 25% kspar, 25% plag. and alteration minerals, sp hydromica
466.4	475.0	8.6		0.14											—	0.14			1%										SP md	md	1	45	SP md md		min Vein	60°	md. altd. w/ and Bi.
475.0	484.5	9.5		0.26											—	0.26			1%										md md	2	50	SP md		3/8" Vein 481.5	80°	Thick QTZ w/ strong adjacent alt. at 481.5, 477.6. Strong sericite along fractures and veins.
484.5	491.8	7.3		0.14											—	0.14			2%										Sp		Tr	SP Wk	3 7.45%	Mo. Mod.	2" QTZ Vein 484.7	50°	Wk alt. P. felds ukly altd to green pinite (?). K. felds fresh. Calcite lining on many fracts.
491.8	500.2	8.4		0.28											—	0.28			2-3%						Tr	Tr	Tr	Sp			Wk	Mod	5% 50%	Tr	2" QTZ Vein 491.7	50°	Mod alt., Mo. substantially higher. CPY to PY ratio greater. Sulfs. well dissem. Rx. more mod bleached.
500.2	507.9	7.7		0.24											—	0.24			2%						Tr	Tr	Tr	Sp			SP	Wk Mod	3 5% 40%	Tr	Sp-Wk			Rx slightly less intense. Rx. continues to be brkn. Sulf. preferentially deposited in P. felds.
507.9	516.3	8.4		0.17											—	0.17			3%							Tr	Sp	Sp			Sp	Wk Mod	3 5% 40%	Tr	Sp-Wk			Rx continues to be brkn up. Much open space. Calcite occurring on open fracts
516.3	525.8	9.5		0.31											—	0.31			3%							Tr	Sp				Sp-Wk	Wk	2 60%		Sp			Rx is moderately silicified. Tex. some wkly obscured. Total Sulf. Content Incr. Tr-sp CPY.
525.8	533.6	7.8		0.30											—	0.30			2%						Tr	Sp	Tr	Tr			Sp-Wk	Sp	2 2.45%		Tr			Still somewhat silicified. Poor. min Assoc. is bleached, appearing - pale olive green.
533.6	535.8	2.2		0.94		Nil									—	0.94			1/2%										Sp		Sp	Ak	40%		Sp			Calcite veining. Most P. spars slightly altered to pinite(?) Some hydromica.

WATER TABLE BEGAN CORING →

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. Q-242
Page 8 of 4 Pages
Collar Elev. 2,870 ±1'
Final Depth 975.0'
Coords. N 38,062 ±1' E 15,230 ±2'
Inclination VERTICAL
Logged by RRC, N.R.N, RCE
Date: Start 8-7-67 Finish 8-30-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu N.S. Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Unk. Non Sulf.	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz.	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
535.8	546.0	10.2		0.34	-	-								-	0.34		-	tr.	-	tr.	tr.		-	1%	-	-	tr.	-	-	1%	-	8%(?)	Post Mix Rhyo.	Alk finger 535.9-538.7		Rhyo. is initially a dark grn. but becomes bleached & gradually becomes a light grn. Dark grn. phenocrysts may be P-spars to pinite.
546.0	551.5	5.5		0.28										-	0.28		-	4%	-	-	-	-	-	tr.	Sp.	-	-	Sp.	Wk.	-	70%	-	Sp.	Alk			Silicified w/ consequent loss of texture. Higher Cpy. content.
551.5	559.9	8.4		0.16										-	0.16		-	2%	-	-	-	-	-	Sp.	tr.	-	-	6%	Wk. Sp.	1%	45%	-	Sp.				Texture is improved. Otherwise as above. Also rk. is more broken.
559.9	569.0	9.1		0.32										-	0.32		-	1%	-	-	-	-	-	tr.	1	-	-	2%	1	-	35%	-	tr.				Rk still broken and texture is much improved.
569.0	578.6	9.6		0.04										-	0.04		-	<1%	-	-	-	-	-	1	Sp.	-	-	Sp.	Wk.	-	30%	-	tr.				In latter half of interval the rk is less broken. Like above
578.6	587.6	9.0		0.06											0.06		-	<1%	-	-	-	-	-	0.03%	Sp.	-	-	Tr-Sp.	Wk.	?	45%	-					Rk med. Shattered & broken. Mod bleached. Wkly Silicified.
587.6	595.2	7.6		0.04											0.04		-	0.5%	-	-	-	-	-	0.02%	Sp.	-	-	Tr	Wk.	?	45%						As Above. Calcite on many fracts.
595.2	601.0	5.8		0.16											0.16		-	1%	-	-	-	-	-	0.03%	Sp.	Tr	Tr	Tr	Wk.	-	45%			Chlor. Trem. Wk. Sim. GOI			As Above to Circa 599' then begs to have assimilated Sdo. Texture in sulfs. + cpy to py ratio there
601.0	610.6	9.6		1.19	0.	0.02								0.02	1.18		-	8%	Tr	Tr	-	-	-	0.03%	Wk.	Tr	60%	-	-	1%	?	50%					Rk is Soft-med. Hardness, Lt to dk grn. Contains varying amts of Chlor, Trem, & plate. Cpy is more combined than Py + seems to be assoc. w/ dk. grn. Sulf (?).
610.6	620.6	10.0		0.49		0.01								0.01	0.48		-	5%	6%	Sp.	-	-	-	0.03%	Mod. Sp.	3%	50%	-	-	Tr	-	20%					Rk for most part Soft. Med-Stly brkn & cabeled by calcite. Sulf along ins. + disem. Mag. v.f. grained occurs in zones. Sometimes intergrown w/ cpy.
620.6	624.7	4.1		1.60		0.01								0.01	1.59		-	6%	4%	-	-	-	-	?	Wk.	-	60%	-	-	-	-	30%		Fractures & Calcite - Sulf Veins	80°-90°		Rk darker green, possibly has more actinolite and less tremolite. More cpy which occurs as v.f. gr. disseminations.
624.7	641.1	16.1		2.55		0.01								0.01	2.54		-	4%	Tr	Sp. Wk.	8%	-	-	-	Wk.	90%	4%	-	-	5%	5%	-	Qtz. Vns. Tr-Hf Cont. 2 specs in 1½" Qtz. Vns.	80° 20° 55° 80°		Tt is composed principally of grained which is bkn-med value w/ med amt of open space filled w/ Cpy. Total Sulf. locally approaches 20%. There was a great deal of lost bkn. interval
641.1	652.7	11.6		0.75		0.01								0.01	0.74		-	3%	Tr	Tr Sp.	-	-	-	Tr	Wk.	1%	70%	-	-	10-15%	5%	5%	641.1 Elev. Bomb Hf. Trem-Actin Hf Calc.			Rk appears to be a uniform composition. It is lt. grn; saturated Sulf. Sulfs. controlled primarily by qtz. Vns. Cpy. appears to be more dissem than Py.
652.7	661.9	9.2		1.92		0.01								0.01	1.91		-	10%	3%	Tr	1%	-	-	Sp.	Wk. Mod.	Tr	75%	-	-	8%	8%	2%					Act. no like inclusions, rk. becoming less dense, sulf. cont up. Most of sulfs are dissem.
661.9	670.7	8.8		1.47		0.01								0.01	1.46		-	5%	4%	Sp.	-	-	-	Tr	Wk.	-	80%	-	-	Tr	Tr	20%	Trem-Actin Wkly. Hf.			Med-Stly brkn. Trem-Actin-well. Hf. wk-med mix occurring as vns + somewhat dissem. Mag. occurrence as v.small dissem grains.
670.7	679.3	8.6		1.94		N.I.								N.I.	1.94		-	12%	4%	Sp.	-	-	-	-	Mod.	-	80%	-	-	3%	?	Tr					As Above. Rk is somewhat granular + may have had qtz. grains dissem.
679.3	686.8	7.5		2.37		0.01								0.01	2.36		-	12%	10%	Sp.	-	-	-	-	Sp.	-	40?	-	-	2%	20	36%	V.f. grained Qtz (?) Hf. Trem-Act.			Rk may have been a limy Sh.Ss. Cpy occurring both dissem + as solid vns w/ Qtz.
686.8	693.3	6.5		1.73		N.I.								N.I.	1.73		-	12%	15%	-	-	-	-	Sp.	Wk.	-	70%	-	-	1%	?					Rk is quite brkn + shattered. - V. pale green - v.f. grained grey mass w/ intense hairs of drk. grn Actin (?) Sulfs primarily along vns. and fracts.
693.3	703.8	10.5		0.32											0.32		-	3+%	3%	Sp.	-	-	-	-	Mod.	-	75%	-	-	<1%	?	5%					Rk must be composed of v.f. trem-well rather than qtz. - 5% assoc of Mag and Cpy.
703.8	712.2	8.4		0.36											0.36		-	4%	Sp.	<1%	-	-	-	-	Mod.	-	75%	-	-	-	?	3%					As Above. Becomes more dense locally and towards end of run becomes predominately Dense Trem-well. Hf. As Above w/ varying amts of Chlor. Slight increase in total sulfs. Rk Quite Brkn
712.2	720.4	8.2		0.87		Nil									0.87		-	3+%	Sp.	Tr.	-	-	-	-	Mod. Sp.	-	?	-	-	-	-	?		Chlor (?) Hf Calc. 703			Rk is pale green and moderately soft. Mod-stly limy and has low total sulf. cont. of cpy. Most of material in Run is dove. + high core loss
720.4	740.7	20.3		0.27											0.27		-	3+%	-	-	-	-	Sp.	Wk. Mod.	-	40?	Tr.	Sp.	?	30?	7?		Apatite Hf. Calc. 730			Rk is strongly broken and gently dip to 737. The Run material is mix of altd. Sd/s + Ap. silt graphite. Ap (?) begins circa 730 - Rk has some assimilated sedz.
740.7	750.0	9.3		0.22											0.22		-	3+%	-	-	-	-	0.01	Tr. Sp.	-	Sp.	Sp.	-	15%	65%	-		Alk - Ap Calc. Hf.			v. Silic. Alk + Apatitic Alk. locally patches of assimilated sedz. Rk still quite brkn.
750.0	755.3	5.3		0.27											0.27		-	3+%	-	-	-	-	0.02%	Tr. Sp.	-	Sp. Wk.	-	-	5%	50?	5%		Many Trem Calcite Hf.	Fr. zone 754.5-755.3	45°		Ten. indistinct, mod qtz. varing. Fr. brains Ap. Alk. and Chlor. Hf. into Ca. Alk.
755.3	759.7	4.4		1.29		Nil									1.29		-	12%	Tr.	Tr.	-	-	Tr.	?	Mod.	-	65%	-	-	-	?	20%			@ 755.3			Rk is strongly mineralized w/ Sx Py + med Cpy. Alk is med to drk green
759.7	768.6	8.9		1.37		Nil									1.37		-	15%	-	Tr.	-	-	-	?	Mod.	-	65%	-	-	-	?	20%					Rk is a v.f. grained limy pale Silicate which is stly. Mag + Mod Chloritized. Mag ends @ 766.6 at which point the rk becomes drk grn v.f.gr. and appears to be stly chloritic.
768.6	780.9	12.3		1.45		.04								0.04	1.41		-	11%	10%	3%	-	-	-	-	Wk. Mod.	-	50%	-	-	-	?	18%		Basic Dike	Bx 768.6-769 Sp. Bx. 776-780.7	50°		Hf is pale brn. A curving area of v.f.gr. Hf + Mag - Mag offering to them. - Dike is v. pale grn. + grained and has occasional phenos. Per sedz is quite young + unconsolidated
780.9	790.8	9.9		.19		Nil									0.19		-	Tr	Tr	3+%	-	-	-	-	Mod.	-	Tr	-	-	-	?	87%	SCRP	Mb. @ 783.7			Mb is not well developed. Reserves Calcite is intergreen w/ pale yellow-grn. waxy Min. Fracts are all lined w/ dark grn Crp w/ some assoc hem + tr-sp traces of cpy.
790.8	799.4	8.6		.61		Nil									0.61		-	Tr	5%	3%	-	-	-	-	65%	-	Tr.	-	-	-	?	30%			Sr fracts + Strip Varing	80°		Rk is more strongly serpentized. Rk had been strongly brkn. Sarp. bds along old fracts and somewhat dissem. Rk has a wk Calt. + pepper look.
799.4	808.7	9.3		.23		X									0.23		-	Tr Sp.	-	1%	-	-	-	-	60%	-	Tr.	-	-	-	-	15%	SCRP				Like Above.
808.7	818.0	9.3		.87		.04								0.04	0.83		-	Sp.	Tr.	Sp.	-	-	-	Tr.	50%	-	1%	-	-	-	-	25%					Like Above w/ the increase in sulfide content. Sulfides are finely dissem. Black specks may be tarnished Cpy.
818.0	824.1	6.1		1.69		.01								0.01	1.68		-	Sp.	Tr. Sp.	Sp.	-	-	-	-	Sp.	Sp.	50%	-	-	-	-	20%	SCRP Sp.	Hf			Cpy still finely dissem. but w/ veining starting to appear. Gypsum veining filling fractures (1/8"-1/4") Yellowish grn alteration (diopside?) is major silicate. Sp. finely dissem. in serp. w/ pentlandite.
824.1	831.2	7.1		2.83		Nil									2.83		-	1	-	-	-	-	Sp.	1+%	90%	Sp.	-	-	-	-	2%	SCRP Sp.	Tt			Sp. fills the fractures while calcite was apparently introduced w/ mineralization. Cpy generally well dissem. but in two areas it is almost solid (a. one of varying thickness; other is from 829.7-830.2).
831.2	840.7	9.5		2.12		.02								0.02	2.10		-	Tr.	-	Tr.	-	-	-	Sp.	60%	30%	-	-	-	-	-	SCRP <1%	Tt			White silicate appears w/ Garnet (tremolite?) Cpy is dissem. and has a dark blue-purple tarnish.
840.7	844.9	4.2		1.01		.01								0.01	1.00		-	1	-	1	-	-	-	41%	95%	Tr.	-	-	-	-	-	SCRP Sp.	Tt			Primarily garnet w/ other minerals appearing as above.
844.9	854.4	9.5		.34		.01								0.01	0.33		-	Tr	-	1	-	-	-	2	60	SP		2	2	-		SCRP SP	HF	veins	50°		Garnet rock w/ qtz-calcite veining and weak-mod. veined cpy. Hem along veins. Approaching Tactite in comp.
854.4	862.6	8.2		2.00		.01								0.01	1.99			1	40?	3%				5	90	-		-	-	-	Tr	SCRP SP	Tt	min "veins"	30°		Green-black Tt, st min. both dis. as replacement and veinlike. Highly magnetic. Random, abundant calcite veins, gypsum similar to above but lighter in color, less magnetic.
862.6	872.0	9.4		2.20		.01								0.01	2.19			?	3%					2	50						SP	SCRP SP	Tt			St min. both vein and disseminating gyp veins. Pr difficult to distinguish from cpy in dis. pal all be cpy.
872.0	880.9	8.9		1.80		Nil									1.80			5%	5%					2	60							SCRP SP	Tt	veins	70°		As above, lighter in color appr and at interval.
880.9	889.9	9.0		1.15		Nil									1.16			5%	5%					2	60							SCRP SP	Tt	min veins	70-90°		Decreasing iron, mg content grading into Hf near end of int. Eq. light gray w/ green garnets, st. cpy.
889.9	898.2	8.3		.34		Nil									0.34			2%	Tr					4	70?			3	3%		-		HF	min veins	70°		Garnet-Diopside, HF, decrease in metamorphism and mineralization.
898.2	907.5	9.3		0.49		Nil									0.49			Tr	-					2%	60%	25%		5	5%				HF	min veins	80°-90°		As above, light green-brown HF. Max 1" wide QTZ vein at 925.6'.
907.5	916.2	8.7		0.47		Nil									0.47			2	-					2%	60%	30%		3	3%				HF				Garnet Diopside HF w/ py and cpy in steeply dipping veins. Rock is massive with solid intervals of 2'.
916.2	925.0	8.8		0.24											0.24			1						2%	60%	30%		7	7%				HF	QTZ veins	45-60°		As above. Relict bedding (?) dips 50°.
925.0	934.0	9.0		0.23											0.23			1						2%	60%	30%		4	4%				HF				As above
934.0	943.0	9.0		0.23											0.23			<1%						Tr	60%	30%		3	3%				HF	Cpy veins	50°		As above

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(Subject to Revised Logging)

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Note (4)
V - Vein
F - Fault
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C - Contact
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Hole No. D291
Page 4 of 4 Pages
Collar Elev. 2,870 51
Final Depth 975.0'
Coords. N 38,062 13 E 15,230 22
Inclination VERTICAL
Logged by RE
Date: Start 8-30-67 Finish 8-30-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
943.0	951.3	8.3		0.29												0.29			<1%							-	60	25		8%	8%				HF			HF makes sharp 80° contact with MZ dike at 951.3'. Abundant steep QTZ veins, up to 2", dipping in various directions.
951.3	953.7	2.4		0.41		NIL										0.41			1%							-			Tr	3%	15%	SP			MZ			Fresh looking MZ. Partial alt. of bi to chlor. No alt. of feldspars. Dis. cpx and px along irregular veins.
953.7	962.1	8.4		0.20												0.20			Tr						Tr	Tr	60%	30%		10%	10%				HF			Lower contact at 953.7 is also sharp, dips 80°.
962.1	975.0	12.9		0.22												0.22			1%						Tr	Tr	60	30		10%	10%				HF			HF is garnet-diopside, as above MZ dike. Mol and cpy in QTZ
		EOH																																				As above except for 967.8-968.8 which shows subhedral MZ + QTZ

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-240
Page 1 of 2 Pages
Collar Elev 2,755 37
Final Depth 520.0
Coords. N 37,740 27 E 15,053 83
Inclination VERTICAL
Logged by N.R.N. + R.R.C.
Date: Start 7-11-67 Finish 7-22-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Na. Bor.	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
DUMP MATERIAL 0.0	35.0	35.0																																				
35.0	44.3	9.3		0.09										UNK NS 0.09	–	–		sp. wk	–	–	wk	–	–	–	–	–	–	3%	wk-Mod	A%	40%	–		Ak	1/4" Qtz-Ser Vn	85°	Bleached, Weakly stained by Lim + Hem. Sec all assoc w/ qtz veing + fracturing
44.3	54.4	10.1		0.04										UNK NS 0.04	–	–		1	Tr	Tr	Sp	–	–	Tr	–	–	–	Sp	1	1%	35%							Rk less bleached, few more detract. K-folds showish pink colors - Lt. yellow brn. lim on fracts.
54.4	62.9	8.5		0.04										UNK NS 0.04	–	–		1	–	–	Sp	–	–	–	–	–	–	3%	1	3%	40%				Vn. 54.5' 55.8'	40°	The re is a Bx zone w/ St Ser and lim-Hem after Sulfs. Rk begins to take on a v. light, but pervasive
62.9	72.6	9.7		0.06										0.06																					Sr. Flt. Zone 64.5 - 87'	?	Hem. Stain starting/ Circa. 60
72.6	77.1	4.5		0.12										0.12				8	Tr	–	St	–	–	–	–	–	–	20%	Mod. St	15%	50%						St. Flt. Zone is composed primarily of qtz, Ser and Hem-Lim assoc. Rock grades from fracturing + shattering into disturbed brecciation. Attitude difficult to determine.
77.1	90.2	8.0		0.06										0.06				5	Sp	–	St	–	–	–	–	–	–	20%	1	5%	20%			Potentiic Ore. Mz Porphyry	77.1	?	Contact Not Distinct. Flt. Continues to Circa 87'. Rk Sdy Alt'd, + has St. Lim-Hem Assoc + Stain. Rk is same as seen in bottom of D-234. Mz has St secondary Tex
																																						Large Qtz. eyes + orthoclase xls. show poikalitic tex
90.2	98.6	8.4		0.35										–	0.35	–		st.	2%	–	St.	–	–	–	–	–	–	5%	Mod-St	–	10%	<1%			Sulfide Contact 7.9'		Fault zone terminates at 92.8' (2.1' in interval). After fault zone small py cubes w/ Cu coating appear w/ a constant distribution. It has gone to chl-hydrosis. Aphanitic groundmass indicernible
98.6	107.3	8.7		0.46	.02	.02								UNK US 0.02	0.46	–		1	4%	–	Sp.	–	–	–	–	–	–	5%	1	–	15%	1%			Qtz Bx zone 101.6 - 102.7		After qtz Bx zone the rk is as above but the groundmass changes from a dark brown to a greenish hue gradually.
107.3	116.1	8.8		0.20										–	0.20	–		Sp.	3%	–	Tr.	–	–	–	–	–	–	1	1	–	10%	2%	Mod. Sp.				Lim concentrations in fracture controlled areas and in some spots assoc. w/ native Cu.
116.1	125.6	9.5		0.04										–	0.04	–		tr. Sp.	1	–	–	–	–	–	–	–	–	10%	Sp. wk	–	5%	2%	–				Yellowish-brown colored K-spars altering to sericite (v.f.g.r.) Set in aphanitic matrix of Lt Tan - Brn Rock. Bleaching to chlor and hydrosis. K-folds Range size from minute to 3/8" and are generally Sub rounded. Also Large Poikalitic K-folds of 2nd. Development (Hydrothermal)
																																						Py. as small euhedral cubes are well dissem. throughout.
125.6	132.6	7.0		0.05										–	0.05	–		Tr	5%	–	–	–	–	–	0.01%	–	–	7%	Sp-wk	Tr	8%	1%		Rk Brcc.	Contact Rk zone 130.0 - 133	?	No breccia slightly more alt. and sulf content increases. Contact zone w/ Ak is brecciated and Ak frags are caught up in the Mz. This zone is not mineralized.
132.6	142.8	10.2		0.16										–	0.16	–		Tr	3-4%	–	–	–	–	–	Tr	–	–	2%	Wk-Mod	1%	48%	Sp					Ak is quite broken to 135.5'. Rk has a higher than normal Qtz. Content. P folds
142.8	154.7	11.9		0.27										–	0.27	–		Tr	6%	–	–	–	–	–	Tr	–	–	15%	Mod	–	45%	1%			Rk zone 147 - 153.6		have mod alt. to yellowish clays.
154.7	164.1	9.4		0.09										–	–	0.09		tr	1%	–	–	–	–	–	Sp	–	–	3%	Mod	2%	45%	Sp.					As above. Yellow clays may be lim. Sr. Sulfs. assoc w/ Flt zone.
164.1	172.7	8.6		0.14										–	–	0.14		tr	<1%	–	–	–	–	–	1	–	–	1%	Wk-Mod	–	1	1					As Above Rk is in broken zone which continues through to 185.5'
172.7	186.6	13.9		0.12										–	–	0.12		1	1	–	–	–	–	–	1	–	–	2%	1	–	40%	1					Broken zone ends at 186.2' Otherwise as above
*186.6	195.8	9.2		0.23										–	–	0.23		1	1%	–	–	–	–	–	–	–	–	<1%	Mod St	15%	30%	1%					Silicified + sulfide mineralized fracture zone. Silicified area blanks sulfide strains. P-folds are losing yellow stain + are altering to chl-sericite.
195.8	204.6	8.8		0.25										–	–	0.25		–	<1%	–	–	–	–	–	–	–	–	5%	1	4%	55%	<1%					In the latter part of the interval it is pred. sericite that blanks the sulfide strains. Staining of P-folds probably absent.
204.6	212.7	8.1		0.16										–	–	0.16		–	1	–	–	–	–	–	–	–	–	<1%	1	–	1	1					In alteration the P-folds became soft and change to a light green hue. At times the color of the P-folds becomes a dark green + appears somewhat like serpentine. Silicified zones now absent.
212.7	221.5	8.8		0.13										–	–	0.13		–	1	–	–	–	–	–	Sp	–	–	3%	1	15%	40%	1%					Silicified zone runs from 218.6' - 218.7'. In latter part of interval small mineralized strains occur with a serpentine-like mineral composing the matrix. Sulfides still have a good Cu coating.
221.5	231.0	9.5		0.14										–	–	0.14		–	1	–	–	–	–	–	1	–	–	<1%	1	2%	35%	1					As Above
231.0	239.8	8.8		0.35										–	–	0.35		–	1%	–	–	–	–	–	1	–	–	1	Wk-Mod	5%	1	1					Sulfide mineralization is heavy in silicified area. (236.8 - 238.0)
239.8	249.1	9.3		0.43										–	–	0.43		–	1	–	–	–	–	–	Sp.	–	–	1%	1	2%	1	1					As Above
249.1	260.1	11.0		0.21										–	–	0.21		–	1%	–	–	–	–	–	Sp.	–	–	<1%	1	1	50%	2%					As Above
260.1	269.3	9.2		0.70		Nil								–	–	0.70		–	<1%	–	–	–	–	–	tr.	–	–	1%	Mod-St	25%	35%	<1%					As Above
269.3	278.1	8.8		0.35		.01								UNK NS 0.01	–	0.34		–	1%	–	–	–	–	–	Sp	–	–	1	1	4%	35%	1%					As Above
278.1	286.7	8.6		0.24										–	–	0.24		–	<1%	–	–	–	–	–	Sp.	–	–	<1%	1	21%	30%	<1%					In the latter half of the interval (282.7 +) rk takes on a broken appearance.
286.7	295.5	8.8		0.51		Nil								–	–	0.51		–	1	–	–	–	–	–	1	–	–	1	Wk-Mod	7%	35%	1					Broken zone continues through interval.
295.5	303.5	8.0		0.42		.01								UNK NS 0.01	–	0.41		–	1	–	–	–	–	–	1	–	–	2%	Mod-St	6%	30%	1%					As Above
303.5	310.0	6.5		0.09										–	–	0.09		–	1	–	–	–	–	–	Sp.	2%	–	–	–	1	<1%	20%	3%		Mz 295.5 303.5'		Secondary feldspars show poikilitic texture + may have ¼" diam. Biot looks altered to chlorite.
310.0	319.0	9.0		0.22										–	–	0.22	.0042	–	1%	–	–	–	–	–	Sp.	1%	–	–	3%	1	4%	30%	<1%		Ak			Interval is extremely broken
319.0	328.8	9.8		0.28										–	–	0.28		–	1	–	Tr.	–	–	–	Sp.	Sp	–	–	2%	1	3%	35%	1					Extremely broken zone ends around 323.5'. Rk still somewhat broken
328.8	340.5	11.7		0.31										–	–	0.31	.0416	–	<1%	–	Sp.	–	–	–	1	1%	–	–	5%	1	4%	30%	1					From 333.7 to 340.5 is an area of extremely broken material
340.5	353.1	12.6		0.33										–	–	0.33		–	2%	–	–	–	–	–	Sp*	Sp.	–	4%	1	6%	35%	Sp.					From 346.8 to 347.1 is a white qtz vein with high sulfide mineralization + also high poly content it small areas of sericite are also in it.
353.1	356.9	3.8		0.19										–	–	0.19		–	1%	–	–	–	–	–	Sp.	–	–	–	–	–	7%	–	–		Qtz vein 353.1 - 356.9		White qtz vein as above
356.9	359.8	2.9		0.37										–	–	0.37		–	1	–	–	–	–	–	tr.	1%	–	–	1%	Mod-St	3%	30%	tr		Ak			As previous Ak
359.8*	365.4	5.6		0.37										–	–	0.37	.0968	–	1	–	–	–	–	–	1	–	–	–	–	–	98	–	–		Qtz vein 360.4 - 362.8		w/ Qtz vein quartz with high sulfide content
365.4	377.2	11.8		0.34										–	–	0.34	.1056	–	<1	–	–	–	–	–	tr	1%	–	–	1	Mod	2	35	Tr		AK			Plag. altered to light green, soft. Possibly Mont. or sericite. Moly along fractures
377.2	386.1	8.9		0.25										–	–	0.25	.0472	–	<1	–	–	–	–	–	Tr.	1%	–	–	2 Sp	Wk-Mod	2	35	Tr		AK			less alteration of feldspar than above
386.1	394.6	7.5		0.32										–	–	0.32	.0892	–	<1	–	–	–	–	–	Tr	1%	–	–	3	Wk-Mod	5	35	Tr		AK			As above, except coarse sericite associated with 2" qtz vein
394.6	403.6	16.0		0.44										–	–	0.44	.0824	–	<1	–	–	–	–	–	Tr	Tr	–	–	3	Wk-Mod	2	35	Tr		AK			As above
403.6	413.2	9.6		0.22										–	–	0.22	.0382	–	1%	–	–	–	–	–	Sp.	Sp	–	–	3%	Mod	3%	55%	tr.					Rk becomes broken circa 406.8 on.
413.2	420.9	7.7		0.16										–	–	0.16	.1076	–	1	–	–	–	–	–	1	1	–	–	5%	Wk-Mod	1%	40%	1					Rk is broken w/ increase in sericite as interval approaches qtz vein.
420.9	433.9	13.0		0.11										–	–	0.11	.1076	–	2%	–	–	–	–	–	Sp*	–	–	–	tr	–	97%	Sp	–		Qtz vein 420.9 - 433.9		As Above qtz veins with small portions of Ak occurring from 424.0 - 424.4 and from 429.4 - 429.5.

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
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Mb - Marble
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Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-240
Page 2 of 2 Pages
Collar Elev. 2,755 37 Final Depth 520.0
Coords. N 37,740 77 E 15,053 83
Inclination VERTICAL
Logged by N.R.N. + R.R.O.
Date: Start 7-11-67 Finish 7-22-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Mo. ~~Bort~~	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Malyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
433.9	437.8	3.9		.32												.32	.0040	-	2%	-	-	-	-	-	tr	tr	-	-	3%	Mod Sr.	-	30%	tr		Ak			Sulf mineralization appears mainly in the plagioclase
437.8	442.5	4.7		.04												.04	.2926	-	1%	-	-	-	-	-	Sp	-	-	-	1%	-	96%	<1%	-		Qtz Vein 437.8-442.5		50°-85°	Ak intermittingly interrupts qtz vein, once from 438.6 to 439.1 & again from 440.3 to 441.4. Latter set of Ak is highly silicified which may be genetically related to vein. The steeper contact angle is more common.
442.5	451.0	8.5		.22												22	.1356	-	<1%	-	-	-	-	-	1	Sp.	-	-	3%	Mod Sr.	2%	30%	tr.		Ak			Rk is broken and texture is somewhat vague. Because of broken nature sulfide & qtz veinlets run randomly. Serpentine-like (?) near Plagioclase may be further altered hydro-mica (Pinite).
451.0	460.1	9.1		.19												19	.0148	-	Sp.	-	-	-	-	-	1	<1%	-	-	1%	wk-Mod	-	35%	1					Calcite appears predominately in highly broken zone from 452.1 - 455.0 Towards end of interval good texture begins to reappear. Pinite like mineral still present.
460.1	471.9	11.8		.16												16	.0140	-	<1%	-	-	-	-	-	tr	1	-	-	<1%	-	-	30%	-					Calcite occupies small fractures & breaks in rock. Rk broken w/ small breaks running throughout. Otherwise as above.
471.9	480.3	8.4		16												16		-	1%	-	-	-	-	-	Sp	Sp	-	-	1%	wk-Mod	Sp	1	tr.					Rk is broken but greatly broken from 473.8 - 475.2 Rk then takes on an aplitic texture from 475.2 - 477.2
480.3	488.7	8.4		.17												17		-	1	-	-	-	-	-	1	tr.	-	-	<1%	Mod Sr.	2%	1	1			Qtz vein	85°?	High sulf in qtz, but contact is vague
488.7	497.3	8.6		.14												14		-	1%	-	-	-	-	-	tr.	1	-	-	1	1	4%	1	-			Qtz vein 491.2 - 493.4	85°?	As Above
497.3	506.0	8.7		.20												20		-	<1%	-	-	-	-	-	1	Sp.	-	-	Sp	1	-	1	-					Rk highly broken from 498.8 - 506.0
506.0	514.1	8.1		.19												19		-	1-2%	-	-	-	-	-	Sp.	1	-	-	<1%	1	-	1	-					As Above
514.1	520.0	5.9		.12												12		-	1%	-	-	-	-	-	Sp	1	-	-	1%	1	3%	1	-					As Above
E.O.H.																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

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Tt - Tactite
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Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER DRILL

Hole No. D-239
Page 1 of 1 Pages
Collar Elev 2,772.73 Final Depth 252.0
Coords. N 37,901.83 E 14,594.12
Inclination VERTICAL
Logged by N.R.N.
Date: Start 7-10-67 Finish 7-14-67

	Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
DUMP MATERIAL	0.0	87.0																																				
	87.0	92.0	5.0		0.30		Nil									0.20	0.10		Wk Tr	1%	-	Sp	-	-	-	Tr	-	-	-	wk	wk	?	35%	-	Ak			WEAK ALTD NORMAL AK. This sample taken some distance into bed rock
	92.0	97.0	5.0		0.41		0.01								0.01	0.30	0.10		Sp	1%	-	Tr	-	-	-	Tr	-	-	-	Mod wk	wk	?	35%		"			Ak appears to have a high ser. content. Sulfs occurring as fairly small grains.
	97.0	102.0	5.0		0.43		Nil								0.01	0.30	0.10		Tr	1%	-	Tr	-	-	-	Tr	-	-	-	Mod wk	wk	?	35%		"			
	102.0	107.0	5.0		0.28		Nil									0.20	0.06		Tr	1-2%	-	Tr	-	-	-	Tr	-	-	-	Mod	wk	?	35%		"			
	107.0	112.0	5.0		0.26		Nil									0.16	0.16		-	1%	-	-	-	-	-	-	-	-	-	wk-mod	wk	?	35%		"			
	112.0	117.0	5.0		0.36		0.02								WHK. W.S. 0.02	0.25	0.09		-	1%	-	-	-	-	-	Tr	-	-	-	Mod	wk	?	35%		"			Ser assoc w/ fracts and and are v. fine alt. product of Ab feldsp. K-feldsp somewhat lightened
	117.0	122.0	5.0		0.43		0.02								WHK. W.S. 0.03	0.31	0.10		Tr	1-2%	-	-	-	-	-	Tr	-	-	-	Mod	wk	?	35%		"			
	122.0	127.0	5.0		0.51		0.02								WHK. W.S. 0.02	0.38	0.11		-	2-3%	-	-	-	-	-	Tr	-	-	-	Mod Sr	wk	?	40%		"			
	127.0	132.0	5.0		0.17										Tr	0.10	0.07		-	1-2%	-	-	-	-	-	-	-	-	-	Mod	wk	?	35%		"			K-spar continues to be slightly lightened.
	132.0	137.0	5.0		0.12										-	0.02	0.16		-	1%	-	-	-	-	-	-	-	-	-	Sp wk	wk	?	35%		"			K-spar look fresh, much less ser.
	137.0	142.0	5.0		0.15										-	0.03	0.12		-	1-2%	-	-	-	-	-	Tr	-	-	-	Mod	wk	?	35%		"			St bleaching of K-spar, increase in ser + sulfs.
	142.0	147.0	5.0		0.13										-	0.02	0.11		-	2-3%	-	-	-	-	-	Tr	-	-	-	wk-mod	wk	?	35%		"			
	147.0	152.0	5.0		0.18										-	0.04	0.14		-	2%	-	-	-	-	-	-	-	-	-	wk	wk	?	35%		"			wk bleaching of K-spar
	152.0	157.0	5.0		0.12										-	0.02	0.16		-	2-3%	-	-	-	-	-	Tr	-	-	-	wk-mod	wk	?	35%		"			
	157.0	162.0	5.0		0.39										-	0.08	0.31		-	3%	-	-	-	Sp	-	Tr	-	-	-	Mod	wk	?	35%		"			Fine grained galena in ST ser. zones.
	162.0	167.0	5.0		0.27										-	0.05	0.22		-	2%	-	-	-	Tr	-	Sp	-	-	-	wk-mod	wk	?	35%		"			
	167.0	172.0	5.0		0.21										-	0.08	0.13		-	2-3%	-	-	-	-	-	Tr	-	-	-	Mod St	wk	?	35%		"			
	172.0	177.0	5.0		0.22										-	0.04	0.18		Tr	3%	-	Tr	-	-	-	Tr	-	-	-	Mod St	wk	?	35%		"			
	177.0	182.0	5.0		0.12										-	0.04	0.08		-	2%	-	-	-	-	-	Tr	-	-	-	Mod	sp-wk	?	35%		"			K-spars are gradually becoming less bleached
	182.0	187.0	5.0		0.12										-	0.01	0.11		-	2-3%	-	-	-	-	-	Tr	-	-	-	wk-mod	sp-wk	?	35%		"			
	187.0	192.0	5.0		0.10										-	0.01	0.09		-	1-2%	-	-	-	-	-	Tr	-	-	-	wk	sp-wk	?	35%		"			
	192.0	197.0	5.0		0.13										-	0.01	0.12		-	1-2%	-	-	-	-	-	Tr	-	-	-	sp-wk	sp-wk	?	35%		"			
	197.0	202.0	5.0		0.06										-	Tr	0.06		-	1-2%	-	-	-	-	-	-	-	-	-	Sp	Sp	?	35%		"			
	202.0	207.0	5.0		0.11										-	Tr	0.11		-	1%	-	-	-	-	-	-	-	-	-	wk	Sp	?	40%		"			
	207.0	212.0	5.0		0.08										-	Tr	0.08		-	1%	-	-	-	-	-	Tr	-	-	-	sp-wk	sp-wk	?	40%		"			
	212.0	217.0	5.0		0.28										-	Tr	0.28		-	2%	-	-	-	-	-	-	-	-	-	wk		?	35%		"			
	217.0	222.0	5.0		0.21										-	Tr	0.21		-	2-3%	-	-	-	-	-	Tr	-	-	-	wk		?	35%		"			
	222.0	227.0	5.0		0.48		Nil								-	0.02	0.46		-	3%	-	-	-	-	-	Tr	-	-	-	wk Mod	wk	?	35%		"			stronger alt + mineralization.
	227.0	232.0	5.0		0.18										-	Tr	0.18		-	1-2%	-	-	-	-	-	-	-	-	-	Sp wk	Sp wk	?	35%		"			less alt + mineralized.
	232.0	237.0	5.0		0.15										-	0.01	0.14		-	1-2%	-	-	-	Tr	-	Tr	-	-	-	Sp	Sp	?	35%		"			
	237.0	242.0	5.0		0.09										-	0.01	0.08		-	2%	-	-	-	-	-	-	-	-	-	Sp wk	Sp	?	35%		"			
	242.0	247.0	5.0		0.11										-	Tr	0.09		-	1-2%	-	-	-	-	-	-	-	-	-	Sp	Sp	?	35%		"			
	247.0	252.0	5.0		0.21										-	0.02	0.22		-	2%	-	-	-	-	-	-	-	-	-	Sp	Sp	?	35%		"			SAMPLE TAKEN ACROSS WATER TABLE. APPEARS to be significant contamination from above.
	E.O.H.																																					

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-238
Page 1 of 1 Pages
Collar Elev. 2,775 60
Final Depth 212.7
Coords. N 38,201 70 E 14,588 70
Inclination VERTICAL
Logged by N.R.N.
Date: Start 8-7-67 Finish 8-9-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Cu (1) Covel/Pitch	Cu (1) Black	Cu (1) Blue Green	Cu (1) UNK NS.	Cu (1) Cc.	Cu (1) Cpy.	Cu (1) Born	Fe (2) Lim.	Fe (2) Py	Fe (2) Mag.	Fe (2) Hem	Fe (2) Spec.	Other (2) Galena	Other (2) Sphal.	Other (2) Molyb	Other (2) Calcite	Other (2) Garnet	Other (2) Silicates	Other (2) Sericite	Other (2) Clay	Other (2) Vn. Qtz	Other (2) QUARTZ	Other (2) CHLORITE	(3) Rock Type	Structures (4) Depth	Structures (4) True Dip	Remarks
0.0	37.0	37.0																																Dump			
37.0	45.0	8.0		.02										.02				Sp. Wk	Tr	Tr	Wk Mod	-	-	-	-	-	-	-	Tr Sp	Tr Sp	2%	40%	0.2%	AK			Somewhat bleached AK, only sp-wkly Alt'd. Lim is st. orange. Hem + lim. as stain on fracts.
45.0	53.6	8.6		.02										.02				1	-	Tr	Mod-St	-	-	-	-	-	-	-	Sp	Tr-Sp	2%	45%	0.2%				Hem-Lim coating becoming thicker, sp Jar + Tr. sp Lim., sp. Cc's.
53.6	62.0	8.4		.02										.02				Sp	-	-	Mod St	-	-	-	-	-	-	-	Sp	Sp	-	45%	Tr				Felds are stly stained w/ hem. Sp amts of Jar (?). Hem-Lim also as coating on fracts
62.0	71.5	9.5		.01										.01				Wk	-	-	Mod	-	-	-	-	-	-	-	Sp	Sp-Wk	2%	47%	1%				Rk is less stained. Rk has been brka throughout + now is mostly rehealed except for gouge zones noted
71.5	80.1	8.6		.02										.02				Sp	-	-	Wk Mod	-	-	-	-	-	-	-	Wk-Mod	Wk Mod	2%	45%	? 2%		Fault: Wk Fract	60°-75°	Rk is quite fractured, somewhat faulted + stly altd. Fracts & Flts thin, but close spaced. wk-Mod ser. Plate
80.1	87.0	6.9		.01										.01				Sp	Tr	-	Wk St	-	-	-	-	-	-	-	Wk Mod	Wk Sp	45%	Tr		Fract + Vns. a 8" Spacing	70°	Insig. is Hem. Stain. Sp Jar. assoc. Vns are serricitized + sp'ly silicified
87.0	97.3	10.3		.12												.03		Tr	1-2%	-	Sp	-	-	-	-	Tr	-	-	Mod St	Sp	-	40%		Approx. Shift Ch. 89'	For. Zone 87.0-91.8	V. Low Ang'le	For. zone material is stly sericitized gouge. St PM zones 5" of zone. wk pt and sp CPY being replaced by Cov.
97.3	106.4	9.1		.21												.04		-	3%	-	-	-	-	-	-	-	-	-	Mod St	Sp-Wk	3%	40%		Rp. 102.4-106.8'	Min. Fracts + Vns. Close spaced	80°-60°	Vns. + Fracts have St. ser. assoc. + Sp Qtz. Sulfs are primarily Lim w/ sp CPY coated w/ Cov.
106.4	115.1	8.7		.24									Tr			.09		-	5%	-	-	-	-	-	-	-	-	-	Mod	Sp Wk	5%	45%	-	Sul Rat 10:6 Tr Sp. Rp. 110.0-115.0 Fracs. Ak. Tr.	Qtz, Sulf. for was 1% Fracs. Contacts	85° 45°-70°	Sulfs. are v. f. gr. + stay preferred along vns. + Aplite. Ap + Por. Ap dikes irregularly emp + intermix w/ Ak. St. Alt. + Wk assoc w/ fracts.
115.1	126.0	10.9		.37									.01			.19		Tr	4%	-	Sp	-	-	-	-	-	-	-	Wk Mod	Sp	1%	? 35%	1%	4%	124.9-126.0 AK 124.7			Rk is fine gr. w/ occasional large feld. phenos. Sulfs are v.f.gr. + well disem, some vn-lg. 3% epidote
126.0	133.3	7.3		.45		Nil										.20		-	3%	-	-	-	-	-	-	-	-	-	Mod	Mod	-	35%	-		St. For Zone 126.0-142.6	?	Rk is both strongly shattered and completely brka into a gravelly gouge. Alt. is St. Gouge zones 768-1280 and 1290-1315
133.3	142.6	9.3		.24												.12		-	4%	-	-	-	-	-	-	-	-	-	Mod	Mod	1%	40%	Sp				Rk continues to be mechanically brka
142.6	150.4	7.8		.10												.08	Tr	Sp	4%	-	-	-	-	-	-	-	-	-	Wk Mod	Wk Mod	1%	35%	1%	Ap 143.0-143.3'	V. Qtz-Sp Vn bounded by Sec.	55°	Slight yellow stain to felds.
150.4	159.0	8.6		.10												.08		-	3%	-	-	-	-	-	-	Tr	-	-	Wk	Wk	1%	35%	2%	AK 146.3			As Above. The Rk still has a shattered appearance under the lens + small gouge zones. Sp CPY has a coating of Cov.
159.0	167.7	8.7		.10											Tr	.03		-	4%	-	-	-	-	-	Tr	Tr	-	-	Mod St	Wk	2%	40%	-		Vn Vn St. For Zone 159-162'	60°	Rk is stly altd. and not mineralized. Only v. Sp CC, Cov on fracts
167.7	182.4	14.7		.11											.03	.08		-	5%	-	-	-	-	-	-	Tr	-	-	Tr St	Wk Mod	1%	30%					The Rk is Indeposedly altd to St. Some p. Felds have gone to Kaolinite(?) sulfs disem Throughout, but v. little Cu.
182.4	184.1	6.7		.09											.01	.08	Tr	-	2-3%	-	-	-	-	-	-	Sp	-	-	Mod St	Mod	3%	50%					Rk remains stly bleached. Fracture's mod
184.1	197.5	8.4		.10											.01	.07		-	3%	-	-	-	-	-	0.04%	-	-	-	Wk Mod	Mod	2%	40%					Rk still bleached. Tex still somewhat disturbed.
197.5	206.5	9.0		.06											Tr	.05		-	2%	-	-	-	-	-	-	Tr Sp	-	-	Wk	Wk Mod	3%	35%					As Above. Plagio felds variably altd to kaolinite(?). Sulfs are wide spread
206.5	212.7	6.2		.07											.01	.05		-	2%	-	-	-	-	-	-	Sp	-	-	Sp Wk	Wk Mod	?	35%					Rk bleached + brakes. Tex somewhat destroyed.
E.O.H.																																					

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-287
Page 1 of 1 Pages
Collar Elev. 2774.18 Final Depth 314.0
Coords. N 38,206.01 E 14,767.25
Inclination VERTICAL
Logged by R.E. + N.R.N.
Date: Start 8-9-67 Finish 8-14-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
ROTARY																																			Dump & Road Ar Bedrock Ak. Sulfide @ 128			
0.0	128.3	128.3																																				
128.3	137.3	9.0		.48		Nil.									.56	.12		Sp	<1%	-	-	-	-	-	-	-	-	-	Sp wk	wk wk	<1%	40%						Rk moderately brkn, wk-ly altd, sp-wk-ly min w/ sp Py, <1% & Tr-sp Cc-Cov, Oxidation ends at 129.8'
137.3	146.0	8.7		.36		Nil.									.27	.09		-	2%	-	-	-	-	-	Tr	-	-	-	Pr wk	wk	2%	40%						Rk some wkly bleached. Min sty controlled by fracts + Vns. Cpx-Bore cotter-Thin c.c. replaces Py.
146.0	154.9	8.9		.20											.10	.10	Tr	-	1%										SP	SP	2%	40%			Min. Pyr veins	55°	wk-md alt, Plag has light yellow sylac, Spx dis and veined
154.9	163.9	9.0		.13											.05	.08			1%										md	st	-	40%	wk					md to v. st. alt, feldspars completely altered rocks over most of interval from 157-161
163.9	172.9	9.0		.29											.07	.22			4%										md	md st	-	40	wk					md to st. alt, w/ fresh red garnet bough near end of int.
172.9	182.3	9.4		.27											.09	.18			1%										st	st	-	35	md					V. st. alt of entire interval. Complete breakdown of feldspar rocks, Sericite and Talc. No cohesion. sp. Spx
182.3	191.0	8.7		.30											.06	.24			1%										st	st	-	35	md					As above
191.0	200.1	9.1		.23											.05	.18			1%						Tr				st	st	-	35	md					alt slightly decreasing but strong. epidote.
200.1	209.5	9.4		.11											.02	.09			<1%										md	md	-	40	wk md					Mo(?) spaced on fracts, dis. Spx. md. st. alt. it becomes strong near end of interval
209.5	218.2	8.7		.11											Sp.	.11			1%										SP	SP	<1	40	wk					alteration of feldspars varies wk-st. some pinite? from sulfides alt. wk overall; st from 115-116.
218.2	227.1	8.9		.24											.04	.20			1%										md st	st	1	40	md					wk alt has fresh feldspar, wk-ly altd Plag + Pinite(?) V. st. alt to 221.3, less strong to end. Porous vertical fractures (leached veins(?)) sp Spx and cc. or cov.
227.1	235.4	8.3		.31											.01	.30			1%										wk	SP	1	40	SP					wk-md alt, vertical Fracts. dis. sulfides
235.4	243.5	8.1		.19											.02	.17			1%										SP	SP	1	40	SP					As above, some silicification
243.5	251.5	8.0		.13											Sp.	.13			<1										Tr	SP	<1	40	SP					wk-md alt, pinite(?) hydromica, dis. sulfides
251.5	259.5	8.0		.16											Sp	.16			<1										Tr	SP	<1	40	md			Sulfide veins	60-90	fine grained, green, over most of interval
259.5	268.5	9.0		.11											tr.	.11			<1										SP	Tr	<1	40	SP					small veinlets of cpx, c.c.
268.5	276.5	8.0		.12											tr.	.12			<1										Tr	Tr	<1	40	SP					coarse grained, wk-md alt, coarse sericite, sulfide veinlets
276.5	285.0	8.5		.11											tr.	.11			<1										SP	Tr	1	40	SP					As above
285.0	293.7	8.7		.20											tr.	.20			<1										SP	Tr	<1	40	Tr			Min Vein	65°	As above, SPX on steep fractures
293.7	302.5	8.8		.12											Sp.	.12			<1		Tr								md st	SP	1	35	Tr					md altd. increased sulfides
302.5	314.0	11.5		.11											—	.11			<1						Tr				md	SP	<1	45	SP					porous, vertical qtz veins and localized st sericite
E.O.H.																																						As above

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

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Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D 236
Page 1 of 1 Pages
Collar Elev. 2,770.25 Final Depth 363.5
Coords. N 38,193.75 E 14,952.41
Inclination VERTICAL
Logged by RCE, N.R.N.
Date: Start 7/28/67 Finish 8/4/67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Cu (1) Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn Qtz.	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	37.0																															DUMP MATERIAL			
37.0	45.3	8.3		0.04										0.03	0.01		mod	Tr	ST					Tr			SP	SP	2	50		AK			st Alt. AK, shallow (<45°) fractures
45.3	54.1	8.8		0.05										0.04	0.01		mod	<1%	mod					—			Tr	Tr	2	45	Tr		min Fract	50°	mod. alt. AK w/ hem staining c.c. on px. fractures and veins dip at all angles
54.1	69.0	13.9		0.04										0.04	—		wk	<1%	mod					—			Tr	Tr	1	45	Tr				
69.0	78.3	9.3		0.03										0.03	—		wk	<1%	wk mod					—			Tr	Tr	1	40	—				As above, intensely shattered from 64.0 - 69.0 Bleached mod. alt. AK
78.3	88.6	10.3		0.02										0.02	—		wk	—	mod					—			Tr	Tr	1	30 40	—				random fracturing
88.6	100.8	12.2		0.04										0.04	--		mod	-	wk					-			Tr	Tr	1	40					As above
100.8	106.6	5.8		0.45										0.45	—		—	2%	—					—			SP	SP	1	50		AK	min fracts	60-90	Less hem, no sulfides, 100.8 - oxide-sulfide contact highly fractured
106.6	116.4	9.8		0.59										0.59	-		—	2%	-					—			SP	mod ST	1	50					mod. alt AK w/ py, born, c.c., cpx, disseminated along fracts.
116.4	125.6	8.2		0.38	528' @ 0.60		528' @ Nil							0.31	0.07		—	K-3	-					—			SP	mod	2	50			sulfide on fract	90	highly fractured, bleached, altered w/ py, c.c., born As above with vuggy qtz veins, more sulfides, more sericite
125.6	135.2	9.6		0.48										0.43	0.05		—	2	-					—			SP	and	2	55					Bleached white mod-st alt, less bleaching, fracturing
135.2	148.4	13.2		0.57										0.50	0.07		Tr	2	Tr					-			SP	and	20	50	Tr		min qtz veins	60°	px, cpx, c.c. - strongest along vertical fracts. st. alt. AK between thick (6"-8") qtz veins. Last 2' highly shattered
148.4	158.1	9.7		1.06		0.02								0.99	0.07		—	2	-		Tr	Tr		-			mod st	st	2	50	—				qtz veins here. py in seams, cpx, c.c. along outer contact. mod alt AK goes over to strong c.c. zone at 151.1, min zone is very gouge & fragments throughout. 56% and less strength to 158.5
158.1	168.5	10.4		0.21										0.21	-		—	1	-		Tr	Tr		-			mod	st	2	50	—				continues in st. alt AK, increasing c.c., increasing cpx
168.5	177.8	8.3		0.15										0.15	-		—	2-3	-								mod	mod	50	75	Tr				Fspars altered to sericite, cpx in vertical stringers thick near vertical (80°-90°) qtz veins with py veins, some cpx, c.c.
177.8	187.0	9.2		0.09										0.03	0.06		—	1	—		Tr						mod	SP mod	1	40	Tr				similar to interval from 136.2 to 148.4 mj - st alt AK, mi - st fracturing, bleaching
187.0	195.8	7.8		0.10										0.05	0.05		—	<1%	Tr		Tr						mod	st.	-	40	SP mod				py, cpx, snowy c.c. gem staining. st. alt highly fractured, light hem staining. st. alt
195.8	207.0	11.2		0.16										0.09	0.07		—	<1%									mod	ST	1	40	mod				py, cpx, c.c., gal
207.0	214.0	7.0		0.04										-	0.04		—	<1%	Tr					5 mod			—	—	2	2	SP	HF	min veins	40°	as above, increasing silicification. py, cpx, c.c. Hf w/ tr brown garnets and abundant thin calcite veins.
214.0	222.4	8.4		0.07										-	0.07			<1%						5 mod ST			—	—	1	1	SP				Freq. 4 fractures per 2' cpx As above, light green st. alt close veining, short intervals of intense
222.4	230.8	8.4		0.20										-	0.20			1%						5 mod st			—	—	Tr	Tr	SP		Py on fracts	0-90	silicification. less than 2% total sulfides continues as above with occasional st. silicification,
230.8	239.6	8.8		0.51		Nil								tr.	0.51			1%	Tr					4 mod			—	—	Tr	Tr	SP				increasing sulfides
239.6	248.9	9.3		0.10										0.03	0.07			1%									ST	ST	3	40	mod ST	AK			As above w/ increasing cpx. Tr at base Intensely altd AK, prominent sericite, chlorite. Highly broken,
248.9	251.4	2.5		0.53		Nil								tr.	0.53			1%	Tr					4 mod			—	—	Tr	Tr	SP	HF			most fragments <1". sediments have same general appearance of sediments over
251.4	260.7	9.3		0.50		0.01								0.01	0.15	0.34		<1%						2			—	Nd	ST	—	3	ST	AK			AK. Py veins, cpx, c.c. ST - v.st alt. AK. Gouge zone from 252.0-255.6. Highly chloritic
260.7	269.8	9.1		0.30											0.05	0.25		1%						—			SP	SP mod	3	40	mod		Min veins	60-90	rest of intervals in st. alt. AK - short intervals Mod alt sericite AK. py, cpx, c.c. in 1" thick steeply
269.8	277.9	8.1		0.19											0.02	0.17		<1%						—			SP	Nd	SP	1	45	SP				dipping qtz veins. less altered and mineralized than above however sericite
277.9	286.0	8.1		0.14											0.02	0.12		<1%						—			SP	SP	<1	45	SP				increases on fractures, mod. fracturing
286.0	293.6	6.6		0.12											0.02	0.10		<1%						—			Tr	Tr SP	<1	45	SP				As above
293.6	301.5	7.9		0.18											0.02	0.16		<1						—			Tr	Tr SP	<1	45	SP				As above, py, cpx
301.5	310.2	8.7		0.13											0.01	0.12	—	2%	-	-	0.27	0.27	Sp	—		—	Sp	Sp	37%	45%	—		Sily Brec zone 303. 310		As above Pk. becomes sily brkn Brec 303.' 4% sulfs on numerous fract. surfaces. Sp Clk + c.c. + born. Tr Chlk.
310.2	318.8	8.6		0.10											0.01	0.09	—	1-2%	-	-	0.27	Tr	Sp	—	—	—	Sp	Tr Sp	<1%	35%	<1%	<1%				Sp + Born. ultimately assoc. w/ cpx. Rk bld. sparsely altd + Mineralized. Sp aggregate 2nd dist. Sp galena assoc w/ cpy
318.8	327.3	8.5		0.15											0.01	0.14	—	1-2%	-	-	0.42	Tr	Tr Sp	—	—	—	1-2%	Sp	27%	40%					Rx slightly more altd + mineralized than alteration area Ser. + Pirite (??), total Sulfs 2-3%
327.3	335.1	7.8		0.10											Tr	0.10	—	1-2%	-	-	Tr	Tr	Sp	—	—	—	<1%	Sp	17%	40%					As Above. slightly more Kaolin
335.1	344.6	9.5		0.06											Tr.	0.06	—	3%	-	-	Tr	Sp	Tr	—	—	—	3%	Sp	24%	27.40%	Tr.		Crumbly fx material 338-343		Flt. zone is quite broken, crumbly + vuggy. Flt. is Pre Min. Mod sulfs in zone.
344.6	353.1	8.5		0.11												0.11	—	1-2%	-	-	Tr	Tr	Tr	—	—	—	<1%	Sp	sp	28%	-				Sp-ably altd. Pl. feldsp altering to ser. + Pirite. Kaolin (??). Sulfs on fracts not necessarily
353.1	363.5	10.4		0.14												0.14	—	1%	-	-	—	—	Tr.	tr	—	—	1	1	—	30%	tr				assoc. w/ qtz. veins Mild alt. to hydromica and then further to pirite. Cc coating still present.
E.O.H.																																			

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

HAMMER

Hole No. D235

Page 1 of 1 Pages

Collar Elev. 2,771 68 — Final Depth 312.0

Coords. N 38,040 56 — E 14,676 78

Inclination VERTICAL

Logged by R.C.E. + N.R.N.

Date: Start 6-27-67 Finish 7-5-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Cu (1) Unknown NS	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0	97.0	97																																			
97	102.0	5		0.05										.05				Md			wk Md								Md	40			AR				apparent high clay content.
102	107.0			.04										.04				wk			wk Md								SP	40							appears md altd.
107.0	112.0			.02									.02					wk			wk								SP	40							as above
112.0	117.0			.03									.03					wk			wk								SP	40							As above
117.0	122.0			.02										0.02				wk			wk								SP	40							
122.0	127.0			.08										0.06	0.02			wk			md								SP	40			Approx Sulf Contents @ 125'				Py in QTZ
127.0	132.0			.28											0.20	0.08		wk	3%	-	wk	-	-	-	Tr	-	-	-	Sp wk	wk	?	35%					Intermixed Lim-Hem + Sulfs. C.O. coats Py + QAY
132.0	137.0			.43			.01						0	0.01	0.27	0.15		Tr	2%	-	Tr	-	-	-	—	-	-	-	wk	wk Md	?	35%					Mod-stly altd. K-spars bleached, mod. Kaolin-ser. develop.
137.0	142.0			.37			Nil								0.27	0.10		-	3%	-	-	-	-	-	Tr	-	-	-	wk	wk Md	?	37%					As above. Sulf are fogs + assoc w/ser.
142.0	147.0			.33			Nil								0.23	0.10		-	3%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	37%					Mod-stly altd.
147.0	152.0			.46			.01	55' @						0.01	0.35	0.10		-	3%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	40%					As above. Only sp — v. Thin coatings f.c.c. on Py + QAY
152.0	157.0			.19	55' @	NBL	Nil								0.15	0.04		Tr	2-3%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	40%					
157.0	162.0			.30	0.45										0.25	0.05		-	3%	-	-	-	-	-	—	-	-	-	Mod	Mod	?	40%					Stly altd + Bleached. The only thing this rocks looks is Cu.
162.0	167.0			.66											0.55	0.11		-	4%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	40%					
167.0	172.0			.46											0.40	0.06		-	3-4%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	35%					Sr Ass. Contacts
172.0	177.0			.55											0.45	0.10		-	3%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	35%					
177.0	182.0			.67											0.60	0.07		-	3%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	40%					
182.0	187.0			.53			Nil								0.45	0.07		-	2-3%	-	-	-	-	-	Tr	-	-	-	Mod	Mod	?	37%					
187.0	192.0			.30			.01							0.01	0.25	0.04		-	3%	-	-	-	-	-	—	-	-	-	wk Mod	Mod	?	37%					
192.0	197.0			.16										—	0.14	0.02		-	2%	-	-	-	-	-	-	-	-	-	wk Mod	Mod	?	35%					Still a Thin coating of c.c. on present
197.0	202.0			.26											0.20	0.06		-	3%	-	-	-	-	-	-	-	-	-	wk Mod	Mod	?	40%					Mod. Contamination from cement.
202.0	207.0			.82	35' @		.01							0.01	0.60	0.21		Tr	2%	-	-	-	-	-	Tr	-	-	-	wk	wk	?	40%					Sulfs fgrained. Really not a lot of visible Py
207.0	212.0			.28			.01							0.01	0.20	0.05		-	2-3%	-	-	-	-	-	Tr	-	-	-	Sp wk	wk	?	35%					
212.0	217.0			.48			Nil								0.28	0.24		-	3%	-	-	-	-	-	Tr	-	-	-	wk	wk	?	35%					
217.0	222.0			.30			Nil								0.15	0.15		-	2-3%	-	-	-	-	-	-	-	-	-	wk	wk	?	35%					Still a good c.c. coating on Py.
222.0	227.0			.35											0.15	0.20		-	2%	-	-	-	-	-	-	-	-	-	wk	wk Md	?	30%					Py still stly bleached.
227.0	232.0			.25											0.10	0.15		-	2%	-	-	-	-	-	-	-	-	-	wk	wk Md	?	30%					
232.0	237.0			.28											0.08	0.20		-	1-2%	-	-	-	-	-	-	-	-	-	wk	wk Md	?	35%					
237.0	242.0			.30											0.10	0.20		-	2-3%	-	-	-	-	-	-	-	-	-	wk	wk Md	?	35%					In areas in total sulfide content, more Py + less Cu, not equal c.c.
242.0	247.0			.21											0.05	0.16		-	2%	-	-	-	-	-	-	-	-	-	wk Mod	wk Mod	?	30%					
247.0	252.0			.22											0.08	0.14		-	1-2%	-	-	-	-	-	-	-	-	-	wk	wk	?	35%					Possibly some gouge material intermixed
252.0	257.0			.29											0.10	0.19		-	3%	-	-	-	-	-	-	-	-	-	wk	Sp wk	?	30%					Py appears to be less bleached.
257.0	262.0			.27			Nil								0.13	0.14		-	2-3%	-	-	-	-	-	-	-	-	-	Sp wk	wk	?	40%					Higher total sulfides
262.0	267.0			.41			Nil								0.15	0.26		-	2%	-	-	-	-	-	-	-	-	-	Sp wk	Sp wk	?	40%					
267.0	272.0			.20											0.07	0.13		-	1-2%	-	-	-	-	Tr	Tr	-	-	-	Sp	Sp	?	40%					
272.0	277.0			.21											0.07	0.14		-	5%	-	-	-	-	Tr	-	-	-	-	Sp	Sp wk	?	55%					
277.0	282.0			.22											0.08	0.14		-	4%	-	-	-	-	-	-	-	-	-	wk Mod	wk	?	40%					
282.0	287.0			.19											0.04	0.15		-	4%	-	-	-	-	-	Sp	-	-	-	wk	wk	?	45%					
287.0	292.0			.15											0.02	0.13		-	4%	-	-	-	-	-	Sp	-	-	-	wk Mod	Sp wk	?	45%					Some Contamination from cement
APPROX. WATER TABLE → 292.0	297.0																																				
297.0	302.0			.14											0.02	0.12		-	2%	-	-	-	-	-	-	-	-	-	wk	Sp	?	30%					gate w. lot of contamination
302.0	307.0			.15																																	
307.0	312.0	5		.12											0.02	0.10		-	Tr	-	-	-	-	-	-	-	-	-	wk	Sp	?	40%					
	EOH																																				

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-234
Page 1 of 3 Pages
Collar Elev. 2,728.04
Coords. N 38,510.97 E 14,769.14
Inclination VERTICAL
Logged by N.R.N.
Date: Start 6-21-67 Finish 7-10-67
Final Depth 796.0

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
Rock Bit 0.0	7.4	7.0																																				
7.4	11.4	4.0		0.02						—	—	—	—	0.02	—	—	—	Tr	—	—	—	—	—	—	—	15%	Sp	80%	—	—	Tr	—	Sp Mod	Lt. Tan Hf Ak Q 11.4			Lt. Tan Hf. Fine grained prob. disp-tron. Fairly hard. Zone Brx - Poor Recovery.
11.4	18.5	7.1		0.02						—	—	—	—	0.02	—	—	—	Sp Ox	—	—	Tr	—	—	—	—	Sp	—	—	Tr	Wk	—	37%	2%	Sp Mod				Sed Tuffed, but sp-wkly Hydrothermally or Supergenely alt'd Ak. - 500 - Ak Contact not seen.
18.5	26.7	8.2																Sp	—	—	Tr Sp	—	—	—	—	Sp-Ox	—	—	1%	Wk	—	35%	3%	Sp-Wk Mod				Ak As Above. K-spars have close to original color; Aur alt'd to Chlor, Calcite + Mod on fracts
26.7	36.0	9.3		0.02						—	—	—	—	0.02	—	—	—	Tr Sp	—	—	Tr	—	—	—	—	Sp	—	—	1%	Wk	—	35%	2%	Sp Mod				As Above. Chlor. Occurring as Concentrations along some fracts.
36.0	46.1	10.1		0.02						—	—	—	—	0.02	—	—	—	Tr Sp	—	—	—	—	—	—	—	Tr-Sp	—	—	1%	Sp-Wk	—	35%	3%	Tr-Sp				As Above, Ck is moderately broken
46.1	56.0	9.9		0.02						—	—	—	—	0.02	—	—	—	Tr Sp	—	—	—	—	—	—	—	Tr	—	—	Sp	Sp-Wk	—	35%	3%				As Above
56.0	62.5	9.2		0.02						—	—	—	—	0.02	—	—	—	Tr-Sp	Tr	—	Tr	Tr	—	—	—	Tr-Sp	—	—	Sp		—	35%	2%				As Above - less Broken; Possible sed. inclusion @ 64'
62.5	71.2	6.0		0.02						—	—	—	—	0.02	—	—	—	Tr	Tr	—	Tr	—	—	—	—	Tr-Sp	—	—	Tr-Sp		—	40%	1%				As Above. Intensive Assimilation contact w/ Sedo circa 71.2'
71.2	76.5	5.3		0.13						—	—	—	0.13	—	—	—	—	—	Sp	—	3%	Tr	—	—	—	5%	15-20%	70%	—	—	—	—	Tr	Tr Mod	Tr Tan-Disp Grn Hf Cn 71.2	Possible Bed	40°	Disc. Cont. Mod. ep-dote green w/n-wkly is prob. tron. - Rk. This is a irreg. bounded by tron + a Lt. dull green. which May be Disp. + Tron. Circa 76.1' rk begins to be frag'd. & Cataclized and then & Calcite begins filling the fracts. Till 76.5 point rk has been only spasmodically frag'd. At 75.6 Rk becomes
76.5	81.5	5.0																Wk	Tr	—	Sp	—	—	—	—	? 20%	1-2%	3%	—	—	—	—	15-20%	Mod Mod	Bx Zone	Lt. Bx 76.5 - 81.5'	?	recommately garnet + clear. and is strongly frag'd. St. Fractured Bx Zone. Non spar spars, Mod wkly alt Malachite, Mod-st Chlor as fine + med sized clear & light green
81.5	89.4	7.9		0.02						—	—	—	—	0.02	—	—	—	—	—	—	? 2%	—	—	—	—	50%	—	?	—	—	—	—	30%		Prog. Silicified Mrb. 81.5			Fine grained marble which becomes Strongly Chloralized or Serpentized 81.8 - 83.5' and 85.6 - 89.4' Below 81.8 and BEL Bx is only fair Serpentized but has short 80% small rounded clear short quartz grains. Also a black mineral assoc. in zone. This is similar to zone seen in D-232.
89.4	94.8	5.4		Nil						—	—	—	—	—	—	—	—	Tr	—	—	—	—	—	—	—	30-40%	—	60-70%	—	?	—	—	Tr	Mod Sp	Hornfelsic Marb (?) Bx + Ck			Dull Cream - Lt Grn. Hf. w/ recalized Lt. Int. intermediate
94.8	103.0	8.2		Nil						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	60 %	—	? 10%	—	—	—	—	30%	?	Salt + Pepper Mrb - Hf	Possible bed	60°	Bx has a slightly located Salt + Pepper Mrb. Rk is a recrystal'ed Lt. w/ uniformly distrib. Chlor-Scrp or possibly smaller appearing Pale Silicates intermixed. Alt varies with
103.0	111.4	8.4		Nil						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	99%	—	—	—	—	1%	1%	5 0	Sp	Clear White med. grained Mrb. 103			Clear white Med grained Mrb.
111.4	120.5	9.1		0.01						—	—	—	—	0.01	—	—	—	—	0.3%	—	Tr	—	—	—	—	95%	—	?	—	—	—	Tr	Sp	Mod	Salt + Pep Mrb. Int 112.7-118.2 Med Gr. Mrb			Mrb. As Above. Zone of mrb w/ uniformly intermixed small rounded clear-gray grains.
120.5	133.4	12.9		Nil						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	99%	—	—	—	—	—	—	—		Med Grained White Mrb. 115.3			Med Coarse grained Clean White Mrb. Bx'ed + vuggy 127-133'
133.4	137.0	3.6		0.02						—	—	—	—	0.02	—	—	—	Tr	Sp	Tr	Tr	—	—	—	—	95%	—	1%	—	—	—	—	—		Med Grained Mrb 137.0	Bx 133.4 133.8'	80°	Fine to med grained Mrb. Slight sm stain, sp disem mn. sp Py
137.0	140.2	3.2		0.06						—	—	—	—	—	—	0.06	—	—	2%	Tr	—	—	—	—	—	70%	—	5%	20%	—	—	—	—		Fine Sed Chert w/ Qtz 145 To 152.2			Mottled + Patchy Silicates in med grained Mrb. fx assoc w/ these zones.
140.2	152.2	12.0		0.01						—	—	—	—	—	—	0.01	—	—	—	—	—	—	—	—	—	95%	—	1%	—	—	—	7%	—	Mod Sp	Med Grained Mrb	Possible Bed	30°	Med. grained white Mrb. to 151.6 Then white chert to 152.2
152.2	156.6	4.4		Tr.						—	—	—	—	—	—	Tr.	—	—	—	—	—	—	—	—	—	97%	—	—	—	—	2%	2%	—					As Above. In Qtz is along fracts and has sr. Orange color. Mod assoc.
156.6	165.6	9.0		0.01						—	—	—	—	—	—	0.01	—	—	0.2%	—	—	—	—	—	—	65%	15-20%	15-30%	—	—	Tr	Tr	—	Sp Mod	Lt. Tan Hf. Int 156.6 Med. grained Mrb 161	Bx 166' 167	5°	Med grained white mrb w/ occasional zones of lt. gra chlor. (??) to 163.7 Then a lt. gra-tan garnet -
165.6	174.6	9.0		0.02						—	—	—	—	—	—	0.02	—	Tr	Tr	—	Tr	—	—	—	—	90%	5%	2%	—	—	—	—	—		Lt Tan Disp (??) Hf Cn 173.6	Bx 174 181		Med grained white mrb w/ occasional patches of green garnet. Unmineralized, but cemented
174.6	183.1	8.5		Nil						—	—	—	—	—	—	—	—	Tr	Tr	—	—	—	—	—	—	60%	? 2%	30%	—	—	—	—	—	Mod 1%		Bx 188.5		Mrb As Above to 181. Well Bx zone 173-81 mostly green garn. Lt Tan Disp (??) HF. 181. Bx has been broken up, but can be scratched by steel.
183.1	188.5	5.4		0.05						—	—	—	—	—	0.01	0.04	—	Tr	Tr	—	—	—	—	—	—	10%	60%	30%	—	—	—	—	—					Grn. Disp. Hf. As Above
188.5	192.4	3.9		0.03						—	—	—	—	—	0.02	0.01	—	Tr	Tr	Tr	—	—	—	—	—	Sp	—	—	—	—	—	90%	—		Dk Gray - Black V.f.g.r.d Silic. 188.5	Df (?)		Dk Gray to black V.f.grained Silic. Slt.St. Non reactive. Black due to presence of fine grained disem.
192.4	200.9	8.5		Nil						—	—	—	—	—	—	—	—	Tr	Tr	—	—	—	—	—	—	60%	20-30%	10%	—	—	—	—	—		Grn. Disp. Hf 192.4 Lt. Tan Disp. Hf. Int. Mrb 195 To 198.5			Hf. is mix of grn gar, and Lt. tan + Grn. Pale. Silicates. Clean med grained mrb begins @ 192.4
200.9	210.4	9.5		0.02						—	—	—	—	—	—	0.02	—	—	2%	—	—	—	—	—	—	35-40%	5%	20%	—	—	2%	2%	40%		Int. Mrb 198.5 To 200.9 Grn Disp. Hf 200.9 To 202.5 Grn Disp. Hf 203.8 - 205 Mod Gr. Mrb 205 - 210.4	Bx 205' 208	55°	Mrb has v.f.gr. bright grn chlor disem; Dk Silic Bl.St. As below contains more Ep. Cont.
210.4	220.1	9.7		Nil						—	—	—	—	—	—	—	—	Tr	0.1%	Tr	—	—	—	—	—	96%	—	3%	—	—	—	—	—	Mod 5%	Int. Mrb 210.4 - 215	Bx 210 217		Silic. Sl.St. Surrounded by grn. + Cole. Silicates in marble. Chlor assoc w/ Bx zone
220.1	232.6	12.5		0.35						—	—	—	—	—	0.11	0.24	—	—	1.5%	—	—	—	—	—	—	85%	1%	2-3%	—	—	—	—	40		Chlor. Scrp. Int. Mrb 220 - 232.6 Grn Disp. Hf 232.6 - 233.6 Grn Disp. Hf 233.6 - 237	Bx Throughout Lt Tan 232.6 Fx-Vn @ 237 Bx 238-239		Mrb As Above. Hf. Mrb has v.lt gra Cole. Contains v.lt green Cole. Silicates, Sulf. + Chlor
232.6	239.0	6.4		0.17						—	—	—	—	—	0.03	0.14	—	—	4%	—	2%	—	—	—	—	68%	25%	40%	—	—	—	—	—		Chl. Epidote Int. 237 - 239.0 Bx @ 239.0		70°	Chlor - Scrp. Lmy. Hf. Disseminated throughout and veined by calcite. Occasional patches of Chl. Fx assoc as well as fine grained disseminations.
239.0	246.6	7.6		0.13						—	—	—	—	—	0.04	0.09	—	—	0.5%	—	—	—	—	—	—	5%	—	—	Tr	Sp	—	30%	2%		Mrb. Silicified Int. 239.0 - 246.6			Lt. epidote green dense rk. composed of GAR - Epidote(?) - and Disp. Lower contact has Fill. assoc.
246.6	249.4	2.8		0.03						—	—	—	—	—	—	0.03	—	—	—	? 0.5%	Sp	—	—	—	—	15%	—	—	—	Sp	—	—	5%					Rk at first is a fine grained Rk apparently composed mainly of Lt. Spar. - Tr. Then becomes graphite and finally normal Alaskite. Rk @ lower cont. seems to be Bx'd. Typical Lost mn Aude. Cut by numerous Calcite Vns.
249.4	257.9	8.5		0.03						—	—	—	—	—	—	0.03	—	—	0.2%	—	—	—	—	—	Tr	2%	—	—	Tr	Wk	—	40%	10%		DP @ 249.4	Fx. Zone 250 - 257.9 250.2	? ?	Fair grained Dp w/ green-gray color, apparently due to assimilation of Sedo. (?) of v. black min. such as Pyr + Lower of Tourmaline.
257.9	265.3	7.4		0.05						—	—	—	—	—	—	0.05	—	—	0.3%	? Tr	—	—	—	—	—	70	—	—	—	Sp	1%	40%	10%					As Above. Rk is moderately Brx'd.
265.3	273.1	7.8		0.04						—	—	—	—	—	—	0.04	—	—	0.3%	Tr ?	—	—	—	—	Sp	Sp	—	—	—	Sp	1%	60%	3%		Int. 270			Silic. - glassy rk w/ sp disem. sulfs.
273.1	282.2	9.1		0.03						—	—	—	—	—	—	0.03	—	—	0.2%	Tr	—	—	—	—	Sp	Sp	—	—	—	Sp	1%	60%	6%		Int. 275			Rk Above
282.2	291.7	9.5		0.04						—	—	—	—	—	—	0.04	—	—	3%	—	0.5%	1%	—	—	—	Sp	—	—	—	Sp	1%	50%	20%		Int. 280			Rk Takes on a reversed lt green color and has a notable increase in sulf. Chlor. Cont also
291.7	295.1	3.4		0.10						—	—	—	—	—	—	0.10	—	—	3%	Tr	—	—	—	—	—	1%	Tr ?	20% ?	—	—	—	30%	30%		Int. 290	Up Cont 60° Low Cont 45°		Rk is about Hf. Infinitesimally - Rk does not assim. Sedo. Most of Sulfs are concentrated @ 290.5
295.1	300.8	5.7		0.11						—	—	—	—	—	—	0.11	—	—	1.1%	—	—	—	—	—	Tr	Sp	—	—	Tr	Sp	—	30%	5%		Int. 295	Dp @ 295		Dp is about grn. Hf. Infinitesimally to in the grn. Hf.
300.8	309.0	8.2		0.19						—	—	—	—	—	—	0.19	—	—	1%	Tr	—	—	—	—	Tr	Sp	—	—	—	Wk	—	30%	12%		Int. 300			Dp w/ wk pale green and pink color. Lt green due to Chlor derived from assim. Sedo. The pink is either 2nd Sulfide or intermingling of Aplite.
309.0	318.2	9.2		0.03						—	—	—	—	—	—	0.03	—	—	0.3%	—	—	—	—	—	Tr	Sp	—	—	—	Wk	4%	50%	15%		Int. 310			Dp As Above. Int. is v. fine grained and may be secondary. CPY is PY alts approaches
318.2	[illegible]	9.1		0.03						—	—	—	—	—	—	0.03	—	—	0.3%	—	—	—	—	—	—	Sp	—	—	—	Wk	4%	50%	15%		Int. 320			Dp w/ a lot of Chlor. Int.
																																						As Above. The v. black mineral mentioned 249.4 - 257.9 continues to appear

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-336
Page 2 of 3 Pages
Collar Elev. 2,728 04
Coords. N 38,510 29 E 14,769 14
Final Depth 796.0
Inclination VERTICAL
Logged by N.R.N.
Date: Start 6-21-67 Finish 7-10-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cu (1) Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE			(3) Rock Type	Structures (4) Depth	True Dip	Remarks
327.3	335.9	8.6		0.03												0.03		-	0.2%	-	-	-	-	-	-	Sp	-	-	Tr ?	Sp-Lk	10%	60% ?	15%			Dp			Dp As Above.
335.9	344.9	9.0		0.04												0.04		-	0.5%	-	-	-	-	-	-	Sp	-	-	Tr ?	1	-	40% ?	15%	2nd Bio 10%	15%	Rk Bio 343-345			Dp As Above w/ slightly higher Biot-chlor cont., w/ notably 2nd K-spar w/ qtz veins. Transition to Rk is gradational. No sharp ch. Top distinctly Rk @ 344.9
344.9	353.9	9.0		0.04												0.04		-	0.2%	1%	-	-	-	-	-	1	-	-	?	Sp	Tr	40% ?	5%	5% 2nd K	25% 2nd Bio	Dp 2 343-345			Strongly biotized Dp. w/ local 2nd K-spar along fracts. Sp Sulf min - Rk is dense
353.9	361.1	7.2		0.03												0.03		-	0.2%	Tr	-	-	-	-	Tr	1	-	-	Tr ?	Tr-Sp	Tr	45% ?	10%	K-Spar Tr	15%	Rk Bio	Recycled Rx 2886-361.1		Rk less strongly Biotized. More of Biot Chlorobased Crst w/ Post. Min Anoc. is along old struct.
361.1	364.5	3.4		0.03												0.03		-	-	Nil	-	-	-	-	-	2%	-	-	-	Tr	-	-	Tr	5%	Biotite 4 Mins	361.1-364.5			
364.5	370.7	6.2		0.10												0.10		-	1%	Tr	4%	-	-	-	Tr	2%	-	-	-	Tr	-	25% ?	4%	2nd K Spar 30%	2nd Bio 8%	Dp ?? @ 364.5			Dp ?? - Rk has only approx 1% qtz eyes, is a dense fine grained rk w/ a lt. salmon pink color which looks like porphyritic 2nd K-spar invasive. Min. Contact down. Now a Biot is clumps near upper contact w/ Garnet. Rk has been shattered & Calcite veinlets fracts.
370.7	378.9	8.2		0.09												0.09		-	1%	Tr	Tr	-	-	-	Tr	3%	-	-	-	Sp	1%	30% ?	12%	2nd K Spar 30%	2nd Bio 3%			0°-5°	Rk has mixed 2nd Biot (chlorite) and pressure 2nd K-spar local concentrations of CPY & Py where the Chlor. Rk shattered & showed drag low plates 371.4 - 372.9 Weak foliate Cementing & Veins.
378.9	387.5	8.6		0.17												0.17		-	1%	Sp	Tr	-	-	-	-	2%	-	-	-	1	Tr	20-30%	15%	25%	1%				There is porphyritic development circa 378.9 - 379.5 Sugary Mz look. Rk then becomes quite fine grained and looks like either a hfgr. aplite or arkosic ss. Dp Tr. then reappears - Chlor - Biot increases. On the whole the rk looks much like a sed, but is not. Sparse aplite veins.
387.5	396.3	8.8		0.07												0.07		-	15%	2%	Tr	-	-	-	Sp	Sp	-	-	-	1	Tr	30%	20%	20%	25%	K-Spar Biot			Qtz eye contact low. There is variable develop. of Porphyritic folds. Biot and Magnetite Cont. K-spar occurs spreading out from fracts. 20% aplite
396.3	405.4	9.1		0.06												0.06		-	1%	1%	Tr	-	-	-	Tr	Sp/Lk	-	-	-	Sp	-	30%	20%	20%	20%	K-Spar Biot		0°-5° Aol	As above. Rk is Brecciated throughout
405.4	414.7	9.3		0.08												0.08		-	<1%	Tr	Sp	-	-	-	-	8%	-	20%	-	-	-	40% ?	10%			Tr + Bio Tr Chlor Dep. of Sulfides	Rx + Fo Aol 407.8		Sed is v. fgrained and apparently silica. Lt. green-green color and is cut by quartz veins.
414.7	423.8	9.1		0.05												0.05		-	Sp	-	4%	-	-	-	-	17%	Tr	35%	-	-	-	18% ?	30%			Sulfides Throughout			Rk is above to 418.7. Then becomes hgr. Chlor - Calc Silicate hf. Local high heavy sulfides in Chlor Hf. Sp. appears & Sp Sulfs.
423.8	432.3	8.5		0.08												0.08		-	Sp	-	Sp	-	-	-	-	12%	40-60%	30%	-	-	-	-	5%			Tr Biot 418		Sed. is gra. hmy Hf to 423'. Gar + Calc Silicates begin to increase until Rx is predominately Hf. Sed. is gra. hmy Hf to 423'.
432.3	441.0	8.7		0.15												0.15		-	Sp	-	Tr	-	-	-	-	17%	67%	30% ?	-	-	Tr	-	30%			Tr Chlor 432		Rx is green fine grained rk w/ local patches of garnet. Rk has a 5% fold contact. Appears to be secondary phenomena, not of igneous origin.
441.0	449.8	8.8		0.12												0.12		-	1%	-	Tr	-	-	-	-	17%	40%	25%	-	-	-	1-3	20%			Chlor. Tr Chlor 449		Tan dense rk w/ occasional aplite and local concentrations of chlor. Local Porphyritic Sp min. generally fract controlled or assoc. w/ chlor.
449.8	458.8	9.0		0.05												0.05		-	1%	-	3%	-	-	-	-	5%	30%	50%	-	-	-	-	10%			453-455 Tr 458		As Above to 453. There is a fine grained Sil rk that has gone to the aplite rk. Dense throughout. Xls are more or less alligned this is followed by.
458.8	471.5	12.7		0.07												0.07		-	<1%	-	1%	-	-	-	-	15%	70%	25%	-	-	Tr	Tr	2%			Rk - Chlor 471		Predominately lt. green gray w/ minor patches of lt. silicates + chlorite - non [illegible]
471.5	479.6	8.1		0.06												0.06		-	1%	-	3-7%	-	-	-	-	15%	50%	30%	-	-	-	-	12%			Chlor 479		Rx of lt. Brn gray, sp. gray Calc silicates + sp aplite. Sr Chlor - Sap in fracts. + [illegible]
479.6	488.0	8.4		0.07												0.07		-	<1%	Sp	Tr	Tr	-	-	-	15%	35%	45%	-	-	-	-	10 ? 15%			480-484 Tr 484	Rx spaced fracts	60°	Rx of gray + lt. green silicate To 484 then dark green Amphi. followed by lt. brn. gray Tr. & calc. as above.
488.0	493.4	5.4		0.18												0.18		-	<1%	-	-	-	-	-	-	18%	75%	4%	-	-	-	-	4%				"	61°	Lt Brn Gray Tr. Cut by Numerous 1/4" spaced Calcite - Sulf filled fracts.
493.4	502.7	9.3		0.11												0.11		-	20%	-	8%	1%	-	-	-	5%	5%	40-50%	-	-	-	-	40%			Chlor - Sericite Hf 493 - 502.7			V. dark green Rk composed of Chlor - Serp and calc Silicates w/ much calcite + and epidote. Sr Rx. Not essentially no CPY assoc.
502.7	514.3	11.6		1.17		Nil										1.17		-	2%	Tr	2%	Tr	-	Tr	Sp	15%	7%	60% ?	-	-	5%	5%	8%			Hall (?) Tr on Hf 502.7-514.3			Rk becomes strongly fractured and mineralized by CPY. Some gth veins assoc.
514.3	524.6	10.3		0.43		Nil										0.43		-	2%	-	-	-	-	-	Tr	2%	Tr	?	-	-	5%	?	15%	2nd K Spar 30%	Dp (?) Sil Silic Chlor Hf 514.3 - 524.6	Rx		Rk is v.v. fine grained and quite hard. Tan color w/ Tr. Rk is primarily composed of calcite silicate of v. fine grained qtz. Rk has a st mottled appearance w/ salmon pink and orange lt. intermixing w/ the remaining gray-green rk.
524.6	536.6	12.0		0.72		Nil										0.72		-	4%	-	1%	-	-	-	Tr	2%	Tr	?	-	-	8%	?	15%	2nd K Spar 2%	Qtz - Silicate Hf - Sericite 524.6 -			Rk is much as above, but with much less K-spar. Red CPY assoc w/ chlor and gth veins.
536.6	545.6	9.0		0.66		Nil										0.66		-	2%	Tr	Tr	-	-	-	Sp	2%	10%	? 30%	-	-	-	? 50%	? 8%	K-Spar 1%			Rk is lt. colored and relatively coarse grained gets to arch. 542. Then more sericitized w/ increasing CPY. 2nd K-spar also occurs here.
545.6	554.7	9.1		0.48		Nil										0.48		-	1%	-	-	-	-	-	Sp	2%	-	40%	-	-	-	? 50%	N.Z.	4%	K-Spar			V. fine grained Silic. Sericitic. As above. Has a mottled appearance. CPY on fracts. Some K-spar
554.7	563.7	9.0		0.56		Nil	*1028' @ 0.72									0.56		-	<1%	-	-	-	-	-	Tr	1%	80%	10%	-	-	1%	1%	1%			Tr 554.7			Lt. Hmy Brn Gray Tr. Cut by veinlets and CPY veinlets along fracts. and assoc. w/ chlor.
563.7	572.3	8.6		0.80		0.01	Nil								Cup 0.01	0.79		-	<1%	-	-	-	-	-	Sp	3%	55%	40%	-	-	-	-	1%			Gray - Silicate Hf 563.7 - 572.3			As above but gradational into garnet silicate Hf. The silicate is lt gray + dark. Still cut by fracts.
572.3	580.0	7.7		1.26		0.01									Cup 0.01	1.25		-	3%	-	-	-	-	-	Sp	3%	15%	80%	-	-	-	-	60%			Massive Chlor 572.3 - 575.4	Chlor. 575.4'	10°	Tr becomes more and more altered approaching contact. Chlorite rk is a massive chlor flakes of small size. Sulf. Are well disseminated throughout. High CPY to Sr - Massive chlor w/ interspersed Sulfs + and chlorite rock. Sulfs. Actin-Tremolite Hf. Rx is a fine grained rock. Tan color w/ chlor. To @ 582.2. Lt. green Rock. Rock CPY using. Tremolite Hf. Has a mottled appearance of green & dark. The veins (?) are irregular shaped & usually apparent. Rx + Non linear. Rx has varied Dp look.
580.0	589.4	9.4		0.44		Nil										0.44		-	2%	2%	3%	-	-	-	Tr	15%	15%	18%	-	-	-	? 30%	30%			Actin-Trem Hf 580.1 - 589.4	Chlor 580.1	40°	
589.4	597.4	8.0		1.07		Nil										1.07		-	4%	3%	Tr	-	-	-	Sp	1%	-	50-60%	-	-	Tr	5%	30%			Fine Tremolite Actin-Trem Hf Rock 589			
597.4	605.5	8.1		0.31		Nil										0.31		-	3%	2-3%	2%	-	-	-	Sp	2%	-	70%	-	-	-	?	20%			Actin-Trem Hf	Bio (?)	65°	Chloritized Actin-Trem Hf is med to dark green and mottled. CPY is very and well disseminated. V.v. fine grained w/ some minor Py. St Assoc. of CPY & Chlor. This chlor. is smaller to the one in the Tr. Rx. Less strongly Chloritized and less CPY. Sr v. fgrained magnetite from 602 - 604.
605.5	613.5	8.0		0.18		Nil										0.18		-	3%	4%	1%	-	-	-	Tr	1%	-	70%	-	-	-	?	15%						As Above. Rx is quite hard and silic appearing. Med Neg + Chlor. 608 - 611. Most Sulfs.
613.5	621.4	7.9		0.25		Nil	1760.7 @ 0.02 Nil									0.25		-	1%	Tr	-	-	-	-	Tr	Sp	Sp	85%	-	-	Tr	? Tr	3%	2nd K Spar 2%						As Above. K-spar (?) is localized around 618'.
621.4	629.5	8.1		0.33		Nil										0.33		-	3%	Tr	-	-	-	-	-	5%	5%	70%	-	-	-	7%	5%	K-Spar 1%		Gar - Actin-Trem Hf 621.4 - 629.5			Gar. begins to appear circa 623, rk becomes less dense and there is a rapid increase in sulfs but [illegible]
629.5	637.3	7.8		0.17												0.17		-	2%	Tr	Tr	-	-	-	0.03	3%	4%	20%	-	-	-	60%	15%			Actin-Trem Hf Gray Sil 629.5 - 637.3 Bio Chlor Hf 637.3			Gar - Actin-Trem Hf. As above. Gravity is med grained sub hedral. Gth is v. high value. This is cut by a few biot-chlor mz which is based w/ the lt. tan clay remnants of the [illegible] shaped minerals. This is intergrown w/ the gravity and followed by gravity which grades into the fgrained silic. Hf. Sub hedral.
637.3	645.7	8.4		0.45		0.01									Cup 0.01	0.44		-	3%	-	-	-	-	-	0.01	7%	-	-	-	Med	-	3%	15%			Gar - Actin-Trem Hf 637.3 - 645.7			Med grained equigranular Mz which contains 15-20% Biot. 1-4 mm of leucoxene + Wisp. The Biot is variably alt., but generally sly alt. to hydromica. Sulfs. Local and disseminated. Assoc. w/ chlor.
645.7	652.0	6.3		0.42		Nil	22.1 @ 0.01 Nil									0.42		-	3%	Tr	Tr	-	-	Tr	0.03	4%	-	-	-	Med	-	? 3%	15%						As Above. P. Felds. Med - Sericitic. Sulfs. Most of them show deterioration of the possibly mechanical.
652.0	655.4	3.4		1.21		0.01									Cup 0.01	1.20		-	4%	-	Tr	-	-	-	0.03	12%	-	? 25%	-	-	-	50%	15%			Qtzite + Hf 652.0 - 655.4			Qtzite similar to that described @ 632.3 grades into the white is highly chlorite + limonite. High total sulfs content + [illegible]
655.4	662.8	7.4		0.71		Nil										0.71		-	7%	-	-	-	-	-	0.03	6%	-	-	6%	Med	-	27%	15%			Bio Hf @ 655.4	Bio Chlor 655.4 Qtzite 655.4	Bx 35° Vn 45°	Rk becomes silic and circa 659. Rx is to sideroxen. P felds silic and is quite + [illegible]

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

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Hole No. D-224
Page 3 of 3 Pages
Collar Elev. 2,728 04
Final Depth 796.0
Coords. N 38,510 99 E 14,769 14
Inclination VERTICAL
Logged by N.R.N.
Date: Start 6-21-67 Finish 7-10-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
662.8	670.9	8.1		1.15		0.01								Cup 0.51		1.14		-	4%	-	-	-	-	-	0.05	5%	-	-	4%	Mz	-	3%	10%	Bxx Mz	5° Calcite Va @ 366.1	45°	St'y altd. local St 2nd K-spar. Mix. fract controlled. Mz has not also to contact Porphyritic Lt.-Med. grn. is St Mont. alt of P feldspars
670.9	679.4	8.5		0.38		N.1										0.38		-	2%	-	-	≤1%	-	-	Tr	2%	-	-	Sp	Mod wk	-	5%	4%				Fz. Above. Bxx. has some what of a 2nd look. Chips are aggregates of this look.
679.4	688.2	8.8		0.26												0.26		-	2%	-	-	-	-	-	Tr	Sp	-	-	Sp	Mod wk	-	1%	4% 10-20%	Aw 2813 Bx 6939 Bx Mz @ 2813	Up 2 Int Low Int	20° 10°	Aw seems to be a The dike of a younger age from the Bxx Mz. Appears to cut across some fels. of the Mz, and is itself somewhat apatitic near the contacts. The
688.2	696.9	8.7		0.30												0.30		-	2%	-	-	-	-	-	0.01	1%	-	-	Sp	Sp wk	2%	4%	10-20%	Aplite Dike 690.5 Bxx Mz @ 690.5	1,960 Sil. Va	80°	Mz is med. stly alt above the Aw + wk-mod Ap's below Sil contact variable appearing as
696.9	706.1	9.2		0.17												0.17		-	<1%	-	-	-	-	-	-	1%	-	-	Tr	wk	-	2%	10%	Grp			replacements in Bot. phor and in fracts. Fracts are primary control. High Ap to Ap ratio
706.1	715.0	8.9		0.19												0.19		-	<1%	-	-	-	-	-	Sp	1%	-	-	Sp	Mod wk	0.5%	4%	15%		Up Int @ 709.5'	60°	Bxx-Mz Contains 5-20% Bxx a large part of which is in grown (Sandwich). 1/2" Aplite dike @ 793.3 Trace age relationship.
715.0	724.1	9.1		0.21												0.21		-	<1%	?	-	-	-	-	?	1%	-	-	Sp	Mod wk	1%	12%	8%	Aplite Ax @ 720.3	Up Contact	75°	Sang at fract & locking Bxx Mz + wk Aplite alt of Bxx + wk Montmorillonite alt of P feldsp. Sil contact down, & mainly fract controlled. Calcite is fract controlled + altered Sandstone.
724.1	732.7	8.6		0.18												0.18		-	<1%	-	-	-	-	-	?	Sp	1%	-	-	Sp	Wk	-	25%	6-7%	Aplite Ax @ 728.6 Bx Dike @ 732.7	Up Int Low Int Bxx Bx Dike @ Bxx Mz Bx 728.6 732.7	45° 50°	St'y altd and mod sericite. Ox now primarily montmorillonite + hydromica clay.
732.7	743.7	11.0		0.05												0.05		-	7%	-	-	-	Tr	Tr	Tr	Sp	-	-	Sp	Sp	-	15%					Bxx Mz As Above. Aplite Ax grades from aplite at contact to med-coarse grained Ax in central zone.
743.7	745.4	1.7		0.01												0.01		-	-	St	-	-	-	-	-	8%	-	-	-	Sp	-	-	5%		Bxx Mz Aw @ 745.4 Bx Bxx to 756.0	Dike Low Int	52° 20°	Ax has appeared to have been somewhat destroyed by shattering + shearing. Lower Ax more normal
745.4	756.0	10.6		0.05												0.05		-	7%	Tr	2%	-	Tr	Tr	Tr	Sp	3%	20%	Sp	Sp	-	25%	-				Bx Dir material composed of angular to well rounded fragments of all sizes up to 2½" diameter. Bx Frags are fr. Mz + Ax w/ about 10% sediments. Sed are mostly silty siltst. and
756.0	768.9	12.9		0.03												0.03		-	3%	-	-	-	-	-	Tr	Sp	-	-	Sp	Wk	Wk	10%	Sp	Qtz. Mz Bx w/2nd Tex 756.0			effective. Matrix appears to be mostly Mz. Mn is post Bx and variably intensity depending on favorability of host. Mn is St, but only Tr-Sp PP. Aware in the St. Pf. The Pf zone showed fracturing and strong primary in which are filled of St. Pf. The Post Min Aplite intruded along the zone.
768.9	774.2	5.3		0.05												0.05		-	3%	-	-	-	-	-	-	Sp	-	-	Tr	Sp	-	10%	Sp	Qtz 2nd Quartz			Bx is composed of altered biot and alt. felds. Sparse quartz + var. + alt. felds. Dike intrudes along most intensely brec. portion of fault zone.
774.2	782.6	8.4		0.03												0.03		-	3%	Tr	-	-	-	-	-	Sp	-	-	-	Sp	-	10%	Sp	"			Bx As described above except Frag size up to 4" and size sample 45% of Bx. Over 1" Frag is moderately generalized. Contains 15% Hem. Mod-St PP and is Primary.
782.6	791.0	8.4		0.03												0.03		-	2%	Tr	-	-	-	-	-	1	-	-	-	Sp	-	12%	Sp	Qtz 2nd Quartz			Unusual St. Mz Pcp - St 2nd Regrowth of Quartz + 10% qtz (secondary porphyry) as rounded eyes up to 1/8". There has been an addition of Potassium resulting in orthoclase in
791.0	796.0	5.0		0.02												0.02		-	2%	Tr	-	-	-	-	-	1	-	-	-	Sp	-	10%	Sp	"			of grd mass and development of Secondary phenos up to 1/8 diam w/ deposit porphyritic tex. Op felds also appear to have under gone alteration. Sericite and other qtz + well disem. There may be an increase in PP w/ increase of 2nd Orthoclase. Bx contains 8% Bxx Bot.
E.O.H.																																					As Above. Large 2nd K-spar phenos comprise approx 6% of Bx
																																					As Above
																																					Bx becoming Coarser grained. 2nd Porphyritic K-spar to 1" long. Qtz to 7/8"
																																					As Above
																																					E.O.H.

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb- Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig- Undif igneous

Hole No. D-233
Page 1 of 1 Pages
Collar Elev. 2,762.81 Final Depth 229.1
Coords. N 37,729.60 N E 14,671.52
Inclination Vertical
Logged by N.R.N.
Date: Start 6-21-67 Finish 6-27-67

Depth From	Depth To	Depth int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
Rotary Thru Dump 0.0	122.0	122.0																																				
122.0	127.0	5.0		0.02										0.02				Sp.	-	-	wk. Mod.	-	-	-	-	-	-	-	Tr	Sp	?	35%			Ak		
127.0	132.0	5.0		0.04										0.01				Sp. wk.	Sp		wk-mod.								Sp	Sp	?	1					
132.0	137.0	5.0		0.17										0	0.05	0.12		Sp	<1%		Tr								Tr-Sp	1	?	1					
137.0	142.0	5.0		0.12											0.06	0.06		Tr-Sp	1%		1								1	1	?	1					
142.0	147.0	5.0		0.17											0.10	0.07		1	3%		1								1	30%	?	1					
147.0	152.0	5.0		0.12											0.05	0.07		Sp	1%		1								1	1	?	40%					
152.0	157.0	5.0		0.30											0.20	0.10		Tr-Sp	1%		1								1	1	?	1					
157.0	162.0	5.0		0.14											0.03	0.11		1	1%		1								Sp	1	?	1					
162.0	167.0	5.0		0.11											0.01	0.10		Tr-Sp	1%	-	Tr	-	-	-	-	-	-	-	<1%	Sp	?	35%					
167.0	172.0	5.0		0.14											0.03	0.11		Sp	1-2%	-	Tr-Sp	-	-	-	-	-	-	-	1%	Sp-wk	?	35%					
172.0	177.0	5.0		0.26											0.13	0.13		Sp	3%	-	-	-	-	-	-	-	-	-	5%	wk-mod	?	40%				wkly bleached Ak, mod sec. alt.	
177.0	182.0	5.0		0.30											0.15	0.16		-	3%	-	-	-	-	-	0.01	-	-	-	5%	wk.	?	35%				Ox. occuring as coatings	
182.0	187.0	5.0		0.14											0.10	0.04		-	2-3%	-	-	-	-	-	Tr	-	-	-	1%	Sp-wk	?	30%				Ak much less alt'd and bleached	
187.0	192.0	5.0		0.24											0.07	0.17		-	1%	-	-	-	-	-	Tr	-	-	-	1%	1	?	35%				This sample contains much grease and is contaminated w/ cement.	
192.0	197.0	5.0		0.29											0.02	0.27		-	2%	-	-	-	-	-	Tr	-	-	-	3%	1	?	40%					
197.0	202.0	5.0		0.18											Tr	0.18		-	2%	-	-	-	-	-	-	-	-	-	3%	1	?	40%					
202.0	207.0	5.0		0.15											—	0.15		-	1%	-	-	-	-	-	-	-	-	-	1%	1	?	40%					
207.0	212.0	5.0		0.13											—	0.13		-	1%	-	-	-	-	-	-	-	-	-	<1%	1	?	40%					
212.0	217.0	5.0		0.15											—	0.15		-	1%	-	-	-	-	-	-	-	-	-	Sp	1	?	35%				Mod fresh and Sp-wkly mineralized	
217.0	222.0	5.0		0.20											Tr	0.22		-	1%	-	-	-	-	-	-	-	-	-	Sp	wk	?	35%					
222.0	227.0	5.0		0.17											Tr	0.17		-	2%	-	-	-	-	-	Tr	-	-	-	2%	1	?	35%					
227.0	232.0	5.0		0.20											Tr	0.20		-	1-2%	-	-	-	-	-	-	-	-	-	Sp	1	?	35%					
232.0	237.0	5.0		0.11											0.01	0.10		-	1-2%	-	-	-	-	-	0.05%	-	-	-	Sp	1	?	30%				Notable increase in MoS_2	
237.0	242.0	5.0		0.21											0.03	0.18		-	2%	-	-	-	-	-	Tr-Sp	-	-	-	Sp	1	?	35%					
242.0	247.0	5.0		0.39											0.10	0.29		-	2%	-	-	-	-	-	0.02%	-	-	-	2%	1	?	30%					
247.0	252.0	5.0		0.10											—	0.10		-	<1%	-	-	-	-	-	Tr	-	-	-	Sp	1	?	35%					
252.0	257.0	5.0		0.34											0.10	0.24		-	1%	-	-	-	-	-	0.05%	-	-	-	5%	1	?	40%				Mineralized zone w/ mod sec. alt. assoc.	
257.0	262.0	5.0		0.21											Tr	0.21		-	3%	-	-	-	-	-	0.02%	-	-	-	4%	1	?	45%				Main cemented constituent is qtz w/ assoc. sec + Py	
262.0	267.0	5.0		0.12											—	0.12		-	3%	-	-	-	-	-	0.02%	-	-	-	5%	1	?	45%				mod. sec alt. assoc w/ Py.	
267.0	272.0	5.0		0.15											—	0.12		-	3%	-	-	-	-	-	0.01%	-	-	-	4%	1	?	45%				Rx is bleached. No pink left.	
272.0	277.0	5.0		0.12											—	0.12		-	1%	-	-	-	-	-	Tr-Sp	-	-	-	4%	wk-mod	?	40%				Plclts are mod alt'd to lt. grn mica other sec or ment.	
277.0	279.0	2.0		0.18											Tr	0.18		-	1%	-	-	-	-	-	Tr-Sp	-	-	-	4%	1	?	40%				As Above	
E.O.H.																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-232
Page 1 of 2 Pages
Collar Elev. 2,734.4 20
Final Depth 617.4'
Coords. N 38,354 93 E 14,868 60
Inclination VERTICAL
Logged by N.R.N.
Date: Start 6-14-67 Finish 7-18-67

Deptn From	Deptn To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	MnO	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
Rick Bit 0.0	0.2	0.2															Mod	-	-	Mod	-	-	-	-	-	-	-	<1%	wk mod	27%	60%	10%	wk mod	AV.	FRACT. Slight Recrystal	≈ 90°	Sty. Silicified Ak Has Been strongly fractured. St. Calc. Concentrated @ 3.3' and 17.8' prob. result of ass. alteration. Sod. Pockets of GT hem. Sporadic scattered sulphuret. MnO in fracs.
0.2	19.3	9.1		0.13						-	-	-	-	0.13	—	—	—																				
19.3	26.1	6.8		0.09						-	-	-	—	0.09	—	—	wk	-	-	wk	-	-	-	-	-	-	-	<1%	wk	1%	50%	47%	wk				Hem & Lim. is wk stain on foliation fracts. wk mod on fracts.
26.1	34.1	8.0		0.05						-	—	-	-	0.05	-	—	Sp wk	-	-	-	-	-	-	-	-	-	-	Tr	wk	-	35%	-	wk				wk Lim in MnO on fracts. Numerous open fracts and voids. Rk sparsely std.
34.1	36.5	2.4		0.02						-	—	-	-	0.02	-	—	Sp	-	-	-	-	-	-	-	-	-	-	Tr Sp	wk	1%	30%	2%	Sp. wk				Wkly Slf. Ak, mod As Rock.
36.5	52.4	15.9		0.18						-	—	-	0.13	0.05	-	—	wk Mod	-	-	-	-	-	-	-	-	-	-	?	?	-	?	50%	Mod wk		Fr. Zone (1) 36.5-52.4 Mod. wk stained fract to 56.5		Fr. Zone Mod. Sericitized. Frag. B. Rock is primarily Ak, and occurs in rounded patches + veins. Remainder of Zone is Intensely Brecciated and has a high chlorite content. Frags. mostly smaller. Rk is stly. stained up resultant ice destination to 56.5 where ass. begins to regain vigor. Ak
52.4	63.0	10.6		0.07						-	—	-	0.01	0.06	—	—	/	-	-	Sp	-	-	-	-	-	-	-	7% Sp	Sp	-	? 50%	3%	Tr				Tex. Rk becomes very dense and apparently Slfd. Tex. - Subordinate interstitial - 4% Sulfides mainly as stringers, as well as larger ass. patches irregular, surrounding gr. grains. Tex. appears to be a combination of Ak, Op & Hem.
—	—	—		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				Tex. Ak Aaak - Slightly coarser grained & more euhedral.
63.0	71.4	8.4		0.06						~	-	—	—	0.06	—	—	Sp	-	-	-	-	-	-	-	-	-	-	-	Sp	-	50%	2%	wk				Increase in Ak, as sed are approached. Also Increase in Mod. Ak Sericite Gap also fd. in Sed. Portion.
71.4	74.8	3.4		0.04						—	—	-	0.01	0.03	—	—	Tr Sp wk	-	-	-	-	-	-	-	-	-	-	-	Sp	-	50%	7%	wk				Rk Strongly altered Pale Green Chlor. Serp. wk (?). Mod. Pseudomorphs after Ak.
74.8	79.3	4.5		0.22						—	—	-	0.17	0.05	-	—	Sp	-	-	-	-	-	-	-	Tr	-	-	-	Tr	-	15%	60%	wk	CHLOR SED 3 Ak	Contact Wk Dist. Not but Extensive Calc. Seams & Veins		50-70	Stly. Wk. wkly. Silic. Wk. Mix is fine grained mass of Sp & Ak which is largely pseudo. Forms. Rk V. Tex. and shows some contortions. Mod. density of seams. Relative uniformity.
79.3	82.9	3.6		0.19						—	—	—	—	—	—	0.19	-	25%	20%	Tr	-	-	-	-	25%	49%	-	?	-	-	?	3%		Mod Gravel & Boulders Mixed Silt 83.9			
82.9	90.7	7.8		0.48		0.03				—	—	-	-	0.03	—	0.46	-	15-15 20%	20%	Sp	-	2%	—	-	60%	5%	-	—	-	-	-	5%	-	-			80°	White - to light recrystallized Lim which is mod. stly. mineralized by mag + Sp. wk. Other assoc.
90.7	101.9	11.2		0.40		0.03				—	—	-	—	Pb 0.18 Zn 0.05 0.03	—	0.37	-	67%	4%	Sp	-	Pb 0.18	Zn 0.05	Tr	70-80%	4%	7%	-	?	0.3%	0.5%	4%	-	-				As Above w/ steep-dipping magnetite, Sphalerite, Galena & Ph Vns. All mine fine grained
101.9	107.4	5.5		0.10						—	—	-	—	—	—	0.10	-	4%	40-50%	Tr	-	-	-	-	70-80%	2%	3%	-	-	4%	4%	-	10%		Rock Rep. Ak. Mod Recrystallized Lim. Sed. (?)	Horizontal	Rk is a dark grey-green color from contained Mag + Sulf. Y. This lack of Mag (?) showing v. complex Small scale folding. Rk is a Magnetite (Sulf.) Pb (coated by Mag in places)
107.4	114.0	6.6		0.51	51.9	Nil				—	—	-	—	—	?	0.51	-	7%	30%	2%	-				60-70%	8%	5%	-	?	1%	1%	-	1% Mod Rock	Fine-Med Recrystallized Lime			St. Mag. occurring in v. large crystals in high density stringers. Mag. Sporadically assoc. w/ the Sp. Sp. in pale Silicate. 1/3 of rk has been altered to a soft to earthy white.
114.0	121.0	7.0		0.21	0.04 0.05	0.01				—	—	-	—	—	—	0.20	-	1%	3%	Tr	-	Tr	Sp	-	85%	1% 2%	3%	-	?	-	-	8% Sp	-	-		Clear Med Recrystallized L.S.			Clean Recrystallized L.S. but y This serp (?) seams along fracts.
121.0	129.4	8.4		0.67		0.12				—	—	-	-	0.12	035?	0.20	-	10%	3%	3%				Tr	60-80%	2%	2%	-	-	1%	1%	1	-	-		Re Crystal to Fine Gr. 125-128.5' Sr. Gr. 128.4 130.9'			Recrystallized lime med. Clean to 125'. A 25° dipping gouge-shale zone @ 124.5'-(0.8' wide) Contains 30% Native Cu. From 125.0 Rk Contains Med Black, Mag, Hem and Massive Ph Veins from 128.4-129.4.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
129.4	138.3	8.9		0.15						—	—	-	—	—	—	0.15	-	Tr	Tr	1%	-	-	-	-	85%	49%	3%	-	-	-	-	-	-	-		Med Grained Clean Gray Lime			Except for Sec. gouge at 129.4-130.9 and 132.6-133.0' Rk is a med grained clean Recrystallized L.S.
138.3	140.8	2.5		1.87		0.01				—	—	-	—	—	—	1.87	-	47%	-	1%	-	-	-	-	55%	50%	3%	-	-	-	-	-	-	-		GAR. Tr. 138.5-140.7 Med. Grained Recrystallized L.S. Clean	Pseudo Bed	60°	St. Lt. Blue Sec. zone bounded on each end by a 1½" massive ally. zone.
140.8	152.2	11.4		0.04						—	—	-	—	—	—	0.04	-	Tr	Tr	1%	-	-	-	-	95%	1%	Tr	-	-	-	-	-	-	-				Clean white Recrystallized L.S.
152.2	160.9	8.7		0.02						—	—	-	—	—	—	0.02	-	-	-	-	-	-	-	-	90%	-	-	-	? 10%	-	-	-	Tr. Mod. Gravel				As above w/ 10% of earthy white clay like material which is non reactive
160.9	170.5	9.6		0.02						—	—	-	—	—	—	0.02	-	Tr	Sp	-	-	-	-	-	50 90%	1%	1%	-	-	-	-	-	-	20-30%	Brecciated Fine grained L.S.	20% (Fine Grained)		Clear Light colored Recryl. L.S. med grained. Also to irreg. patches of amorphous serp.
170.5	179.6	9.1		0.05						—	—	-	—	—	—	0.05	-	15%	0.3%	-	-	7%	-	-	60%	Tr	10%	-	-	3%	3%	-	-	5%	Coarse Grained L.S. 170.5-176.7' Med. Fine Gr. L.S. 176.7-178.2 Coarse L.S. 178.2	Porph. Bed 176.7-178.2	83° Partially Fol.	70°	This Rk. Appears to have interglass light colored calc. Silicates. Appears to have fine L.S. Serp - 1% Vns. up at 55°. Mod. Sper. Assoc. Appears to be alt. of Ph. Qtz Vn. Clean + vuggy.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				At 176.7-179.1 A brecciated lime. ck. appears to contain 40% slightly dk. gray rounded pieces, grains heavy min (?). Also contains well disseminated Sp. Rest of Rk is coarse grained recrystallized L.S.
179.6	188.6	9.0		0.04						—	—	-	—	—	—	0.04	-	Tr	Tr	Sp	Tr	-	-	-	98%	-	-	-	-	-	-	-	-	-				Coarse Grained Recryl. L.S. w/ few hem. seams.
188.6	198.0	9.4		0.02						—	—	-	—	—	—	0.02	-	Tr	0.5%	Tr	Tr	10% ?	-	-	85%	5%	Tr	-	-	Tr	Tr	-	-	-	Mod Grained Recryl. L.S. Bit. Ck. 188.6-198.0	V.F. grained Sp. Grain Inclusion	65°	Med. grained Recrystallized L.S. w/ fine grained Sulf + Copper look caused by v. fine Sper. disseminated inclusions
198.0	207.3	9.3		0.03						—	—	-	—	—	—	0.03	-	0.2%	Tr	-	5% ?	-	-	-	90%	2%	Tr	-	-	-	-	-	-	1%	Coarse Calc. L.S. 198.0-207.3			As Above
207.3	216.2	8.9		0.01						—	—	-	—	—	—	0.01	-	0.2%	Tr	-	2% ?	-	-	-	95%	Tr	-	-	-	-	-	-	-	3%				As Above.
216.2	226.9	10.7		0.01						—	—	-	—	—	—	0.01	-	Sp	Tr	-	2%	-	-	-	90%	2%	Sp	-	-	-	2%	-	-	2%	Med grained L.S. Rk. Mod. Grained Recryl. L.S. Bit. Ck. 216.2-226.9	Sec. Fol. 224.9' Cont.	? 35°	Med grained L.S. 216.2-218 Contains v. fine grained Sp. grains disseminated + in concentrations w/ Sulf. Accom. Rk Then goes back to Med. grained Recryl. L.S. At 226.8 zone is an irregular 35° cont. w/ a garnet-diopside (?) Ak. Tex. Rk. has a dull yellow tan color.
226.9	231.6	4.7		1.46		Nil				—	—	-	—	—	—	1.46	-	7%	Tr	7%	? 12%	-	Sp	Cross Dip 30%	25%	40%	-	-	-	5%	-	-	-				Intermixed Gross, Gar in Diop. - St. Zone of Ep, Cc, Hem, Sp. and other A. Red Brn Red Gar at Sp. Contact from 227-229.7
231.6	243.6	12.0		0.05		Nil				—	—	-	—	—	—	0.05	-	Sp	1%	Tr	-	-	-	-	90%	5%	3%	-	-	-	85%	-	-	-		Dp @ 231.6		35° Sec	Dense mottled grey ck. white contains speck is Sp of a black lustrous min. - Assm. Sec. 232-233'
243.6	247.6	4.0		0.02						—	—	-	—	—	—	0.02	-	-	10%	-	-	-	-	-	70%	-	-	-	-	-	-	5%	-	-		Dst Min Anor 243.6-247.6	Low Cont	50°	Dark fine grained ground mass w/ small fell. phenos alt. to green min (mont.?)
247.6	253.4	5.8		0.03						—	—	-	—	—	—	0.03	-	Tr	1%	Tr	-	-	-	-	1%	-	-	Tr	-	-	25%	-	-	-		Dp @ 247.6			Dp as above
253.4	256.4	3.0		0.14						—	—	-	—	—	—	0.14	-	0.5%	Tr	-	Tr	-	-	Tr	2%	Tr	Tr	-	-	-	20%	5%	-	4%				Dp w/ v. fine Cpy and fine grained Bit.
256.4	268.2	11.8		0.01						—	—	-	—	—	—	0.01	-	0.5%	-	-	-	-	-	Tr	15%	30%	40%	-	-	-	2%	-	-	-	Bx. Gar-Dio Trem. 256.4-262.2 Gar. Trem. at 262.2-268.2	Brecciated & Vuggy React. w/ Quartz Rec. Sp. Bit			Zone is bx. w/ vuggy + locally gouey. Rk has lt. tan - green color. Cpy is in a mix of gar, diop, Trem + Retinolite. Trem w/ Gar only seen pinching to 7%. Sulfs are quite sparse.
268.2	272.5	4.3		0.01						—	—	-	—	—	—	0.01	-	Tr	-	Tr	-	-	-	-	65%	40%	40%	-	-	-	2%	-	-	-	Dio. Diop. 268.2-272.5		50°	Mod. green w/ large green elongate Trem.-Retino. and patch of Lt. to dark Red-Brown color.
272.5	282.4	9.9		0.17						—	—	-	—	—	—	0.17	-	4%	Tr	Sp	Tr	-	2%	-	20%	5%	70%	-	-	2%	2%	1% 5%	-	-		272.5' Chan. Bit. Ck.	2" Qtz Gouge Var. 272.5	45°	Soft lt. tan, dull ck of uniform mineralogy + tex. to 279.6. This a Sely. Chlor. Ak.
282.4	289.7	7.5		0.09						—	—	-	—	—	—	0.09	-	2-3%	-	-	-	-	-	-	15%	15-20%	5-70%	-	-	-	Tr	2%	-	-		Trace Gar Ak.	% Sporadic Gar in Med Tactite	70°	Lt. apple green + w. tan, inter mixed fine grained Ak. Faintly Fol. Lt. grn min may be a Sec. as Trem-Retin. fracts are all sealed by bin. gal. Sec. patchy fine grained Sulfs.
289.7	301.6	11.9		0.14						—	—	-	—	—	—	0.14	-	2%	Tr	Sp	-	-	-	-	20%	40%	40%	-	-	-	-	10%	-	-			Bin. Gal. 297.6-301.6 Rk 350-360	52°	Do above w/ varying amts of chlorite.
301.6	315.7	14.1		0.03						—	—	-	—	—	—	0.03	-	1%	Tr	-	-	-	-	-	1%	-	-	4%	Sp	2%	35%	4%	-	-		Dp @ 301.6			Dp: w/ 4% fine grained 2nd Bit + Sulf. 1% of A black lustrous min. Rk is Brk.
315.7	324.5	8.8		0.03						—	—	-	—	—	—	0.03	-	1%	Tr	-	Tr	-	-	-	1%	-	-	Sp	Sp	-	40%	4%	-	-				As above. Rk has a Blast Mz. look. Chlor. is after 2nd. Bit.
324.5	331.8	7.3		0.03						—	—	—	—	—	—	0.03	-	1%	Sp	-	-	-	-	-	Tr	-	-	Tr	-	-	70%	2%	-	-				10% 2nd Bit in v. Silic grnd. mass.

PRELIMINARY GEOLOGIC LOG
(Subject to Revised Logging)
ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-232
Page 2 of 2 Pages
Collar Elev. 2,734.20 Final Depth 617.4
Coords. N 38,351.93 E 14,868.60
Inclination VERTICAL
Logged by N. R. N.
Date: Start 6-14-67 Finish 7-18-67

	Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu N.S.	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
	331.8	340.2	8.4		0.01						–	–	–	–	–	–	0.01	–	–	<1%	–	–	–	–	–	sp.	sp.	–	–	–	–	–	50%	18%	Dr Gneiss			Chlor. is after 2nd Biot. to ≈ 5%. Remaining Chlor. finely disem. prob. due to assim. of sed. by dacite.
	340.2	348.3	8.1		0.04						–	–	–	–	–	–	0.04	–	–	<1%	–	–	–	–	–	tr.	sp.	–	–	–	–	sp.	40%	12%				(" ≈ 7% "
	348.3	356.1	7.8		0.01						–	–	–	–	–	–	0.01	–	–	<1%	–	–	–	–	–	tr.	tr.	–	–	–	–	<1%	55%	8%				" ≈ 5% Gradually lessening of dissem. Chlor.
	356.1	361.0	4.9		0.01						–	–	–	–	–	–	0.01	–	–	tr.	–	–	–	–	–	tr.	tr.	–	–	–	–	sp.	30%	7%				Much less alteration of dacite. Chlor. is predominately after 2nd Biot
	EOH																																					
Re Entry	367.0	371.7	10.7		0.09						–	–	–	–	–	–	0.09	–	–	0.5%	–	–	sp	–	–	–	sp	–	–	? 30%	wk	20%	20%	Aplite	Dike	42°	Silt Alto Dp. Has Uniform Med. Gen Color Derived From V.St. Chlor-Sec. Sp Sulfs + Sp. Tourmaline Assoc., Sharp Walled Aplite Dike Cuts Dp. sp 2nd K-Spar in Dp.
	371.7	373.3	1.6		0.04						–	–	–	–	–	–	0.04	–	–	Tr	Mod	Tr	–	–	–	–	5%	–	–	–	Sp	–	–	Mod	Post M.N Anor. 2.6.2-367.0	Up Tr. Dike	40°	
	373.3	380.5	7.2		0.25						–	–	–	–	–	–	0.25	–	–	Sp	–	–	–	–	–	Tr	5%	60%	30%	–	–	Tr	Tr	3%	Post M.N Anor. 371.7-373.3	Dike Dike	15°	Mod Alto Post M.N Anor. w/ Sp. Cp. + mod Mag. Chlorite in Vns Dike Grunded by Bk zone.
	380.5	389.3	8.8		0.12						–	–	–	–	–	–	0.12	–	–	Sp	–	–	–	–	–	Tr. Sp	5% 35° 77%	60% 55%	30% 45%	–	–	Tr	Tr	3% 2%	Thin Bed Dol. 378.8-Gar. Dol. Tr. Thin Bed Dol. 380.5-381.0 (?)	Possible Bed Possible Bed	15° 10°	Lt Brn Qtz w/ intermixed V. Lt Grn - Silicate believed to be diop-dep Tremolite, Tremolite (?) zone locally. Indicated bedding low ang. Alternating Bands + lenses of Gar. + Dark Silicate Suggest a originally thin-bedded Limes Rk. Also Present is Sp 2nd K-spar and Sp Rhodochrosite Alt. to Cpy
	389.3	398.0	8.7		0.09						–	–	–	–	–	–	0.09	–	–	0.3%	–	Tr	–	–	–	0.03%	10%	45%	40%	–	Tr	–	Tr	Tr	Tr. Gar. Tr. Dol. Gar. Tr. 389-398			Lt Yellow - Tan Gar. + V. Lt Grn Term. irregularly intermixed. Thin bedding evidence, dips Corr. 395. Max. begins to pick up here also.
	398.0	406.3	8.3		0.13						–	–	–	–	–	–	0.13	–	–	0.2%	–	–	–	–	–	0.02%	10%	40%	50%	–	–	–	–	1%	Thin Bed V. Fgrained Bk 398-399	Bed	15-20	This bedded Hf gives way to a mottled gra-epidote-Tremolite Rk which has replaced (?)
	406.3	415.3	9.0		0.12						–	–	–	–	–	–	0.12	–	–	–	–	–	–	–	–	0.01%	5%	50-60% 40%	30-40% 40%	–	–	–	–	–	Gar-Sp-Tremol Bk 399-Tr (?)			Gar. Trem Hf-Tr As Above. Sparse amounts of Cpy. present.
	415.3	424.4	9.1		0.18						–	–	–	–	–	–	0.18	–	–	0.1%	–	–	–	–	–	0.02%	7%	75%	20%	–	–	–	–	3%	Gar (?) - Trem Tr			This Rock is a uniform Lt Brn color w/ Thin irreg. Bands of V. pale green Trem (?)
	424.4	433.0	8.6		0.29						–	–	–	–	–	–	0.29	–	–	0.8%	–	–	–	–	–	Tr	5%	? 60%	30-35%	–	–	–	? 3%	4%	This bed, S.G. w/ Silica Bk 424-433.0	Bed (?)	40°	The Lt Brn Rk is Heavy, fine grained and cuts the lightly Serrated 2nd Foliation Rk. Rk Brittle + Bake Throughout. End appeared Silt (?) zone similarly dipping as above. Gar-Trem Hf-Tr is some what mottled. Sp Cpy assoc. w/ Tabular Qtz.
	433.0	441.0	8.0		0.39						–	–	–	–	–	–	0.39	–	–	0.8%	–	Tr	–	–	–	0.03%	3%	? 40-50	45%	–	–	–	–	1%	Gar-Trem Hf-Tr. Sp Cpy. Assoc. V.L. Grn Sil. Bedded Silt			Gar-Trem Tr-Hf as Above. The V. Thin bedded Silicate Hf is as above. It is quite hard, v. fine grained med. green and tr. pink-Tan bands. Banding has not strong st. Continuity, but appears to be bedding partially this is Silt. development along fracture in Thin Rk.
	441.0	449.3	8.3		0.16						–	–	–	–	–	–	0.16	–	–	2%	10%	Tr	–	–	–	1%	–	–	?	Sp. wk	–	? 8%	10%	Biotite Dp. 441.0	Bed (?)	40°	Intrusive Cy - Dp is dark colored resulting from St. and hornfelsed by intrusive. This Rk shows only about 4% ptz. Cpy is they are quite such Rolls and Rk is not readily visible. The Rk is cut by numerous V. fine Silt. seams + phenocrysts.
	449.3	457.4	8.1		0.11						–	–	–	–	–	–	0.11	–	–	2%	1%	Tr	–	–	–	2%	–	–	?	Sp. wk	–	? 10%	7%	Fine Bed Silt Sh. 449.3-457.4	Silt Sh. Sh. 82 4533-4550		Dp is fine grained as above. Gradation into Silt. Sds. difficult to prepare Slide results inconsist are Salt.
	457.4	465.5	8.1		0.14						–	–	–	–	–	–	0.14	–	–	4%	1-2%	Tr	–	–	–	1%	–	–	?	1	–	? 10%	15%	Fine Bed Silt Sh. 457.4-465.5			Fine grained bed rk which doesn't appear strongly alt. has 20% a Vague Dp look, but I believe it is.
	465.5	474.3	8.8		0.09						–	–	–	–	–	–	0.09	–	–	2%	1%	Tr	–	–	–	–	Sp	–	–	Sp	wk	–	? 30%	15%				Rk Shows good Dp tex and is moderately alt from 465-468. Apparently, Rk as a whole is fresh and the biot. + Mag may be primary.
	474.3	482.2	7.9		0.07						–	–	–	–	–	–	0.07	–	–	1%	2-3%	–	–	–	–	0.02%	1%	–	–	?	wk	–	? 30%	10%		Bore Pr. Pieces 4.33	75-85	Brec. Silt alt to Chlor to 477. Thus Rk becomes stained Red by iron Deposition which was aided by more fissing + shattering Particles around it.
	482.2	490.4	8.2		0.04						–	–	–	–	–	–	0.04	–	–	0.3%	Tr	–	–	–	–	Tr	Tr-Sp	–	–	?	wk	–	? 40%	Sp				Rk is quite light colored and appears to be moderately silicified. Rk is brittle with stands alt. Rk brittle + Bleka.
	490.4	499.5	9.1		0.17						–	–	–	–	–	–	0.17	–	–	0.5%	–	–	–	–	–	0.01%	1%	–	–	?	Sp. wk	–	40%	Tr				As Above.
	499.5	508.5	9.0		0.14						–	–	–	–	–	–	0.14	–	–	0.5%	–	–	–	–	–	0.01%	1%	–	–	?	Sp. wk	–	40%	Tr				As Above
	508.5	515.6	7.1		0.20						–	–	–	–	–	–	0.20	–	–	0.3%	Tr	Sp	–	–	–	Tr	2%	30	60	–	–	–	–	Sp	Dior-Gab Tr Hf Dike 508.5-515.6			Lt Brn fine grained gra-diop. w/ lesser amts of Hf and green (?) Silt
	515.6	524.8	9.2		0.39						–	–	–	–	–	–	0.24	–	–	0.5%	–	–	–	–	–	Tr	2%	30	30	–	–	–	?	Tr	Dior-Gab Tr Hf	Bed (?)	40°	Hf composed primarily of Hf to mold gra grains above in more coarse easily. Sp Tr.
	524.8	533.6	8.8		0.39						–	–	–	–	–	–	0.39	–	–	0.5%	–	1% ?	–	–	–	0.03%	7%	55%	55%	–	–	–	?	Tr		Bed (?)	35°	Mottled mixture of Hf colored Silicates
	533.6	542.7	9.1		0.13						–	–	–	–	–	–	0.13	–	–	0.6%	–	1% ?	–	–	–	0.01%	1%	35%	55%	–	–	–	–	2%		Bed (?)	30°	As Above w/ some zones of Hf. Bandy. Dark red mineral may be Hematite. Quite in Tan frags
	542.7	552.7	10.0		0.16						–	–	–	–	–	–	0.16	–	–	0.5%	–	?	–	–	–	Tr	1%	30%	30%	–	–	Tr	? 30%	? 3%	Sil Sh V. Fg Gr. (?) 552.7-552.7 Gar. - Trem			V. fine grained bedded gneiss. Banding on the order of 1/8-1/4" alternating light and dark gra. Bedding appears strong + regular. Strong 30 to 40° Rk has high gra content, some chlor. Rk is quite brittle + fine grained. Cpy occurring in fracts. Rk is quite brittle.
	552.7	559.4	6.7		0.29						–	–	–	–	–	–	0.29	–	–	0.8%	–	–	–	–	–	0.02%	3%	60%	30%	–	–	–	–	1%				The darker green coloring is pick activation + the lighter green diopside
	559.4	568.8	9.4		0.37						–	–	–	–	–	–	0.37	–	–	1%	–	–	–	–	–	Tr	7%	80%	10%	–	–	–	–	2%				As Above
	568.8	578.5	9.7		0.25						–	–	–	–	–	–	0.25	–	–	1	–	–	–	–	–	1	1	1%	45%	–	–	–	–	2%				As Above
	578.5	587.2	8.7		0.13						–	–	–	–	–	–	0.13	–	–	Sp.	–	Tr ?	–	–	–	Sp	8%	40%	30%	–	–	–	–	1%				
	587.2	595.9	8.7		0.12						–	–	–	–	–	–	0.12	–	–	0.8%	–	–	–	–	–	0.02%	1%	8%	30%	–	–	–	–	5%	Bior-Gab Hf Dike Silt Sh. Sh. TD 580.9 Tr. Hf Dike Assoc. w/ Tr. Gab. Trem Hf Tr.	Bed (?)	10°	Bior-Gab Silt Sh. Sh. is v. fine grained + dense, but alteration is Chlor. The Gab Trem Hf is composed primarily of V. Lt. Grn Gab w/ dominant phases of Sp. Gra. Trem Hf Tr.
	595.9	606.2	10.3		0.26						–	–	–	–	–	–	0.26	–	–	0.5%	–	–	–	–	–	0.02%	1%	15%	50%	–	–	3%	?	1-2%	Gab-Trem Hf Tr. Hf Dike Assoc. w/ Tr. Gab. Trem Hf Tr. Sil Sh. Sh. 595.9-606.2	Bed (?)	47°	Gab-Trem Hf as above. Tr. Gab. is apparent Diopside Tr. Hf. Tr. has Trem Hf is a pale green and med grained Gb which shows the Trem Hf Tr. Trem Hf as Above, Silt Sh. Sh. as below. Rk Alt. but similar bedding appears in Silts.
	606.2	617.4	11.2		0.26						–	–	–	–	–	–	0.26	–	–	0.5%	–	–	–	–	–	0.02%	Sp	5-10%	50%	–	–	30%	?	2%	Tr. Gab. Trem Hf Tr. Sil Sh. Sh. TD 617.4 Tr. Hf Dike Assoc. w/ Tr. Gab. Trem Hf Tr. Sil Sh. Sh. TD END	Bed (?)	50°	This bedded Silt Sh. Sh. as described below.
	E.O.H.																																					

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

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Tt - Tactite
Hf - Hornfels
Mb - Marble
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Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-231
Page 1 of 4 Pages
Collar Elev. 2791.54 Final Depth 1000.2
Coords. N 39,751.74 N E 15,247.89 E
Inclination Vertical
Logged by N.R.N.
Date: Start 6-13-67 Finish 7-10-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Non Visible Non Sulfide Cu	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	5.0	5		0.04										0.04				wk			wk							wk	ok	Mz				Ak			
5.0	10.0			0.04										0.04																							
10.0	15.0			0.02										0.02																							
15.0	20.0			0.01										0.01				Mo																			
20.0	25.0			0.03										0.03																							
25.0	30.0			0.04										0.04																							
30.0	35.0			0.05										0.05																							
35.0	40.0			0.08										0.08																							
40.0	45.0			0.13										0.13														wk-Mod									
45.0	50.0			0.18										0.18																							
50.0	55.0			0.11										0.11																							
55.0	60.0			0.09										0.09																							
60.0	65.0			0.09										0.09																							
65.0	70.0			0.07										0.07														Mod									
70.0	75.0			0.16										0.16																							
75.0	80.0			0.19										0.19																							
80.0	85.0			0.23										0.23																							
85.0	90.0			0.18										0.18																							
90.0	95.0			0.11										0.11																							
95.0	100.0			0.09										0.09																							
100.0	105.0			0.10										0.10																							
105.0	110.0			0.06										0.06																							
110.0	115.0			0.07										0.07				wk																			
115.0	120.0			0.05										0.05																							
120.0	125.0			0.18										0.08	0.10				Tr																		
125.0	130.0			0.47		0.07								0.07	0.25	Approx 0.15			23%																		
130.0	135.0			0.91		0.12								0.12	0.64																						
135.0	140.0			0.88		0.07								0.07	0.66																						
140.0	145.0			0.83		0.08								0.08	0.60																						
145.0	150.0			0.99		0.12								0.12	0.72																						
150.0	155.0			1.60		0.06								0.06	1.39																						
155.0	160.0			2.47		0.02								0.02	2.32													Mod.									
160.0	165.0			1.89		0.01								0.01	1.73																						
165.0	170.0			2.26		0.02								0.02	2.09																						
170.0	175.0			1.25		0.01								0.01	1.09			Sp. wk																			
175.0	180.0			1.28	1.5' @ 1.17 / 0.05'	0.01								0.01	1.12																						
180.0	185.0			1.37		0.01								0.01	1.21																						
185.0	190.0			1.27		0.02								0.02	1.10																						
190.0	195.0			0.70		0.01								0.01	0.54																						
195.0	200.0			0.72		0.01								0.01	0.57																						
200.0	205.0			1.06		0.02								0.02	0.89																						
205.0	210.0			0.62		0.01								0.01	0.46			wk																			
210.0	215.0			0.61		0.01								0.01	0.45																						
215.0	220.0			0.99		0.01								0.01	0.82																						
220.0	225.0			1.27		0.01								0.01	1.11																						
225.0	230.0	5		1.90		0.40								0.40																							

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

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Note (4)
V - Vein
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C - Contact
Ig - Undif igneous

Hole No. D-[illegible]
Page 2 of 4 Pages
Collar Elev. 2791.50 Final Depth 1000.0
Coords. N 33,257.74 N E 10,247.39 E
Inclination Vertical
Logged by N.R.N.
Date: Start 6-13-67 Finish 7-10-67

DRY SAMPLES RELIABILITY GOOD

WATER TABLE

WET SAMPLES - RELIABILITY DECREASES WITH DEPTH

END OF MANAGE DRILL BEGINNING DIAMOND DRILL

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	NV NS	No Sulf.	Cc.	Cpy.	Born.	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
230.0	235.0	5		1.01		0.07								0.07		0.84	0.10		Tr	3%	-	-	-	-	-	0.03%	-	-	-	Nil-ST	Nil	45%		Ak			
235.0	240.0			0.57		0.01								0.01		0.44	0.12			3%						0.02%												
240.0	245.0			0.24		Nil										0.18	0.06			3%						0.02%												
245.0	250.0			0.22		Nil										0.12	0.10			4%						0.01%												
250.0	255.0			0.21		Nil										0.16	0.06			3%						0.02%				ST							Stg alld + Bleached Ak.
255.0	260.0			0.20		Nil										0.15	0.05			2-5%						0.05												
260.0	265.0			0.24		Nil										0.16	0.04			2%						0.04												
265.0	270.0	5		0.30		Nil										0.18	0.12			7%						0.02												
270.0	275.0	5.0		0.21		Nil										0.10	0.11			2-3%						0.01												
275.0	280.0			0.24		0.01										0.08	0.16			5% 8%						0.07												
280.0	285.0			0.31		Nil										0.10	0.21			10%						0.04												
285.0	290.0			0.36		0.01								0.01		0.09	0.26			4%						0.03												
290.0	295.0			0.24												0.06	0.18			5%						0.04												
295.0	300.0			0.35		0.01								0.01		0.06	0.28			4-6%						0.03				Nil ST								
300.0	305.0			0.45		0.01								0.01		0.20	0.24			4%						0.03												
305.0	310.0			0.38		0.01								0.01		0.12	0.25			4%						0.03												
310.0	315.0			0.45		0.01								0.01		0.27	0.17			5%						0.04												
315.0	320.0			0.61	45° @ 0.46	0.03								0.03		0.17	0.41			4%						0.03												
320.0	325.0			0.56	0.01	Nil										0.10	0.46			5%						0.08												
325.0	330.0			0.40		0.01								0.01		0.20	0.19			6%						0.07												
330.0	335.0			0.45		Nil										0.10	0.35			4%						0.09												
335.0	340.0			0.49		0.01								0.01		0.20	0.28			4%						0.08											Sample is contaminated. Some Lavender-vein stained frags from above.
340.0	345.0			0.33		0.01								0.01		0.16	0.17			5%						0.03												
345.0	350.0			0.34		0.01								0.01		0.10	0.23			4%						0.03												
350.0	355.0			0.38	25° @ 0.52	0.01																																
355.0	360.0			0.34	0.009	Nil																																
360.0	365.0			0.85		0.01																																
365.0	370.0	5.0		0.44		0.01																																
370.0	371.0	1.0		0.40		Nil																																
371.0	377.3	6.3		0.24												0.24			-	3%	-	-	-	-	-	0.01%	3%	-	-	6%	Nil	4%	30%	1%	-	-		Med-ST Alto + Bleached Ak, Mal Sulf assoc. w/ qtz vns, bnd [illegible] also. Mal Calcite frags
377.3	388.1	10.8		0.33						Bx						0.33			-	2-3%	-	-	-	-	-	0.03%	2-3%	-	-	6%	1	8%	50%	2%	-	-		As Above. St Calcite on fracs
388.1	395.7	7.6		0.37						Bx						0.31			-	2-3%	-	-	-	-	0.07	0.01%	1	-	-	15%	1	4%	45%	1%			75°	As Above. Sulf strongly assoc. w/ intermixed qtz + sor. Ak + CPY + Py rcks. Mag also assoc.
395.7	404.4	8.7		0.36						Bx						0.36			Sp.	1	-	-	-	-	-	0.05%	1	-	-	3%	1	3%	40%	2%				As Above
404.4	413.7	9.3		0.25						Bx						0.25			-	2%	-	-	-	-	-	0.02%	1	-	-	5%	1	5%	40%	2%				As Above
413.7	422.5	8.8		0.27						Bx						0.27			-	2%	-	-	-	-	-	0.01%	1	-	-	3%	Nil	3%	40%	1%				As Above
422.5	428.7	6.2		0.29						Bx						0.29			-	3%	-	-	-	-	-	0.04%	1	-	-	5%	1	5%	40%	-			New Alt Sec Calc Bleaching	90°	Less alld, Vnd., Less CPY + CPY, some 2nd Bot showing up
428.7	436.9	8.2		0.28						Bx						0.28			-	3%	-	-	-	-	-	0.04%	1	-	-	4-5%	Nil	5%	40%	3%				As Above
436.9	445.6	8.7		0.37						Bx						0.37			-	4-5%	-	-	-	-	-	0.09%	3% UK	-	-	10%	Nil	4%	30%	4%				Variably alld + Bleached. - CPY + CY in wrg. sor-qtz vns - Mag. in thin but qtz vns.
445.6	451.2	5.6		0.20						Bx						0.20			-	10%	-	-	-	-	-	0.17%	5-10% UK	-	-	20%	Nil	15%	60%	-				Strong Mineralized + alld. to sor. - Py has wkly bleached appearance w/ Tac. becoming fuzzy
451.2	465.7	4.5		0.15						Bx						0.15			-	4%	-	-	-	-	-	0.04%	UK	-	-	20-25%	Mod	10%	55%	-				St CY assoc w/ St Qr., CPY + CPY fracs. loc. - Sil'n also assoc. w/ this
465.7	477.2	11.5		0.16						Bx						0.16			-	10%	-	-	-	-	-	0.02%	4%	-	-	20%	1	35%	60%	-			Zone Fib. Qtz + Qr Alt - + Alt St Qtz-Mo Vns 1/4-3/4" St Qtz Unit ck Still Bleach	? Now 90° 60-70°	Strongly Bleach + Locally gouge - St - Zones Cor. Min. less strong - not Advite as first frags
477.2	487.2	10.0		0.11						Bx						0.11			-	10%	-	-	-	-	-	0.27%	3%	-	-	18%	Nil	25%	60%					As Above - intensity of breakage decreasing. More qtz as dehsit vns. [illegible]
487.2	496.0	8.8		0.12						Bx						0.12			-	4%	Tr	-	-	-	Tr	0.17%	3%	-	-	20%	1	11%	60%					Py strongly Bleach from above fft Tac Alt destroyed + St Qtz vnlg. Some 3/4" white Qtz vns assoc. w/ Py, Most + tr CPY. These vns bounded by Sericite zones. Other vns. qtz stained 1/8 and [illegible]
496.0	504.7	8.7		0.19						Bx						0.19			-	7%	-	-	-	-	-	0.20%	2%	-	-	20%	1	30%	65%		V.St Vning 3/8-1" Thick	70-90°	Tac. gradually re-appears starting at 470'. Rhyolite slightly bleach. Vnlg less, Sili. still [illegible]
504.7	513.7	9.0		0.35?						Bx						0.13			-	3%	-	-	? 1%	-	-	0.02%	1%	-	-	15%	Nil	6%	40%					V.St Vning - Qtz-Mo-Py-CPY, Sericite-Qtz, Qtz-Sor-Py-CPY; V.St Mag. Tac frags
513.7	521.9	8.2		0.13						Bx						0.13			-	3%	-	-	? 1%	-	-	0.01%	1%	-	-	10%	Mod	49%	40%		Mag 5-10%			Previous is grey Sor-Mag-Alt. Weakly St Qtz bdrs. 513' - 514' - May not be an aquite. See [illegible] assoc. w/ CPY + Py. - Remainder of Ak bleached + Mag has Ak Tac. Qtz vning much less. [illegible] Ak has mod-St Alcohol bleach. R-Sericite weakly + R-Calc not a lot. - Often [illegible]

PRELIMINARY GEOLOGIC LOG
(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-231
Page 3 of 4 Pages
Collar Elev. 3791.6'
Final Depth 1000.2
Coords. N 37,751.74 N E 13,247.39 E
Inclination Vertical
Logged by N.R.N.
Date: Start 6-13-67 Finish 7-10-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	No Assay Values	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
521.9	530.7	8.8		0.17										0.08		1.17		-	3%	-	-	! Sp	-	-	0.02	0.03	-	-	10%	Mod	8%	46%	-		Ass	Vn. (Qtz-Sil) 1/4" 4" spd Ser-Silic 1/4"	15° 80-90°	Rk becoming less bleached, less of P. felds altd to ser min. more color in K-gray.
530.7	539.3	8.6		0.16										0.01		1.16		-	2-5%	-	-	1%	-	-	Sp	Sp	-	-	5%	Mod	8%	40%	5%	Mod. 1%				P. felds altering to greenish min.; The greenish min. occurs as disem. grains & as assoc. w/ Py.
539.3	547.6	8.3		0.15										0.01		1.15		-	3%	-	-	? 1%	-	-	0.01	Sp. wk	-	-	5%	1	3%	40%		Lo Biot 0.5%				As above. 2nd Biot occurring as wisp of brown Biot. QPY to PY ratio quite low
547.6	557.1	9.5		0.18										0.01		1.18		-	3%	-	-	-	-	-	0.1%	1	-	-	8%	1	12%	50%		Mod 6% Lo Biot 2% Lo Chl		90°+60°	P. felds alt. to gra. ser - Mod - K-felds only wkly bleached. Mod - qtz - ser varing w/ mod moss
557.1	565.1	8.0		0.13										0.01		1.13		-	5%	Tr	-	Tr	-	-	0.03%	1	-	-	20%	1	12%	50%		1				Mas. are primarily thick bands of ser w/ small amts of qtz surrounding PY
565.1	574.2	9.1		0.16										0.01		1.16		-	6%	Tr	-	Tr	-	Sp	0.1%	1	-	-	20%	1	5%	45%	? 80					K gray fine grained unit occurs abundantly between 557 + 574'
574.2	586.7	12.5		0.17										0.01		1.17		-	5%	Tr	-	Tr	-	Tr	0.08%	1	-	-	10%	1	6%	40%		Mod 1%		1/8-1/4 qtz-ser-py-K-felds 1" ser-py	Vert. 60°	Mod RXTD Ak. Calcite on all fracs
586.7	596.2	9.5		0.23										0.02		1.23		-	6%	-	-	-	-	-	0.03%	1	-	-	22%	1	25%	55%						Mod-STLY Vnd + min. - low QPY to PY ratio
596.2	608.4	12.2		0.10										0.01		1.10		-	3%	-	-	-	-	-	0.1%	Sp	-	-	35%	1	8%	38%				St. Fr. N.W. Fr. 603.6' St Fr. 97.	?	Fr. zone is crumbly gouge w/ disseminated sulfides
608.4	621.6	13.2		0.14										0.02		1.14		-	3%	-	-	-	-	-	Tr	Mod	-	-	35%	1	-	35%						As Above. - only Sp QPY
621.6	636.8	15.2		0.12										0.01		1.12		-	1%	-	-	-	-	-	0.01%	Tr-Sp	-	-	15%	Mod-Lo	6%	60%		Mod 1%	Apatite Circa 636' Ak Circa 637'	Bk Bkn, wk bleach Sp.		Rk is bkn + shattered, but intensity decreasing
636.2	645.4	8.6		0.11										0.01		1.11		-	1-3%	-	-	-	-	-	Tr Sp	Sp	-	-	25%	1	6%	45%		Mod 2%		"		As Above, locally g.g. zones w/ concentrated sulfs
645.4	654.1	8.7		0.15										0.01		1.15		-	2-3%	-	-	-	-	-	0.03%	wk	-	-	10%	wk-Mod	7%	45%	2%	Mod 2%				Ak As Above. More as paint + assoc w/ 1/8" rear vert qtz vns
654.1	661.4	7.3		0.26										0.02		1.26		-	2%	-	-	-	-	-	0.02%	wk	-	-	8%	1	5%	45%	1%					Ak As Above - Rk is moderately Bkn
661.4	670.3	8.9		0.13										0.01		1.13		-	1-2%	-	-	-	-	-	Sp	Sp	-	-	3%	1	2%	40%	5%	Mod 3% Bio 2%				As Above. Sulf are assoc w/ altd P felds + Biot. little vn control. P felds altering to gra.
670.3	680.2	9.9		0.11										0.01		1.11		-	1-2%	-	-	-	-	-	0.03%	Sp	-	-	8%	Mod	8%	45%	5%	Mod 3% Bio 2%		Fr. Mylonite 671-686'		Rk is sheared, bkn and locally g.g.
680.2	690.0	9.8		0.10										0.01		1.10		-	2%	? Tr	-	? Tr	-	-	Tr Sp	Sp	-	-	2%	Mod	8%	50%	5%	?				As Above to 686. Thru rk is hard, silic and somewhat bleached looking
690.0	698.5	8.5		0.08										0.01		1.08		-	2%	Tr	-	Tr	-	-	Sp	Sp	-	-	8%	1	5%	45%	8%	?				Rk becomes less silic, more Bkn and has an increase in the alt. of P felds to gra. min.
698.5	708.1	9.6		0.11										0.01		1.11		-	2-3%	Tr	-	Tr	-	-	0.01	2%	-	-	10%	wk-Mod	12%	55%	5%	?		Bleached 698-703'		Mod - St Alt + Bleaching and Qtz ser varing
708.1	716.6	8.5		0.05										0.01		1.05		-	1%	-	-	-	-	-	Tr	Sp	-	-	2%	Mod	6%	38%	3%					wkly Bleached, altd and sparsely mineralized. Calcite on fracts
716.6	725.4	8.8		0.05										0.01		1.05		-	1%	-	-	-	-	-	Sp	Sp	-	-	2%	Mod	6%	40%	3%			1/8" Qtz Vns	90°	As Above.
725.4	734.4	9.0		0.09										0.01		1.09		-	2%	Tr	-	-	-	-	Tr	Tr	-	-	3%	1	8%	50%	3%	Mod 1%				Lt. gra. Alt predt. of P felds alt. increasing towards end of run
734.4	742.8	8.4		0.07										0.01		1.07		-	2-3%	-	-	-	-	-	Tr	Sp	-	-	2%	1	8%	40%	3%	2%	Biot 1%			Re appearance of Biot.
742.8	751.3	8.5		0.06										0.01		1.06		-	1-2%	Tr	-	-	-	-	Tr	Tr	-	-	1%	wk Mod	2%	40%	1%	Biot 3%				As Above
751.3	756.4	5.1		0.05										0.01		1.05		-	2%	Tr	-	-	-	-	Tr	Tr	-	-	2%	1	12%	48%	2%	Sp		1/2" Qtz Vn	70°	As Above. Tra gypsum has blowing "spots"
756.4	764.5	8.1		0.09										0.01		1.09		-	.5%	-	-	-	-	-	tr	tr	-	-	2%	wk Mod	5%	40%	Sp			1/8-1/4 qtz	85°	As Above
764.5	773.6	9.1		0.09										0.01		1.09		-	.1%	-	-	-	-	-	tr	tr	-	-	1%	Mod	11%	30%	Sp			1/8-1/4 qtz		Slight Chl. increase
773.6	781.5	7.9		0.11										0.01		1.11			.1%	-	-	-	-	-	tr	-	-	-	.4%	wk-Mod	2%	42%	Sp					As Above
781.5	789.5	8.0		0.13										0.01		1.13			.09%	-	-	-	-	-	tr	tr	-	-	Sp	Mk	1%	55%	.5%					End of interval becomes more silicic w/ increase in chl. specs.
789.5	799.0	9.5		0.14										0.01		1.14			.5%	tr	-	-	-	-	Sp	-	-	-	4%	Mk	2%	60%	.5%					Generally more silicic
799.0	808.1	9.1		0.55	822'	0.03								Cup 0.03		0.52		-	3%	-	-	-	-	-	Tr	Sp	-	? 50%	20%	Sp	7%	30%	5%	Grp 4%	Ak Grades into silic.	1/8" qtz-PY 1 spd vns	80°-90°	Silic Ak. grades into silic. Ik. gray Ak. The Ik. is cut by numerous Gyp veins and Carrie Sporadic (PY, Bk has 3% and A. Gyp). Tabular PY assoc w/ Gtz vns & Ak.
808.1	816.6	8.5		0.63	@ 0.45 Ni	Nil										0.63		-	5%	-	Tr	-	-	Tr	Sp	Sp	-	? 50%	25%	wk	4%	15%	4%	Grp 7%				As Above w/ zones of PY of B12 and B18'. Assoc of ss Sp + PY has B-B12 to B13
816.6	824.8	8.2		0.32		Nil										0.32		-	3%	-	-	-	-	-	Tr	Sp	-	? 40	-	-	4%	? 30%	4%	Wk-Mod 10% Grp-Sp	grnish @ 821'	Bed	15°	St pink Gtz-ser in mottled pattern may be 2nd K gray. 15° cont w/ fine grained gtz-ser. Mst Gtz assoc w/ Biot or in Qtz vns.
824.8	833.0	8.2		0.64		Nil										0.64		-	6%	Tr	Tr	-	-	Tr	Sp	Sp	-	20%	-	Sp	3%	50%	2%	3%	Grnite + HF intermixed				Intermixed pink and gray dark Hornfels gtz-ser. 8% gyp in very stringers
833.0	840.0	7.0		0.22												0.22		-	2%	-	-	-	-	tr	Sp	Sp	-	60%	3%	-	Sp	35%	6%			Alaskite cont. 850.5'	60°	Greenish rock w/ .5" zone of gypsum, sericite, (Serpentine - 4%)
840.0	850.5	10.5		0.09												0.09		-	4%	-	-	-	tr	Sp.	Sp.	Sp.	-	-	15%	Mod-Sp	6%	65%	Sp.		Alaskite @ 850.5'	Fit - 842.5-845.9	a - 75° b - 45°	Sericite occurs preg. in fr. zone w/ altered feldspars flanking the zone
850.5	859.0	8.5		0.15												0.15		-	1%	-	-	-	tr.	Sp.	Sp.	Sp.	-	-	1%	wk	2%	50%	Sp					Areas of aphanitic texture probably due to silicification.
859.0	867.9	8.9		0.06												0.06		-	.5%	-	-	-	-	tr.	Sp.	-	-	-	-	wk-mod	1%	35%	Sp.					As above. Chlorit. of felds in areas.
867.9	877.1	9.2		0.06												0.06		-	2-1%	-	-	-	-	Tr	0.02	-	-	-	3%	1	5%	50%	Sp	Grp 2%		1" Qtz Vn	2 90°	Wkly Bleached Ak. w/ sparse disem Sulfs + sp sulfs assoc w/ Qtz varing.
877.1	885.6	8.5		0.09												0.09		-	4%	-	Tr	-	-	Tr-Sp	0.01	-	-	-	10%	Mod	8%	65%	5%	Grp 4%		1/8" Qtz vns	60° 80°	V. Sc. Sil'n 881.5-885.6, Sr PY + Bop in vns within zone of Sil'n. PY not assoc w/ Bop.
885.6	893.1	7.5		0.08												0.08		-	<1%	-	-	-	-	Tr	Tr	-	-	-	2%	wk-Mod	5%	40%	2%	Grp 2%				wk. Mod. bleached Ak. I
893.1	902.7	9.6		0.05												0.05		-	<1%	-	-	-	-	Tr	0.01	-	-	-	2%	1	5%	45%	1%	4%	Mod Grp 2%			As Above. - some of P felds are altering to K gra. mont. Gtz vns are very + of various trends
902.7	911.5	8.8		0.10												0.10		-	1%	-	-	-	-	tr	Tr	-	-	-	1%	Mod	12%	55%	1%	1	Grp 2%			As Above
911.5	920.5	9.0		0.05												0.05		-	<1%	-	-	-	-	Tr	Sp	-	-	-	2%	1	6%	45%	Sp	1	Mod Sp			As Above
920.5	929.1	8.6		0.05												0.05		-	<1%	-	-	-	-	-	tr	-	-	-	2%	Mod-St	3%	40%	Sp	Mod <1	Sup 1%			Sulfides preg. in qtz veins.
929.1	937.3	8.2		0.10												0.10		-	1	-	-	-	-	-	tr	-	-	-	1	wk-Mod.	3%	40%	Sp	Mod Sp	1			As Above

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-231
Page 4 of ~~xx~~ Pages

Collar Elev. 2791.54 Final Depth 1000.2
Coords. N 32,751.24 N E 15,347.39 E
Inclination Vertical
Logged by N.R.N.
Date: Start 6/3-67 Finish 7-10-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Cu (1) Pitch	Cu (1) Black	Cu (1) Blue Green		Cu (1) Cc.	Cu (1) Cpy.	Cu (1) Born	Fe (2) Lim.	Fe (2) Py	Fe (2) Mag.	Fe (2) Hem.	Fe (2) Spec.	Other (2) Galena	Other (2) Sphal.	Other (2) Molyb	Other (2) Calcite	Other (2) Garnet	Other (2) Silicates	Other (2) Sericite	Other (2) Clay	Other (2) Vn. Qtz	Other (2) QUARTZ	Other (2) CHLORITE			(3) Rock Type	Structures (4) Depth	Structures (4) True Dip	Remarks
937.3	946.8	9.5		0.09												0.09		-	<1%	-	-	-	-	-	sp.	tr.	-	-	6%	mod-sf	1%	35%	tr		<1%				Most mineralization is in "F" fault zone which is primarily sericite & has dip of 60°
946.8	955.0	8.2		0.04												0.04		-	1	-	-	-	-	-	tr.	1	-	-	3%	wk	3%	30%	tr		1				As above
955.0	960.4	5.4		0.07												0.07		-	1	-	-	-	-	-	tr.	-	-	-	<1%	wk-mod	<1	30%	tr		sp	1	Ak		There is a little bleaching in the feldspars and the texture becomes somewhat vague
960.4	961.5	1.1		0.64												0.64		-	sp	-	-	-	-	-	-	-	-	-	10%	mod	1	3%	-		Most 4%	Fluor 50%	Mz 960.4 - 961.5			Mz may be altered Ak by fluorite rain. Sphene (<1%) assoc. w/ higher Cpy concentration
961.5	972.3	10.8		0.10												0.10		-	<1%	-	-	-	-	-	tr.	-	-	-	1%	mod-sf	1%	35%	tr		Most sp	Gyp <1%	Ak 961.5 - 972.3			A small (.3') zone of Mz appears in this interval. It is otherwise like the preceding Ak
972.3	975.1	2.8		0.12												0.12		-	<1%	-	-	-	-	-	tr.	-	-	-	7%	mod	1	10%	-		Most 5%	Fluor 5%	Mz 972.3 - 975.1			As above Mz
975.1	986.5	11.4		0.02												0.02		-	1	-	-	-	-	-	tr.	-	-	-	sp	wk-mod	<1%	35%	tr		Most sp.	Gyp <1%	Ak			As above Ak. Hydromica appears in area where texture is particularly vague
986.5	1000.2	13.7																-	1	-	-	-	-	-	1	tr.	-	-	1	mod-sf	2%	40%	tr.		Most sp	1	Ak			The rock becomes more aphanitic at the last 1.5' of the interval.
	E.O.H.																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-230
Page 1 of 2 Pages
Collar Elev. 2,762.89 Final Depth 297.0
Coords. N 37,225.95 E 14,928.58
Inclination VERTICAL
Logged by N.R.N.
Date: Start 6-10-67 Finish 6-15-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Hem Pyrite Hem Bx.Fr. Cu	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal. Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	10.0	10.0		.07						—	—	—	—	.07	—	—	—	Rd St	—	—	St	—	—	—	—	—	—	5%	wk	?	40%	1%	Ak			Grains Stl. Hem. STAINED. Some Lim in Gossan; Cuttings 1/16" diam.
10.0	20.0	10.0		.04						—	—	—	—	.04	—	—	—	wk Mod	—	—	Mod St	—	—	—	—	—	—	2%	wk	?	40%	Tr				P. felds Clouded, but don't appear soft. Rock whole not strongly Alt.
20.0	25.0	5.0		.05						—	—	—	—	.05	Tr	—	—	wk	—	—	1	—	—	—	—	—	—	4%	wk-Mod	?	40%					Normal Ak - Mod-St Alt. - Tr. C.C.
25.0	30.0	5.0		.03						—	—	—	—	.03	Tr	—	—	wk	—	—	1	—	—	—	—	—	—	4%	1	?	40%					As Above
30.0	35.0	5.0		.03						—	—	—	—	.03	—	—	—	Mod	—	—	St	—	—	—	—	—	—	3%	1	?	40%					Tex Normal; Lim-Hem becoming coating rather than just stain.
35.0	40.0	5.0		.03						—	—	—	—	.03	—	—	—	Mod	—	—	1	—	—	—	—	—	—	3%	1	?	40%					As Above
40.0	45.0	5.0		.05						—	—	—	—	.01	.03	Tr	—	Sp	3%	—	Sp	—	—	—	—	—	—	4%	wk	?	55%					Abrupt decrease in Hem-Lim and start of Sulf. 3% Py w/only scattered cc. coatings
45.0	50.0	5.0		.23						—	—	—	—	.01	.20	.02	—	Tr	2-3%	—	Tr	—	—	—	—	—	—	4%	wk	?	60%					Sp Hem-Lim; Py fine grained and generally assoc. w/ qtz + ser.
50.0	55.0	5.0		.26						—	—	—	—	.01	.20	.04	—	Tr	2-3%	—	Tr	—	—	—	—	—	—	4%	wk-Mod	?	40%					Normal Tex; P fels. quite white, and not soft.
55.0	60.0	5.0		.16						—	—	—	—	.01	.13	.02	—	Sp wk	1-2%	—	wk	—	—	—	—	—	—	3%	wk-Mod	?	40%					Increase in Hem-Lim decrease in Sulf.
60.0	65.0	5.0		.25						—	—	—	—	.01	.20	.03	—	Tr	2%	—	—	—	—	—	—	—	—	1-2%	wk	?	45%					Abrupt change to No lim-Hem; C.C. coating Tex or absent on most of grains
65.0	70.0	5.0		.028						—	—	—	—	.02	.008	Tr	—	wk Mod	Sp	—	Mod	—	—	—	—	—	—	2%	wk	?	40%					Abrupt change back to Mod lim-Hem, and Immed. decrease in Sulfs. It appears that there may be a lag in sample return w/ caving intervals cleaning.
70.0	75.0	5.0		.012						—	—	—	—	Tr	.012	Tr	—	wk	Sp	—	wk Mod	—	—	—	—	—	—	2%	wk	?	35%					Mod Hem-Lim continues, sucr frags are larger than the ones without lim-hem.
75.0	80.0	5.0		.29						—	—	—	—	—	.20	.09	—	Sp	2%	—	St wk	—	—	—	—	—	—	5%	wk	?	45%					Essentially unaltered and unmineralized
80.0	85.0	5.0		.09						—	—	—	—	—	.09	Tr	—	wk	1%	—	Sp	—	—	—	—	—	—	2%	wk Mod	?	40%					About 1/3 as many Hem-Lim stained frags as nonstained. P. felds present, but quite crumbly
85.0	90.0	5.0		.03						—	—	—	—	—	.03	Tr	—	St wk	1%	—	Sp	—	—	—	—	—	—	4%	1	?	40%					As Above
90.0	95.0	5.0		.04						—	—	—	—	—	.04	Tr	—	1	2%	—	1	—	—	—	—	—	—	8%	1	?	40%					As Above
95.0	100.0	5.0		.10						—	—	—	—	—	.10	Tr	—	Tr	4%	—	Tr	—	—	—	—	—	—	5%	wk	?	40%					St. Ser and Py assoc. Sp cc. on occasional Qtz grains.
100.0	105.0	5.0		.15						—	—	—	—	—	.12	.03	—	—	4%	—	—	—	—	—	—	—	—	5%	wk-Mod	?	40%					As Above, CC. on Qtz
105.0	110.0	5.0		.31						—	—	—	—	—	.30	.11	—	—	2-3%	—	—	—	—	—	—	—	—	4%	wk Mod	?	35%					
110.0	115.0	5.0		.37						—	—	—	—	—	.25	.12	—	—	2-3%	—	—	—	—	—	—	—	—	4%	Mod-St	?	35%					Leached P felds are quite soft + crumbly. Sulf are primarily Cp w/ sp Py + Cc coatings w/ CC - All well disseminated.
115.0	120.0	5.0		.68	20.0' @ 0.49 Ni					—	—	—	—	—	.50	.18	—	—	3-4%	—	—	—	—	—	0.02	—	—	10%	1	?	40%					Mod-St Alt, Mod Min
120.0	125.0	5.0		.47						—	—	—	—	—	.30	.12	—	—	2-3%	—	—	—	—	—	0.02	—	—	10%	1	?	40%					As Above
125.0	130.0	5.0		.43						—	—	—	—	—	.30	.12	—	—	4-5%	—	—	—	—	—	0.01	—	—	10%	1	?	40%					As Above. K-spar retaining pink-purple color while P felds are steadily alt to Ser-Kaolin
130.0	132.5	2.5		.32						—	—	—	—	—	.30	.13	—	—	4%	—	—	—	—	—	0.01	—	—	10%	1	?	40%					As Above. Sulf occurring in larger grains
132.5	135.0	2.5		.35						—	—	—	—	—	.30	.05	—	—	3%	—	—	—	—	—	Sp	—	—	10%	1	?	40%					K-spar being whitened
135.0	137.5	2.5		.50	10.0' @ 0.43 Ni 0.01					—	—	—	—	—	.35	.15	—	—	3-4%	—	—	—	—	—	Sp	—	—	10%	1	?	40%					As Above.
137.5	140.0	2.5		.51						—	—	—	—	—	.35	.16	—	—	3%	—	—	—	—	—	Tr Sp	—	—	6%	Mod	?	40%					K-spar less whitened, P felds altering to reddish clay, to well spread
140.0	142.5	2.5		.36						—	—	—	—	—	.30	.06	—	—	3%	—	—	—	—	—	Tr Sp	—	—	6%	Mod	?	40%					As Above
142.5	145.0	2.5		.23						—	—	—	—	—	.20	.03	—	—	3%	—	—	—	—	—	—	—	—	4%	Mod St	?	40%					As Above. - CC. coating Py for most part as there is very little Hem
145.0	147.5	2.5		.30						—	—	—	—	—	.20	.10	—	—	3%	—	—	—	—	—	1	—	—	4%	1	?	1					As Above
147.5	150.0	2.5		.18						—	—	—	—	—	.16	.02	—	—	3%	—	—	—	—	—	1	—	—	4%	1	?	1					As Above
150.0	152.5	2.5		.34	5.0' @ 0.43 Ni 0.01					—	—	—	—	—	.15	.19	—	—	3-4%	—	—	—	—	—	Tr	—	—	7%	Mod	?	40%					Increase in Hem. Content. CC. occurs as Thin coating on it and some Py
152.5	155.0	2.5		.52						—	—	—	—	—	.30	.22	—	—	3-4%	—	—	—	—	—	Tr	—	—	8%	Mod	?	40%					As Above
155.0	157.5	2.5		.28						—	—	—	—	—	.12	.16	—	Sp	3%	—	—	—	—	—	Tr	—	—	8%	Mod	?	45%					Some Lim stained frags. Possibly some caving. CONTAMINATION FROM ABOVE
157.5	160.0	2.5		.22						—	—	—	—	—	.10	.12	—	—	2%	—	—	—	—	—	—	—	—	4%	Mod St	?	40%					As Above
160.0	162.5	2.5		.24	7.5' @ 0.54 Ni					—	—	—	—	—	.10	.14	—	—	2%	—	—	—	—	—	—	—	—	1	1	?	40%		Ak + Mm			P. felds. mod-st alt to yellowish clay. K-spars only weakly lightened
162.5	165.0	2.5		.89						—	—	—	—	—	.35	.54	—	Tr	2%	—	—	—	—	—	Tr	—	—	5%	Mod	?	37%		"			Most of Sulfs are Cp + CC.
165.0	167.5	2.5		.29						—	—	—	—	—	.09	.20	—	—	2%	—	—	—	—	—	Tr	—	—	5%	Mod St	?	40%		Ak			As Above
167.5	170.0	2.5		.18						—	—	—	—	—	.03	.16	—	—	2%	—	—	—	—	—	Tr	—	—	3%	Mod	?	35%					Rk. Somewhat fresher looking
170.0	172.5	2.5		.23						—	—	—	—	—	.05	.18	—	—	1%	—	—	—	—	—	Tr Sp	—	—	4%	1	?	35%					Increase in Cp/Py ratio, looking more Alt'd. Looking
172.5	175.0	2.5		.16						—	—	—	—	—	.02	.14	—	—	1%	—	—	—	—	—	Sp	—	—	4%	1	?	38%					As Above. Cp looks much impressive than assay shows
175.0	177.5	2.5		.19						—	—	—	—	—	.02	.17	—	—	1%	—	—	—	—	—	Sp	—	—	4%	1	?	35%					As Above
177.5	180.0	2.5		.09						—	—	—	—	—	.01	.08	—	—	1%	—	—	—	—	—	Tr-Sp	—	—	2%	1	?	35%					Somewhat fresher looking
180.0	182.5	2.5		.56	10.0' @ 0.53 Ni					—	—	—	—	—	.08	.48	—	—	3-4%	—	—	—	—	—	Tr-Sp	—	—	4%	wk	?	40%					Notable increase in sul. and Cp
182.5	185.0	2.5		.47						—	—	—	—	—	.05	.47	—	—	3-4%	—	—	—	—	—	Tr-Sp	—	—	7%	wk-Mod	?	40%					As Above

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

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Tt - Tactite
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Hole No. D-230
Page 1 of 2 Pages
Collar Elev. 2,762 ±3'
Final Depth 297.0'
Coords. N 37,885 ±5
E 14,928 ±8
Inclination VERTICAL
Logged by N.R.N
Date: Start 6-10-67 Finish 6-15-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	New Vein Sulf	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
185.0	187.5	2.5		.74						-	-	—	-	-	.10	.64	-	-	8%	-	-	-	-	-	Tr	-	-	-	8%	wk	?	50%		Ax			RK is bleached, apparently resulting from fells group to have less high CaF content, still all calcite
187.5	190.0	2.5		.31						—	-	-	-	-	.07	.24	-	-	2%	-	-	-	-	-	Tr	-	-	-	8%	wk-MM	?	50%					As Above. There is a slight sericitic Clay mineral present
190.0	192.5	2.5		.21						—	-	-	-	-	.05	.16	-	Tr	2-3%	-	-	-	-	-	Tr	-	-	-	6%	1	?	45%					Py content > CPy. Still some CC. Coating Py + CPy
192.5	195.0	2.5		.23						—	-	-	-	-	.02	.21	-	-	1-2%	-	-	-	-	-	Tr	-	-	-	2%	1	?	45%					K-spar only weakly bleached, P. fells veined AND replaced. Sil
195.0	197.5	2.5		.16						—	—	-	-	-	.02	.13	-	-	1%	-	-	-	-	-	Tr	-	-	-	2%	1	?	40%					As Above
197.5	200.0	2.5		.23						—	-	-	-	-	.02	.21	-	-	1%	-	-	-	-	-	Tr	-	-	-	3%	1	?	40%					As Above
200.0	202.5	2.5		.27						-	-	-	-	-	.05	.22	-	Tr	1%		-	-	-	-	Tr	-	-	-	1%	1	?	40%					As Above.
202.5	205.0	2.5		.22						—	—	-	-	-	.05	.17	-	Tr	<1%	-	-	-	-	-	Tr Sp	-	-	-	1%	1	?	40%					Most of Sulf present is CaF
205.0	207.5	2.5		.16						—	-	-	-	-	.02	.14	-	Tr	<1%	-	-	-	-	-	Tr	-	-	-	2%	1	?	40%					Py > CPy
207.5	210.0	2.5		.20						—	—	-	-	-	.01	.19	-	-	1-2%	-	-	-	-	-	Tr Sp	-	-	-	2%	1	?	40%					Increasing Ank + Kz
210.0	212.5	2.5		.11						-	—	-	-	-	.01	.10	-	-	2%	-	-	-	-	-	1	-	-	-	2%	1	?	40%					As Above
212.5	215.0	2.5		.25						—	-	-	-	-	.01	.24	-	-	2%	-	-	-	-	-	Sp	-	-	-	10%	1	?	50%					Must be med amt of qtz-sulf-ser. veing in ess
215.0	217.5	2.5		.21						-	-	-	-	-	.03	.18	-	-	3%			-	-	-	-	-	-	-	7%		?	45%					
217.0	220.0	2.5		.19						—	-	-	-	-	.02	.17	-	-	2-3%				-	-	Tr	-	-	-	5%	1	?	45%					
220.5	222.5	2.5		.16						—	-	-	-	-	.01	.15	-	-	2%	-	-	-	-	-	Tr	-	-	-	5%	MM	?	45%					Slight Contamination from above - Non-veined parted in sample
222.5	225.0	2.5		.33						-	-	-	-	-	.02	.31	-	-	4%	-	-	-	-	-	CaSt	-	-	-	6%	1	?	60%					Must have been qtz sulf veing. Sulf spot up. P. fells still to yellowish clay
225.0	227.5	2.5		.28						—	-	-	-	-	.02	.26	-	-	1%			-	-	-	CaSt	-	-	-	6%	1	?	55%					Less veing, bulg excellent as above
227.5	230.0	2.5		.19						—	-	-	-	-	.01	.18	-	-	4%			-	-	-	Sp	-	-	-	7%	-	?	50%					
230.0	232.5	2.5		.19						—	-	-	-	-	.01	.18	-	-	3%	-	-	-	-	-	Sp	-	-	-	4%	wk-MM	?	45%					Lim. Contamination from above
232.5	235.0	2.5		.27						—	-	-	-	-	.01	.26	-	-	3%	-	-	-	-	-	Sp	-	-	-	4%	1	?	45%					
235.0	237.5	2.5		.25						—	-	-	-	-	.02	.23	-	-	2-3%	-	-	-	-	-	Sp	-	-	-	3%	1	?	45%					Some Flags up to [illegible] long which may be Sow
237.5	240.0	2.5		.21	1	Nil				—	-	-	-	-	-	.21	-	-	2%						Sp				3%								Med Ank + Mis of Typical Ak
240.0	242.5	2.5		.27		.01				—	-	-	-	.01	-	.27	-	-	3%						Sp											As Above
242.5	245.0	2.5		.21		.01				-	-	-	-	.01	-	.21	-	-	2-3%						Sp											"
245.0	247.5	2.5		.22		Nil				-	-	-	-	-	-	.22		-											5%							"
247.5	250.0	2.5		.26		.01				-	-	-	-	.01	Tr	.26													5%							"
250.0	252.5	2.5		.34		.03				-	-	-	-	.03	Tr	.31													5%			50%				Med Qtz veing
252.5	255.0	2.5		.32		.02				-	-	-	-	.02	Tr	.32													5%		?	50%				
255.0	257.5	2.5		.30						-	-	-	-	-	.02	.28	-		3%						0.03%				4%		?	45%				2% Contamination from above
257.5	260.0	2.5		.23						-	-	-	-	-	.01	.22	-	-	4%	-	-	-	-	-	0.01%	-	-	-	4%		?	45%				
260.0	262.5	2.5		.17						-	-	-	-	-	Tr	.17	-	-	4%	-	-	-	-	-	0.02%	-	-	-	4%	1	?	50%				
262.5	265.0	2.5		.22						-	-	-	-	-	.01	.21	-	-	3%	-	-	-	-	-	0.03%	-	-	-	4%	1	?	45%				
265.0	267.5	2.5		.18						-	-	-	-	-	Tr	.18	-	-	3%	-	-	-	-	-	Sp	-	-	-	5%	1	?	45%				
267.5	270.0	2.5		.16						-	-	-	-	-	-	.16	-	-	3%	-	-	-	-	-	Tr	-	-	-	2%	1	?	45%				10% Lim. Contam Stained Ak from above
270.0	272.5	2.5		.23		Nil				-	-	-	-	-	Tr	.23	-	-	2%					-	0.03%	-	-	-	4%	1	?	45%				
272.5	275.0	2.5		.30		.01				-	-	-	-	.01	Tr	.30	-	2%	3-4%	-	-	-	-	-	0.01%	-	-	-	50%		?	50%				2% Intern Lim
275.0	277.5	2.5		.33						-	—	—	-	-	Tr	.33	-	5%	3-4%	-	-	-	-	-	0.03%	-	-	-	3%	1	?	48%				5% Lim Contam
277.5	280.0	2.5		.20						-	—	—	-	-	Tr	.20	-	10%	3-4%	-	-	-	-	-	0.01%	-	-	-	3%	1	?	40%				10% Limonite Stained Ak from above
280.0	282.5	2.5		.18						-	—	—	-	-	Tr	.18	-	1%	3%	-	-	-	-	-	0.01%	-	-	-	3%	1	?	40%				
282.5	285.0	2.5		.16						-	—	—	-	-	Tr	.16		3%	2-3%	-	-	-	-	-	Tr	-	-	-	3%	MM	?	40%				3% Contamination
285.0	287.5	2.5		.11						-	—	—	-	-	Tr	.11		1%	2%	-	-	-	-	-	Tr	-	-	-	1%	wk-MM	?	35%				Wkly Bleached. K-spars are H. pink and P. fells are yellow-white.
287.5	290.0	2.5		.14						-	—	—	-	-	Tr	.14		Tr	1-2%	-	-	-	-	-	Tr	-	-	-	1%	1	?	35%				
290.0	292.5	2.5		.43						-	—	—	-	-	.05	.38		Sp	3%	-	-	-	-	-	0.03%	-	-	-	3%	1	?	40%				Increase in all + Mis
292.5	295.0	2.5		.28						-	-	—	-	-	.01	.27		Tr	4%	-	-	-	-	-	0.02%	-	-	-	3%	1	?	40%				
295.0	297.5	2.5		.25						-	—	—	-	-	Tr	.25		7%	3%	-	-	-	-	-	0.02%	-	-	-	3%	1	?	45%				Much Contamination
E.O.H.																																					

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Number of Holes 1
Hole No. D-237
Page 1 of 2 Pages
Collar Elev 3785
Final Depth 2240
Coords. N 37,425.10 N E 15,261.25 E
Inclination Vertical
Logged by W.R.N.
Date: Start 6-2-67 Finish 6-7-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu N.S.	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
18.0	21.0	3.0		0.07														wk Mod	Tr		wk Mod									Mod	?	40%		Ak			Typical Ak
21.0	24.0	3.0		0.07														St			wk								15%		?	50%					" " Appears to be some Aplite
24.0	27.0	3.0		0.41		0.18												Tr St			wk								20%	wk Mod	?	35%					Sr Jas-Lim. Appear the interval gen. w/ a St. gossan zone
27.0	30.0	3.0		0.32														St							Sp				25%	Mod	?	40%					V.St. Act. Fine Lim. in the above, some Mod. wkly have the above
30.0	33.0	3.0		0.14														wk	Tr		Sp								25%	wk	?	35%	Tr				St. Act.
33.0	36.0	3.0		0.07														St wk	Tr		St								12%	wk	?	40%					Sp's Typical Ak; Bx has some wkly decomposed
36.0	39.0	3.0		0.06														wk	Tr		Sp								10%	wk	?	45%					As Above
39.0	44.0	5.0		0.04														wk			wk								7%	wk	?	40%	Ak + Aplite intermixed				Avout 1/3 of sample is Fine grained Aplite
44.0	49.0	5.0		0.03														St wk	Tr		wk Mod								15%	St wk	?	45%	"				As Above
49.0	54.0	5.0		0.22														/	Tr		Mod								8%		?	40%	Sr Aplite in most of Ak Aplite w/ of Ak				Lim. Stn. in most of Frags.
54.0	59.0	5.0		0.03														wk			wk								2%	St wk	?	40%					Majority gen. is Aplite. This log all Thru Ak
59.0	64.0	5.0		0.16														St	Tr		Sp				Tr				25%	/	?	40%	Sr Aplite Thru Ak				CC. occurring on the fractures on sides
64.0	69.0	5.0		0.49		0.02												St	St		Tr								20%		?	45%	Ak				St. CC.
69.0	74.0	5.0		0.38		0.03																															
74.0	76.5	2.5		0.41		0.02																															
76.5	79.0	2.5		0.50		0.03												Tr	St										8%	St wk	?	45%	Ak				Sp. Jas-Lim. on grains. Sulf. has a low gen. CC. coating
79.0	81.5	2.5		0.53		0.01																															
81.5	84.0	2.5		0.47		0.02																															
84.0	86.5	2.5		0.45		0.02																															
86.5	89.0	2.5		0.49		0.02												Tr	St		Tr								8%	St wk	?	40%	Ak				Typical Ak As Above
89.0	91.5	2.5		0.51		0.01																											Ak				
91.5	94.0	2.5		0.72		0.03																															
94.0	96.5	2.5		0.51		0.02	70.0																														
96.5	99.0	2.5		0.54		0.01	0.060 0.03											St											5%	St wk	?	40%	Ak w/ Aplite				Typical Ak. Ak does not have as much sulf. as the previous sulf.
99.0	101.5	2.5		0.41		0.01																											Ak				
101.5	104.0	2.5		0.49		0.01																											Ak				
104.0	106.5	2.5		0.45		0.01																															
106.5	109.0	2.5		0.38		0.01												St	St		Sp								5%	wk	?	40%	Ak				Typical Ak. Total sulf. up. CC. fracs. with very little coating w/ Grey + Pk
109.0	111.5	2.5		0.48		0.02																															
111.5	114.0	2.5		0.48		0.02																															
114.0	119.0	5.0		0.51		0.02												St	St										8%	wk	?	40%	Ak				Ahead decrease in sulf. Ak has grey CC. coating is thinner and less total sulf.
119.0	124.0	5.0		0.98		0.05												St wk																			
124.0	129.0	5.0		1.39		0.08												St wk	St						St				8%	wk	?	45%	Ak				Total sulf. up. and so also CC.
129.0	134.0	5.0		0.80		0.06																															
134.0	136.5	2.5		0.25																																	
136.5	137.0	2.5		0.22														Tr	St						Tr				5%	St wk	?	40%	Ak				CC. coating becoming predominant
139.0	141.5	2.5		0.14																																	
141.5	144.0	2.5		0.27																																	
144.0	146.5	2.5		0.47	0.01		25.0 0.020											Tr	St						Tr				25%	St wk	?	40%	Ak				Tr. Thru CC. on Frags.
146.5	149.0	2.5		0.14																																	
149.0	151.5	2.5		0.13																																	
151.5	154.0	2.5		0.11																																	
154.0	156.5	2.5		0.11																																	
156.5	161.5	5.0		0.10														Tr	St						Tr				2%	St	?	40%	Ak				[illegible]
161.5	166.5	5.0		0.17																																	
166.5	171.5	5.0		0.33														Tr	St						Tr				5%	St wk	?	40%	Ak				[illegible]

PRELIMINARY GEOLOGIC LOG
(Subject to Revised Logging)

ASARCO-SILVER BELL UNIT

Note (3)
Tt - Tactite
Ht - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Dc - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. [illegible]
Page [illegible] of [illegible] Pages
Collar Elev. [illegible] Final Depth [illegible]
Coords N [illegible] E [illegible]
Inclination Vertical
Logged by [illegible]
Date: Start 6-2-67 Finish [illegible]

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born.	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galeng	Sphal.	Molyb	Calcite	Sarnet	Silicates	Sericite	Clay	Wh. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
171.5	176.5	5.0		0.26											0.07	0.9		-	2%	-	-	-	-	-	Tr	-	-	-	2%	wk	?	40%			Ak			Mid Alto Ak w/ thin CC on Pq-Cpy
176.5	181.5	5.0		0.26											0.10	0.1-		-	2%	-	-	-	-	-	Tr	-	-	-	3%	wk	?	40%						
181.5	186.5	5.0		0.29											0.10	0.19		-	2%	-	-	-	-	-	-	-	-	-	3%	wk	?	40%						Typical Ak.
186.5	191.5	5.0		0.35											0.12	0.23																						
191.5	196.5	5.0		0.34											0.17	0.7		Tr	2%	-	Tr	-	-	-	Tr	-	-	-	2%	wk	?	40%						
196.5	201.5	5.0		0.10											0.07	0.08																						As Above
201.5	206.5	5.0		0.17											0.09	0.08		Sp	3%	-	Sp	-	-	-	-	-	-	-	2%	wk	?	40%						Increase in oxidation, but also increase in total sulf.
206.5	209.0	2.5		0.13											0.05	0.0[illegible]		Tr	2%	-	Tr	-	-	-	-	-	-	-	1%	sp	?	40%						Rk is only sparsely diff.
209.0	214.0	5.0		0.73		0.03	0.78 to 0.79											Sp	2%	-	Tr Sp	-	-	-	Tr	-	-	-	<1%	sp	?	40%						As Above
214.0	219.0	5		0.13											0.02	0.11		Sp	2%	-	Tr Sp	-	-	-	Tr	-	-	-	<2%	sp	?	40%						As Above.
219.0	221.5	2.5		0.11											0.01	0.10		-	Sp	wk	Tr	-	-	-	-	Tr	-	-	-	Sp	-	15%		Post Mz Dike ~~Ak~~			Ad olive green vugs, perhaps in andesite.
221.5	224.0	2.5																																Ak				Dead 1/2 of Rk is lost Mz dike
E.O.H.																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-228
Page 1 of 2 Pages
Collar Elev. 2,767 54
Final Depth 646.5
Coords. N 38,043 63
E 14,863 68
Inclination - VERTICAL
Logged by N.R.N.
Date: Start 6-1-67 Finish 6-14-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Neg. Varigated Non Sulf.	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay-Kaolin	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
Rocky Thry Dump 0.0	83.0																																			
83.0	91.5	8.5		0.06						—	—	—	—	0.06	—	—	—	Nil	—	—	WK	—	—	—	—	—	—	—	35-25%	Mod	?	40%		AK			RK is 65% altd as result of hydrothermal + supergene solutions. S. is has been away of many of the fels
91.5	101.7	10.2		0.21						—	—	—	—	0.06	0.15	—	—	WK	Tr	—	WK	—	—	—	—	—	—	—	30%	?	—	40%		Ore zone Aplite	5%		Ore zone Aplite has aplite 5% caused the ore through a fine grained grey aplite. Grades into RK at both ends
101.7	110.3	8.6		0.06						—	—	—	—	0.06	—			WK Mod	Tr	—	Sp	—	—	—	—	—	—	—	20%	WK	5%	45%					RK has been shattered by faulting and strongly altd and silicified. Tec. Not Ess. AK
110.3	118.3	8.0		0.04						—	—	—	—	0.02	0.02	—	—	WK	Sp	3 Tr	WK	—	—	—	—	—	—	—	12%	Sp WK	5%	35-40%					RK shows strong micro shattering of grains. Aug is fresh, Qtz - yes Nargil Clay devel in RK
118.3	127.7	9.4		0.13						—	—	—	—	0.02	0.11	—	—	WK	0.4%	Tr	2 Sp WK	—	—	—	—	—	—	—	6%	?	3 7%	35-40%					Shattering somewhat decreased, but is still strong. Suite of dikes then becomes altd circa 127.5'
127.7	136.6	8.9		0.39		0.01	36.1' @ 0.57 0.01			—	—	—	—	0.01	0.30	0.08	—	—	4-5%	—	—	—	—	—	?	—	—	—	35%	WK	?	40%		Fl. Dike Strong Throughout			Whole RK is quite broken and faulted, Str. altd and mineralized. Good Cc of Cpy, Tr Born in RK
136.6	144.7	8.1		0.74		0.01				—	—	—	—	0.01	0.65	0.08		—	2-4%	—	—	—	—	—	?	—	—	—	10%	Mod	—	25%		Aplite Dike 145' Tec			Ar. Aqua. Sulfs are Sp in the sulfs portions of Ar. are not in gg. areas. Str. v. fine grained in places
144.7	153.8	9.1		0.55		0.02				—	—	—	—	0.02	0.37	0.16	—	Tr	3%	—	—	—	—	—	Tr	—	—	—	15%	Mod WK	3%	40%		Intermixed Aplite Dike Ar. Sulfs Aqu. Aqu. Sulfs Sp in Ar. Sulfs Sp			Intermixed solid Aqu and Crumbly Aqu
153.8	163.8	10.0		0.61		0.01				—	—	—	—	0.01	0.50	0.10	—	—	2%	—	—	—	—	—	Tr	—	—	—	6%	Mod	1%	30%					RK broken. P. Felds altd to yellow-brown clay. Sulfs fine. Contaminated and assoc. w/ Ar.
163.8	173.2	9.4		0.19						—	—	—	—	Tr	0.15	0.04		—	1-2%	—	—	—	—	—	Tr	—	—	—	2%	WK	—	25%					RK not real strongly altd. K-Spar relens in other P. Felds bleached but still not
173.2	182.0	8.8		0.09						—	—	—	—	—	0.07	0.02	—	—	1-2%	—	—	—	—	—	—	—	—	—	5%	—	—	30%	0.5%				Faulting has caused shattering of grains in surrounding RK.
182.0	191.1	9.1		0.30						—	—	—	—	Tr	0.16	0.15	—	—	1-2%	—	—	—	—	—	—	—	—	—	7%	WK Mod	2%	30%	0.5%	1872'			RK brec. Sulfs begin to increase around 187.6
191.1	200.5	9.4		0.94		0.01	30.1' @ 0.59 0.01			—	—	—	—	0.01	0.20	0.73	—	—	1-2%	—	—	—	—	—	—	—	—	—	25%	?	?	60%	—	Numerous Qtz Vns, Lenses	?		RK is strongly altd and silicified. RK is based with sulfs. The Cpy has the Cc coating
200.5	212.2	11.7		0.46		Nil				—	—	—	—	—	0.15	0.23		—	1-2%	—	—	—	—	—	Tr	—	—	—	8%	WK	5%	28%	0.5%	Qtz. Vns		85°	Mn. decreases back towards normal. Cpy & Py sulfs approaches one
212.2	221.2	9.0		0.36		0.02				—	—	—	—	0.02	0.10	0.24		—	2-3%	—	—	—	—	—	Sp	—	—	—	7%	WK	3%	35%		Qtz-Sec-Sulf Vns		60°	Vns are not sharp walled. They are rounded, intermixed Qtz-Sec sulfs along central line
221.2	230.0	8.8		0.23						—	—	—	—	Tr	0.02	0.21		—	1-2%	—	—	—	—	—	Sp	—	—	—	4%	WK	2%	30%		Qtz-Sec-Sulf Vns		65-70	Vns are sharp walled. Some are rounded, intermixed Qtz-Sec sulfs along central line
230.0	238.6	8.6		0.45		0.02	88.4' @ 0.67 0.02			—	—	—	—	0.02	0.55	0.38	—	—	2-3%	—	—	—	—	—	Tr	—	—	—	7%	WK Mod	4%	35%		Qtz-Sec-Sulf Vns	60°	45°	Sulfs seen w. Qtz-Sec. Sulf
238.6	247.9	9.3		0.22						—	—	—	—	Tr	0.02	0.20		—	1-2%	—	—	—	—	—	—	—	—	—	2%	WK	2%	30%					Typical RK
247.9	256.8	8.9		0.17						—	—	—	—	—	0.05	0.12		—	3%	—	—	—	—	—	Sp	—	—	—	15%	WK Mod	3%	45%		Qtz-Sec-Sulf Veins	Near Vn		Bleaching Fels. AK
256.8	265.4	8.6		0.17						—	—	—	—	—	0.02	0.15		—	2-3%	—	—	—	—	—	Tr Sp	—	—	—	7%	WK	3%	45%					Intermix. Bleaches AK
265.4	274.6	9.2		0.37		Nil				—	—	—	—	—	0.02	0.35		—	3%	—	—	—	—	—	Sp	—	—	—	8%	WK	4%	40%		Qtz-Sec-Sulf Veins		80°	Qtz Vns
274.6	283.0	8.4		0.40		0.01	84.0' @ 0.40 0.01			—	—	—	—	0.01	0.02	0.37		—	4%	—	—	—	—	—	Sp Py	—	—	—	5%	WK	2%	50%		Qtz-Sec-Sulf Veins		270°	Vns are / Qtz Qtz w/ Tr Cpy coating as blebs and in masses Seams
283.0	291.6	8.6		0.31		0.01				—	—	—	—	0.01	0.05	0.25		—	4%	—	—	—	—	—	—	—	—	—	5%	1	18%	65%					Tec becomes Non Typical RK. Strongly bleached
291.6	302.0	10.4		0.40		0.02	104.0' @ 0.40 0.01			—	—	—	—	0.02	0.02	0.36		—	3%	—	—	—	—	—	Sp	—	—	—	15%	1	15%	50%		Qtz-Sec-Sulf Veins			Str. Also is altered
302.0	313.1	11.1		0.27						—	—	—	—	—	0.02	0.23		—	2%	—	—	Sp	—	—	Tr	—	—	—	5%	WK	2%	40%					Intermixed Tec. Fels altd and bleached, Tec becomes dissemp. Sulfs. Sulfs seen in Tec.
313.1	324.4	11.3		0.23						—	—	—	—	—	0.01	0.22		—	2%	—	—	Tr	—	—	Tr	—	—	—	7%	WK	1%	45%					RK Bleaches. Sulfs comes also up. Sulfs are in the area
324.4	330.0	5.6		0.23						—	—	—	—	—	0.02	0.21		—	2%	—	—	—	—	—	Sp Sp	—	—	—	5%	WK	1%	60%	43				
330.0	338.5	8.5		0.16						—	—	—	—	—	Tr.	0.16		—	1%	—	—	—	—	—	0.5% WK	—	—	—	4%	WK	1%	50%	2%				Intermixed Tec. Fels altd intermixed
338.5	345.3	6.8		0.20						—	—	—	—	—	Tr.	0.20		—	2%	—	—	—	—	—	Sp Tr Sp	—	—	—	2%	WK	2%	35%	4%				
345.3	354.3	9.0		0.17						—	—	—	—	—	Tr.	0.19		—	2%	—	—	—	—	—	Tr Sp	—	—	—	1%	1	1%	45%	5%	Rocky Tuff 353.7	Skin Stains	Mod 45°	Bleached RK is increasing amts of pale green alty mineral (mica?) 353.7-356. The RK has
354.3	363.4	9.1		0.43		Nil	91.0' @ 0.43 0.01			—	—	—	—	—	0.14	0.29		—	4-6%	—	—	—	—	—	Sp Sp	—	—	—	1%	Sp	7%	40%	5%				Fine Tec. Tec is intermixed with bleached RK and has quite a number of sulfs
363.4	372.0	8.6		0.29						—	—	—	—	—	0.14	0.15		—	2%	—	—	—	—	—	Tr Sp	—	—	—	4%	Sp WK	5%	50%	3%			50°	RK is altered and strongly mineralized. Sulfs are also disseminated. The RK is also as well as the Tec
372.0	380.3	8.3		0.33						—	—	—	—	—	0.10	0.23		—	3%	—	—	—	—	—	Sp Sp	—	—	—	8%	WK	5%	50%	4%			50°	Strongly altered and silicified. RK is based with sulfs.
380.3	388.2	7.9		0.12						—	—	—	—	—	0.01	0.11		—	2%	—	—	—	—	Tr	Sp Tr	—	—	—	6%	WK	2%	60%	5%			70°	Strongly altered and silicified. Tec. pitch veins replaced by sulfs. A
388.2	396.9	8.7		0.12						—	—	—	—	—	0.03	0.09		—	2%	—	—	—	—	—	Tr Tr	—	—	—	2%	WK	1%	50%	3%				Mod Silicified + Bleached
396.9	405.8	9.9		0.15						—	—	—	—	—	0.07	0.08		—	2%	—	—	—	—	—	Sp Sp	—	—	—	2%	WK	1%	55%	2%				Str. altd. surrounding and cutting the bleaching fels. Few stringers Tec. in the area.
405.8	415.3	9.5		0.07						—	—	—	—	—	Tr.	0.07		—	4%	—	—	—	—	—	Sp Sp	—	—	—	2%	WK Mod	5%	70%	2%				Str. decreases and assoc. w. complete loss of Tec. Starting above 413.1 Mod altered RK
415.3	424.5	9.2		0.81		0.01	82.4' @ 0.68 Nil			—	—	—	—	0.01	0.05	0.15		—	6%	—	—	—	—	—	—	—	—	—	5%	Sp	?	80%					RK is almost all replaced by silica. Mod sulfs assoc. Brecciation pre min.
424.5	432.9	8.4		0.50		0.02				—	—	—	—	0.02	0.06	0.42		—	5%	—	—	—	—	SP	0.5%	—	—	—	—	—	?	80%					is Above. Str. altd + Cpy, Mod Aqu. & Tec. fragts
432.9	439.6	6.7		0.44		Nil				—	—	—	—	—	0.04	0.40		—	5%	—	—	—	—	—	Sp	—	—	—	5%	Sp	?	80%					As Above w. Aqu. Tec. coming back
439.6	447.6	8.0		2.13		Nil				—	—	—	—	—	0.15	1.98		—	10%	—	—	—	—	—	Sp	—	—	—	10-5%	WK	2%	70%					Str. altd. fels. w/ Sulfides. RK has undergone faulting. Tec. present
447.6	458.2	10.6		0.56		Nil				—	—	—	—	—	0.07	0.49		—	5%	—	—	—	—	—	Sp Sp	—	—	—	5%	WK	2%	60%					RK has a wide Tec. has been bleached and has to smaller w. stringers. Tec. has shown of [illegible]
458.2	465.4	7.2		0.06						—	—	—	—	—	Tr.	0.06		—	1%	Tr	—	—	—	—	Sp Sp	—	—	—	2%	Sp	5%	80%					RK has a wide Tec. but appears to be altd strongly bleached and silicified
465.4	477.7	12.3		0.05						—	—	—	—	—	—	0.05		—	1%	Tr	—	—	—	—	Sp Sp	—	—	—	2%	Sp	5%	60%					RK becomes somewhat finer grained and takes on a look similar to porphyritic [illegible]

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. 8-278
Page 2 of 2 Pages

Collar Elev. 2,767.54 Final Depth 646.5'
Coords. N 38,043.23 E 14,863.66
Inclination VERTICAL
Logged by N.R.N.
Date: Start 6-1-67 Finish 6-14-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py.	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Moly.	Calcite	Garnet	Silicates	Senarite	Clay	Vn. Qtz.	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
177.7	186.6	8.9		0.21												0.21																					Sc. 225 introduction as thickness 6.9'. Vn. [illegible] Most known alteration
186.6	195.4	8.8		0.16												0.16																					Bleached. [illegible] Ak
495.0	503.7	8.3		0.10												0.10																					Weak bleached Ak
503.7	512.7	9.0		0.10												0.10																					As Above
512.7	522.0	9.3		0.09												0.09																			55.3		As has bleached less, but [illegible]
522.0	533.0	11.0		0.09												0.09																					Moderately bleached Ak. Sulfs well disseminated but low total volume. Sulfs primarily Py
533.0	540.8	7.8		0.08												0.08																					As above except More Sph & Mo's
540.8	550.2	9.4		0.10												0.10																				65°	Ak. Bleached Ak. Sulfs. replacing Ak fels and segregated in Mod grained
550.2	561.3	11.1		0.08												0.08																			5338	45°	Aplite is much less mineralized, but [illegible] on some fracts
561.3	566.8	5.5		0.09												0.09																					Not bleached, sparsely mineralized Ak
566.8	575.5	8.7		0.10												0.10																				85°-90°	Not to strongly bleached, quite a lot of Mos on fracts. Ak approx dense
575.5	584.5	9.0		0.10												0.10																			588.8	30°	As Above
584.5	593.6	9.1		0.15												0.15																				85°	As Above. That which is being called chlor may be sericite or Muscovite, but generally less sulfs as soon
593.6	603.3	9.7		0.09												0.09																				60°	Sulfs has been strongly fractured and subsequently silicified
603.3	606.2	2.9		0.57												0.57																		Vuggy 603-606.5	Fr. Zone 15 606-606.9	?	Recrystallized Vuggy. High quartz zone, probably originally a fill fracture. High cpy cont.
606.2	621.1	14.9		0.09												0.09																		Ak		?	Strongly veined and invaded by Qtz. Fels are all chlor-pyr in fracs see fill's above. 606-612.3
621.1	623.9	2.8		0.02																5%																90°	Aplite Dip 65°. Olive-Yellow Green, Fine to Med grained. Mafics are still 4 mm from [illegible]
623.9	634.0	10.1		0.10												0.10																		Ak			Bleached, looking like K fels but only slight pink color. Ak is primary sulf and
634.0	641.9	7.9		0.10												0.10																				65°	Ak is laced w/ Qtz stringers. Mo + Sph noticeably stronger. Sulf mineral Py, but Cpy is not
641.9	646.5	4.6		0.05												0.05																					Ak is only sparsely veined and quite weakly mineralized, but still moderately bleached
E.O.H																																					

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-227
Page 1 of 1 Pages
Collar Elev. 2,765.91
Final Depth 2462
Coords. N 37,749.47 N E 14,854.90 E
Inclination Vertical.
Logged by N.R.N.
Date: Start 5-29-67 Finish 5-31-67

	Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov	Sp. Gr.	Cu (1) Chrys.	Pitch.	Black	Blue Green	New Green Non Sulfide	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem.	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
Rock Bit	0.0	76.0	76.0																																			
	76.0	84.1	8.1		Nil						-	-	-	-	-	-	-	-	Hem	Tr	-	Mz	Tr	-	-	-	-	-	7%	Mz	7	25%			Ax			Normal Ax Tzd, wk bleaching, Hem vn wk brecciated of Kspar and slip Bxx to Qtz
	84.1	93.8	8.9		.02						-	-	-	-		0.02	-	-	wk Mzd	Tr	Sp Mz	-	-	-	-	-	-	-	10%	Sp	4%	35%						Tzd mostly replaced by Qtz stringers and Sp disseminated throughout
	93.8	102.5	8.7		.02						-	-	-	-		0.02	-	-	wk Mzd	Tr	-	Mz	-	-	-	-	-	-	12%	Mz Sp	10%	25%						Tzd mostly replaced or stringered by Kspar etc.
	102.5	111.7	9.2		.08						-	-	-	-	-	0.08	Tr	-	Mzd	Tr	-	Sp	-	-	-	-	-	-	12%	Sp	2%	35%						Tzd Rock Bxing Qtz vns, Hem vns, Sp vns, Cpy vns, Kspar Vns
	111.7	121.5	9.8		.45	.02					-	-	-	-	-	0.02	0.21	0.22	-	Tr	8%	-	-	-	-	-	Sp	-	-	-	7%	Mz	100	38%		Ax Rhyolite 111.7-117.1 Andesite Ax 117.1-121.5 Tzd	40° 90°		Kspar bleaching is light pinks & tans due to large amounts of Hem & Cpy & Sulfide in the Qtz
	121.5	132.7	11.2		.55	.01					-	-	-	-	-	0.01	0.40	0.41	Sp	4%	-	-	-	-	-	-	Tr	-	-	-	10%	Mz	8%	35%					Less Sericite & Ax. Most of alt. confined to large qtz-Sulf vns
	132.7	143.5	10.8		.20						-	-	-	-	-	Tr	0.10	0.10	Tr	2%	-	-	-	-	-	-	Tr	-	-	-	12%	wk Mz	2%	15%	3	Ax Quart Sericite Tzd Tuffs			St alt. Tzd Kspar weak
	143.5	151.7	8.2		.10						-	-	-	-	-	Tr	0.05	0.05	-	2%	-	-	-	-	-	-	Sp	-	-	-	5%	1	-	30%	3				Normal Ax Tzd, wk bleaching of Qtz vns, Sericite seen in Fine vns Qtz vns
	151.7	160.9	9.2		.26						-	-	-	-	-		0.07	0.19	-	4%	-	-	-	-	-	-	Sp	-	-	-	6%	1	3%	35%	4%				wk Mzd Qtz vns
	160.9	169.1	8.2		.35						-	-	-	-	-		0.05	0.20	-	3-4%	-	-	-	-	-	-	Sp	-	-	-	8%	1	8%	45%					Ax moderately fresh Sec & mostly clay sericitized
	169.1	177.5	8.4		.20						-	-	-	-	-		0.05	0.15	-	2-3%	-	-	-	-	-	-	-	-	Tr	0.6%	-	-	5%	1	7%	40%					Nonmoss 1/2 qtz veins, MoS2 along mar. fract.
	177.5	185.2	7.7		.18						-	-	-	-	-		0.02	0.16	-	1-2%	-	-	-	-	-	-	Sp	-	-	-	7%	Mz	6%	35%					Normal Ax
	185.2	194.4	9.2		.24						-	-	-	-	-		0.04	0.20	-	4%	-	-	-	-	-	-	Sp	-	-	-	8%	-	?	45%					St. Ax + Mz 85.2-88.2. Ax arenaceous in qtz + sec to 165
	194.4	203.0	8.6		.28						-	-	-	-	-		0.02	0.26	-	1-2%	-	-	-	-	-	-	Tr	-	-	-	10%	1	7%	40%					Sulfs in green clumps which are linearly mineralized
	203.0	212.6	9.6		.16						-	-	-	-	-		0.01	0.15	-	1-2%	-	-	-	-	-	-	Sp	-	-	-	10%	Mz Sp	?	45					Sulfs 2500-4% St. Sericitized or sericitized
	212.6	222.4	9.8		.19						-	-	-	-	-		0.01	0.18	-	4%	-	-	-	-	-	-	Sp	-	-	-	5%		7%	40%					Cpy + Py rd a qtz. Sulfs well seen. Some Sulfides in the Mz + Ax
	222.4	231.1	8.7		.22						-	-	-	-	-		0.01	0.21	-	2%	-	-	-	-	-	-	Sp	-	-	-	7%	1	7%	35%					As Above
	231.1	240.5	9.4		.24						-	-	-	-	-		0.01	0.23	-	1-2%	-	-	-	-	-	-	Sp	-	-	-	7%	1	7%	35%					Sulfs less and not sericitized. Cpy-Py phenocrysts, still seems to be a bit poor in Cpy
	240.5	246.2	5.7		.15						-	-	-	-	-		Tr	0.15	-	1%	-	-	-	-	-	-	Sp	Tr	-	-	3%	1	6%	30%					Total Sulfs down still trace of CC. The trend of white & Calcareous Qtz Seen in Core
	E.O.H.																																					

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-226
Page 1 of 1 Pages
Collar Elev. 2,768.54 Final Depth 365.7
Coords. N 37,887.88 N E 24,274.48 E
Inclination VERTICAL
Logged by N.R.N.
Date: Start 5-25-67 Finish 5-29-67

	Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Tentatively Cu as it is Limonite	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
Rock Bit	0.0	105.0																																				
	105.0	113.8	8.8		.02						Tr	—	—	—	.02	—	—	—	Sp	Tr	—	St	—	—	—	—	—	—	—	8%	wk	4%	27%		Ak	1" Qtz Vng 111.2-112.8	? 70°	St Hem Stain to 111.5 then becomes wk; Typical Ak Tex.
	113.8	123.3	9.5		.02						(+)	—	—	—	Tr	.01	—	—	Wk	Tr	—	Sp	—	—	—	—	—	—	—	8%	Mod	<1%	25%			"		Solid @ 123.3
	123.3	132.9	9.6		.53		.02				.02	—	—	—	—	.45	.06	—	Tr	3%	—	—	—	—	—	—	—	—	—	6%	Mod	7%	25%			Track Disp. @ 127.3	?	ST Alt + Bleaching assoc w/ CC zone
	132.9	141.9	9.0		.49		.01				—	—	—	.01	—	.43	.05	—	Tr	3%	—	—	—	—	—	—	—	—	—	7%	Mod	—	8%					Qtz Cont. Abnormally Low. K-spar somewhat leached, P. fells altering to kaolinite(?)
	141.9	151.0	9.1		.49		.01				—	—	—	.01	—	.43	.05	—	Tr	3%	—	—	—	—	—	—	—	—	—	8%	wk Mod	—	22%			Solid Frame Throughout	90°	
	151.0	160.4	9.4		.74		.02				—	—	—	Tr	Tentative .02	.66	.08	—	Wk	3-4%	—	Sp-wk	—	—	—	Tr	—	—	—	1	1	≤ 2%	25%					Mod Alt. plag to Ser. K spar cloaded + somewhat alt. CC abig seams + diss. - sooty
	160.4	170.0	9.6		.79		.03				—	—	—	.01	.03?	.68	.09	—	1	1	—	Tr	—	—	—	—	Tr(-)	—	—	1	1	1? 25-30%	Tr					As above. Core slightly leached & end run w/a Tr of gen cuox
	170.0	174.3	4.3		.62		.07				—	—	—	.07	—	.51	.04	—	Wk-Mod	2%	—	Tr	—	—	—	1	—	—	—	1	1	Tr	25	Tr 2%		GG FLT Zone? 80° GG FLT Zone? 115' 60°	Steep 70°? Steep 60°?	As above More leaching
	174.3	180.1	5.8		.98		.02				—	—	—	.02?		.96?	Tr	—	1	Tr?	—	Sp	—	—	—	Tr?	—	—	—	5%	Mod	—	25%	Tr?				GG FLT ZONE? Mainly leached w/some py, cc, cpy?
	180.1	189.2	9.1		.51		.03				—	—	—	.03		.43	.05	—	Sp-wk	1/2%	—	Tr	—	—	—	Tr	Tr	—	—	5?	20%	Tr	25%	Tr				Mod Alt. mainly clay Alted felds. Vuggy text @ 1st of run may be due to removal of bright bottle-dat black mineral may contain soty cc but looks like MnOx
	189.2	198.1	8.9		.59		.09				—	—	? .06?	—	Tentatively Cuox is Lim. .03	.45	.04	—	1	1	—	1	—	—	—	1	—	—	—	20%	25%	5-10%	20%	1				As above felds alt to clay stained it br by lim
	198.1	207.4	9.3		.54		.10				—	—	? .06?	—	.04	.41	.03	—	1	1	—	—	—	—	—	1	—	—	—	25?	1	1	1	1				As above some 2nd K spar regrowth? replacing orig. K spar
	207.4	216.0	8.6		.52		.13				—	—	.13	—	Tr	.42	Tr	—	Sp	3-4%	—	—	—	—	—	—	1	—	—	—	1	1	8- 10%	30%	1				As above blk MnOx-like mineral drops
	216.0	226.0	10.0		.35		.01				—	—	.01	—	Tr	.29	.05	—	Tr-Sp	1	—	—	—	—	—	—	1	—	—	—	1	5%	1	1	1				As above, no blk MnOx-like MX but cc coats [illegible] + some py. only tr 2nd K spar
	226.0	236.4	9.4		.21		.16				—	—	—	—	—	.12	.09	—	Tr	3%	—	—	—	—	—	—	1	—	—	—	20%	1	1	1	1				As above
	236.4	245.4	9.0		.11						—	—	—	—	—	.05	.06	—	Tr	3-4%	—	—	—	—	—	—	—	—	—	20%	1	4%	30%			G & Tour 235.4-245.5 G.S. Tour @ 239.4 Int 245.4	80°? 40°-60°	ST ALT Assoc w. flt. zone
	245.4	254.5	9.1		.19						—	—	—	—	—	.05	.14	—	Tr	2-3%	—	—	—	—	—	Tr	—	—	—	5%	wk Mod and	1%	27%	1				Typical Ak. Solid replacing P. felds or in fracs lined by ser.
	254.5	262.6	8.1		.16						—	—	—	—	—	.08	.08	—	—	2-3%	Tr	—	—	—	—	—	—	—	—	3%		1%	4%	Sp				P. felds altering to a serecite product
	262.6	271.3	8.7		.36		.01				—	—	—	—	—	.16	.20	—	Tr	3%	Tr	—	—	—	Tr	Tr-Sp	—	—	—	5%	1	10%	35%	2%		Qtz Solving in 1/2" Thick	75°	More strongly veined than previous
	271.3	279.4	8.1		.53		N.1				—	—	—	—	—	.38	.15	—		3%	—	—	—	—	—	Tr-Sp	—	—	—	8%	1	8%	30%	5%				Ak Cut by frequent soft seams and patches. Ser. Surrounds Sulfs
	279.4	288.0	8.6		.22						—	—	—	—	—	.11	.11	—	—	4%	—	—	—	—	—	Sp	—	—	—	15%	1	4%	33%	3%		Ap. to @ 287.3 Ak @ 288.0		As Above
	288.0	296.4	8.4		.35						—	—	—	—	—	.20	.15	—	—	3%	—	—	—	—	—	Tr-Sp	—	—	—	15%	1	3%	35%	2%				Ak is Bleach Tex. Rk is moderately bleached looking
	296.4	305.6	9.2		.36						—	—	—	—	—	.18	.18	—	—	7%	Tr	—	—	—	—	1	—	—	—	40%	5-15%	?	45%			Sec-Sulf-Qtz Seam 1/4"	40°	Extremely altered Rk. Tex destroyed, sulfs well dispersed mainly Py + lesser Mg + Tr Cu
	305.6	314.1	8.5		.27						—	—	—	—	—	.17	.10	—	—	4%	—	—	—	—	—	Tr-Sp	—	—	—	30%	10%	4%	40%			1/4" Qtz-Sulf Vng 1/8" Qtz-Sulf Vng	45°	Tex. for most part destroyed by p's - ser.
	314.1	323.3	9.2		.18						—	—	—	—	—	.08	.10	—	—	3-4%	—	—	—	—	—	Sp	—	—	—	25%	10%	3%	38%			Shearing Qtz-Sulf 1/2	~70° 60°	Tex. still vague. Rk fairly well broken up. Some qtz seams
	323.3	332.5	9.2		.20						—	—	—	—	—	.05	.15	—		6%	—	—	—	—	—	—	—	—	—	22%	10%	8%	40%					As Above
	332.5	345.5	13.0		.16						—	—	—	—	—	.05	.09	—	—	4%	—	—	—	—	—	Sp	—	—	—	20%	10%	15%	40%			2" Qtz-Sulf Vng @ 342.2	35°	Rk is quite broken. Sulfs seams + veinlets up to 1/2" wide. Weak Ak Tex
	345.5	354.4	8.9		.12						—	—	—	—	—	.02	.10	—	—	5%	—	—	—	—	—	Sp	—	—	—	10%	7%	7%	35%					Tex. Coming back
	354.4	365.7	11.3		.13						—	—	—	—	—	.05	.08	—	—	3%	—	—	Sp	—	—	Sp	T.	—	—	8%	7%	3%	30%					Bleached Ak
		EOH																																				E.O.

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-225
Page 1 of 1 Pages
Collar Elev. 2,775.59 Final Depth 219.1
Coords. N 37,732.99 N E 14,501.91 E
Inclination VERTICAL
Logged by N.R.N.
Date: Start 5-22-67 Finish 5-25-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Cu (1) Pitch	Cu (1) Black	Cu (1) Blue Green	Cu (1) Nat. Cu Non-Sulf. Cu	Cu (1) Cc.	Cu (1) Cpy.	Cu (1) Born	Fe (2) Lim.	Fe (2) Py	Fe (2) Mag.	Fe (2) Hem	Fe (2) Spec.	Other (2) Galena	Other (2) Sphal.	Other (2) Mo/Yb.	Other (2) Calcite	Other (2) Garnet	Other (2) Silicates	Other (2) Sericite	Other (2) Clay	Other (2) Vn. Qtz.	Other (2) QUARTZ	Other (2) CHLORITE	Other (2) Nonsulf. Cu	(3) Rock Type	Structures (4) Depth	Structures (4) True Dip	Remarks
Rock Bit 0.0	91.0	91.0																																				
91.0	100.4	9.4		.04										.04				Ak											2%						Ak	Shear 30° at 6/6 Vn-1/8" 110.8-111.9'		Normal Ak Tex
100.4	113.9	13.5		.04										.01	0.03			Ak	Py		Ak								6%	Ak?	15%	15%	Tr		"			" " "
113.9	120.9	7.0		.11										.01	0.10			Sp	3%										40%	Ak ?		40%			"			Sulfide Contact @ 113.9'; Intens. Sec. alt. results in decomposition & development of small cavities
120.9	130.4	9.5		.21										.01	0.10	0.10		Sp	20%							Tr			30%			40%			"			Complete alt. to qtz - Ser ; Py occurs in well disseminated patches 1/8" to 1/4" diameter
130.4	139.8	9.4		.22											0.08	0.14		Tr	5%							0.5%			10%	Ak	2%	35%			"	Sulf. Sericite 1/16" to 1/8"	80°	Normal Ak Tex. toward end of run
139.8	148.6	8.8		.09											0.02	0.07		Tr	3%							0.05%			7%	Sp	<1%	25%	2%		"			" " " Sulf veinlets bounded by ser., but essentially no qtz
148.6	157.5	8.9		.06											0.02	0.04		-	2%							Tr			5%	Sp Ak		30%	2%		"			" " " Original Rk contained Approx. 2% lde, but primary bin.
157.5	166.8	9.3		.11											0.02	0.09		-	2%							Tr			10%	Ak	3%	35%			"	Shear zone 158.0-161.2	?	Mod. Bleached AK.
166.8	174.1	7.3		.06											0.01	0.05		-	1%							0.05%			1%	Sp	Tr	20%	2%		"			Normal Ak Tex
174.1	182.8	8.7		.06											0.01	0.05		-	2%							0.10%			4%	Sp		30%	2%	5%	"			" " "
182.8	191.5	8.7		.03											Tr	0.03		-	3%	?		0.5%				Tr			Tr	Sp		30%	3%	5%	"			" " " Higher than normal primary but consistent
191.5	203.0	11.5		.04											Tr	0.04		-	4%	?		0.5%				Tr			5%	Mod	10%	40%	3%	5%	"	Qtz. veins in Sec. alt. zone Shear 45° at 194 Shear 45° at 199	60°	Both Kaol & felds are bleached white; sulf content higher, as 200. w/ stringing
203.0	211.4	8.4		.07											0.01	0.06		-	2%							Tr			4%	Ak Mod	10%	40%	2%		Ak Tex 203.0 208.8 213.1'			Ak less alt. than above. Apatite has avg. xl. size of 0.5 mm. Contains sp. disem. Py.
211.4	218.1	6.7		.04											Tr	0.01		-	3%							Tr			3%	Ak	<1%	30%	<1%		Ak	Sur-sulf vnlt 90° 1/8 and 1/4"	65°	Typical Ak
218.1	219.1	1.0		.11											Tr	0.11		-	3%							Tr			4%	Sp		20%	<1%		"			" "
E.O.H.																																						

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO- SILVER BELL UNIT

Note (3)
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Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-224
Page 1 of 3 Pages
Collar Elev. 2717.48 Final Depth 972.1
Coords. N 37589.39 N E 15491.90 E
Inclination Vertical
Logged by N. R. N.
Date: Start 3-22-67 Finish 6-21-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	45.0	45.0						–	–	–	–	–	–	–	–			–	–			–	–	–	–	–	–	–	–	–	–	–	–				No Recovery - Rock Bit
45.0	54.0	9.0		.20						.20	–	?	–	–	–	–	Wk	–	–	–	–	–	–	–	–	–	–	1%	3%	4%	25%	–	Sp	AK			Wk Alt. Mostly superpos. w/ sericite on fracs. – Quix weak, some clay
54.0	63.0	9.0		.18						.01	–	?	–	–	.17	–	–	1	Tr						–	–	–	1			1	£1%	1				As above gray clay? Alt of plag foliat. wk Alt. More calc on fracs.
63.0	69.5	6.5		.07						–	–	–		.09	–	–		1	[illegible]						–	–	–	1			1	1	–	Calc-silicate			As above some (c 1%) sericite on sp cpy pty
69.5	78.2	8.7		.12									–	.10	.02			1	0.5%	–	–	–		Tr	–	–	–	1	sp	1	1	Tr	–				As above only plag + bio. show alt to clay-ser + chlor
78.2	87.1	8.9		.15									–	.08	.07			1	£1%	–	–	–	–	1	–	–	–	sp	sp	sp	1	Tr	Tr				As above, lim fading out toward end run, about 1% biotite in AK (primary)
87.1	96.0	8.9		.09										.05	.04	–		1	1	–	–	–	–	1	–	–	–	sp wk	1	Tr	1	1	–				As above lim on all fracs.
96.0	104.7	8.7		.06						–	–	–	.03	.02	.01	–		1	0.5%	–	–	–	–	1	–	–	–	1	1	1	1	25% S	–				Med Alt. both plag + K spar clouded by clay-ser tr chrys
104.7	113.4	8.7		.19						–	–	–	.01	.16	.02	–		1	£1%	–	–	–	–	1	–	–	–	1	1	1	20%	1	–				As above
113.4	123.6	10.2		.29						–	–	–	–	.05	.24	–		1	1%	–	–	–	–	1	–	–	–	wk	1	sp wk	35%	1	–				As above 1st silic Alt zone at 1st 2' of run shows 5% sulf w/ py:cpy = 1:1.5
123.6	135.4	11.8		.11						–	–	–	–	.08	.03	–	sp	£1%	–	–	–	–	–	1	–	–	–	sp wk	1	Tr	25%	1	–				As above lim fades out in 1st foot of run tr grn chox
135.4	143.0	7.6		.10						–	–	–	–	.08	.02	–	Tr	0.5%	–	–	–	–	–	1	–	–	–	Tr	Tr	1	25%	Tr	–				Wk Alt only plag shows signs of clay-ser.
143.0	151.2	8.2		.36						–	–	–	–	.03	.03	–		1	0.5%	–	–	–	–	1	–	–	–	1	1	1	30%	£1%	–				Wk Alt patchy Mod Alt about 1% partly chloritized remnants of bio. Quartzite occurrence
151.2	159.5	8.3	–	.10	–	–	–	–	–	–	–	–	–	.05	.05	–		1	1	–	–	–	–	1	–	–	–	1	1	1	35%	Tr	–	Vuggy AK	156.3'		Wk Alt patchy stains As above where K spar is bleached white - May indicate albitization
159.5	169.3	9.8		.68						–	–	–	–	.17	.50	–		1	£1%	–	–	–	–	1	–	–	–	sp	Tr	1-2%	35-40%	1	–				Vuggy (Myrmekitic) AK along silic zone May be due to removal of silic Alt plag.
169.3	177.3	8.0		.10						–	–	–	–	.04	.06	–		1	1%	–	–	–	–	1	–	–	–	Tr	Tr	Tr	30%	1	–	Normal AK	169.3		Mod Alt. Vuggy AK as above wk w/ py:cpy 166.4-169.3
177.3	186.3	9.0		.18						–	–	–	–	.03	.08	–		1	£1%	–	–	–	–	1	–	–	–	1	1	1	30-35%	1	–				Wk Alt. sp sulf on veinlets and w/ chlor aft. bio py:cpy = ±1:1
186.3	196.4	10.1		.17						–	–	–	–	.04	.13	–	Tr	0.5%	–	–	–	–	–	1	–	–	–	1	1	1	1	1	–				As above
196.4	205.3	8.9		.16						–	–	–	–	.04	.12	–		1	1	–	–	–	–	1	–	–	–	1	1	1	1	1	–				As above
205.3	213.4	8.1		.11						–	–	–	–	.02	.09	–		1	1	–	–	–	–	1	–	–	–	1	1	1	1	1	–				As above
213.4	223.4	10.2		.16						–	–	–	–	.06	.10	–		1	0.5%	–	–	–	–	1	Tr	–	–	1	1	1	1	1	–				As above salmon to flesh colored 2nd K spar? replace orig. K spar in centers of grains
223.4	232.4	9.0		.12						–	–	–	–	.03	.13	–		1	2%	–	–	–	–	1	Tr	–	sp	1	10%	40%	tr	–	–				Ak as above cut by Med Qtz-py-cpy veing w/ mod silic along veins some wk Alt out from veins cal. on fracs + veins
232.4	241.2	8.8		.10						–	–	–	–	.01	.09	–		1	1%	–	–	–	–	1	Tr	–	Tr	1	–	5%	Tr	–	–				Wk alt confined to plag py + cpy tend to be concentrated around relict bio
241.2	251.2	10.0		.18						–	–	–	–	.04	.14	–		1	2%	–	–	–	–	1	Tr	–	–	1	1	10%	40%	1%	–		Qtz-py vns	2-10"	As above silic. along qtz-py vns
251.2	261.7	10.5		.19						–	–	–	–	.02	.17	–		1	4-5%	–	–	–	–	1	1	–	Wk	sp	1-2%	5-10%	£1%	–	–				Qtz vns sil. + Alt Ak adjacent. Ak out of sil zone (2-3" wide) is only Alt
261.7	271.6	9.9		.09						–	–	–	–	.03	.06	–		1	4%	–	–	–	–	1	wk	–	–	1	wk Mod	1-2%	40%	£1%	–				As above wk cal along fracs, poss. supergene?, some Rod K spar regrowth on orig K spar
271.6	279.7	8.1		.09						–	–	–	–	.01	.08	–		1	5%	–	–	–	–	1	1	–	–	sp	Tr-wk	5%	35-40%	2%	–				As above Note: cal definitely assoc. w/ py bearing hydrothermal vein. Qtz veing decreases
279.7	289.1	9.4		.08						–	–	–	–	.01	.07	–		1	3%	–	–	–	–	1	1	–	–	1	1	2%	30%	1	–				As above More py assoc. w/ carbonate veining
289.1	297.3	8.2		.07						–	–	–	–	Tr	.07	–		1	3%	–	–	–	–	1	1	–	–	Tr	Tr-wk	1	32%	Tr	–				As above
297.3	303.6	6.3		.09						–	–	–	–	1	.09	–		1	1	–	–	–	–	1	1	–	–	1	1	3%	33%	1	–				As above some 2nd K spar regrowth on orig K spar
303.6	314.0	10.4		.38						–	–	–	–	1	.38	–		1	4%	–	–	–	Tr-Mod	–	?	–	1	1	£1%	Tr-20%	20%	£1%		?Mz??	303.6		Text in this rk resembles a fine grained Mz or Sp. Fine abs of cal and bio. are alt to chlor. hydrothermal cal veins (vert) are convex w/ carbonate being dissolved from ground mass. The rk is prob a contact phenomena made up of AK and hydrotacite. prob. tuffaceous agillites
314.0	322.0	8.0		.14						–	–	–	–	–	.14	–		1	–	–	–	–	–	1	?	–	1	1	1	1	5%	1	–				As above more pronounced Mz text in places
322.0	331.0	9.0		.21						–	–	–	–	–	.21	–		1	–	–	–	–	–	1	?	–	1	1	1	1	1	1	–				As above
331.0	339.2	8.2		.12						–	–	–	–	Tr-	.12	–	–	3%	–	–	–	–	–	1	–	–	?	1	1	1	30%	10-15%	1	Qtzite? (nodules)	331-339'		some qtzite? w/ introduced chlorite-biotite + ip text similar to above
339.2	348.3	9.1		.19						–	–	–	–	1	.19	–		1	–	–	–	–	–	1	–	–	?	1	1	1	1	20%	–	tr			Still some Qtzite? patchy Mz text w/ chlor sub suggests small Mz dikes-sills interfinger w/ sediments
348.3	357.3	9.3		.06						–	–	–	–	Tr	.06	–		1	–	–	–	–	–	1	Tr	–	?	Tr	Tr	80-90%	10-15%	–	–	Qtzite? (prob.) AK	348.3		The rk is apparently a Qtzite w/ some and bio. subsequently chloritized however some Ip text suggests it may be AK.
357.3	366.0	8.7		.41	.37						–	–	–	.01	.41	–		1	4-5%	–	–	–	–	1	Tr-ST	–	–	–	–	2%	70%	2%	–	HED 358.3 Aplite	CTD 358.3 circa 361'	Steep 70-80°	Medium Mz like AK? Has somewhat gradational or w/ inv. contact. This grade into sil chlor rk that is probably a mixture of sediments + AK circa 361' and py is pt.
366.0	371.0	5.0		.20											.20										Tr		?	1	1	?	50%	20%	–	Tr			As above. Some hint of phenitic ip text on close examination. Very chlor content
371.0	381.9	10.9		.11											.11			1	2%	–	–	–	–	1	Tr	–	–	1	1	1	60%	5-10%	–	£1%	AK circa 371		Strong AH (silf) AK. Text somewhat indistinct but finer than normal. Appears qtzite in places. Abnormally large K's instead suggests proximity to sediments
381.9	389.7	7.8		.16											.16			1	3%	–	–	–	–	1	1	–	–	–	–	–	–	–	–				As above + 25% Calcite veg on fracs
389.7	393.6	3.9		.08											.08												–	–	–	£1%	£1%	1				Normal AK, wk Alt
393.6	403.9	10.3		.06											.06					Tr	Tr						+	1	1	1	3%	1				wk Alt. Mod silic, text somewhat indistinct.
403.9	413.7	9.8		.14											.14	–		1-2%	2%	£1%	–	–	–	–	Tr-wk	–	Tr	sp	Tr	1%	5%	1%	–				AK has odd texture due to Mz introduction along qtz-py-cpy veins. Mz has replaced to been giving an appearance of great ± 1% 341 b.o

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Hole No. 224
Page 2 of 3 Pages
Collar Elev. 2717.48 Final Depth 2731
Coords. N 375 89.89 N E 154 91.90 E
Inclination Vertical
Logged by NBN
Date: Start 5-27-67 Finish 6-21-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green	Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz.	QUARTZ	CHLORITE	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
	422.3	8.6		0.16																																	WK Alt, wk Silic. Text. is mere finely spline Hbn. secondary and lies a Graphic appearance
422.3	431.0	8.7		0.35										Tr	0.35																						As above, increased silic. sp. and Lepidite
431.0	440.7	9.7		0.29											0.29																						As above, a 2% 2nd bio w/ py + spy assoc
440.7	449.2	8.5		0.20											0.20																						AK as above
449.2	458.8	9.6		0.32	.01									.01	0.32																						Strong bleached Alt. B leaching increases and Tex. increases downward
458.8	463.8	11.0		0.58	N.I.										0.58																						Rock is finely Textured down. Alt is primarily Qtz-Ser. increase in Sulfs. Tex. becomes Other than typical AK. Bcc. much development destroys evidence of Tex. Trace
463.8	470.6	6.8		.79	0.01									.01	0.77																						Rk is dense, compact, silic. & vaguely Tex. Appears to be kept in tension so rock + low WK Text.
470.6	486.0	7.4		1.41	0.01									0.01	1.41																						Rk is dense, compact, silic. & vaguely Tex. Appears to be kept in tension so rock + low WK Text.
486.0	493.6	7.6		0.10	0.01									0.01	0.4																						As above. Rk has small 1/4" fine fells developed which may be sets. Rock Alter unfavorably. Appears Tex.
493.6	498.1	4.5		0.29	0.01									0																							Tex. is generally subtract Mz. Bcc. is Finding of 2nd bio zone; Sulfs along this fault surface
498.1	505.0	6.9		0.41	0.01									0.01	0.41																						Tex. is generally subtract Mz. Bcc. is Finding of 2nd bio zone; Sulfs along this fault surface
505.0	510.4	5.4		0.55	0.01									0.01	0.56																						Dark green fine grained Rk. Loaded w/ calcite veins. Hbn. filets. Lower contact Gradual w/ slight silic. Sulfs. Qtz. Alt. Tex. Silicate (?) and Hbn grades into Rock Hbn w/ P. Sulfs.
510.4	518.6	8.2		0.72	0.01									0.01	0.72																						Fine chlor. Hf. Wk-Mod silicified. Tr Mo Cu along inlets w/ some disseminations. Sp Mag Hbn. Assoc w/ Sp
518.6	524.2	5.6		0.36	0.01									0.01	0.36																						Similar to above. Rk rather hard + impervious - a poor Hard.
524.2	534.8	10.6		0.46	.01									0.01	0.45																						Fine grained Sil. w/ Gen. Silicic w/ a 2nd Chr. Rk. a Tone. Rk was bowed v/ Sp and on read specs on Text.
534.8	542.5	7.7		0.49	.01										0.49																						Rk is Qtz Alt w/ Sericite. Sulf. are Cpy + Py. Rock is very fine grained + Rk. Some more Hard + some altering generally
542.5	552.6	10.1		0.43	.01										0.43																						Rock piece of Jobs Stringer of serpentine. Quartz does into a 2nd Tex. Hbn assoc w/ dark geo.
552.6	559.4	6.8		0.34											0.34																						Rock does not give Alt. (?) and is Hbn Tex (?). Sulf is a Cpy + Py in a Qtz vein. Vague perpendicular to direction of Qtz
559.4	572.0	12.6		0.23											0.21																						Transition zone to a new lithology. Qtz is less vague so rock is a pale green in color and is a dry Tuff. Altered + Silic. Alt. Sulfs. Cpy + Py.
572.0	580.8	8.8		0.12											0.12																		AK				Extremely cleaved, bleached and silic. AK
580.8	594.5	11.7		0.18											0.18																						As above to 592.8. Then tex increases & weakened AK
594.5	603.0	8.5		0.16										Tr	0.16																						Typical AK as only the Rock is slightly more silic.
603.0	611.8	8.8		0.17											0.17																						As above. Sulf are in fine red oxe. Rock Alter assoc w/ P. fells or surrounded by Hbn. bio.
611.8	620.8	9.0		0.14											0.14																						Rk more weakly Alt. a 0.37% Bismuth lead bios. Sheeting and Sericite. Believe it is a Boundary
620.8	628.6	7.8		0.13											0.13																						Sulf is almost all Cpy. Rock is less cleaved (?) at a secondary
628.6	637.2	8.6		0.13											0.13																						Harrison + small fine sec. base to upper of 633. Sr. Sericite and Mod. Sulfs are assoc.
637.2	646.2	9.0		0.12											0.12																						Cpy + Sp. fine are intimately mixed
646.2	654.6	8.4		0.16											0.16																						As Above.
654.6	662.9	8.3		0.14											0.14																						Normal AK Text. some chlor. growth in center of alt plag. Gen. wk Alt. Silic. Tr Cu
662.9	671.1	8.2		0.20											0.20																						As above but more qtz-cpy-rich veining. Tr Cu
671.1	680.0	8.9		0.13											0.13																						As above. Gypsum along fracs. Sphlte - typical text. w/ some py-cpy-Moly along inlets
680.0	687.3	7.3		0.14											0.14																						Typical AK, slight decrease in xyl size + increase in chlor. scale. May indicate Tex. proximity to Sed. Ct.
687.3	695.2	7.9		0.20											0.20																						As above cpy is surrounded by halo of 2nd bio. The cpy blebs favor alt. plag xyls. Tex.
695.2	704.0	8.8		0.17											0.17																						Several 1/8" qtz-py-cpy-Moly vns cut AK @ ≈ 80° also several small vns. Cpy vns cut to brec. Tr Hbn Cc. All features indicate approach to permeable Fill Zone
704.0	712.9	8.9		0.05											0.05																						Mod. AK Alt w/ diss 2nd bio. assoc. w/ Sulfs
712.9	721.9	9.0		0.11											0.11																						As above. Mod. Sec Alt along qtz-sulfide vn. more chlor - less 2nd bio.
721.9	730.6	8.7		0.06											0.06																						As above thin (1/16-1/8") Gyp stringers cut rk at steep dip
730.6	739.5	8.9		0.13											0.13																						As above increase in 2nd bio.
739.5	747.9	8.4		0.22											0.22																						Sericitized Alpha Band zones. Rock Fm. wk Alt. Rock a Tone. Rk. Assoc. Cpy vns Gravity. Low Angle and are fast min. Flooding occurs. Rk Bands in Tuff. Alter Qtz. Rk.
747.9	756.5	8.6		0.09											0.09																						Vn cut Sericitization and moderate low hot all tempered.
756.5	765.0	8.5		0.13											0.13																						Quite Green + dense Rk. Rk spec. hard and tough. P. blebs usually Alt to kaolin + Pyrite. Sulfs + fine + well disseminated
765.0	773.2	8.2		0.09											0.09																						Rk remains dense, hard when on somewhat less. Fairly Aphanitic (Hyp?) Tr. Sericite & Sed. Qtz. Hbn. Sulfs Cpy. Hbt.
773.2	78[illegible]	8.3		0.09											0.09																						As above. Fragmentness due to sulfs. Sulfs 1/2" qtz. Qtz w/ Sp (Py) Cpy + Py sulfs. Tex.
78[illegible].5	78[illegible]	7.7		0.08											0.08																						Cpy vn wispy, increase + bio. Hbn. Hbt. Rk Hard.

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-224
Page 3 of 3 Pages

Collar Elev. 2717.48 Final Depth 973.1
Coords. N 27589.89 N E 15491.90 E
Inclination Vertical
Logged by NRN
Date: Start 5-22-67 Finish 6-21-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
789.2	797.9	8.7		0.06						—	—	—	—		—	0.06	—	—	0.5%	? 2%	—	—	—	—	Tr	—	—	—	2%	wk 4%	1%	20%	2%	18%	5% 3%	Qtz Ser Sch 19'. 5' 4/4 AN	60 50°	K-Sch only slightly lightened. P. felds are mod. alt to Kaol + Mont. Y. Sp. Sulf.
797.9	806.4	8.5		0.08						—	—	—	—		—	0.08	—	—	0.7%	?	—	—	—	—	Sp	Tr	—	—	2%	/	2%	35%	3%	3%	4% 2%	Tr Qtz Sch 7985'	45°	Sulf. occurs in P. felds
806.4	815.3	8.9		0.10						—	—	—	—		—	0.10	—	—	0.5%	? Tr	—	—	—	—	Tr	Tr	—	—	<1%	wk	—	40%	4%	?	3% 3%			As Above
815.3	823.4	8.1		0.08						—	—	—	—		—	0.08	—	—	1%	—	—	—	—	—	Tr	Tr	—	—	5%	wk Mod	2%	45%	2%		4% 4% 3%			As Above
823.4	832.3	8.9		0.14						—	—	—	—		—	0.14	—	—	0.7%	—	—	—	—	—	90%	Sp	—	—	2%	/	6%	50%	4%		2% 4% 2%			As Above
832.3	841.0	8.7		0.12						—	—	—	—		—	0.12	—	—	<1%	—	—	—	—	—	Tr	Tr	—	—	1%	?	6%	?	15%		2% 4% 2% 5%	Dnite Angle Ang. An. 8.5%	70°	Dacit appearing to may be a wall where a 3rd vein was assimilated - high in white ground mass is fine grained and appears glassy. 3% Qtz eyes. Remainder of rock
																																		4A			is normal An tex, but has approx. 5% 2nd Biot - check general assoc w/ Mz & P. felds
841.0	848.7	7.7		0.09						—	—	—	—		—	0.09	—	—	2%	—	Tr	—	—	15%	Qtz 2%	Tr	—	—	20%	Mod	8%	40%	4%	2%	2% 3%	Qtz Sch Qtz Sch Sp Sch		Strongly bleached Ac, K-felds & Calc link, P. felds and ss Are To Mzz. Weakly ser. Most Sulf assoc w/
848.7	856.7	8.0		0.14						—	—	—	—		—	0.14	—	—	1%	—	—	—	—	—	0.2%	0.2%	Tr	—	—	2%	/	20%	55%	4%	2%	2% 4%	Qtz Sch 8.5'		
856.7	861.4	4.7		0.11						—	—	—	—		—	0.11	—	—	3%	—	Sp	—	—	Sp	0.2%	Tr	—	—	4%	/	8%	40%	3%	—	2% 4% 2%	Qtz Sch 8.5'	5-70°	Ss - Grs. Varig - strongly sulfd. Some inverting. Sil% also.
861.4	870.7	9.3		0.09						—	—	—	—		—	0.09	—	—	<1%	—	—	—	—	—	.01%	—	—	—	tr.	mod	2%	45%	<1%	—	2% 4% 1% 4%			Vuggy fine grained calc @ 857.4. Py is weakly recrystallized
870.7	879.1	8.4		0.07						—	—	—	—		—	0.07	—	—	<1%	—	—	—	—	—	Sp	—	—	—	tr	wk	2%	30%	2%		1% 4% <1% 4%			
879.1	891.2	12.1		0.06						—	—	—	—		—	0.06	—	—	<1%	—	—	—	—	—	Sp	—	—	—	tr.	mod	3%	30%	2%	—	<1% 4% <1% 4%	An - Mz ? Porph 883.6		Gradual change in tex. to Mz, Qtz becoming some what rounded
891.2	899.2	8.1		0.13						—	—	—	—		—	0.13	—	—	1%	Tr	Tr	—	—	—	—	Tr	—	—	—	—	wk Mod	6%	40%	12%	—	1% 4% 4%	An - Mz ? Porph Mz		
899.2	908.1	8.8		0.22						—	—	—	—		—	0.22	—	—	1.5%	—	—	—	—	—	—	Tr	—	—	—	1	3%	15% 7%	10%	—	4% 4%			Rk is slightly smaller grain sized Tuff. Below and has a uniform dk gray color. As progress down the hole there is a gradual increase in and. Bot-phlog until it occupies 10% of Rk. Rk is still w/ Tuff appearance but has a certain degree in gtz as fine tested grains. It is now subhedral making around 1/16". The fresh felds are more tabular and represent approx. 45% of Rk. K-felds tends to be euhedral and appears secondary to hydrothermal. Bot-phlog is uniform in density, but does not appear in blocks. I believe this to be a result of Rk resulting from assim of Sch. Rk Rock still intensive, Tt is dense it has been fine grained w/ small scattered patches of gtz crystals
908.1	911.7	3.6		0.18						—	—	—	—		—	0.18	—	—	2%	—	—	—	—	—	—	4%	90%	5%	—	—	4%	4%	—	—	Tt 908		63°	
911.7	915.7	4.0		0.81						—	—	—	—		—	0.81	—	—	4%	—	—	—	—	—	0.03%	5%	—	30%	2%	Mod	15 7%	15%	30%	—	2% 4%	Tg. Ek + Lg Ang. Chlorite Ang. Mz 911.7-915.7 Lime Ex. Gl. Ek		80°	Rk of Tg. Ek + Lt gn Ang Hf which is intensely fractured by gtz. Sch was well pronounced.
915.7	925.4	9.7		0.24						—	—	—	—		—	0.24	—	—	4%	—	—	—	—	—	Tr	10%	—	?	—	—	3%	2%	30%	—	2% 4%	Qtz Sch Vns Brown Tan Sphal	85°	Strongly brecciated to grn. soft limy Hf., has grained py appears to be pr. brecciated
925.4	934.4	9.0		0.45						—	—	—	—		—	0.45	—	—	2%	—	—	—	—	—	—	4%	—	—	—	wk Mod	—	2%	25%	30%	2% 4%	Mz Cilla 926			Rk has a reciprocal to gra. color due to assim. Hf, Monzonite and of P. felds & Chlor. alt. of Biot. Biot Content Approx 25%. Rk has tuff like P. felds. As before.
934.4	941.7	7.3		0.44						—	—	—	—		—	0.44	—	—	2-3%	—	—	—	—	—	—	Sp	—	—	—	Mod	2%	20%	25%	15%	2% 4%	Mz 1.15 Mz 936.3-941	Apatite Dike	45°	Sr Secondary Bot altering to Chlor. Wd Med-Sr and K-felds.
941.7	950.8	9.1		0.34						—	—	—	—		—	0.34	—	—	3-4%	—	—	—	—	—	—	3%	—	—	—	wk	2%	15%	30%	12%	2% 4%	Mz Chlor. Vn Cal Chlor 950.8			Rk As Above to Arch 946. This becomes more bleached looking and chlor. rich occurs. Rk occurs commonly by gxp.
950.8	957.4	6.6		0.44						—	—	—	—		—	0.44	—	—	5%	5%	5%	—	—	—	—	30%	—	—	—	—	—	—	45%	—	2% 4% 5-7%	Mz 957.8	Sr Bx + Gg 950.8-952.8		Sr. Brecciated fracture filled by Sup. Sr. Mzz, mag. 0.01% 953-956.
957.4	967.3	9.9		0.14						—	—	—	—		—	0.14	—	—	1-3%	Tr	—	—	—	—	—	—	—	—	Tr	wk Mod	3%	15%	5%	Sp	1%				Mzz Alto. Mz, Bot formed and occupies 10% of Rk. Sulfs disseminated in pts.
967.3	972.1	4.8		0.30						—	—	—	—		—	0.30	—	—	1-3%	Tr	—	—	—	—	—	—	—	—	Tr	wk Mod	3%	15%	5%	0.1%				As Above
	E.O.H.																																					E.O.H.

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
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Bx - Breccia
Da - Dacite
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Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-223
Page 1 of 2 Pages
Collar Elev. 2767.54 Final Depth 671.3
Coords. N 38,042.63 N E 4863.68 E
Inclination Vertical
Logged by N.R.N.
Date: Start 5-9-67 Finish 5-22-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp Gr	Cu (1) Chrys.	Pitch	Black	Blue Green	Cu (1) Other	Cc	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb.	Calcite	Garnet	Silicates	Sericite	Clay	Vn Qtz	QUARTZ	CHLORITE	Other	Other	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	9.2	5.5		—																																			Rock Bit. Not Recovered
5.5	15.0	9.5		0.02										0.02																						Ak		60°	Typical Ak Tex. 95% Qtz. as original subhedral x's.; feld. sparsely alt., but strongly stained by limo
15.0	27.3	12.3		.03										0.03																							/	80°	As Above. Rk is quite broken between 20 - 17.5 and 25 - 22
27.3	37.0	9.7		.04										0.04																							34 - 52	?	As Above. Broken Intervals full material
37.0	47.2	10.2		.03										0.03																							As Above		As Above
47.2	56.5	9.3		.02										0.02																							Frac.	75°	Normal Ak Tex.
56.5	65.1	8.6		.04										0.04																							As Above	80°	Normal Ak Tex.
65.1	74.1	9.0		.04										0.03																							As Above		As Above
74.1	83.3	9.2		.02										0.02																									As Above
83.3	91.6	8.3		.07										0.05	0.05																								As Above. Rk. Contains up to 30% altered Biotite
91.6	100.2	8.6		.20										0.07	0.08	0.10																							As Above
100.2	109.2	9.0		0.46			1.61								0.2	0.20																							Below 70' Frac. Ak + Mag. Stain. Fr. appears both prior & after
109.2	118.2	9.0		.76			"								0.50	0.26																							Intensely Alt'd. & Severely Mineralized Fault Material
118.2	127.6	9.4		.42	4.68 @ 0.54 N.T.		"								0.26	0.16																							Rk is less altered & mineralized; Intervals of shey shattered & weathered
127.6	137.8	10.2		.55			"								0.30	0.25																							Rk still shows effects of fault. 50% of Rk is a yellow alteration product of K-feldspar
137.6	147.0	9.2		.44											0.22	0.22																							As Above except Yellow mineral Now 1% of Rk
147.0	154.6	7.6		.16																																			As Above
154.6	163.1	8.5		.11											0.05	0.06																							Ak as above interspersed w/ patchy (streaks of) aplite. Alt varies from sp to st sen along ins
163.1	172.1	9.0		.10											0.02	0.08																							Ak - wk clay alt of plag, brx lim. stain on alt plag only slight cc enrichment
172.1	180.7	8.6		.12											0.04	0.08																							Normal Ak. almost fresh
180.7	193.0	12.3		.10											0.02	0.08																							As above tr Alt.
193.0	201.1	8.1		.14											0.04	0.10																							As above
201.1	209.5	8.4		.16											0.02	0.14																							
209.5	218.8	9.3		.18											0.04	0.14																							
218.8	227.7	8.9		.12											0.03	0.09																							
227.7	235.8	8.1		.11											0.02	0.09																							Calcite on inlets & fracs may indicate proximity to Sodic
235.8	244.6	8.8		.14											0.02	0.12																							
244.6	253.6	9.0		.12											0.01	0.11																							Cal as above grn. clay or chlor. Alt of plag
253.6	261.8	8.2		.15											0.02	0.13																							
261.8	269.9	8.1		.17											0.01	0.16																				Fit 9.1' 263.3		
269.9	279.6	9.7		.12											0.01	0.11																			Apl. 10 276 - 279		Normal Ak to 276' from Aplitic tex.; Alt. in fracs; Calcite in fracs up to 1/4" and along v small fracs. To 279
279.6	287.9	8.3		.17											0.03	0.15																							Normal Ak Tex. whole rock is slightly reactive. CPY to PY ratio greater than 1
287.9	297.2	9.3		.17											0.01	0.16																							As Above. Appears to be a wk silicification of Plags Sericite.
297.2	305.5	8.3		.34											Tr	0.32																							Most disseminated w/ both PY & APY
305.5	314.6	9.1		.18											Tr	0.18																							APY & PY most commonly concentrated within K feld. xls.
314.6	323.4	8.8		.11												0.11																							
323.4	331.9	8.5		.15												0.15																							
331.9	340.4	8.5		.15												0.15																							
340.4	353.5	13.1		.17												0.17																							Local red bleaching of K-spar
353.5	361.1	7.6		.31											Tr	0.31																			Apl. 10 348.8 - 350.8	343.5 - 345	?	Local red bleaching of K-spar where Aplite has been altered by fl. it contains or Biotite
361.1	370.0	8.9		.17												0.17																			Mz. + Ak (?)			Mz. invades Ak in irregular pattern w/much mixing & Assimilation; No sharp contacts
370.0	379.9	9.9		.19												0.19																							As Above. Rk is approx. mostly 10% Mz.
379.9	388.9	9.0		.21																															Ak Vns	1.8" Qtz-Sulf 80-90°		Normal Ak Tex
388.9	397.0	8.1		.18												0.18																			Ak w/ Qtz Sulf			Ak w/ 2% Mz tex + mineral assemblage groups
397.0	403.6	6.6		.25												0.25																			Ak	1.4" Qtz-Sulf Sulf Vns	80°	Normal Ak
																																			Ak			" "

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(Subject to Revised Logging)

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Hole No. D-223
Page 2 of 2 Pages
Collar Elev. 2,767.54 Final Depth 671.3
Coords. N 38,043.63 E 486,368
Inclination Vertical
Logged by N.R.N.
Date: Start 5-9-67 Finish 5-22-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
403.6	412.1	8.5		.16											Tr	.16		-	3%	-		-	-		0.1%	Ch	-	-	6%	Mod	17%	40%	17%	3%	Ak	For end 407.3	50°	Ak. Tex, Mod. Sulf in vtlts same N. P. Fe Ox, P. Fe Ox being alld to Hydromuscovite
412.1	421.1	9.0		.10												.10		-	3%	-	-	-	-	-	0.08%	<1%		-	3%	Mod	2%	25%	8%	4%				Ak. Tex. Kspar beginning to be dissolved. Clay alt product of ◇ shaped minerals scattered with
421.1	429.2	8.1		.11												.11		-	3%	-	-	-	-	-	0.1%	<1%		-	4%	Mod	4%	20%	5%	3%				Normal Ak Tex w/ wk-Mod Alt.
429.2	438.1	8.9		.20												.20		-	2%	-	-	-	-	-	0.1%	<1%		-	4%	Mod	3%	27%	4%	3%				As above ; Mod Bleaching w/ loss of Tex beginning @ 445.5
438.1	446.8	8.7		.15												.15		-	4%	-	-	-	-		.15%	1%		-	4%	Mod	6%	27%	5%	2%				" "
446.8	455.3	8.5		.36												.36		-	2%				-		0.2%	Sp		-	6%	5%	?	8%	3%				THERE Now total Tex destruction. Rk is a uniform white bx composed of sericite + alt. qtz + FeOx
455.3	463.9	8.6		.33												.33		-	4%	-	-	-	Sp	-	0.2%	4%		-	6%	?	30%	3%						As Above. Bx is fine-min sed is cemented primarily by a greenish sericite
463.9	474.6	10.7		.33												.33		-	4%	-	-	-	-		0.2%	Sp		-	4%	2%	25%	5%						Tex weakly evident. Rk shows effect of above fault. Good CPY content, specific gravity & Au available just note poor [illegible]
474.6	483.5	8.9		.22												.22		-	2%	-	-	-	-	-	0.5%	1%		-	16%	wx	17%	20%	7%					Good Ak Tex ; [illegible] Rk > 1 , Sulf content is [illegible] w/ minor gtz veing and altered Gr. [illegible]
483.5	491.9	8.4		.20												.20		-	1%	-	-	-	-	-	0.5%	Tr		-	20%	wk	7%	25%	5%					As Above
491.9	501.0	9.1		.29												.29		-	1%	-	-	-	-	-	0.5%	Tr		-	10%	wk	4%	25%	5%			For D 492.9	60°	Slightly shattered Ak
501.0	509.5	8.5		.14												.14		-	1%	-	-	-	-	-	0.5%	Sp		-	2%	Sp	4%	25%	4%					Normal Ak
509.5	518.0	8.5		.11												.11		-	1%	-	-	-	-	-	0.3%	Tr		-	3%	wk	4%	25%	5%					" "
518.0	527.2	9.2		.12												.12		-	1%	-	-	-	-	-	1.3%	Tr		-	3%	wk	<1%	25%	5%			Sil. Ch. Fracs	70°	" "
527.2	535.4	8.2		.13												.13		-	2%	-	-	-	-	-	0.5%	Sp		-	4%	wk-Mod	5%	27%	4%					Normal Ak Tex , moderately bleached
535.4	545.1	9.7		.16												.16		-	3%	-	-	-	-	-	0.9%	Tr Sp		-	3%	Mod	4%	27%	4%					" "
545.1	553.6	8.5		.15												.15		-	1%	-	-	-	-	-	0.1%	Sp		-	3%	wk-Mod	7%	27%	4%					Normal Ak
553.6	562.6	9.0		.18												.18		-	2%	-	-	-	-	-	0.1%	Sp		-	4%	wk	2%	25%	5%					" "
562.6	572.3	9.7		.17												.17		-	2%	-	-	-	-	-	Tr	Sp		-	3%			25%						
572.3	581.5	9.2		.20												.20		-	3%	-	-	-	-	-	1%	3%		-	7%	Mod	5%	30%	4%			Qtz. [illegible] Qtz. [illegible]	85°	Last bed of ore has bed of Tex and Mod qtz sericite veins
581.5	590.3	8.8		.20												.20		-	3%	-	-	-	-	-	0.9%	3%		-	4%	Mod	2%	27%	3%					Mod. bleaching of Normal Ak Tex
590.3	599.6	8.5		.13												.13		-	3%	-	-	-	-	-	0.6%	<1%		-	3%	Mod	2%	25%	4%	6%				3% book bit. - Somewhat 2nd looking
599.6	608.2	8.6		.18												.18		-	4%	-	-	-	-	-	0.4%	2%		-	9%	Mod	2%	27%	8%	6%				Mod Alt'd Ak
608.2	615.9	8.7		.25												.25		-	3%	-	-	-	-	-	0.08%	Tr		-	4%	Mod	6%	20%	3%	7%		Qtz. Sericite Qtz. Sericite Qtz. Sericite

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. [illegible]
Page 1 of 4 Pages
Collar Elev. 2761.70
Final Depth 1008
Coords. N 38,173.02 E 15,470,94 E
Inclination VERTICAL
Logged by M.R.N.
Date: Start May 5, 1967 Finish 5-27-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	Gypsum		(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	16.0	16.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NC. Starting Bit. No Recovery
16.0	21.4	5.4		1.16		0.92				tr?	0.2%	0.2%	.76		No vis sulfs		—	Mod	—		wk	—	—	—	—	ST	—	—	—	Mod? ST	—	ST?	—		Chlorite Hf Mz Circa 21.4'			Chlor. Hf, prob. orig an argillic sit or Mud stone. Abd. of chlor + clay? (sem includes 10% cond. of Mz)
21.4	27.8	6.4		0.39		0.25				—	—	0.1%	.29		"	"	—	Mod	—	—	—	—	—	—	—	No	—	—	tr	Mod?	tr	tr	1%	—					Mz - WK-Mod Alt. of bio. + Mafics. Alt + chlor. zoned slag. still rather fresh
27.8	36.5	8.7		0.10						—	—	—	0.1%		"	"	—	1	—	—	—	—	—	—	—	Δ	—	?	—	1	—	1	—	—					As above
36.5	-	9.5		0.14						—	—	0.1?	0.1?		"	"	—	Sp	—	—	—	—	—	—	—	Wmc	—	?	—	—	—	—	—	—	Tremolite Hf 36.5'			White (except where stained) sub-Macroscopic granular xy's, rather soft, composite whole
-	46.0	—	—	—						—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		rock, sb Cb, Sp limy, Sp Mz dendrite sb to tr Cux
46.0	55.4	9.4		.26						—	—	.6?	.12?		"	"	—	Sp WK	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	tr					As above. More lim stain, Sp Mz. wk Cux. last 1' of run
55.4	65.0	9.6		0.80		0.59				—	—	0.2?	0.60		"	"	—	Mod	1%	—	tr	—	—	—	—	WK Mod	—	?	—	Sp?	5%	—	Mod	1%	limy grn Hf. 59'	(Sulfs Circa 64)		limy lt grn Hf w/ no vis mine. 5% ab vns + patchy lim aff mass sub w/ chlor hydrothermally applied
65.0	68.3	3.3		0.17						—	0.11%						—	WK	tr?	—	—	—	—	—	—	20%	—	—	tr?	tr?	80%	—	—	—	limy Gr Chlo circa 64' limy grn Hf @ 68.3'	limy grn Hf @ 68.3'		Hf g equigranular strata. 80%
68.3	74.6	6.3		0.76		0.64				—	>	0.2?	.56		tr	tr	—	Mod	1%	—	—	—	—	—	—	Mod 2%	—	?	—	?	1%	—	Sp	tr		limy lt grn Hf as above, Mod-ST lim, Mod cux @ end run	
74.6	81.0	6.4		0.11						—	—	.11	—		tr?	1?	—	Sp WK	tr Sp	—	—	—	—	—	—	ST	—	?	—	P	3%	—	—	—		As above	
81.0	93.5	12.5		0.05						—	.02	?	—		.03?	—	—	WK	tr? <2%	—	—	—	—	—	—	5-1%	—	50%	—	—	2-5%	55% 55%	tr?		As above. Actinolite xy's 0.1" long tr vis. RK is either altered or poss? silic	
93.5	104.2	10.7		.10						—	—	0.1?	—		tr?	—	—	1	tr	—	—	—	—	—	—	5%	tr	90	—	—	1%	10%	tr		Qtzite circa 93.5-98.0	F1 @ 93.5 104.2		Rather clean glassy qtzite stained by lim. The Qtzite grades into Hf as above
104.2	115.1	10.9		.42		.11				—	—	—	—		Tr?	.42	—	Sp	90 3%	—	—	—	—	—	—	20%	50%	—	5-10%	1%	—	tr Sp		Gar Hf @ 98.0			limy grn Hf w/ an increased gar percentage. Sp (sa) appears to be assoc. w/ the Mag
115.1	121.6	6.5		.21						—	—	—	—		—	.21	—	WK	3%	2-3%	—	—	—	—	—	1	5%	65% 20%	—	—	1%	1%	2%		Pseudo Ig Hf Gar Hf			This Hf has sub lateral xy's of plag growing in aphan matrix near bt of run. Appears Dp-like
121.6	131.6	10.0		.10						—	—	tr?	—		—	.10	—	—	1	1	—	—	—	—	—	1	30%	50%	—	—	1%	5%	Sp					Similar to above, less plag?. More gar.
131.6	142.2	10.6		.10						—	—	—	—		—	.10	—	Sp WK	2-3%	Mod Sp	—	—	—	—	—	5-1%	3-5%	55%	—	—	1	2-4%	tr?		Sil Tt grn Hf @ 131'			RK prob. occasionally a sil. sit. st., quite recrystallized, dense, mostly impermeable
142.2	150.7	8.5		.24						—	—	—	—		—	.24	—	Sp	3-5%	tr?	—	—	—	—	—	5-1%	5% 5%	30% 50%	—	—	3%	10% 1%	—					As above, some pock-like subhedral gar growing in silty groundmass
150.7	159.1	8.4		.13						—	—	—	—		—	.13	—	tr	1%	—	tr	—	—	—	—	tr	1%	tr 80	—	—	1%	tr	10%	—		Chlor, limy Hf circa 159' TT @ 160.7			Grn limy Hf. Main green mineral is probably scap (chlor. pennatite + prob. supp. epidote)
159.1	167.6	8.5		.09						—	—	—	—		—	.09	—	1	1	Tr	Tr	—	—	—	0.5%	5-1%	5 50	—	—	—	tr	35%	tr	—					Hf as above. Tr. is lt br massive w/ irregular ab blebs in the garnet voids
167.6	176.8	9.2		.25						—	—	—	—		—	.25	—	WK	10%	1%	tr	—	—	—	—	10%	70%	10%	—	—	3-5%	5%	5%	—					As above but w/ patches of chlor + invid silicates
176.8	184.5	7.7		.62						—	—	—	—		—	.62	—	tr	1	1	tr	—	—	—	tr	1	70%	20%	—	—	1%	30%	tr	—					As above. slightly more alt.
184.5	192.9	8.4		.11						—	—	—	—		—	.11	—	—	.2	—	Tr	—	—	—	—	1	20%	40	—	—	3%	4%	2%	—	Sil Hf grn Hf circa 184			Patchy grn + brn Hf w/ lim. gar patches poss. up to 20% more aphan. gar
192.9	201.5	8.6		.20						—	—	—	—		—	.20	—	—	4%	tr	tr	—	—	—	—	1	30	1	—	—	3-4%	35%	1	—					As above. increased patchy gar.
201.5	209.5	8.0		.09						—	—	—	—		—	.09	—	—	5-6%	—	—	—	—	—	—	1%	5%	10%	—	—	1%	80% 20%	tr	—	Qtzite 202.5 Qtzite 207.7 Qtzite 208.3			As above except for Qtzite. Qtzite - silt size particles, quite clean, brownish white, hard.
209.5	217.7	8.2		.14						—	—	—	—		—	.14	—	—	3%	—	—	—	—	—	tr	5%	tr	10%	—	—	tr	80 20%	1%	—					Qtzite as above - Hf between Qtzite - sil. limy rk w/ more chlor. + silicate min. prob. limy sit st
217.7	227.2	9.5		.10						—	—	—	—		—	.10	—	tr	2%	—	—	—	—	—	Tr	5%	10-20%	10%	—	—	tr	70	tr	—	Sil Hf circa 225			This rk is sil as above, but contains 10-20%? aphanitic gar? This may indicate limy original comp.
227.2	234.0	6.8		.04						—	—	—	—		—	.04	—	—	1%	—	—	—	Tr	—	—	—	10-20%	5%	10%	—	—	tr	50%	1%	—				Rk is limy & contains more alt silic. + gar than above. It becomes tactitic toward end run. Tr bar.
234.0	240.9	6.9		.13						—	—	—	—		—	.13	—	—	1%	—	3	tr	—	—	—	5% 30%	5%	30%	—	—	1%	25%	5%	—	limy grn Hf @ circa 240.0			Rk borders on Tt 234.0-237' then limy grn Hf w/ little gar. only rk prob. an argillite is
240.9	246.3	5.4		.18						—	—	—	—		—	.18	—	—	1	—	3%	—	—	—	—	1	4-7	30%	—	—	1	40	2%	—					As above. patchy qtzitic zones or layers.
246.3	256.2	9.9		.10						—	—	—	—		—	.10	—	—	2%	—	—	—	—	—	—	5%	—	5?	—	—	tr	80	—	—	Qtzite 248.5	Bd + Ft @ 248-251.8	limy-Mz Flt-30°	Fine grained limy qtzite showing some laminar bedding? @ 50°. as Mz @ 254'
256.2	263.2	7.0		.21						—	—	—	—		—	.21	—	—	4%	Tr?	—	—	—	—	1%	5%	5	80	5-20%	—	5?	5%	2%	—	Mz-256.6 Bd @ 257.4 Qtz to D 263.2			Mz - Mod-ST alt, all feld - to sem-clay, bio to hydro mica + sec. Patchy Tt + Hf accounts for gar + silic cond.
263.2	270.2	7.0		.15						—	—	—	—		—	.15	—	—	2%	—	—	—	—	—	tr	20%	—	?	—	—	2%	80%	1%	—	Banded Qtz. Hf Circa 270 Qtz circa 267 Qtzite circa 268.5		70 to 40° dip	limy vfg Qtzite. laminated bedding dipping 70° to 40° prob. due to folding + breaking
270.2	277.9	7.7		.18						—	—	—	—		—	.18	—	—	1%	—	—	—	—	—	—	10%	—	?	—	—	1	80 70%	2%	—	Qtzite with Hf @ 276.4			limy similar or equal to above, slightly more chlor?, bedding (banding) varies from 0.2" to paper thin
277.9	286.2	8.3		.35						—	—	—	—		—	.35	—	—	ST	—	—	—	—	—	—	1	—	—	—	—	tr	1	2-3%					Mz - WK Alt, ST silt. Qtzite mixed w/ thin (0.1" to 1") beds of limy chlor. Hf.
286.2	295.6	9.4		.30						—	—	—	—		—	.30	—	—	1	—	—	—	—	—	tr	1	—	1%	—	—	1%	50%	5%	—	Sil Hf grn @ 286.4			Similar to above but less alt, more silic + chlor.
295.6	305.2	9.6		.59			.008			—	—	—	—		—	.58	—	—	4%	—	—	—	—	—	—	tr	5%	—	1	—	—	1	50%	5%	—	Qtzite 300 305.3			As above, but w/ 0.5' Qtzite beds (vfg) every couple of feet. last 5' has Mod cpy as veins
305.2	313.6	8.4		.37			.1			—	—	—	—		—	.31	—	—	1	—	—	—	—	—	—	1	—	1	—	—	—	1	5-10%					As above
313.6	321.6	8.0		.84			.004			—	—	—	—		—	.84	—	—	1	—	—	—	—	—	—	1	—	1	—	—	—	1						" " Poss. a slight increase in cpy over rk drilled so far
321.6	329.6	8.0		.21						—	—	—	—		—	.21	—	—	1-2%	—	—	—	—	—	—	1	—	1	—	—	—	1	2%	—					" "
329.6	338.0	8.4		.30						—	—	—	—		—	.30	—	—	1	—	—	—	—	Sp	1	—	—	1	—	—	—	1		—					" " core strongly broken
338.0	346.4	8.4		.20						—	—	—	—		—	.20	—	—	3%	—	—	—	—	—	tr	1	—	10-20%	—	—	3%	90%	1	—					" " Rk now mainly lt grn coarse slt st apparently. Mainly silica
346.4	353.8	7.4		.23						—	—	—	—		—	.23	—	—	—	—	—	—	—	—	—	1	—	1?	—	—	—	—	1	—			bedding -65°	" "
353.8	362.8	8.3		.15						—	—	—	—		—	.15	—	—	—	—	—	—	—	—	—	1	1	tr	20-30% 40	—	—	—	20-30 40	1	—				Rk similar in appearance to above, there appears to be greater % of calc.
362.8	372.5	10.4		.39						—	—	—	—		—	.39	—	—	1	—	—	—	—	—	—	1	1	5%	1	—	—	1	1	—	—				As above

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D-224
Page 2 of 2 Pages
Collar Elev. 2761.70 Final Depth 700.0
Coords. N 38,173.02 N E 15,470.94
Inclination VERTICAL
Logged by J.A.B.
Date: Start MAY-5-1967 Finish 5-27-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov.	Sp. Gr.	Cu (1) Chrys.	Pitch	Black	Blue Green		Cc.	Cpy.	Born	Fe (2) Lim.	Py	Mag.	Hem	Spec.	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz	QUARTZ	CHLORITE	Gypsum	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
3725	381.0	8.5		.11						-	-	-	-	-	-	.11	-	-	2-3%	-	-	-	-	-	tr	10	tr	45%	-	-	1-2%	1%	-	-	Hf grd lmy silHf			As above
381.0	389.4	8.4		.18						-	-	-	-	-	-	.18	-	-	2%	-	-	-	-	-	1	1	-	1	-	-	1%	1%	tr	-	-			" " Most cal is along inlets + fracs
389.4	398.0	8.6		.14						-	-	-	-	-	-	.14	-	-	1	-	-	-	-	-	Tr	1	-	1%	-	-	1	2-5%	↑	-	-		30° bedding	" " " " " " " some interbedded fg qtzite 1/2-1' thk
398.0	406.7	8.7		.43	.41					-	-	-	-	-	-	.43	-	-	2-3%	-	-	-	-	-	tr	2 15%	-	5%	-	-	1	25%	tr	-	-		15° bedding	This bedded (1/2" to 1/16" lmy ls, sdy ls, silty ls) silty ls + silt st was prob original rk
406.7	420.7	14.0		.42						-	-	-	-	-	-	.42	-	-	5%	-	-	-	-	-	1	20%	-	1	-	-	-	1	1	-	-			As above
420.7	436.0	15.3		.17						-	-	-	-	-	-	.17	-	-	4%	-	-	-	-	-	1	5%	-	?	-	tr	2%	2%	8%	-	Mz	circa 420.7	45° bedding under	Mz - Mainly chlor alt of bio + greater than usual amphiboles?
436.0	445.1	9.1		.23						-	-	-	-	-	-	.23	-	-	1	-	-	-	-	-	-	1	10% 35%	tr 50%	10%	-	-	1%	3%	10%	1%	TT	circa 441.0		Mz - Quite gradational into Sedi. Vague Mz text. visible in sed-like rk, TT w/patchy Hf
445.1	457.1	12.0		.21						-	-	-	-	-	-	.21	-	-	3%	≤1%	-	-	-	-	-	5-10%	10%	60%	-	-	≤1%	10%	5%	tr	Gar Hf	circa 445	drilling? -50°	Hf, limy w/ some poss. qtz sand, and patchy Gar tr Cpy w/ mag
457.1	465.0	7.9		.18						-	-	-	-	-	-	.18	-	-	1	tr?	-	-	-	-	-	-	1	10%	-	-	1	5-10%	≤1%	-				It grn, limy, poss. silicic Hf w/ patchy br gar w/ some assoc. cpy
465.0	473.1	8.1		.29						-	-	-	-	-	-	.29	-	-	1%	-	-	-	-	-	Tr	1	5%	35%	-	-	tr	10%	1%	tr				As above. less gar. Mottled, patchy. lt br. in lt grn Hf
473.1	481.4	8.3		.23						-	-	-	-	-	-	.23	-	-	3-4%	-	-	-	-	-	Tr	1	35%	16%	-	-	≤1%	5%	Tr	Tr	TT	474		Massive aphanetic lt br gar very tight. cpy along inlets + diss where rk is porous
481.4	489.7	8.3		.20						-	-	-	-	-	-	.20	-	-	3%	-	-	-	-	-	Tr	1	30%	5-10 5-10%		-	1	5-10%	1	-				As above. vfg qtz? grains suggest original rk was sandy ls
489.7	497.1	7.4		.22						-	-	-	-	-	-	.22	-	-	1-2%	-	-	-	-	-	1	tr 5-10%	20 20%	40%	-	-	10 1	5-10%	1%	-	Gar Hf	circa 491.1		rk grades into lt green aphanetic Hf w/only patchy gar visable less cal.
497.1	506.3	9.2		.28						-	-	-	-	-	-	.28	-	-	3%	-	tr	-	-	-	-	1	5%	10%	10-20%	-	-	1	15-20%	1	-	FT	circa 497		RK is more than 50% gar but alternate w/ patchy Hf sic bands. one patch had cpy, and pyr
506.3	515.4	9.1		.26						-	-	-	-	-	-	.26	-	-	1	-	1	-	-	-	Tr?	10%	15-20	55%	-	-	1%	1%	5%	-	lmy, Gar chlor Hf qtz silt st	circa 506.3		lt grn. lmy chlor Hf w/ patchy lt br gar. v.sm cal inlets. to 2cm & spar along inlets
515.4	523.7	8.3		.17						-	-	-	-	-	-	.17	-	-	1	Tr?	1	-	-	-	Tr	10%	5-10 2%	25%	-	-	1	50	1	-	chlor Hf qtz silt st	circa 518		Hf as above. vfg qtzite (silt size qtz) w/ epidote, gar and cal. prob. orig a limy qtzose silt st
523.7	532.4	8.7		.18						-	-	-	-	-	-	.18	-	-	2%	-	1	-	-	-	1	10%	25%	15	-	-	≤1%	50	1	-	1% Gar	FIT to 522.7 - 530.7		As above. Increased chlor and gar.
532.4	540.4	8.0		.19						-	-	-	-	-	-	.19	-	-	1%	2%	-	-	-	-	tr?	1	1	40	-	-	1	25	5%	-	1	limy SH chlor Hf bedded TT	circa 532 @ 541.3		chlor Hf w/ mod fine gar.
540.4	549.1	8.7		.22						-	-	-	-	-	-	.22	-	-	≤1%	-	4%	-	-	-	-	1	1	30-40 10%	20%	-	-	Tr	30%	4% 5%	-		bedded HF	@ 546.3	-50°	Thin bedded (1/2" to 1/16") FT, prob orig. thin bedded limy ss or sandy ls some cpy in
549.1	557.4	8.3		.18						-	-	-	-	-	-	.18	-	-	1	-	1%	-	-	-	-	1	1-2 5%	40%	-	-	-	50%	1%	-	≤1%			-50°	As above. but rk is Hf comp mainly of qtz rather than TT
557.4	563.4	6.0		.18						-	-	-	-	-	-	.18	-	-	≤1%	≤1%	≤1%	-	-	-	1%	≤1%	5%	-	-	1	50%	1%	-		Sil Hf	circa 558' @ 563.4		Sil. Hf grades into a silt-size qtzite @ about 563.4 rk very tight "not favorable for mineralization"
563.4	567.7	4.3		.15						-	-	-	-	-	-	.15	-	-	1	-	Tr	-	-	-	-	Tr	Tr	2%	-	-	Tr	98%	1%					Silt size qtzite very "tight", only Tr Mix ... chalcopyrite
567.7	574.2	6.5		.18						-	-	-	-	-	-	.18	-	-	1	-	-	-	-	-	-	2-5 3%	5%	-	-	-	1%	5%	Tr	-	-			Patchy, irregular gar blebs in lt grn to white calc silic? matrix
574.2	584.5	10.3		.08						-	-	-	-	-	-	.08	-	-	3%	-	-	-	-	-	-	Tr	5-10 %	90%	-	-	Tr	5%	Tr	-	Tremolite? Hf	@ 577.6		TT-Hf as above. Trem Hf - lt green massive interlocking sub macroscopic xls of Trem?
584.5	592.8	8.3		.14						-	-	-	-	-	-	.14	-	-	5-10%	-	-	-	-	-	Tr	5-10 %	20%	40-50%	-	-	Tr	40	1	-	Gar-Hf	585'		Patchy TT (Gar) in lt grn aphan. matrix little mineralization
592.8	602.0	9.2		.05						-	-	-	-	-	-	.05	-	-	.5%	-	-	-	-	-	1	5%	30%	?	-	-	1%	10%	-	-	TT	@ 592.6		lt br. Massive gar. Qtz fills any open spaces in Gar. wk cpy + Mo. along sw cks
602.0	613.0	11.0		.26						-	-	-	-	-	-	.26	-	-	1%	-	-	-	-	-	1	1	60%	30-35%	-	-	2%	5-10 %	-	-				As above. some increase in Hf sic. calc silic
613.0	620.5	7.5		.16						-	-	-	-	-	-	.16	-	-	.05 %	-	Tr	-	-	-	.001 %	5%	20%	40	-	Tr	2%	30%	-	-	Lt green Hf w/ tr Garnet Hf, silicious Hf, vague porphyritic Tr (Mz?) throughout			Tr as above. Hf is Lt grn Hf w/ tr Garnet Hf, silicious Hf, vague porphyritic Tr (Mz?) throughout
620.5	625.3	4.8		.10						-	-	-	-	-	-	.10	-	-	1	-	-	-	-	-	1	1	Tr	1	-	-	1	50%	-	-	Hf and Pink			Hf as above. ST white pink and K spar 621.4 - 622.6' cut by calcitic veins. Tr ...
625.3	628.8	3.5		.09						-	-	-	-	-	-	.09	-	-	1	-	-	-	-	-	Tr	15-20%	40%	15%	-	-	Tr	10%	-	-	TT	@ 625.3		As 1st 2' of rock (cm) of ab'd zone. thin mass gar.
628.8	630.1	4.8		.04						-	-	-	-	-	-	.04	-	-	1	-	Tr	-	-	-	1	1	30	1%	-	-	1	40	-	-				Similar to above, but more silt size qtz
630.1	637.4	7.3		.09						-	-	-	-	-	-	.09	-	-	1	-	-	-	-	-	1	2%	Tr	40%	-	-	1	60%	5%	-	lt grn Hf	circa 630'		lt grn sil Hf w/ mottled white patches
637.4	646.0	8.6		.08						-	-	-	-	-	-	.08	-	-	1	-	-	-	-	-	1	1	2%	1	-	-	1	1	1	-				As above some cloudy pink patches may be and K spar
646.0	654.7	8.7		.17						-	-	-	-	-	-	.17	-	-	1	5	-	-	-	-	-	1%	5%	70%	-	-	1	10%	3%	-	-	silt gar Hf	circa 646		Qtz silt st, lt grn Hf + patchy gar. unit was prob a limy quartzose silt st
654.7	662.6	7.9		.15						-	-	-	-	-	-	.15	-	-	1	-	-	-	-	-	Tr	1%	1	5	-	-	1	2	1	-				As above. gar occurs in inlets around what may be bx frags of Hf.
662.6	670.8	8.2		.08						-	-	-	-	-	-	.08	-	-	1	-	-	-	-	-	Tr	3%	2%	25-35%	-	-	1	50-60%	1	-	-	lt grn sil Hf	circa 658		Mottled lt grn + white Hf w/ sp gar. white areas may rep. bedding
670.8	680.0	9.2		.16						-	-	-	-	-	-	.16	-	-	1	-	-	-	-	-	1	Tr	1%	20-40%	-	-	1	60-70%	2%	-				As above contains some thin (1/16") qtzite beds.
680.0	689.8	9.8		.11						-	-	-	-	-	-	.11	-	-	1	-	-	-	-	-	-	3-5%	5%	1	-	-	1	1	Tr	-	-			As above. Qtzite is silt size
689.8	696.0	6.2		.09						-	-	-	-	-	-	.09	-	-	1	-	-	-	-	-	-	5%	Tr	35%	-	-	1	15%	1	-	-			As above less Qtz + more calc silicates
696.0	700.0	4.8		.16						-	-	-	-	-	-	.16	-	-	1%	-	-	-	-	-	-	1	1%	1	-	-	-	1	1	-	-			As above
	EOH																																					E.O.H.

PRELIMINARY GEOLOGIC LOG

(Subject to Revised Logging)

ASARCO - SILVER BELL UNIT

Note (3)
Tt - Tactite
Hf - Hornfels
Mb - Marble
Qt - Quartzite
Bx - Breccia
Da - Dacite
Mz - Monzonite
An - Andesite

Note (4)
V - Vein
F - Fault
D - Dike
C - Contact
Ig - Undif igneous

Hole No. D [illegible]
Page 1 of [illegible] Pages
Collar Elev 2621.03 Final Depth 385.6
Coords. N 37,004.87 N E 15,994.42
Inclination VERTICAL
Logged by N.R.N.
Date Start 5-4-67 Finish 5-9-67

Depth From	Depth To	Int'vl	Elev.	% Cu Total	% Cu Avg.	% Cu NS	% Cu Avg	% Core Recov	Sp. Gr	Cu (1) Chrys	Pitch	Black	Blue Green	N.S.?	Cc.	Cpy.	Born	Fe (2) Lim.	Py.	Mag.	Hem.	Spec	Other (2) Galena	Sphal.	Molyb	Calcite	Garnet	Silicates	Sericite	Clay	Vn. Qtz.	QUARTZ	CHLORITE	Green mica	Sil. K'spar	(3) Rock Type	Structures (4) Depth	True Dip	Remarks
0.0	10.0	10.0																																				N.R. STARTING BIT - NOT RECOVERED
10.0	18.5	8.5		0.48		NIL							Tr		0.38	0.10		Tr	1%										Mod Mod		St				Ak	6.7 - 29.0 Qtzm	?	Rk Quite Broken; Tex mostly Destroyed by Silicification; Bleached Sheared Rk zone 16.7 - 29.0
18.5	30.0	11.5		0.53											0.45	0.05			2%					Tr					St St	St Mod	Wk								Sulfs occur as veinlets & disseminated w/ considerable Rk and a correlation is dangerous
30.0	39.1	9.1		0.64											0.46	0.20			1-2 %										St St	St Mod								Tex Shear shattering & Silicifying of rock. Tex likely is all sec. alteration
39.1	47.8	8.7		0.53											0.45	0.68			1½%										Wk Wk		Sp							NORMAL Ak. Tex. & Sulfs Seem Controlled, but not assert w/ 6 of vein
47.8	57.0	9.2		0.39		1									0.34	0.35			1½%					.02					Wk Wk	St	Wk				SHEARED Ak (?)	Above 47.8 Qtz Vein 47.8 - 51'	65°	Tex. lost at 55' Rk appears to have been silicified. No evidence of K-spar & sericitic alt. 5% gives clay division
57.0	69.5	8.5		1.08		0.01								0.01	0.87	0.20			1½%					Tr					Mod Mod		Sp	Wk		Ak Sp				As Above - Stronger mineralization, but more decomposed w/ Stx vns.
69.5	74.7	5.2		0.79		0.01								0.01	0.80	0.18			2½%										Wk Mod St	St St	Sp			Ak Tr Ak Sp				Rk As Above - Shattered Stx. + Flooded (?) Sat in a fine grained white clay-ser grained mass
74.7	83.8	9.1		0.90		0.01								0.01	0.80	0.10			2½%										St	Mod St	Sp			Ak				Rk As Above - Sulf. concentrate as above
83.8	92.3	8.5		0.35		Nil									0.30	0.05			1½%										Sp	Wk	Sp			1-2%	Ak Tr 89.0 - 90.0	Flt 84 85 - 85' Flt Gouge		As Above w/ 85 there is relatively normal Ak
92.3	100.9	8.6		0.63		Nil									0.48	0.15			2½%										Sp		Sp	Sp			Ak	93.1 - 100.0 Flt Gouge & Shear Zone Qtz Vn @ 100.4 Vein - Fault	70°	As Above
100.9	110.4	9.5		0.66		1									0.56	0.10			2½%										Sp	Wk Wk	Wk			1-2%				As Above; 3' Spacing of 2" gouge zones
110.4	119.8	9.4		0.49		0.01								0.01	0.36	0.12			3½%										Mod Mod	Mod Mod	Sp	Wk					115' - 117.5' Flt Zone	?	As Above
119.8	129.3	9.1		0.34		0.01								0.01	0.21	0.12			2-3 %										Sp	Wk Wk	Wk Mod	Wk					124.7 - 126.3 Flt Zone	50°	Normal Ak Text Play Alt to clay-ser K spar with Alt to clay-Ser. Sulfs diss & in Wk Silt Sil in Wk
129.3	137.6	8.7		0.53		Nil									0.38	0.15			3½%										Wk Wk	Sp	Mod							As Above
137.6	145.8	8.2		1.57		Nil									1.37	0.20			3½%										Wk Wk Mod	Mod	Wk	25%						As above
145.8	154.8	9.0		1.12		Nil									0.82	0.30			2½%												Sp Wk		Tr	Tr Sp				As above, patchy .5% diss sulfs. Mainly cc replacing Gryp. Some Cpy cc along Sulf-Gb
154.8	163.4	8.6		0.47		Nil									0.24	0.23			1															Wk				As Above. Sulfs confined mainly to vns
163.4	172.4	9.0		0.40		Nil									0.20	0.20			1½%										St	Wk	3%	1		≤1% 5%				As Above
172.4	180.8	8.4		0.14											0.12	0.02			1										St St	Wk	2%	1		1% Tr	20%			As above
180.8	189.1	8.3		0.26											0.20	0.18		Sp	≥2.5%								Tr Sp			Wk Mod	2%	30-35%		Tr	Tr	Sp			" " Lim (orange) is not on chlor - Mark Play. Increased Alt. due to porosity & silt & Bow fix
189.1	197.8	8.7		0.17											0.08	0.09			1½%												10%	40%	5%			10%			As above, Bx is early Mineral w/ Qtz or Sil Material w/ some MoS2 & Py vns, post Bx
197.8	207.0	9.2		0.34											0.10	0.24		Tr	10½%										Wk Wk	St Silic Wk	15%	50%	1%	Tr	Tr				Broken Ak cemented by st Qtz-Py w/ 1% Cpy near tr or 0.3 Mo @ 207.0
207.0	215.3	8.3		0.16											0.09	0.07			2-3%											Wk Mod	10%	40%	Tr	Tr	5%				STly Silic Ak, cut by wk-Med. Qtz vns
215.3	224.9	9.6		0.12											0.02	0.10			1										Mod St	Sp	5%	40%		Tr					As above, fewer Noticable sharp walled vns, text patchy because of st silif
224.9	233.2	8.3		0.12											0.02	0.10			1								Tr		Mod		2%	30%		Tr	Tr				As above
233.2	242.2	9.0		0.07											0.01	0.06			1-2%								Tr		Sp Wk	Yw 5%	50%	Tr	3%	Tr		Qtz-Sulf Vns		60°	St Sil'n To 236'; Sulf primarily Vn. + frac Controlled.
242.2	250.6	8.4		0.08											0.01	0.07																						
250.6	255.7	5.1		0.13											0.03	0.10			7½%								Tr		Mod St		7%	60%		3%	Tr		Ak Sp Sulf 251.8 Qtz-Sulf Vns 253.7 - 254.8		Rk Becomes St. Silicified @ 248 and contains high total sulfs. Mz. stringers. Start @ 251.8'
255.7	263.8	8.1		0.20											0.02	0.18			12½%					Tr		.02%			St	Sp		60%				Mz 264.8'			V. St Ser Qtz Cementing Mz pebbles up to 1.5" long. St Sulfs assoc.
263.8	274.0	10.2		0.27											0.01	0.26			10½%							.02%			St Mod	Sp		50%	Tr					Rk is intensely Alt'd. Mz. Tex destroyed By Qtz-Ser Alt. emanating from Bx zone. Rk is med grained equigranular with 5% Black Biot. 2mm - 2mm.
274.0	285.2	11.2		0.16											Tr	0.18			4½%										St	Wk	3%	40%	2%	4%	Sp		Qtz-Sulf Vns		Rk is strongly altered by invading quartz-Ser. The Biot is variably altered to chlor.
285.2	293.5	8.3		0.12											Tr	0.12			3½%										Mod St	Sp Wk	7%	30%	4%	4%	Tr			75°	As Above. Mica primarily assoc. w/ vns + fracs.
293.5	305.1	11.6		0.11											Tr	0.11			5½%										Mod St	Wk Mod	7%	25%	8%	8%	5%				As Above; Feldsp. Felds varying shades of Lt. Green. Below this is to be mont-monite. 2nd K-spar in 1"
305.1	313.7	8.6		0.07												0.07			9½%										St	Wk Wk	35%	35%	6%	12%	8%			80-90°	Feldsp altering to lt. gn. clay, Biot 60% alt to chlor, 2nd K-spar surrounds phenos, Qtz-ser vns w/ Py up to 1/2"
313.7	323.1	9.4		0.10												0.10			6½%		Tr								Mod St	Mod	8%	20%	8%	12%	5%				As above. This Rk has quartz-Ser. invading & interstitial to the Phenocrysts
323.1	332.0	8.9		0.07												0.07			4½%				Tr				Tr		Wk St	Mod Wk	4%	10%	8%	6%	3%		Qtz-Ser-Sulf Vns		As above except vns + fracs are 40°-60° and there are two opposing sets
332.0	340.7	8.7		0.11												0.11			2½%										Mod		12%	30%	10%	3%	10%			40-60	As above. Intensity of Alt. Increasing
340.7	347.9	7.2		0.10												0.10			1½%								Tr				15%	40%	4%	1%	5%		Qtz-Sulf Vns 340.7 - 342	70°	Sil'n St.
347.9	356.9	9.0		0.12											Tr	0.12			4½%								Tr		Mod Mod	Wk	6%	40%	4%	1%	3%				As Above
356.9	363.9	7.0		0.16											0.01	0.15			7½%		Tr						Tr		Mod	Wk	6%	35%	6%	4%	3%		Qtz-Ser-Sulf Vns	80-90°	As Above + Sulfs Vn. Controlled To large extent
363.9	372.0	8.1		0.09												0.09			5½%		Sp						Sp		Mod	Wk	12%	30%	4%	4%	5%				As Above
372.0	385.6	13.6		0.12												0.12			2-3%	0.5%							Tr		Mod	Sp	5%	20%	4%		7%				Phenos are not euhedral. Hypo-Felds appear to be oligocl. (2nd Mb to)
	E.O.H.																																					E.O.H

Final Depth 842.0
Collar Elevation 2,718.66
Coordinates 37,863.68N 15,475.68E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-218
Sheet No. 1 of 3
Date Completed 3-23-67
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay-chlor	lim, hem	Rock Type	Remarks
0.0-29.0	29.0	RB	—	0	—	—	—	—	—	—	—	—	—	—	—	Rock Bit
37.4	8.4	NX wl	2.97	84	.92	.39		.39			No Vis suls .53?		Mod clay	Mod lim	Hf	Hf grn Hf wk-Mod Gar? some hi clay + chlor patches, several Mz box frags 1st of run
46.7	9.3		3.18	84	.40	.33		.33			.07?		1	1		Hf is weakly qtz-py Mod, wk-Mod lim mainly on fracs, wk MN ox
54.9	8.2		3.08	97	1.22	.96	43.6 @ 0.97 / 0.67	grn + blk ox 96			.26?		Wk-Mod	wk lim Mod MN ox		As above, less weathered, rk pass. disp Hf w/ some Gar. Mod blk ? + GRN Cu ox last 1/2 run
64.3	9.4		2.35	106	.86	.45		.45 grn + blk ox			.41?		1	Mod lim		As above Disp Hf w/ sp? gar. Mod exotic lim mainly on fracs, wk Mal + blk Cu O.
72.6	8.3		3.02	88	1.52	1.30		1.30			.22?		1	sp MN ox	Suls circa 1st of run	As above, ≈ 2' Mod Mal in cent. of run, wk py w/ tr-sp cc @ end run
80.5	7.9		2.63	93	.53	.14		.14	sp-wk		.39	sp gyp	1	wk-Mod lim	Chlor Hf circa 70'	As above, Wk-Mod(+) py wk cc and py, wk-Mod lim, st clay Alt.
85.3	4.8		2.73	94	.75	.28	27.1 @ 0.55 / 5.77	.28	wk-Mod		.47	wk gyp	wk clay sp-mod wk-Mod chlor	1		Hf. Mod py, wk-Mod cc and py, sp-wk grn Cu ox, RK mainly chlor. Hf slight limy
91.0	5.7		2.63	93	.54	.06		.06	Mod	.26	.28			wk lim	Mz @ 85.4'	Mod-ST Alt, Sil'N, Mod-ST py, tr cpy wk-Mod cc tr MoS_2
99.7	8.7		3.14	86	.46	.02		.02	wk-Mod	.30	.14		Mod chlor	—	limy chlor Hf @ 91.6' Pyrox Hf @ 95.6'	limy chlor Hf w/ wk-Mod py tr-sp cc, Pyrox? Hf @ 95.6' (May be trem.) sp p some gar Toward end run
105.5	5.8		2.85	101	.34	-		—	wk	.14?	20?		1	—		Mod py - qtz veining, sp gar tr Cu sul's wk chlor
106.8	1.3		2.72	98	.04	-			tr	.04?			1	—	And @ 106.5 low CT @ - 37°	blk aphanetic And, quite magnetic, tr py wk-Mod clay Alt.
111.1	4.3		2.91	89	.44	.01	0.44 / 0.01	No Vis sul .01	wk	.35	.08		1	—	Pyrox. - Gar. Hf @ 106.8	Mod py along qtz vns. up to 1/2" wide tr cu suls
116.5	5.4		2.88	91	.26	-			Mod(-)	.13	.13		wk-Mod chlor	—		Mod py on vns w/ little or NO qtz sp cc. wk-Mod gar diss in limy M
125.8	9.3		2.65	92	.05	-			tr?		None vis .05?		—	—	And @ 116.5 CT - 78 to 90°	Amygdaloidal (calcite filled) w/ olivine phenos, ST, magnetic. Occ frag Moth seds in run
138.1	12.3		2.66	96	.03	-			1		None vis .03?			Gar + Calc silicates		As above. Num. cal. vnlets, + ST cal. in grnd mass. Matrix chloritized.
143.0	4.9		2.97	93	.45	.01		None vis .01	wk-Mod	.44	tr?		Mod chlor		Mz box @ 138.1' Gar Hf circa 143'	Hf frags in chlor matrix, wk introduced py + hem for 2' then Mod-ST py wk cpy tr MoS_2 gal
152.5	9.5		2.97	99	.22	.01		.01	wk-Mod(-)	.21	tr		sp-wk chlor	Mod calc sil.		Grn gar intermixed w/ gy-grn Hf. Mod py as vns w/ sp qtz sp cc? tr cpy
161.6	9.1		2.69	102	.76	.02		.02	Mod(+)	.74	—		1	1		RK as above, less gar. some chlor. Mod py sp-wk cpy tr cc?
163.0	1.4		3.01	100	.37	.01	40.1 @ 0.78 / 0.01	.01	Mod	.36	—		1	1		As above, py vns dip @ 70°
165.6	2.6		3.12	103	1.49	Nil		Nil	Mod-ST	1.49		tr gal	sp chlor	?		ST Sil'N w/ ST py cpy rk mainly comp of suls, gar + silica
170.3	4.7		3.18	97	.79	Nil		Nil	Mod(+)	.79		1	Mod chlor	1		As above Mod cpy
178.2	7.9		2.79	105	1.50	.01		.01	1	1.50	tr?		Wk-Mod chlor		And @ 178.2 CT - 60°	As above laminated bedding? 1/40" think, alt. bands of qtz gar + calc sil
181.0	8.8		2.86	76	.03	—			No. Vis		No Vis. .03?		—	—		Post Min. And. Porphyritic 1/20" inch feld. xyls + chloritized Olivine? xyls 1/20" strongly, Magnetic + limy
196.6	9.6		2.68	113	.01				1		.01?		—	—		As above
206.9	10.1		2.84	97	.02				1		.02?		—	—		As above
213.9	7.2		2.87	93	.93	.01		No Vis .01	Mod	.92	—	tr MoS_2	sp chlor		Hf @ 205.8 CT - 76	limy H grn Hf. Mod(-) py, wk cpy tr MoS_2 w/ qtz vns
222.3	8.4		3.08	91	1.01	.01	33.0 @ 0.95 / 0.01	.01	wk-Mod	1.01	—		1	wk patchy gar		As above, Most Min. is along qtz vns + vnlets dipping 75° to 90° patchy gar
232.8	10.5		3.01	95	.93	.01		.01	1	.92			1	sp gar patchy		As above, patchy Gar 1st 2' of run then lt grn chlor Hf w/ sp Gar Mod(-) py wk cpy tr MoS_2
239.7	6.9		2.75	87	.91	.01		.01	1	.90			1	—	Gp? circa 232.8	CT Not clear. Fine xg lime May be Sp. Mod Alt Sil'N, Wk-Mod py wk cpy tr MoS_2 in qtz vns
248.4	8.7		2.72	92	.26	.01		.01	wk	.25		—	tr chlor	—		Wk to Mod Alt, Mod Sil'N along qtz vns, wk chloritic Alt, Wk py, sp wk cpy tr MoS_2
253.5	5.1		2.85	92	.27	.01		.01	wk-Mod	.26	tr?		1		Chlor Hf box @ 253.1	As above
262.5	9.0		2.83	86	.77	.01	11.6 @ 0.65 / 0.01	.01	wk-Mod +	.76		tr gal tr sph	Mod-ST			grn limy Chlor Hf box? (May be relocated) Mod py wk-Mod cpy tr MoS_2 + sph poor recovery
268.1	5.6		3.27	88	.46	.01		.01	wk	.45			Mod(-)	sp patchy gar.	Disp Hf @ 263	Hf comp mainly of diopside, wk py, sp cpy tr MoS_2
276.4	8.3		3.38	90	.30	.01		.01	1	.29			Sp	1		As above
285.0	8.6		3.45	85	.17	.01		.01	sp-wk	.18			tr sp chlor	1		As above, sp-wk py tr-sp cpy hem. lines some py vns
294.7	9.7		3.35	83	.38	.01		.01	Mod(-)	.37		Mod hem	—	Mod-ST gar.	hem-TT @ 285.4	TT w/ ≈ 10% hem Mod-ST py Mod cpy tr MoS_2, Tr gal. assoc w/ late cal-bar vnlets
303.5	8.8		2.97	87	.37	.01		.01	1	.36		1		wk-Mod gar		As above, 20-25% hem Mod(+) py wk-Mod cpy, some cpy assoc. w/ late vns
306.4	2.9		2.85	99	.83	.01		.01	Mod-ST	.82		sp-wk gal		wk gar		As above, Mod-ST py Mod cpy tr gal

Final Depth 842.0
Collar Elevation 2,718.66
Coordinates 37,863.68N, 15,475.68E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-21B
Sheet No. 2 of 3
Date Completed 3-23-67
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Chlor, clay Ser	Garnet, calc. Silic	Rock Type	Remarks
312.6	6.2	NXwl	3.94	62	1.51	.01	36.6@ 0.66 0.01	No vis ox .01	ST to Massive	1.60	—	wk gal Med hem				ST to Massive py w/ ≈ 3-5% admixed cpy wk gal. tr MoS2 ST Silt.
315.4	2.8		2.79	84	1.17	.01		.01	ST	1.16		sp gal		wk-Mod Gar		Hm TT as above, Mod py, Mod(-) cpy
321.6	6.2		3.08	87	.35				wk-Mod	.35			wk chlor	Mod-ST Gar	Diop. TT @ ≈ 315.4	Diop-chlor TT w/ lime, wk Qtz-py vning, wk py sp cpy
329.1	7.5		3.24	85	.25				wk-Mod	.25			Sp chlor			As above, prob. about 30% gar sp chlor RK very porous
338.3	9.2		2.91	96	.56	.01		.01	Mod to Massive	.55		wk gal	Mod wk-chlor	Sp Gar		RK mainly Sulf + Gar. ST py, Mod(-) Cpy tr-sp gal Most sulf in thin Qtz-py VNS
347.8	9.5		3.10	94	.29				wk-Mod(-)	.29					Chlor TT @ 338	Fine ly/like Gar + Diop. wk chlor, wk py sp-wk cpy
356.2	8.4		3.25	71	.19					.19			wk chlor	wk-Mod Gar		As above, chlor. vuggy ZONE 350.8 to 352.6 tr gal assoc w/ 1/4" Gar VNS
364.1	7.9		3.01	98	.28				wk-Mod	.28			wk-Mod chlor	Mod Gar	Sil. TT @ 355.2 Chlor Hf @ 359.9	RK comp of Qtz + amber Gar wk py sp-wk cpy TT Gal w/ Qtz-py VNS
373.7	9.6		3.17	84	.36				wk-Mod(-)	.36		sp fluorite		tr-sp Gar	Diop-Chlor Hf @ 364.1 Mz @ 372.0 chlor Hf circa 379.1	Chlor Hf - wk py, sp cpy controlled by VNS
379.1	5.4		2.66	72	.38				wk(-)	.38						Finely/like Hf increase chlor toward Mz, wk py sp-wk cpy tr MoS2 in Qtz-cpy VNS
383.9	4.8		2.88	88	.28					.28					Mz @ 385.9 CT @ 30° Hf @ 387.4 Diop Hf circa 393	Mz - May be Gp. planes. ≈ 1/20" ST Alt. wk chlor Mod 2ND K spar in gouge Mass sp-wk py
392.7	8.8		2.68	94	.30					.30						DK grn limy chlor Hf. tr hem. wk Qtz-py VNS
399.0	6.3		3.14	78	.43	.01		No vis ox .01		.42		tr MoS2		tr? Gar		Chlor Hf, some Tt. Mod chlor, Ah, Silin in Mz wk py, sp-wk cpy along VNS
413.6	14.6		2.93	57	.65	Nil		Nil	wk-Mod(-)	.65			wk chlor			lt grn diop? Hf. gar + chlor along VNS sp py, cpy along VNS
416.3	2.7		2.86	33	1.06	Nil		Nil		1.06						As above, some gar. in places the rk is clay rich sp-wk cpy
426.9	10.6		3.04	66	.39				Wk-Mod	.39			sp-wk chlor	Wk-Mod Gar		As above, More gar. wk cpy, tr MoS2 along Qtz VNS
435.8	8.9		3.02	91	.46	Nil	78.5@ 0.71 Nil	Nil	wk	.46			—			Hf grn (pistacite?) diop Hf wk-Mod(-) py, wk(-) cpy loc. along VNS
445.5	9.7		3.05	82	1.13	Nil		Nil		1.13			—	Mod-ST Gar	Gar Hf circa 436	As above ≈ 30-50% br Gar starting @ cent of run, wk py wk(-) cpy on VNS + disf Hf-cc gal tr MoS2
453.5	8.0		2.95	99	.65	Nil		Nil		.65		tr BN	—		Gar Hf	As above, about 1/2 diop? Hf + 1/2 Gar wk-Mod py Mod cpy along Qtz-cpy-Mo VNS tr disf some diss
[illegible]																Hf w/ wk patchy Gar wk py Mod(-) cpy? tr MoS2, BN in Qtz VNS some diss.
461.8	8.3		3.07	96	.88	Nil		Nil		.78		sp MoS2 .06BN	—	ST Gar		these VNS carry st cpy sp MoS2 + Tr BN in places, in the center of white Qtz. The VN-ok banding is shack. There is little assoc. py
471.2	9.4		2.96	99	.94	Nil		Nil	sp-wk	.84		tr MoS2 .10BN	—			RK 1/2 diop? 1/2 Gar wk py Mod cpy sp MoS2 Sp diss BN. Cpy + MoS2 Mainly in Qtz VNS dip - 78 to 90°
479.8	8.6		3.32	85	.06				Sp	.06		—	wk-Mod chlor	Sp Gar		As above, ST Silin along hair-like Qtz VNS Mod diss cpy sp BN, tr MoS2
488.4	8.6		3.27	89	.40					.40		tr MoS2	sp chlor	wk Gar		lt gy-br limy Hf, wk patchy gar tr-sp py, cpy
497.0	8.6		2.59	102	.08				wk	.08				sp-wk Gar	lt grn Hf @ 490	As above, sp py, cpy, tr MoS2 Carbonate VNS carry cpy + MoS2?
506.6	9.6		3.02	87	.10				Sp-wk	.10		tr bar tr MoS2	wk-Mod chlor	sp Gar	bx circa 497	Hgrn Hf, limy, appears silty bedding 1/20" dips 30-40° sp py cpy tr MoS2?
515.9	9.3		2.76	94	.33				wk	.33		tr MoS2	Mod-ST chlor	—	AHd 511.3 - 513.3 strip CT	Bx frags of Hf as above, TT and hem Hf cem. w/ CaCO3 Frags 1-5" dark frags predominate, sp Tot Sulf
521.9	6.0		2.70	103	2.20	.02	33.5@ 0.80 Nil	No vis ox .02	1	2.20			1	Sp Gar		bx as above, frags more chloritic, sp-wk cpy. Fine pebble br along AHd CT
528.8	6.9		2.64	95	.12				No vis	.12?		Mod-ST Mag	ST chlor Serp?	—	Post Min Bnd @ 521.9 CT? Hem. TT @ 528.8	bx - ST lime matrix w/ chlor. frags Mod cpy mainly along VNS up to 1/2" wide, some diss
533.1	4.3		2.77	105	1.52	.01		No vis ox .01	wk-Mod	1.51		tr MoS2			TT @ circa 533	Porphyritic emy ye delidal w/ cal fill. vss. strongly Magnetic
540.1	7.0		3.56	89	.45	Nil		Nil	wk-Mod(-)	.45			—	Mass. Gar	HFD 541.3	10% hem in fine ly/lime Gar-Silin-diop? Mod py - Mod-ST cpy on VNS + diss
549.8	9.7		3.09	98	.18				wk	.18			sp chlor	ST-Mass		Porous TT, br Gar, in places Qtz fills voids + is assoc w/ cpy-py where No Qtz - rk is crumbly!
558.8	9.0		3.13	94	.14				tr	.14		tr MoS2		WK Gar		lt gy-grn Hf prob. diop. ≈ TT @ 546.2 wk-Mod cpy in TT wk py, cpy in Hf
566.8	8.0		3.15	97	.28				sp	.28			Mod chlor	Mod Gar		lt grn limy Hf - sp-wk py sp cpy on VNS sp chlor
574.9	8.1		3.03	93	.96	Nil		Nil	Mod-ST	.98			wk-Mod chlor	wk-Mod sp, Gar		As above, slight increase in cpy patchy Gar
583.2	8.3		2.78	102	.82	1		1	Mod	.82			Mod chlor	tr Gar		Hf as above, st Qtz-py vning Mod-ST py Mod epidote, wk cpy tr MoS2
591.4	8.2		2.86	101	.67	1		1	wk-Mod	.67		sp kcn	Mod-St Chlor	Wk-Mod Gar	TT circa 588'	As above Qtz-py vnlets from hair-line to +1" 75° to vertical
600.1	8.7		3.33	84	.87	.01		.01	1	.86		tr MoS2	—	Mass. Gar		Hf w/ increasing Gar. Mod Qtz py-cpy vning, Mod py cpy, tr MoS2 Mod cpy diss in TT
609.6	9.5		3.07	76	1.77	.02		.02	1	1.77			—	1		Br Gar - Wk-Mod py Mod cpy, sp MoS2 along VNS + assoc w/ Qtz injected into porous rk
																St ly silf. Gar. wk-Mod py - Mod cpy sp-wk MoS2 @ end run is porous earthy - unsilf. Gar. that carries Mod cpy Mod limy vns inside in center

Final Depth 842.0
Collar Elevation 2,718.66
Coordinates 37,863.68N, 15,475.68E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-218
Sheet No. 3 of 3
Date Completed 3-23-67
Logged By JAB + N.R.N.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay, Ser chlor	Calc. Silic Gar	Rock Type	Remarks
615.3	5.7	NX WL	2.92	105	1.70	.02	73.96 / 0.88 / Nil	No Vis Ox .02	Mod(-)	.168	—	tr MoS_2	—	Massive Gar	Gar.-Diop Hf. Bxs 615	Mod brn gar. in a silbrd grn grd mass; Mod CPY, Sp Bor(?) in Calcite Vn + disseminated
624.2	8.9		3.42	93	.52	Nil		Nil	wk	.52		1	—	1	TT at 615.3	ST Lt. brn garnet Tr. porosity increased down; wk fine grd CPY in Calcite + disseminated Sp MoS_2
631.3	7.1		2.79	102	.23	Nil			tr-Sp	.23		1	tr chlor	Sp-wk Gar	Lt grn Calc Silicate Ht @ 624.2	Dense Lt. grn Calc Sili; Sp Gar, wk chlor; Sp CPY + MoS_2
640.7	9.4		3.03	88	.46	Nil		Nil	wk	.46		1	wk chlor	1		Gar. Cont. Increases Downward. Mod Sili + Qtz veining; Mod Py, Sp CPY + ZnS Mod chlor
648.6	7.9		2.72	91	.24				sp-wk	.24		1	tr-Sp	Sp gar		Gar. v.sp.; Rk is grnish orange + silic Sp Py Tr-Sp CPY + Sph Tr MoS_2; Rk is altered along minute fracs to a pale greenish min. which looks like K-spar
661.7	13.1		2.66	95	.34				wk-Mod(+)	.34		1	Sp-wk	Mod gar	St Bx 654.0 - 657.4	Mod Gar to circa 651; wk epidote; wk qtz veins; wk Py, Sp CPY, Sp Sph(?) a St Bx is strly. mineralized by Py + sph 654.0 ± 657.4. Mod Chlor
670.0	8.3		2.93	99	.22				wk	.22		1	Sp chlor	wk gar	Hf grn S.1 Hf	Dense Lt grn Sili Hf w/ occasional patches of Gar; wk Py along veinlets; Sp, CPY.
679.0	9.0		2.61	94	.05				sp-wk	.05		1	tr chlor	tr-sp gar		Hf grn to lt br NON-limy Sil Hf. wk py Sp MoS_2 along Qtz vn
686.7	7.7		2.79	102	.09				tr-Sp	.09		1	1	—		Rk is very hard + flinty - comparable to similar RK in DB7 below DP
696.5	9.8		2.87	90	.25				Sp	.25		1	wk-Mod + chlor	—		As above, wk patchy calcite, Sp py tr cpy
705.5	9.0		3.18	93	.22				tr-Sp	.22		1	Mod chlor	Mod Gar	chlor. bx @ 696.5, Gar Hf @ 690'	As above, Sp CPY. chloritized bx, (bx frags limy), Hf grn to lt br sp ly limy Hf w/ patchy br gar? Sp py cpy tr MoS_2 Num. gyp VNS cut rk
714.6	9.1		3.32	88	.44	.01		No Vis Ox .01	1	.43		1	Sp chlor	ST-Mass? gar	Hf	these VNS contain tr sulfs late prob. hydrothermal gyp VNS qtz As above Gar decreases @ end of run. Sp py, wk cpy tr MoS_2 along VNS
722.9	8.3		2.99	93	.24				1	.24		1	1	ST gar		As above decreasing No. of gyp veinlets
731.9	9.0		2.92	99	.30				1	.30		1	Sp-wk chlor	—		As above, pre-Alt. bx @ 722.9 - 724.6
739.8	7.9		3.06	92	.25				1	.25		1	wk chlor	Mod Gar		bx 732.8 - 735.2 As above, Sp py Sp-wk cpy Sp MoS_2 Sp gyp veining
748.4	8.6		3.16	98	.13				tr	.13		Sp MoS_2	1	wk Gar		lt br - Hf grn Hf wk-Mod gyp VNS tr py, cpy bx, MoS_2 The gyp appears to carry sulfs. ONEW carries Mod MoS_2 lining the wall rk-VN contact. another gyp VN carries bornite in the con tr - No most other gyp VNS are barren (gyp is post min. but has included mineralized VNS JAB)
756.9	8.5		3.00	98	.09				1	.09		tr MoS_2	tr chlor	Sp-wk Gar		limy Hf. Sp-wk grn Garnet. tr py, cpy, MoS_2? Mod gyp veining but w/ No su
763.2	6.3		3.00	99	.05				1	.05		1	1	Sp Gar		As above, Mod fine gyp VNS tr py cpy MoS_2?
774.6	11.4		2.91	95	.18				1	.18		1	wk-Mod chlor	tr Gar	bx @ 763'	fine bx, most frags < 1/16" some 1/16" to 1/4". Blocks or solid to 3" thick 769?-772.8 ST gyp. 1' alabaster @ 762.4 + 3' @ 773.5 qtz. amythist grow
781.9	7.3		2.57	99	.42	.01		No Vis Ox .01	1	.41		Sp MoS_2	wk chlor	Mod-ST Gar	Hf @ 777.9'	in the gyp. No sulfs noted. bx as above, wk cpy tr Sp MoS_2 in frags - Hf-limy sp chlor wk gar. Sp cpy tr MoS_2
790.1	8.2		3.01	99	.25				1	.25		tr MoS_2	tr-Sp chlor	wk Gar		As above, still Mod gyp VNS
798.6	8.5		3.18	97	.17				1	.17		tr MoS_2	tr chlor	Mod Gar	S.1 Slt. Stone circa 790'	Slt ST composed mainly of siltsize Qtz poss. bedding dips 86° sp sulfs
806.3	7.7		2.96	98	.13				1	.13		1	1	tr-Sp Gar	1	As above Mod patchy gar. sp chlor gives rk lt grn color.
814.8	8.5		3.21	98	.04				1	.04		1	1	tr Gar		As above. tr lime gyp VNS as above
823.5	8.7		3.11	98	.08				1	.08		1	1	1		As above
832.1	8.6		3.20	98	.06				1	.06		1	1	1	Hf grn S.1 Hf circa 823	Probably the same rk as above, No bedding. silt texture less usable - tr py cpy MoS_2
842.0	9.9		3.19	97	.10				1	.10			1	1	banded (bedded) Hf - 50°	Hf grn NON limy bedded Hf. 1/10" gar bands alternate w/ 1/20 - 1/40" Hf beds tr Py, cpy MoS_2
EOH			Avg. Rec'y	92%												

Final Depth 2564.4
Collar Elevation 3080.94
Coordinates 36,799.64 N 19,398.45 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-87 Re-entry
Sheet No. 1 of 8
Date Completed 3/6/67
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	limonite hem	Rock Type	Remarks
513.3 - 526.4	13.1	NXWL	2.56	68	.25				sp	.25	–	Tr ZnS	Bar wk clay wk clay	–	Mz	Mod Alt, wk silin, Mod 2nd K spar along qtz unlets w/ tr MoS2, sp py sp-wk cp
539.1	12.7		2.61	48	.25				sp-wk	.25	–	sp ZnS	Ser		Dp @ 537.4	As above, wk hem, chlor 535.7 - 537.2 tr? Sph.
547.3	8.2		2.52	85	.15				sp-wk	.15	–		Mod-St chlor-ser			Mod-St Alt, sp-chlor or grn clay, sp-wk 2nd K spar sp py, cpy
553.0	5.7	✓	2.53	59	.17				sp	.17	–		St sp sp chlor		flt bx 545.6 to circa 555	Gg rk w/some bx + sul. gg sp 2nd K spar sp py, cpy
562.0	9.0		2.57	95	.16				sp	.16	–	Tr-sp MoS2	Mod ser clay			Mod Alt, sp py, MoS2 on qtz uns, rk broken + friable from flting?
571.5	9.5		2.61	85	.16				sp	.16	–	Tr-sp MoS2	wk-mod clay sel			Alt as above, sp py, cpy tr MoS2 tr 2nd K spar, rk more sel'd
579.5	8.0		2.63	92	.13				sp	.13	–	Tr-sp MoS2	wk-mod clay-sel			Wk-Mod Alt, min as above
587.8	8.3		2.62	91	.13				1	.13	–	1 X	1			wk-mod Alt, sp-wk py, sp cpy, Tr MoS2, Tr 2nd K-spar. Tex looks vaguely Mz.
596.5	8.7		2.60	98	.12				1	.12	–	1 X	1			wk-mod Alt, sp-wk sil'n, sp chlor; sp py, cpy, MoS2; Frac. 10° Dp sulf silin
604.7	8.2		2.61	96	.17				1	.17		1 X	1			wk-mod Alt, wk sil'n, sp-wk 2nd K-spar; sp cpy, py, Tr Cal(?), MoS2, Tr Cal
612.9	8.1		2.60	100	.18				1	.18		1 X	1			wk-mod Alt, Mod-St sil'n; M.N As Above
621.2	8.4		2.60	93	.19				1	.19		1 X	1			wk-mod Alt, Mod-St sil'n, sp-wk chlor, sp py, cpy, MoS2
629.9	8.7		2.61	98	.11				1	.11		tr MoS2 X	1			wk-mod Alt, Mod sil'n, sp 2nd K-spar; Tr-sp py, cpy + MoS2
639.4	9.2		2.65	93	.11				1	.11		1 X	1			wk-mod Alt, wk sil'n, wk 2nd K-spar along fracs + in form MoS2; sp-wk py sp cpy, sp MoS2.
647.7	8.6		2.61	93	.16		.019 Mo		1	.16		.019 X	1			As Above; The py is most generally in fracs bounded by sil'n. MoS2 is in QTZ veins + cpy is in sil'n
656.5	8.8		2.66	95	.13				1	.13		1 X	1			wk-mod Alt, wk sil'n, sp chlor, wk (+) 2nd K-spar; MoS2 in 30-45° dip
665.5	9.0		2.66	92	.12				1	.12		1 X	1			wk-mod Alt + sil'n, sp-wk 2nd K-spar, sp chlor; sp py, Tr-sp cpy, Tr Mo
674.8	9.3		2.55	86	.14				1	.14		1 X	1			wk-mod Alt, wk sil'n, wk 2nd K-spar + chlor; wk py, sp wk cpy, Tr-sp MoS2 some bleaching along frac
683.1	8.3		2.60	100 +2	.15				1	.15		1 X	1			As Above w/ wk-mod chlor-Bar.
690.2	7.1		2.61	99	.13				1	.13		1 X	1			As Above. The rk is Brkn + gg from place to place
700.4	10.2		2.62	81	.14				1	.14		1 X	1			As Above
708.8	8.4		2.60	100	.12				1	.12		1 X	1			As above w/ increase in sulfide content
716.8	8.0		2.65	94	.12				sp-wk	.12		1 X	1			wk Alt, wk sil'n; sp py, Tr-sp cpy, Tr-sp MoS2
725.2	8.4		2.64	94	.16				1	.16		1 X	1			wk Alt, sp sil'n; Tr-sp py, sp cpy, Tr MoS2. Bar in all stages of Alt.
733.5	8.3		2.64	99	.13				1	.13		tr MoS2 X 1 grn	wk clay ser tr chlor			Alt is primarily along fracs. wk-mod Alt & QTZ veining w/ MoS2; wk(+) py, sp cpy, sp MoS2. Some Bar
743.0	9.5		2.63	90	.08				sp	.08		tr MoS2 X	1			wk Alt, sp-wk sil'n, sp chlor, sp-wk 2nd K-spar; sp py, Tr-sp cpy + Tr MoS2
752.4	9.4		2.64	95	.08				1	.08		1 X	1			As Above
761.1	8.7		2.63	91	.07				1	.07		1 X	1			As Above
770.2	9.1		2.65	91	.15				1	.15		tr MoS2 X 1 bar	wk-mod clay ser tr chlor			As above, one Meta-sed zone circa 767' was 2" x 15"
779.0	8.8		2.63	97	.13				1	.13		tr MoS2	1			As above, Dp is slightly more porphyritic than it was higher up
787.8	8.8		2.62	95	.11				1	.11		1	1			As above, wk-mod sil'n
795.2	7.4		2.65	85	.41	.01		.01	sp-wk	.40		1	1			wk-mod Alt, sp-wk sil'n, st cpy in edge of core (5") assoc. w/ chloritic veins?, sp py, MoS2
804.0	8.8		2.65	99	.14				sp	.14		1	tr chlor sp-wk clay			wk Alt, sil'n, sp py, sp-wk cpy tr MoS2 tr 2nd K spar on unlet
813.2	9.2		2.66	97	.09				sp	.09		1 X	tr chlor wk-mod clay sp chlor			As above, No 2nd K spar
821.5	8.3		2.63	99	.05				sp-wk	.05		1	mod clay wk ser		bx @ 816.5 - circa 821'	Dp as above, bx - siliceous bx of chert or silf metaseds, He, qtz w/ sp 2nd K spar. wk-mod py, wk cpy sp sph, tr MoS2
830.1	8.6		2.65	90	.10				wk	.10		1 X	mod-st clay-ser		Dp	wk Alt, sil'n, Tr-sp py, cpy tr MoS2 tr 2nd K spar out from unlets
838.5	8.4		2.64	92	.12				wk	.12		1 X	1			Alt as above. rk bxiated + reheated, wk bar in bx wugs
846.6	8.1		2.64	95	.11				wk	.11		1	wk-mod chlor sp chlor			wk-mod Alt, sil'n, sp chlor, Mod grn clay sp py sp(+) cpy tr MoS2
855.5	8.9		2.62	95	.15				wk	.15		1 X	mod clay			As above, sp py sp-wk cpy, tr MoS2

Final Depth 2564.4
Collar Elevation 3080.94
Coordinates 36,799.64 N 19,398.45 E
Inclination VERTICAL

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-87 RE-ENTRY
Sheet No. 2 of 8
Date Completed 3/6/67
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay, ser chlor		Rock Type	Remarks
864.1	8.6		2.64	100+1	.09				sp-wk	.09		tr MoS2	wk chlor / Mod chlor	X		Wk-Mod ALT, wk Sil'n + CHLOR, sp-wk PY, sp CPY, tr MoS2; 20°-40° Qtz sulf. valets
872.5	8.4		2.59	98	.12					.12			Sp chlor, wk clay ser	X		As Above; Close spaced parallel shear front 20°-50° 874' on
882.8	10.3		2.59	97	.11					.11		—		X		Wk-Mod ALT, wk(+) Sil'n + QTZ vning, sp-wk PY, sp CPY, Tr MoS2; Rk is full of shatter lines, some 70° slip plane.
885.2	2.4		2.78	96	.38				Mod	.38		—	Wk-Mod chlor	X	DENSE, DARK ALTD. SHO or ALTD. LOWC	DENSE, DARK CHLOR-Feld Rk, JASPER breccia Tex could possibly be igneous. Rk is cut by numerous 30°-40° PY seams, some calcite valets.
889.0	3.8		2.64	98	.22				Wk	.22		tr MoS2	Sp-wk chlor, clay	X	Dp	Sp-wk PY, Tr CPY
898.2	9.2		2.63	97	.07				Sp-wk	.07		—		X		wk-Mod ALT, wk Sil'n, wk CHLOR; sp-wk PY, sp CPY
907.2	9.0		2.66	94	.13					.13		tr MoS2				wk-Mod ALT, sp-wk Sil'n, wk Qtz vning (30°), sp-wk PY, Tr-sp CPY, Tr MoS
915.4	8.2		2.66	95	.08					.08			wk(+) clay ser			As Above, wk Chlor + sp 2nd K-spar.
923.8	8.4		2.64	98	.12					.12		—	sp Sil'n, sp	X		As Above
932.5	8.7		2.68	96	.11				wk	.11		Tr-sp MoS2	wk (+) clay, sp CHLOR	X		wk ALT, wk Sil'n, sp-wk CHLOR, Tr-sp 2nd K-spar, sp PY + CPY
941.5	9.0		2.63	99	.09				Sp-wk	.09		Tr MoS2	wk-Mod clay, sp-wk CHLOR	X		Ser ALT, wk Sil'n, Mod-Grn Clay(?) in Grnd. Mass; sp-wk PY, Tr-sp CPY
949.9	8.4		2.65	94	.16					.16			sp-wk clay, Tr CHLOR	X		Mod ALT, wk-Mod Sil'n, wk CHLOR, sp-wk PY, Tr-sp CPY, sp 2nd K-sp
958.8	8.9		2.65	96	.06				wk	.06			wk clay, Tr-sp CHLOR	X		wk-Mod ALT, sp Sil'n + Qtz vning, sp 2nd K-spar, sp-wk 50° fract. sp PY, Tr-sp CPY, Tr
967.6	8.8		2.63	98	.06				sp-wk	.06				X		wk ALT, sp Qtz vning, sp CHLOR, sp(+) PY, Tr-sp CPY, Tr MoS2
[illegible]	8.9		2.67	96	.07				wk	.07		Sp MoS2	wk-Mod clay, wk-Mod CHLOR	X		wk-Mod ALT, sp Qtz vning, sp Calcite valets (high angle); Tr-sp PY, (PY, Tr MoS
[illegible]24.0	7.5		2.67	95	.09					.09		Tr-sp MoS2		X		As Above, wk high angle fract, FLT Bx @ 975.4'; sp PY, Tr-sp CPY,
[illegible]	8.5		2.63	97	.05				sp	.05			wk clay? sp chlor	X		wk-Mod ALT, sp 2nd K-spar, wk CHLOR; sp CPY + PY, Tr-sp MoS2, FLT @ 176.
100[illegible].6	8.1		2.63	100+2	.07				wk	.07				X		wk-Mod ALT, wk(+) Sil'n, Tr-sp 2nd K-spar, sp chloritization of Biot; sp PY, Tr-sp CPY, Tr MoS2
1009.[illegible]	8.5		2.58	93	.07					.07				X		wk-Mod ALT, wk Sil'n, sp CHLOR; Biotite valets; HIGH ZONE 990.0'-1000' contains mod PY + CPY
1017.3	8.2		2.60	100	.06					.06			wk clay & wk chlor	X		wk-Mod ALT, wk Sil'n, wk(+) CHLOR, 20°-90° Qtz-MoS2 valets. Commen; Rock becomes shattered + intensity increases from 1007' on; sp-wk PY, sp CPY, Tr-sp MoS2
1029.0	11.7		2.61	71	.07					.07				X		wk-Mod ALT, sp Sil'n + Qtz vning, mod CHLOR; Num 80° fract Curv 1016'. FLT Bx @ 1016.9'; sp-wk PY, Tr-sp CPY, Tr
1037.6	8.6		2.64	94	.09					.09			Sp clay chlor	X		wk ALT, 5-10% sp ALTD Biot, sp Sil'n; sp PY, Tr-sp CPY, Tr MoS2
1045.7	8.1		2.64	100+2	.09					.09		tr MoS2		X		wk ALT, Biot wk-Mod ALTD to CHLOR, Min as above; Med-Coarse fold are not uncommon.
1053.9	8.2		2.62	100	.10					.10				X		As above
1062.5	8.6		2.64	94	.22					.22			Sp-wk clay Mod chlor in Hf	X	Hf bx @ 1058.8 -1061.3	" "
1070.7	8.2		2.63	95	.08					.08				X		Chlor Hf bx along fft? struct. wk epidote, sp cpy, wk py, tr 2nd k spar
1080.0	9.3		2.62	97	.08					.08			Sp clay ser	X		wk Alt, sp py, cpy, tr MoS2 wk Qtz vning assoc w/py vnx + MoS2 vns
1088.4	8.4		2.63	100	.07					.07				X		wk Alt, sp py, cpy, tr MoS2 3" band of 2nd K spar, epidote & tr py, cpy @ 107
1096.9	8.5		2.63	93	.12					.12				X	biotite Hf 1085.7 – 1090.7 upper w/lower cts dip -30°	As above, feld phenos up to .2" in length
1106.7	8.8		2.63	8.4	.06				Sp wk	.06			Sp chl-Tr ser chlor	X	Dp	biotite Hf w/ wk-Mod py tr cpy on valets + diss, tr qtz in cal vn Dp as a
1114.2	7.5		2.62	100+5	.09				wk	.09				X		wk Alt, sp-wk py, sp cpy, tr MoS2
1122.7	8.5		2.64	100	.11				sp-wk	.11				X		As above fluorite vn @ 1106.0' dipping @ 60°
1126.5	3.8		2.63	98	.16				wk(+)	.16			Mod-ST CHLOR	X	biotite Hf 1122.4 Dp @ 1125.5	As above
1133.1	6.6		2.67	93	.07				sp-wk	.07			sp CLAY-sp CHLOR			Dp as above, Hf CT @ -15°; Rk is fine bio. in calcite Matrix wk-Mod py tr cp
1141.5	8.4		2.61	97	.10				Sp	.10				X		Tp CT @ -15° Dp as above
1150.4	6.9		2.64	97	.10				sp-wk	.10			sp-wk clay-ser sp CHLOR	X		wk ALT, sp CHLOR, sp Qtz valets, sp-PY, Tr CPY + MoS2. Rk has rehealed shattered appe
1158.7	8.3		2.62	93	.07					.07			sp clay-ser sp chlor	X		wk ALT, wk Sil'n; sp PY, Tr-sp CPY, Tr MoS2
1166.8	8.1		2.65	97	.16				wk	.16				X		wk ALT, sp Sil'n, sp CHLOR; sp PY + CPY, Tr MoS2; Several 15° Qtz-MoS2 valets
1179.8	12.4		2.62	94	.10					.10			wk clay sp chlor	X		As Above except CPY is sp-wk
1184.6	5.4		2.72	99	.19					.19			wk + clay	X	DK. Biot value Hf 1178.2 – 1179.0	ALT As Above; wk PY occurring in valets, sp CPY; Calcite commen w/ sulfs

Final Depth 2564.4
Collar Elevation 3086.94
Coordinates 36,799.64 N 19,398.45 E
Inclination VERTICAL

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-87 RE-ENTRY
Sheet No. 3 of 8
Date Completed 3/6/67
Logged By N.R.N. + JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: Clay Ser Chlor		Rock Type	Remarks
1193.8	9.2		2.62	87	.10			—	Sp-wk	.10			wk-mod Ser-Talc			Mod Alt, sp-wk Chlor, Quite shattered-sheared in near vertical direction
1204.4	10.6		2.54	82	.11			—	1	.11			Mod Clay Talc, Sp Ser		Mz(?) 1199.4-1199.9'	Quite Brkn + Gsh. 1192.8-1193.8'. Dense Chloritic Ht Xeno @ 1193.8' Dp is Quite Shattered and Brecciated w/a 20° Flt zone @ 1197.3' Dp
1211.5	7.1		2.61	99	.16			—	1	.16			Mod Clay -Talc-Mod of Ser		Dense Dark Chlor Ht (?) 1206.6-1207.5'	is wkly. Chloritized probably has assimilated some Ht.. Sp Py, Tr-Sp CPy, Tr Mo is wkly. Chloritized Ht. is darker & Dark and has mod v. fine P. + Sp CPy
1216.2	4.7		2.70	97	.26			—	wk-Mod	.26			Sr Bio-Chlor		Dense Dark Chlor - Ht. CT?	The Dp is wk(+) Silicified; The Chlor Ht.
1221.6	5.4		2.58	99	.25			—	1	.25			Mod-Sr Clay wk Chlor Sp Ser		Pale Grn Ht. 1218.5-1219.5' Mz 1219.5-1221.6'	This Rk is v. Dense and may be primarily Bio. Tr is and Dx num. Calcite veinlets. Sp v. fine Py, Tr CPy. Contacts Area 40°
1230.5	8.9		2.55	94	.11				Sp-wk	.11			Sp-wk Clay-Ser Chlor		Dp w/ Mz 1222.8-1223.5' Bx 1223.5-1229.0'	Silic Dp Makes low angle CT w/ Grn Ht. Ht contains mod Py CPy in 10°-50° hairline veinlets. The Mz(?) is lightly alld. and has num. xenos of Ht. Dp; Mod Alto Dp + Mz, wk-mod Chlor. The Bx zone is chloritized + Epidotized
1238.4	7.9		2.63	100 +2	.07				1	.07						weakly. Overall contains sp-wk Py + Tr-Sp CPy, Tr MoS2
1247.2	8.8		2.64	95	.10				1	.10						WK Alt, Tr-Sp Chlor, Sp Qtz. Vning + Sil'n. Min As Above. Tr + Good Dp
1254.6	7.4		2.63	93	.10				1	.10					Pinal Schist (?) 1251.8-1253.1	As Above except Qtz.-Py-MoS2 veinlets more numerous. 30° dip con
1261.8	7.2		2.62	100	.10				Sp	.10		tr MoS2	Sp Clay-Ser-Chlor			Dp As Above; Pinal is tightly folded on small scale. Thinly foliated. Contains wk Alt, Tr-Sp Sil'n + Qtz Vning.; Sp Py+CPy, Tr MoS2
1267.6	5.8		2.64	96	.06				1	.06		—	Sp-wk Chlor			As Above
1274.4	6.8		2.64	100 +4	.10				Sp-wk	.10						As above, Sp-wk Py
1283.4	9.0		2.66	97	.17				Sp	.17			Tr-Sp Clay Sp-Chlor		Mz @ 1282.0	Tr. as above Mz-wk Alt large Anthedral fels. Mod small epi xyls, some sed xe
1293.1	9.7		2.63	84	.09				Sp	.09			Tr-Sp clay-Chlor		Dp @ 1285.4 CT @ 40°	CT w/ Dp is gradational w/ Mz-like xenos or xyl groups in Dp
1301.1	8.0		2.61	97	.28				Sp	.28		Tr MoS2	Sp-wk Chlor wk Clay		Bx @ 1292.8-1294.1'	Sp-wk Alt, Mz-Dp CT has num. Qtzite xenos (1/4" dia) + shows flow banding in Bx comp of Meta sed xenos + Dp silt and folds pathized w/wk-mod cpy. Sp-wk sph. Both rks
1305.9	4.8		2.84	98	.16				Sp-wk	.16		Sp MoS2 Tr-Sp PbS Tr MoS2	wk-Mod Chlor Sp-wk Clay		Dp @ 1301.1-1306.0	Dp as above Frags of fine Metased, silt Alt to epi + chlor. Sp py, tr (?), sp gn + sph. Tr MoS2 Bx exhibits fluidized text. near bottom CT.
1318.3	12.4		2.61	96	.22				wk	.22		Tr MoS2	wk Chlor Sp-wk Clay		Bx 1312.0	Bx appears to be fluidized w/ Dp also involved in brecciation. Some wk Mod w/much chlor Matrix ground sds + Dp wk-mod epi. Sp py, cpy gn sph?
1327.6	9.3		2.62	87	.06				Sp-wk	.06						No Meta Sds in Bx here Dp is granulated w/ grains + plates rolled and sheared to produce friable rk w/ sp tot sulf + some post move. Qtz w
1337.1	9.5		2.63	85	.06				wk(+)	.06					Solid Dp @ 1333.5'	As above - Solid Dp - wk Alt, Sil'n. Sp-wk, py some chloritic Alt
1346.1	9.0		2.64	98	.06				1	.06			Tr Clay -Chlor			Sp-wk Alt, sil'n, sp py, cpy along veinlets Tr MoS2 wk-Mod xenos up to 1/2"
1354.0	7.9		2.66	100	.23				wk	.23						Sp-wk Alt + Sil'n; sp(+) Py, CPy, Tr MoS2. Brn Gar + Epidot. Area 135 5.0°
1362.8	8.8		2.56	98	.20				Sp	.20			wk Chlor Tremolite		Hornfelsic Qtzite + Gn. St.	Lt. Grn. Ht. Qtzite w/ garnet-epidote prominent to 1358.2'; wk Py CPy Sp h
1367.3	4.5		2.51	100	.14				1	.14			Sp Chlor Tremolite			Bedding Thin 2 1/8". dips @ 30°. Below 1358.2' Rk is slightly finely wkly. Chlor Ht., wk Acid Recrst. Near vert. intrus. of Dp. 20° Qtz-Sph Va @ 136
1376.0	8.7		2.67	97	.07				Sp-wk	.07			Sp Clay Chlor		Mz @ 1367.3 (?)	Sp Alt. Rk composed of variously sized + shaped fdl Phenos in a fine grained matrix, Rk contains numerous xenos, 10% Bio, and circa 2% synpenetic Py. Some Xeno contain Epidote, Py, + Metal
—	—				—			—	—	—	—	—	—	—		Surfaces of fdl Phenos are reaction surfaces.
1388.2	12.2		2.63	97	.08				wk	.08			Tr-Sp Clay, Chlor		Fluidized Dp + Sed to 1377.4 Trace Dp	Fluidized Dp + Sed contains mod epidote + Rare Sulfs. Dp is Sp-wk Alt.
1393.5	5.3		2.63	99	.16				Sp	.16			Sp Clay tr chlor		Dp	contains Sp Py + CPy and is wkly Silit. wk Alt, wk(+) Sil'n, Sp Py, Sp CPy most near contact w/sed.
1401.3	7.8		2.82	97	.19				1	.19			tr clay	tr epidote w/cpy	Recrystized Qtzite 2+ 60° on chlor. + Qtzite	V. fine grained lt. grey Qtzite. Alt to brn grained increases downward until mod. Rk location probably bedding dips @ 60°. Sp-wk CPy, Sp Py, Sp cpy
1413.0	11.7		2.74	98	.42	.01		No vis. Cu .01	1	.41						Lt. grey-green fine grained Qtzite. Rounded to sub rounded fine-med Qtz grains distributed through a grd. mass of finer uniformly sized grains.
—	—				—			—	—	—	—	—	—	—		This rk appears to a wk chlor (?) rather than meta. The contact was
1421.5	8.5		2.66	99	.16				Sp	.16			tr clay	tr epidote w/cpy+py	slightly Arkn. Qtzite	mod. mineralized. over all sp. CPy, Tr-Sp Py. Vague location of 60° dip
1429.1	7.6		2.60	100	.17				1	.17			1	1	Mz-Sed Bx 1429.1' on	fine grained, Sp Alt. folds; Sp CPy, Tr Py, Tr of a metalic blue min.
1436.1	7.0		2.63	98	.09				1	.09			WK-Mod Clay, Ser		Sed. LADEN Mz	Mod Alt, wk epidote; Sp CPy, Tr-Sp Py, Rk is slightly Arkosic, all grains are of a uniform size. 2" wide chloritized Bx @ 1427.3 Mz has invaded and assimilated the Qtzite. The Sed. occurs
—	—				—			—	—	—	—	—	—	—		as irregular sized + shaped xenos, mod alt to epidote, Sp Chlor.
1437.9	1.8		2.61	96	.12				1	.12					QTZITE	The Mz is without xenos from 1432.0 to 1436.1. Mod Py, Sp(+) CPy
1442.4	4.5		2.56	99	.12				1	.12						Fine grained Qtzite, somewhat Brn, wk Chlor; Tr-Sp Py+CPy
1453.3	10.9		2.68	98	2.06	.004 (tr)			wk	2.06			Mod Clay		Tremolite Mz @ 1442.4'	Qtzite as above, rather bxiated, but no extensive movement of frag
1459.3	6.0		3.03	100	.88				1	.88			Mod Clay Chlor		Clay St. @ 1450.0-1455.0	Mb w/some trem. in patches Mod finely diss cpy sp-wk diss py sp chlor sp-wk sph?
1462.2	2.9		2.65	98	.60				tr	.60			Tr clay chlor		Mz @ 1459.3 CT irregular	As above, Mod py diss + in veinlets w/ Mod cpy diss in large blebs + diss WK Alt. Mod xenos and Qtz blebs, wk hbl xyls + some sphene? Mod cpy in.

Final Depth 2564.4
Collar Elevation 3080.94
Coordinates 36,799.64 N 19,398.45 E
Inclination vertical.

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-87 RE-ENTRY
Sheet No. 4 of 8
Date Completed 3/6/67
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay-Ser	Gar, calc silicates	Rock Type	Remarks
1463.4	1.2		3.05	98	1.18	.004 (Ft)	21.0 @ 1.47/Ni		Sp-wk	1.18		x	—	wk gar	Tremolite Garnet @ 1462.2 CTA 45°	Tremolite Hf w/blebs of gar. scattered throughout. Mod(-) cpy in one large blob + diss in ck (may be assoc. w/ gar.) sp chlor sp py
1470.2	6.8		2.59	98	.08				tr	.08		x	tr		Mz @ 1463.4 CTA @ 25°	Mz por. Rather odd text. br to lt br grnd mass, bbl + sphere as above
—	—				—				—	—		—	—	—		
1478.3	8.1		2.67	99	.11				Sp	.11		x	tr chlor clay-ser			in one area bbl is silt to brM + epi? Tr Sulf Acid gives react fr cal. in minute vnlets + patches. Tr + other metased. Numerous phenocrys
1487.2	8.9		2.65	97	.12				tr-sp	.12		x	1			Mz as above Many xenoliths - pebble of plag? rimmed by pink K spar w/ spar xyls in the fold xyl.
1495.9	8.7		2.64	92	.11				tr	.11		x	fresh		FH 1495.0 - 1495.9	Mz as above w/xenos as above, last .9' metased w/epidote, gar + Mb w/ty. Mz as above. bx @ 1st part (1') run. one xeno. of chlor. hf similar to that which carries ore in the Pope Hill area. Mz is sheared by fitting circa 1495
1504.1	8.2		2.66	99	.05				1	.05		x	tr-chlor clay-ser		Dp @ 1495.9 Qtz Mz @ 1510.5	WK Alt along Qtz-Py-Cpy vnlets, sp py, cpy epidote
1510.4	6.3		2.62	97	.11				sp	.11		x	1			Dp as above @ 1 above CT Dp becomes very xenolithic w/ gessed xenos w/ mod epidote. Mz - wk epidote alt. mod xenos of qtzite
1522.2	11.8		2.63	97	.03				tr-sp	.03		x	fresh-tr clay-ser			Mz as above. Num. xenos of pink feldspathic material. 1 xeno of older pink Mz + 5% qtz eyes
1528.7	6.5		2.62	99	.03				1	.03		x	1			As above. Qtz Mz has xenos of PE Pinal schist + qtzite
1535.1	6.4		2.67	100	.10				sp	.10		x	fresh w/ st and? bio		PE Pinal sch @ 1528.7 CTA	50° Dk contorted shattered bands of qtz + bit. The bit may be Alt. product of Muscovite (Fe-Mg Metasomatism from sed rks)
1540.1	5.0		2.63	95	.08				tr-sp	.08		x	Fresh to tr clay -ser		Qtz Mz + Dp @ 1535.1	Vert CT between Mz + Dp w/fluidized? Bk between solid Dp @ 1538.1 sp tot Su
1548.7	8.6		2.78	97	.08				1	.08		x	—	Some chlor weak silicate	bx @ 1540.1	Post Min but pre-Sil'n bxl comp. of Meta sed (Hf, Mrb, Qtz, Hf) and angular + Alt. Dp. No mineral vns cut bx but it is silt. + very hard
1555.6	6.9		2.65	99	.02				tr	.02		x	fresh to tr chlor-clay ser		Qtz Mz @ 1548.7	Mz as above. Many xenos of older por + qtz frags. K spar halos around some xenos
1563.2			2.79	96	.15				sp	.15		x		wk-Mod chlor, sp grn clay	Fluidized Bx to 1560 Mz	Mz + Fluidized Bx w/frags of qtz + Dp + Mz. Fluidization is pre-Min. wk cpy in ground mass. Fine grained mrb. lt colored cut by numerous color - salt
—	—				—				—	—		—	—	—	Fine grained Mrb	vnlets. Local patches of garnet + cpy. 4" gr. zone at 1561.8. sp-wk cpy sp py. There is also a fair amt of drk. black metallic min. assoc w/ mr Sal
1571.2	8.0		2.67	94	.29				sp-wk	.29		x		1		Fine grained Mrb cut by 30° chlor-salt vnlets. sp-wk py, sp cpy wk
1580.2	9.0		2.80	100	.18				1	.18		x		1	Mrb to 1576.6 + mod Tremolite Hf	v. f. inc. sph (?). fine grained oolitic tex 1572. Mrb As Above w/ mod amt of the black metallic min. Pre min. Bx circa 1575.
1590.2	10.0		2.71	100	1.77	.01		No vis. cu. .01	1	1.76		x		sp chlor weak calc alt		The Hf. is lt. grey-green, dense and is mod GRANULITED w/ BRN GAR. (Wk + cpy. Hf as above, contains sp-wk Gar. + sp Epidote. Mod-Sp cpy, tr sp py, Tr Py
1592.5	4.5		2.70	95	.08				tr-sp	.08		x	tr ser-clay		Biot. Dp 1590.2	fine grained pebble tex @ 1589.0 wk ly Alt. + Sil. lit Dp. sp cpy along fracts.
1600.2	7.7		2.62	98	.08				sp	.08		x	sp ser-clay sp chlor		Dp	As above. sp cpy, py. 3" band of K spathic Alt @ 1595.6
1608.7	8.5		2.64	94	.04				1	.04		x	tr-sp ser clay			As above, Dp almost fresh in places. wk-Mod xenos of sil. Pinal Sch + metased
1615.2	6.5		2.63	93	.05				1	.05		x	1			Dp - sp-wk Alt. sp py, cpy along vnlets, wk-Mod dk xenos
1623.3	8.1		2.63	88	.08				1	.08		x	1			Dp as above band of calc silicate 2" wide @ 1618.1' PE Pinal xeno. 8' @ 1620.6
1631.7	8.4		2.61	100 +2	.06				1	.06		x	1			Dp as above, cal on vnlets tr MoSz sp py, cpy Qzite .7' of bleached Dp w/wk sp-wk
1640.1	8.4		2.64	95	.06				1	.06		x	1		Bx 1633.3 to 1636.3	Sp-wk Alt; Bleached light link to 1632.4'. Bx w/ limed frags 1633.3 + 1636.3. Mod epidote in zone. Remainder is Biot. Dp w/ occasional pink xenos. sp cp
1650.3	10.2		2.64	88	.06				1	.06		x	1			Sp Alt., sp sil'n, sp cpy, Tr-sp py. 10% Biot. Biot show flow lineations.
1659.0	8.7		2.62	98	.06				1	.06		x	1			As Above, sil'n along frequent fracts. 3" pink xeno @ 1654.9'. Calcite was present
1667.6	8.6		2.64	94	.03				1	.03		x	1		layering of bio @ ~45°	As above, sp py, cpy tr MoSz wk qtz veining some cal vnlets
1676.1	8.5		2.62	96	.07				1	.07		x	1			WK Alt, sil'n rest as above
1683.8	7.7		2.64	100	.05				1	.05		x	sp clay -ser			As above to 1681.4, - here Dp loses porph. text + becomes frag. w/ 15% qtz eyes, all bi Alt to Ch
1693.0	9.2		2.63	98	.05				1	.05		x	1			WK Alt; 6"-12" spacing of 1/2" Qtz vns.; 15% Biot, xenos common, sp cpy + py
1699.6	6.6		2.91	93	.13				Tr-sp	.13		x	Mod chlor		Alt'd Siliceous sed @ 1693.0'	Strongly Siliceous Hf.; First 0.8' of run has a St. And. of a salmon-pink min. below this the ck is light green, possible bedding 25°-40°. sp brn Gar. sp cpy Bx is gouge like w/ chlor between Calcite ribs between 1698.8' and 1700.2'
—	—				—											
1708.4	8.8		2.79	100 +3	.06				sp	.06		x	sp chlor			A 5cm elongate prismatic white min forms along fracs.
1716.1	7.7		2.65	100 +6	.03				Tr-sp	.03		x	1			Lt. grey-green Siliceous Hf w/ splotches of brn Gar (?). Dk green 1713.9 - 1704.6 sp chl occurring as seams + vnlets.
1725.0	8.9		2.85	97	.05				tr	.05		x	1			As Above. Dk Grn. area are just not bleached. 50° cpy, Gar + Calcite seams + vns common. Gar + calcite vns up to 1" wide. Calcite veinlets + st chlor 1714.0 - 1715.7
1733.3	8.3		2.86	99	.06				1	.06		x	1		bedding (?) 30°	Pale green Intensely Siliceous Hf Qtzite w/ extensive zone of gar. occasional low Angle Qtz. vnlets - 30° vague lineation may be bedding. Tr cpy, Sph. occasional patches of Tremo
1741.1	7.8		2.59	100	.09				1	.09		x	tr chlor			As Above; between 1727 + 1729 rk has been somewhat shattered w/ subsequent development of chlorite calcite along fracs. Gar. zone between 1732.3 + 1732.7. As Above; Numerous hair like sph. vnlets. sp Qtz veining, wk Calcite veining. Darker

Final Depth 2564.4 -
Collar Elevation 3080.94
Coordinates 36,799.64 N 19,398.45 E
Inclination vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-87
Sheet No. 5 of 8 Re-entry
Date Completed 3/6/67
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay-Ser	Calc. Silicates	Rock Type	Remarks
1750.4	9.3	NX wl	2.83	96	.12				tr-sp	.12		x	tr chlor	sp-wk gar		Hf as above. Local zone of mod chlor (?). GAR. Zone 1747.3-1748.4 Top ct flat bottom irr
1759.0	8.6		2.77	99	.09				1	.09		x	1	1		Hf is cut by num. hair line fracs. dip 40°. sp gen. ctg also fracs. Below gar. zone sp ct. is assoc. w/ ctg.
1766.7	7.7		2.94	97	.06				1	.06		x		sp-wk GAR sp wall Mod Tremolite		Hf. As above, irreg. zones of dense gar. @ 1751.0, 1754.3-1755.3, 1757.1-1757.6'. sp sp ct in hair line fracs. + disseminated w/ cpy. Calcite in vns. + assoc. w/ the gar.; sp tremolite - wollast
1776.1	9.4		2.96	96	.08				1	.08		x		1		Light Hf as above, min as above, dense gar zones, prob rep. dirty beds in rk. 1 thick, dip ≈ 30-40°
1784.7	8.6		2.79	94	.04				Tr	.04		x	tr-trace chlor sp-wk	sp GAR tr-sp wall	Dip-35°	As above gar representing dirty bed 1769.3-1771.6 (2.3') As above to 1788.0 then HF silt Hf cut by bleached Alt. unlets. The rk becom
1792.8	8.1		3.43	98	.04				Tr-sp	.04		x	Tr chlor	wk-mod GAR Tr-sp wall	Dip ~ 30°	trace @ 1783.0 + grades into H grn silt. Hf as above @ 1783.0
1801.0	8.2		2.83	95	.13				1	.13		x	wk-mod chlor	wk-mod GAR	Alternate TT, + light grn Hf limy grn Hf	Grn Hf as above to 1785.1-1786.5 is a gar. zone grading back into lt grn Hf @ 1791.8 - sp gar w/ acid reactive cal throughout + tr-sp cpy, tr-sp MoS2. Alternating TT + chlor Hf w/ lt grn acid react. w. Hf. throughout ra
1809.8	8.8		3.24	99	.07				1	.07		x	1	sp GAR	TTD 1804.4' chlor, cal. Hf D 1808.4	Mod cpy assoc. w/ TT, rest is barren
1814.7	4.9		2.61	93	.06				Tr	.06		x	Mod Chlor		Ando @ 1814.7	Acid reactive Hf + TT cut by numerous cal vns & pods sp-Tr sul
1819.1	4.4		2.68	97	.04				Tr	.04		x	Mod-st chlor		MB @ 1819.9 @ ~ 30°	Acid reactive grn chlor Hf w/patch gar. Sp cpy w/chlor in small unlets
1819.9	0.8		2.64	92	.01				Tr	.01		x			TTD 1824.1 CTD ≈ 70° limy chlor Hf 1822.5 MB @ 1834.7	dk gy-grn almost aphanetic past min Ando, NUM. cal unlets tr-py?
1824.1	4.2		2.81	98	.14				Tr	.14		x			CT low angle Bandon MB + TT 1838.1	As above, tr-sp cpy in cal. unlets ∴ dike isn't post Min but left Rather cf MB (xls to 1/2") cut by sharp irregular qtz. Min. unlets w/ minor qtz red earthy hem is also localized along the unlets
1827.5	3.4		2.82	95	.72				1	.42		x Born .30	wk chlor. mod other Talc	Mod gar sp wall sp GAR	wollastonite Gar RKD 1842.5	Under Hf for about 2' grades into br limy MB w tr-sp cpy
1834.7	7.2		2.91	98	.02				—	.02		x				Mod MoS2 1/2 MoS2 wk hem assoc w/ cpy
1838.1	3.4		2.69	98	.04				—	.04		x				limy chlor Hf w/patchy br to grn-br gar wk hem sp cpy tr py all and reactive
1844.2	6.1		3.11	99	.36					.21		x Born .15	sp CHLOR	st wall mod GAR	Bandon MB + TT 1838.1	MB as above about 1/2" vns sp hem tr cpy, tr py, one 1/2 gyp vns
1849.0	4.8		2.70	99	.17				Tr	.07		x Born .16		1	wollastonite Gar RKD 1842.5	Predominately MB w/ Gar patches + bands .1" to 3" thick wk cpy unlets w/ sp-wk hem on outer edges Alt bands of MB + chlor MB w/some Gar. Wollastonite-Gar RK
1850.2	1.2		3.04	95	.11				—	.08		x Born .03		1	As Above to 1850.2	CDMP mainly of wol w/ grn Gar blebs
1854.5	4.3		2.83	99	.08				—	.08		x			Fine-Med. Grained MB. 1850.2 to 1854.5, RT & S	Med-coarse grained wall. w/ irregular bands + blebs of lt. brn. GAR. GAR MAKES UP ca 20% of Total Rk. Sp Bor is Assoc. w/ The GAR. Lower Contact @ 18 ang irregular
1857.2	2.7		3.14	98	.15					.02		x Born .13		St GAR sp wk wall	Med-coarse. Rk. 1854.5-1857.2	White fine to med. grained Mrb. (Possibly dolomitic). Vis. show Rhombic Cleavage. Rk is cut by sparse lt Grn-brn GAR vns. bounded by wall. Sp Bor-cpy Seams. on wall-silt unlet
1858.5	1.6		3.18	97	.18					.18		x			Fine-Med. Grained MRB. To 1858.5 Lower ct ≈ 20°	med. grained wall and GAR well inter mixed. GAR ≥ 50%. To 1856.1' then about 50%. Lower Ct. ≈ 5° Sp. Bor. + Tr cpy is hairline seams. dissem + patches. shows slight preference for wall.
1859.8	1.0		2.66	94	.09					.09		x	wk Chlor		Dp @ 1858.5 Dp to 1859.8	Fine to med grained mrb. Sp GAR. sp Bor-cpy seams. Heat lower contact w/ sf. Lower ct irreg. 5-10 A thin GAR - Wall zone parallels the 20° contact.
1860.6	0.8		2.79	96	.22					.04		x Born .18		Mod Wall GAR	Wall. + GAR. To 1866.6'	WK ALT, Mod sil'n, Tr-sp cpy. Lower Ct. 25°
1866.8	6.2		2.67	99	.03					.03		x		wk wall. + GAR	Lt Grn Silic. Hf	Med-Grained wall w/ irreg bands + blebs of Lt. Brn GAR; wk-Mod Bor, Sp cpy as concentr
1871.2	4.4		2.95	99	.03					.03		x		wk GAR sp wall	"	Dense, fine-grained Silic. Hf. Num. Lt. Tan Alt. Seams (all parallel) dip ≈ 40°. Rk is locally Chloritic. Mod gar. from 1866.0 on. Sp Bor-cpy occuring as Seams.
1873.7	2.5		3.26	100	.01					.01		x		Mod-st GAR wk wall	Wall. Rk 1871.2 - 1873.7	Mod bio. GAR. to 1867.4' sam wall Assoc. Remainder of Run is the dense, silic. Lt. Grn. rk w/ only rare gar blebs. Contains sp MoS2 as blebs + along fracs. Lower Ct. irreg. dips 30°
1877.4	3.7		2.98	99	.01					.01		x			Grd-wall, Rm Rk. To 1877.4	Lt. Brn. Gar in wall (?) is about equal amts together in a mottled mix. ODD. wall, unlets Cut the rk. Tr sp MoS2 present. Lower Ct. ≈ 60°. A 1/4" Fluorite unlets is in cont.
1878.4	1.0		2.98	99	.36					.15		x Bor .21		St. Wall Mod GAR	Wollastonite 1877.4 - 1878.4	Dense Silic Hf, Lt Brn + Lt Green GAR intermixed to 1875.2. The rk is intermixed Lt. Brn G wall and Mrb. Contains sp MoS2 Lower Ct ≈ 40°.
1885.8	6.9		2.98	97	.05					.05		x			Med Grained Mrb.	Med-coarse Grained wall. w/ sf dissem GAR. A 2" band of brn gar. with Assoc. berzelite - CPY is at 1878.1'. Lower Ct ≈ 35°
1891.0	5.7		2.89	99	.15					.02		x Born .13			Irreg grained Mrb 1885.8-1889.4 + 1890.4-1891.0 Irregular wk. GAR. in Mrb. Silic	White Med. grained marble cut by fairly num. most bearing fracs which have an average dip of 40°
1898.4			3.22	99	.03					.03		x		Mod wall St. GAR.		Between 1889.4 + 1890.4 is a wall-gar zone which contains wk CPY - Bor. Rk is Approx. 35% GAR. 1/4 of the green + remainder brown. The gar. is set in a grnd mass of Lt. green calc Silicates w/ patches of st. wall @ 1891.2' and 1892.1'
—	—				—			—	—	—	—	—	—	—	—	From 1894.6' on the grnd mass contains a mod amt of reactive lime. Green Gar. is more prevalent in this zone. Lower ct. irreg + dip ≈ 15°. Tr Sulfs. Tr MoS2
1900.0			3.11	98	.01					.01					Dense Silic Lt. Grn Hf.	
1904.7			3.42	99	.27					.18		x Bor .09		St. GAR wk. wall.	GAR. in Lt. Grn. CMD. Silicate	Lt. Green Silicous Hf contains Tr-sp dissm. MoS2. GAR. is predominant @ 1900.9-1901.5 and mod @ 1902.1'. From 1902.0-1902.7' wk bors + CPY is Assoc. w/ GARN. From 1903.6' on the grnd mass is reactive.
1908.9			2.72	98	.02					.01		x Bor .01			Med Grained Mrb. 1904.6 -	upper Ct. ≈ 10°. Rk is lt. colored. Recrystallization to med equigranular tex occasional MoS2 Seams.
1916.1			3.09	99	.08					.08				Sp wall, GAR	Med. grained Mrb To 1909.4 wall GAR Tr to 1910.1	All Two MRB. is med grained, Cut by occasional sulf. Seams. No GAR. Presen GAR in wollastonite rk is irregularly banded. GAR. represent approx 25% of total Rk. occasional reactive particles are present. Rk contains sp.
—	—		—	—	—	—	—	—	—	—	—	—	—	—	Med grained Mrb To 1916.2	CPY + primary Chalcocite (?)
1918.9			3.25	98	1.33					1.33		Ag 0.95; Zn 2.50; Pb 0.04 Mn .088			GAR. Tr + Sm massive Sulfs 1916.1 - 1918.9	Lt. brn garnet is st. to massively mineralized w/ galena, CPY, and possibly other sulfide minerals. The zone is weakly vuggy w/ Calcite xls. in the vugs. upper ct.
1921.2			3.22	98	.05					.01		Bor .04		Mod GAR + Calc Silic	Dense Lt Green Hf w/ Tan gar. Bands @ 1921.1'	Dense Lt. Green (Tremolite ?) Hf cut by Thin Lt. Brn. GAR. Bands which dip approx. 40° at top + bottom of run. Gar less controlled. Lower ct dips 15°. Sp CPY attends to Born

Final Depth 2564.4
Collar Elevation 3080.94
Coordinates 36,799.64 N 19,398.45 E
Inclination vertical.

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-87
Sheet No. 6 of 8
Date Completed 3/6/67
Logged By J.A.B. + N.R.N.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: Clay-Ser	Calc Silicates	Rock Type	Remarks
1923.9	2.7	NX wl	2.77	99	.03					.03		Mo .0008 x		Sr wall, GAR	Wall-GAR, Rk to 1923.2 Dense Silic. Lt. Grn MB 1923.2-1923.9	Sr. wall. w/sp GAR. to 1923.2'. Dense siliceous Lt. Green Hf with patches of dark black Hf @ 1922.6' and 1923.5'. Sp-wx MoS2 as seams Circa 1923.4'
1928.3	4.4		3.19	100	.04					.04		Mo .0016 x		Sr wall-GAR	GAR:-Tremo.-wall. Rk to 1927 Then Silic. Rk 1927-1928.2	GAR. Occurs as poly. sized blebs. and patches of garnet. Does not comprise of 50% of Rk. Mafic is dense to fine lt. green tremolite (?) + wall. upper ct. does 20° shower
1935.5	7.2		2.76	99	.14					.14		Mo .0188 x			Fine Grained MB to 1932.2 Then Med Grained MB	Two fine grained MB w/sp has a stray. Appearance from discing. v. tiny Sulfs + Cpy and Cpy by occasional cpy seams.
1944.6	9.1		2.73	99	.03					.03		x			Med Grained Mrb to 1941.9 Then fine fine Grained	Med grained marble is cut by occasional cpy + Pos veinlets. Fine grained marble to 1944.4 shows some recrystallization w/ calcite grains forming minute lensoidal eyes. 20° ct
1953.0	8.4		3.07	99	.01					.01		x			GAR.-mrb.-Silic. Rk to 1948.7 Then Dense Silic Rk to 1953.0	Mixture of green + Brn Garnet, wollastonite, and the dense siliceous lt. green Hf to 1948.7. Contains only Tr. Sulf. Remainder is Lt. green Silic. Hf. Contains Sf Disseminated
1961.0	8.0		2.74	98	.11					.11		x		Sp GAR	Med. grained MRB. 1953.0-1965.1	Med grained marble cut by cpy seams and occasional patches
1965.1	4.1		2.75	99	.55	.02		.02		.53		x		Wx Wall	Lower ct. lithg dips Approx 25°	Med grained Mrb. Grn GAR To 1965.2', A 1" cpy vn @ 1953.9', occasional seams throughout
1975.2	10.1		3.10	98	.20					.20		Mo .0054 x		Sr GAR-Wall	GAR-Lime-Calc Silicate Hic. 1965.1-1975.2	Mottled mixture of Brn + Grn Gar, limey patches and Lt. Grn Calc Silicate Min. Sulfs, heavily concentrated over all Tr-sp Born-cpy, Sp MoS2
1978.6	3.4		3.10	98	.32					.10		Mo .0013 x Bor .22		Med Wall GAR, Chlor	Med Grained Mrb Tr. 1975.2 Tran Calc Silicates	Med. grained Mrb. Contains sp GAR Brn GAR. Sp cpy in frags. Mod Brn Gar to 1977.2 Then a white Calc. Silicate w/ v. small patches of Gar. Contains sp-wx Bor + cpy
1990.9	12.3		2.94	95	.08					.08		Mo .0039 x Mo Z4 x		Sr GAR Wall	Lt. Grn. Silic Hf. 1978.7 Wpr Ct 230°	Sr-chlor marks contact of dense Lt. green Silic. Hf: dark Gar occasional Calcite vns. 2" Moly-cpy band @ 1989.7'
1999.1	8.2		3.12	100	.03					.03		x			Bedding @ -30°	V.H grn Sil Hf and/ vfg qtzite? or Sil. siltstone w/ faint discontinuous bedding from 1/20" to 3/20" thick, tr sulfs tr chlor sp-wx diss gar.
2,006.7	7.6		3.12	100+1	.09					.09		x		Sr GAR Sp wall		As above, patchy zones of gar approx. 1' thick tr sulfs. Not acid reactive
2,013.9	7.2		2.85	99	.03					.01		Bor .02 x				Alternating MB & TT, - MB = 2.5' thick TT = 1.5' thick, tr cpy, sph?
2,023.7	9.8		3.00	98	.01					.01		x		Mod GAR Sp wall	vfg Sil Hf-Qtzite? @ 2021.6	Mixed TT + MB @ 2021.6' - vfg Sil Hf or Qtzite: which was prob a sil Sil(?) tr Sulfs
2,031.8	8.1		2.75	98	.01					.01		Tr sph x			MB @ 2023.8, Sil Hf @ 2029	MB w/ some TT on lower end, then Sil Hf
2,039.7	7.9		2.77	98	.01					.01		Sp MoS2 x			Hf @ 2032.8' MB @ 2034.6	lt white lit w/ some chlor + sp MoS2, then qtz sulfide mottled MB
2048.3	8.6		2.69	97	Nil					—		x		Sp chlor, wall, GAR	Hf to 2040.7' Med. Grained Mrb 2040.7-2053.9'	Mix of gar. sp wall, sp chlor + Mod Pyrite to @ 2040.7'. Rk then w/ no wis sulfs becomes a Med. grained Mrb. Mrb has salt + pepper look w/ sp disem Sulfs + Another dark min.
2053.9	5.6		2.70	98	Nil					—		x				Med grained salt + pepper Mrb. sp cpy + py. dark min may be chlor. Cont. Approx 50° upper + lower contact dip 50° + have sr garnet accom. To 2054.5 The rk has v. thin laminations of Hf w/ calcite. This zone contains sp cpy. This is followed 0.5' of a dense siliceous zone which has cuhedral to subhedral xls. or pseudomorphs of xls which have a shape similar to feldsp.
2055.3	1.4		2.94	100	.02					.02		x		Sp chlor + GAR	Dense Silic. Lt. Grn Hf. @ 2053.9-2055.3	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
2063.2	7.9		2.70	98	.01				Tr-sp Py	.01		Sp MoS2 x			Med. Grained white Mrb. 2055.3'-2063.2'	white med. grained marble w/ only a trace of Sulfs on occasional fracs
2066.4	3.2		2.72	98	Nil					Nil		x			Salt + Pepper Med Grained Mrb to 2066.4	2063.3', Salt + Pepper Mrb. w/ sp cpy + py. wk chlor-serp. Remainder is Bleach white
2075.6	9.2		3.08	97	.08					.08		Sp sph x		Sp GAR	Gar-MB @ 2070.0	MB as above to 2070.0 thin thin (1/16"-1/8") alt. MB + Grn gar dip ∇ -60°, sp cpy sph? tr py
2084.2	8.6		2.89	97	.07					.03		Bor .04 x				As above, sp cpy ~~py~~, tr sph?
2092.9	8.7		2.88	100	.02					.02		x		Tr-Sp GAR	MB-2088.3 Gar-MB @ 2089.6	MB as above, without Gar, Gar-MB w/ 38% Gar. tr sulfs
2101.4	8.5		2.93	96	.04				Tr Py	.04		Tr sph x		Sp GAR		MB, white with a 4/16 grn gar, decreasing towards end run, sp cpy sph gal
2109.9	8.5		2.87	98	.12					.12		Tr-Sp sph x			MB @ x 2100'	decreasing Gar cut to ≈ 4% sulfs as above, sul veinlets cut gar veinlets
2115.3	5.4		2.83	97	.10					.10		Sp Py x		Tr Chlor		As above,
2120.2	4.9		3.04	98	.09					.09		x		Sp Chlor	Fg SS (limy) @ 2115.3	limy SS (Qtzite) fg (3 ϕ) tr 1/20" lamination bed. visable only tr sulfs
2124.9	4.7		2.99	99	.06					.06		x		Tr-Sp GAR Tr Chlor	MB 2120.2'	MB w/ some Qtz sand? 0.4' ss bed @ 2121.5'. sp gar tr sph? gal? cpy, py
2133.4	8.5		2.80	100	.04				tr	.04?		tr sph x			MB @ 2129.9' Sandy Mrb @ 2132.6	Sandy MB, white finely xyline, then vfg Qtzite MB thin (1") beds
2142.4	9.0		3.14	95	Nil				1			x			Silic. Lt. grn Hf @ 2134.2'	Non-reactive tr grn silic. Hf. Tr MoS2 + other tr. tot. sulfs throughout
2151.8	9.4		2.88	98	.04				1	.04		tr Mag x			Limy Chlor Hf 2140.8	sulfs, very thin (1") bedded brecciated in places
2160.9	9.1		2.91	97	.02				1	.02		x				limy-chlor. Hf very thin (1") bedded alt bands of Chlor + limey chlor. sp cpy wk sph (?), Tr gal + MoS2 first foot of run then tr. tot sulfs
2163.1	2.2		3.08	98	.10				1	.10		tr sph x tr gal				As above, tot sulfs
2168.3	5.2		2.93	98	.12				1	.12		tr gal x wk-Mod Mag			lime Hf @ ∇ 2163.3	brecciated towards end run
2169.6	1.3		2.65	95	.01				—	.01?		x				limy Hf w/ sp cpy sp gal, tr sph + wk-Mod Mag diss throughout + assoc. w/ sulfides
2178.8	9.2		3.35	86	.01				tr	.01		tr MoS2 x			TT @ 2170.9 bed 2177.1	limy Qtz bx. poss. related to the Dp
2188.1	9.3		2.70	90	.15				1	.15		x wk-Mod Mag			Chlor MB @ 2184.8' Hf grn Hf @ 2184.0	Med hem in grn chlor limy Hf bx, then grn gar TT @ 2170.9 tr sulfs sp magnetite. Sil Qtzite or Dp? of 2177.1 then vuggy lit bx of chlor Hf Chlor. MB, w/ wk cpy in places w/ wk Magnetite, Hf grn Chlor Hf w/ sp garnet veinlets 1/16" + tr tot sulfs not limy

Final Depth 2564.4
Collar Elevation 3080.94
Coordinates 36,799.64 N 19,398.45 E
Inclination vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-87
Sheet No. 7 of 8
Date Completed 3/6/67
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay ser	Calc silicate sect	Rock Type	Remarks
2192.4	4.3		2.63	95	.09				tr	.09		sp gal? sph?		WK chlor	HF, 1" Mg qtzite HF @ 2184.4	qtzite HF ct ≈ -30° Sparse sulf, May be small Dp sill @ lower ct qtzite
2196.1	3.7		2.66	97	.10				1	.10		WK-Mod sph			MB 2190.5	Vuggy (silica lined) MB w/ sp-wk cpy, Wk gal + wk-Mod sph., several 1" layers of J.fg SS
2202.7	6.6		3.15	99	.02				1	.02		sp sph				MB w/ some ltgrn HF, sp tot sulf
2208.8	6.1		2.68	91	.11				Sp	.11		tr byp		WK-Mod chlor	Relocated 6x2204.2	MB w/ vuggy areas of mod sph, gal, + tr cpy, toward end run there is limy phases of the Dp.
2215.3	6.5		2.64	100+1	.03				tr	.03			tr-sp clay-ser	WK epidote	Dp circa 2218	Dp is brecciated, frags = 2 to 3' WK Alt, WK py bx frags
2225.7	10.4		2.73	97	.05				1	.05			1	WK ep: WK chlor		contain much epidote, Numerous sed xenos
2227.9	2.2		3.30	100	.06				1	.05		.01 Bn	—	WK-Mod gar	HF @ 2225.1	Contact zone is brecciated + altered, HF is limy w/ sp cpy, sph? on hair-like vns
2233.3	5.4		2.95	95	.01				1	.01			—	Mod-ST gar	TT @ 2227.9 HF @ 2229.1	TT-Br Massive gar, tr sulf. HF-ltgrn NON limy, tr sulf
2238.4	5.1		3.04	100	.12				Sp	.12			—	Mod chlor		ltgrn HF w/ some chlor along fracs, tr tot sulf brecciated at end run
2244.1	5.7		2.62	74	.06				tr	.06			tr-Sp clay-ser		Dp @ 2238.4	WK Alt, slightly brecciated, wk epidote sp py
2249.9	5.8		3.00	86	.20				WK	.20				Wk gar sp chlor	HF @ 2244.1	ltgrn HF & TT toward end run, some Dp w/ chlor in bx matrix sp-sm
2252.7	2.8		2.92	95	.13				Sp	.13			—	Wk-Mod epidote	Dp bx @ 2249.7	Very angular Dp frags in epidotized rk frag. matrix
2256.8	4.1		3.09	88	.24				wk	.24		Sp sph Wk-Mod Mag	—		HF @ 2252.2	limy HF w/ wk gal + epidote, sp tot sulf, chlor. xyls assoc w/ Dp bx frags
2270.2	13.4		2.67	93	.04				1	.04			tr? ser	wk epidote	Dp bx @ 2256.0'	Very Angular Dp bx in epidotized matrix, Mod chlor xyl aggregates in matrix. Bx frags 1/2" to 3" and larger, sp-wk py wk Alt.
2279.6	9.4		2.73	94	.09				1	.09			1	1		As above, frags up to 2' in length, some hi grd Dp ≈ 20% b.o.
2290.5	10.9		2.94	80	.11				1	.11		Wk Mag + spec	—	Wk-Mod chlor	Dp + Meta sed bx	As above, but w/ HF, chlor HF, w/ sp cpy + sp-wk Mag in areas
2300.0	9.5		3.31	93	.18				tr	.18		tr sph		Wk chlor sp gar	pyrrhotite @ 2295.0'	bx w/ smaller ang. frags in epidote matrix, then HF w/ wk Dp on wlls, tr Mz
2309.9	9.9		3.11	96	1.05	.01		No visible Oxides	tr?	1.05				Mass gar	TT @ 2301.5	HF grades abruptly in to redish-br Massive TT ~~opa~~ cut by Mod qtz Mass, Unlets + ≈ 5% cpy on parallel vert unlets
2317.9	8.0		2.78	100+1	.16				Sp	.16		Sp-wk Mgs .0234	Wk chlor	WK-Mod gar	bx @ ≈ 2309'	bx of Dp, HF, Mz, holoxyline rk, poss. Alaskite ranging in size from 1/8" to .8 set in epidotized matrix. HF-wk cpy sp Mgs. Min May be pre bx
2327.8	9.9		2.66	88	.04				tr	.04			Sp chlor	tr gar		As above, More Mz frags
2337.0	9.2		2.67	94	.02				1	.02			Mod-ST chlor		limy chlor HF 2331.4	HF alt to dk chlor which also alters sp-like Mz @ end of run
2340.3	3.3		2.66	93	.20				Sp	.20			ST chlor		Sp-like Mz @ circa 2336'	Sp-like Mz to 2337.4 then limy chlor HF, sp-wk cpy, tr py
2342.7	2.4		2.92	98	3.10	.01	13.6' @ 0.88 N:1	No vis ox .01	Mod	3.09		2-2% hem	—	—	limy hem hf @ 2340.3	limy Metasediment w/ ≈ 20% diss hem, Mod-ST cpy diss out from
2353.9	11.2		2.58	73	.41	N:1		N:1	sp	.41		tr MoS_2	ST chlor		limy chlor HF bx circa 2342.7	Chlor limy HF bx, @ 2347.0 there is 1' of Mod cpy w/ sp dom rest-sp tot sul. opa-py was
2362.2	8.3		2.71	96	.02				tr	.02		—	Mod-ST chlor			As above tr cpy, tr Mag, py
2371.6	9.4		2.63	93	.05				Sp-wk	.05			tr clay-ser sp chlor		Dp bx @ 2363.0	Dp bx w/ some sed fragments, Dp-Wk Alt, sp py, tr cpy
2373.7	2.1		2.60	81	.13				tr	.13			Mod chlor			Dp bx w/ large frags prob. up to 1', sp py, sp-wk cpy wk hem along fracs
2376.0	1.3		3.24	92	.21				tr	.21		Mod hem		Mass gar	TT @ 2373.7	Some sed frags w/ Dp bx @ ct, TT w/ ≈ 20% hem + ≈ 2% cpy diss
2377.1	2.1		3.10	93	.06				No vis	.06				Mod gar Mod well	Gar-Well rk @ 2375.0	limy, Gar-well? HF, tr bx tr-sp hem, tr? Mag
2379.3	2.2		3.07	91	.75	N:1	6.8' @ .46 N:1		WK-Mod	.75		0.90 zn		Mod chlor	chlor HF @ 2377.5	Wk ly limy, chlor HF, H' Dp @ start run, HF- wk-Mod cpy in large blebs wk py
2382.2	2.9		2.74	86	.11	N:1			wk	.11		0.17 zn				Mz and Meta seds prob. a bx, sp cpy wk py, tr Mag.
2383.9	1.7		2.64	100+28	.67	N:1			wk-Mod	.67		0.68 zn				As above, but mainly Meta-seds, wk cpy segregated in large blebs
2388.8	4.9		2.66	91	.38				Sp	.38			Wk ser		Mz @ 2384.1' CX @ 55°	CT well Min w/ cpy. Mz - shows ≈ 3% diss cpy in blebs ≈ 1/8" dia. Sp-wk py
2397.5	8.7		2.63	100+3	.12 Reassay .12				tr	.12						w/ microgr. cons Mod-st 2ND Kspar in ground mass 5% bio chloritized, rounded qtz eyes 2% ≈ 1/4" diameter, 1' bx @ 2386.2'
2406.0	8.5		2.60	81	.34				tr	.34			Sp ser			As above, 2ND Kspar xls up to 3/4" long Meta sed xeno @ 2402.5'
2416.0	10.0		2.60	100+3	.03				tr	.03				Wk epidote		As above, wk cpy, sp py Mod epidote, chlor. all of bio. brecciation of Mz in place. w/ frags of Meta seds
2424.3	8.3		2.66	98	.12 Reassay .28				1	.28?				1	bx @ 2415.2	Bx of Mz + limy Metaseds, Sp cpy, wk py. Mz lacks and K spar + epidote + diss cpy
2434.2	9.9		2.63	74	.08				tr-sp	.08			Wk chlor sp ser	—	Mz ≈ 2431.2	Bx as above, larger frags, ≈ 2' of Dp frags @ 1st of run, then Mz w/ and Kspar + wk diss cpy, tr Meta seds
2441.5	7.3		2.63	82	.17				Sp	.17			Sp-wk chlor	tr epidote		Mz w/ sp-tr Alt (Mz?) xenoliths from Mz w/ Wk chlor

Final Depth 2569.4
Collar Elevation 3080.94
Coordinates 36,799.64 N 19,398.45 E
Inclination vertical.

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-87
Sheet No. 8 of 8
Date Completed 3/6/67
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay, Ser	Gar, Calc silicates	Rock Type	Remarks
2445.4	3.9		2.74		.02				tr	.02		x	tr clay ser wk chlor		Mz #1	Some Mz #2 @ 1st of run, .9' Meta sed @ 2442.4', Mz - wk Alt, chlorization
2452.4	7.0		2.84		1.31	.01	16.0' @ 0.95 0.01	No vis ox .01	tr	1.30		x		Mod grn-chlor Gar.	limy Meta sed @ 2445.4'	Meta sed of gray, calc sil, chlor-limy w/ wk-Mod Cpy, sp Bx diss & ...
2459.7	7.3		2.84		.34	Nil			tr-sp	.34?		x	Mod chlor	sp gar wk-Mod gr	Meta sed bx @ 2453.4'	1st Alt Mz then Meta sed bx of chlor Hf, Qtzite w/ epidote Sp Bx
2461.4	1.7		2.27		2.17	.01		No vis. ox .01	sp-wk	2.16		x	st chlor	wk cp.		bx as above but w/ Mod-st Cpy replacing (past bx) parts of the
2468.4	7.0		2.62		.13				tr	.13		x	wk-sp chlor		Fractured chlor MB @ 2461.4 chlor Qtzite GMBA 2466.9	Broken fractured chlor MB w/ some patchy gar + Mod cpy. FRN Qtz wk cp
2479.1	10.7		2.67		.07				1	.07		x	wk chlor			Open textured limy-chlor Qtzite sp sulfs. Bx toward end. TT-Hf Bx
2489.6			3.04		.06				wk-Mod(-)	.06		x	Mod-st chlor	wk-Mod Epidote	TT @ 2478.3' Dip Chloritic Hf Bx @ 2479.1	15-20% Brn GAR; 10% Epidote; 5% Hematite; 20% Chlor; 30-45% Calcite; 2% Py. sp Cpy. Rx is still some Hf of a Bx
2498.9	9.3		2.86	92	.02				tr	.02		x	tr chlor	Mod. cp.	Bx CHLORITIZED	St Bx. FRags Are quite angular and up to several inches in length. Few patches of Mz #2 Seem to be intrusive. Frags are of limy sedi., Pink schist, Dp, chl
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	All are Strongly Chloritized. Epidote wk, but locally St.; Hem wk, gar wk; wk calcite + Sp Qtz veins. Final Bloc 2497-2498.4
2504.6	5.7		2.71	90	.01				1	.01		wk hem x	—	Mod Gar	Tr to 2500.0 then chloc, limy Bx & Tr Bx	Tr is Maroon from Hematite. This Rx is not very dense, many small pores. Chloc Limy Hf + Tr Bx is widely Epidotized. Bx frags are small in size generally less than 1/2"
2506.8	2.2		2.87	100+2	Nil				1	—		x		St-Mass Gar. wk-Mod Gar	TT 2504.6-2506.8	Lt Brn GAR + Diopside w/ intermixed Calcite, Sp Mz2 Possible Bedding 50°
2515.3	8.2		3.08	98	Nil				1			x			Thin beds TT + Green Non Reactive Hf @ 2509.6 Then it thin bed Hf + TT	1/2" wide Bands of Gar. in Calcite seperated by 1/2-1 1/2" bands of green silicates non reactive Hf to 2504.6 then rock takes on a thinly banded appearance (chiefly composed of H brn gar, olive green Hf, calcite + occasional chlor + Epid.; Tr Sulfs
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2517.2	1.9		3.03	83	.08				sp-wk	.08		x	wk-Mod chlor	Mod epidote	chlor Tr-Hf Bx 2515.3'	Fine grained Bx of H brn gar set in chlor + calcite Matrix. Quite porous; sp Sul
2525.6	8.4		2.80	98	.05				sp	.05		x	st chlor		Dip-38° Bx @ 20-25.6	TT (lim) + Hem Hf w/ banded non-lim silt Hf being replaced by hem
2535.1	9.5		2.70	81	.10				1	.10		x	1			Meta Sed w/ sp Mz bx. Meta sed = sp Cpy, Py Mz ~~sp-wk Cpy~~ wk-Mod Cpy
2544.4	9.3		2.63	88	.06				tr-sp	.06		x	1			Bx as above, NO Mz. Hf grn Hf some TT, wk epidote sp tot sulfs
2554.9	10.5		3.09	76	.06				sp	.06		x	tr hem	sp-wk chlor	Mz #2 @ 2547.7 Bx	Mz - wk py, sp-wk NO K spar, wk-Mod Alt, patchy chlor repl of bx Meta
2564.4	9.5		3.14	67	.03				tr	.03			tr chlor	epidote-Gar Mod gar tr epidote	@ 2556.2 Pyrox? Hf Bx 2554	Rx comp of poss Molybdenite or another pyrox? Thin banded Hf grn Hf @ 2559. beds range from 1/16" to 1/2" and dip at ~45°
EOH			Avg Rec'y													

Final Depth 1582.4
Collar Elevation 3124.3
Coordinates 36170.5 N 19155.2 E
Inclination vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-17 RE-ENTRY
Sheet No. 1 of 3
Date Completed 12-1-66
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
913.2-922.0	8.7	BXWL	2.62	99	.12			—	Sp	.12			Sp Sap-Clay Tr Chlor		Dp	WK ALT, DISTINCT TEX; Sp Py, Tr-Sp CPY, Tr MoS2, XENS PRESENT
933.6	11.4		2.61	75	.12			—	Sp	.12			/			Dp AS ABOVE, CUT BY ALT. PINK RK, THE GROUND MASS OF WHICH IS
															POR. ORTHOCLAS 931.0-933.5	PRIMARILY ORTHOCLASE. PHENOS OF WHAT IS NOW A DK GRAY-GREEN MATERIAL HAVE BEEN COMPLETELY REMOVED THROUGHOUT MOST OF THE RK. IT APPEARS THAT THIS MAY BE THE SAME AS THE 1'
																MIROLITIC LOOKING ORTHOCLASE RICH RK FOUND IN EAST PART OF EL TIRO LOWER CONTACT 40°
942.9	7.3		2.64	87	.12			—	Sp	.12		Sp MoS2	EARLY SAP, ST-WK TALC			WK-Mod ALT, MYLONITIC TEX 938.6 - 941.7. Sp-WK Py, Tr CPY + Mo
948.6	5.7		2.58	92	.09			—	Sp	.09		Tr-Sp MoS2	/			WK ALT, LOCAL INTRODUCED ORTHOCLASE, MYLONITIC TEX LOCALLY PRES
957.8	9.2		2.62	97	.09			—	Sp	.09		Tr MoS2	WK TALC			FLT GOUGE CIRCA 948.6', Sp Py, Tr CPY + MoS2
967.0	9.2		2.63	100	.07			—	Sp	.07			/		PINAL @ 966.1'	Mod ALT, Sp Sil'n, WK 2nd K-SPAR ALONG FRACS; TEX INDISTINC RK LOCALLY MYLONITIZED. Sp CPY, Tr Py, Tr MoS2
																AS ABOVE, LOCALLY SILICIFIED + VEINED. RK IS MYLONITIZED FROM PLACE TO PLACE. PINAL SCHIST 966.1' - 966.5' THEN AT 30° DIP IN
976.0	9.0		2.63	97	.09			—	Sp	.09			TRACE WK MoS2		PINAL TO 972.6' DP TO 974.1' BA TO 977.1'	WHITE QTZ VN. THEN 2" PINAL + MIN AS ABOVE
																BRN PINAL SHIST, LOCALLY VEINED W/ QTZ, WK CALCITE VNLETS. Sp CPY ALONG MAFICS IN BANDING. DP IS ALT + SILICIFIED. BX ZONE
987.0	11.0		2.64	72	.04			—	Sp	.04		/	/		DP @ 977.1'	CONTAINS FRAGS OF PINAL, DP + VN QTZ. Tr-Sp VLFING Py, CPY Tr MoS2
995.7	8.7		2.65	97	.09				Sp	.09		Tr-Sp MoS2	WK-CLAY WK TALC			WK-Mod ALT, WK Sil'n ALONG FRACS + Sp QTZ-MoS2 VNLETS, Sp CALCITE SEAMS. Sp CPY, Tr Py, Tr-Sp MoS2
1004.6	8.9		2.62	96	.09			—	Sp	.09		/	/			Mod ALT, WK Sil'n; STRONGLY SHATTERED + RE HEALED, CALCITE ON FRACS, Sp CPY
1012.8	8.2		2.62	100	.07			—	Sp	.07		Tr MoS2	SP CLAY WK-MOD TALC			WK ALT, MUCH LESS BRN EXCEPT CIRCA 1004'; WK-Mod Sil'n ALONG FRACS. Sp 2nd K-SPAR ON FRACS, Sp 2nd BIOT ON FRACS. Sp CPY, Tr-Sp Py + MoS2
1022.4	9.6		2.61	96	.07			—	Sp	.07		/	/			WK-Mod ALT, Mod Sil'n; Mod-ST SHATTERING (REHEALED); Tr-Sp CPY, Py, Tr MO
																WK TO Mod-ST ALT, WK-Mod Sil'n, SHATTERING WK TO 1019.5' THEN ST SHATTERING OR MYLONITIZATION TO 1022.4. THIS PORTION Mod-ST ALT OVERALL Tr-Sp Py, CPY, MoS2
1031.2	8.8		2.63	98	.08			—	Sp	.08		/	/			WK-Mod ALT, Sp-WK Sil'n, Sp-WK ANHDR; Tr-Sp Py + CPY, Tr MoS2
1040.3	9.1		2.66	91	.07			—	Sp	.07		/	WK-Mod TALC-CLAY			75° DIPPING FLT ZONE CIRCA 1028.0
1050.4	10.1		2.71	87	.07			—	Sp	.07		/	/			WK-Mod ALT, WK QTZ-MoS2 VNLETS (0-15° Dips), BLEACHING ALONG FRACS. RK IS SHATTERED, ST ALTD, + REHEALED 1039.3 - 1040.6
1060.8	10.4		2.62	86	.06			—	Sp	.06		/	/			WK-Mod ALT, WK 2nd K-SPAR ALONG FRACS; RK IS SHATTERED THROUGHOUT, LOCALLY WK AND LOCALLY Mod. ALT. INTENSITY CORRESPONDS
1070.5	9.7		2.64	88	.06				/	.06		—	WK clay	Sp Cal. on vnlets-fracs		LT GRN WK-Mod CHLORITIC Dp. VARYING DEGREES OF SHATTERING Tr-Sp CPY + Py, Tr MoS2
1079.7	9.2		2.61	95	.06				/	.06		-	/	/		AS ABOVE, POSSIBLE FLT CIRCA 1070.
1089.1	9.4		2.62	95	.11				/	.11		tr MoS2	WK clay, chlor, talc?	/	CHLOR WK. VEINS 1079.7-1080.2 1081.6-1089.9	Mod-STRONGLY SHATTERED (REHEALED), Mod ANHDR-TALC ALT, Mod Sil'n. Tr-Sp Py + CPY, Sp MoS2 IN GTZ VNLETS
1099.2	10.1		2.61	79	.06				/	.06		—	WK clay - sec?	/		DP AS ABOVE. HY CONTAIN WK AMTS OF VLFING DISSEM Py W/ Sp CPY.
1108.9	9.7		2.62	94	.06				/	.06		tr MoS2	/	/		DP W/ VEINS OF PINAL. RK IS WK-Mod SHATTERED. FLT ZONE CIRCA 1094
1118.0	9.1		2.64	95	.06				/	.06		/	/	/		WK-Mod ALT; Tr-Sp CPY + Py, Tr MoS2
1126.2	8.2		2.64	99	.08				/	.08		/	/	/		AS ABOVE, WK-Mod QTZ VNING + SILICIFICATION ALONG FRACS. MIN. AS A
1136.0	9.8		2.61	97	.07				/	.07		/	/	/		AS ABOVE EXCEPT QTZ VNING + SILIC ONLY SPARSE
1145.5	9.5		2.65	95	.15				/	.15		/	WK clay chlor, talc?	/		WK ALT, LOCAL Sil'n + QTZ VNING; RK IS SHATTERED W/ NUMEROUS PARALLEL V. CLOSELY SPACED FRACS. Tr-Sp Py, CPY; Sp MoS2 ASSOC. W/ QTZ VNLETS.
1154.8	9.3		2.64	98	.05				/	.05		+	WK clay chlor	/		AS ABOVE, LOCALLY ALT. IS MORE INTENSE, WK-CHLOR-TALC
1164.2	9.4		2.62	98	.05				/	.05		/	/	/		AS ABOVE, 1" WIDE REHEALED BX CIRCA 1150.7' (5-10° DIP); SOME 2nd K-S
1169.2	5.0		2.61	89	.03				/	.03		/	/	/		AS ABOVE. SHATTERING PROMINATE.
1179.0	9.8		2.63	90	.09				/	.09		/	WK-Mod clay	/		AS ABOVE
1188.8	9.8		2.61	95	.08				/	.08		/	/	/	Shearing + Mylonite D 1188.0 Pd Pinal, 1187	Sp-WK Alt Sil'n, WK xenos of Pinal? Sp Py
1201.0	12.2		2.62	63	.13				/	.13		/	Sp-WK Clay-Ser	/	-1196 Dp	Rk Stly Sheared w/ Mod. clay, Sp Py. No det. offset. 6" Sheared May be a 45°
1203.7	0.7		2.63	53	.21				Sp-WK	.21		/	/	/		1.2' core loss @ 1st of box. Pinal dark + bio rich. Sp py to Sp py + MoS2
1203.3	1.6		2.70	50	.29				/	.29		/	St Chlor	/	Chlor-bio Alt 1201.7-1203.3	Core Stly Silic. 1195' to end run. Core shows WK Mod cal veing. Rk sheared, Sp chlor on vnlets, Sp + py. Dp - no of phenos is increasing
																Dk br-gy bio-chlor Alt. WK-Mod Qtz VNS, Sp-WK Py, CPY Tr MoS2 SAME

Final Depth 1682.4
Collar Elevation 3124.3
Coordinates 36170.5 N 19156.2 E
Inclination Vertical

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GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-17 Re-entry
Sheet No. 2 of 3
Date Completed 12-1-66
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay-ser chlor	Calcite	Rock Type	Remarks
1210.8	7.5	BXWL	2.62	99	.17			Oxide probably due to oxidation during processing. No ox. visable in core	sp-wk(-)	.17		tr MoS_2	wk-Mod	sp-wk cal ON fracs	Hf @ 1207.3 -1210.8	Dp as above, sil Hf w/ sp-wk bio? chlor prob. derived fr a sil. slt st. sp py, cpy tr MoS_2. No bedding vis
1218.9	8.1		2.63	100	.09				SD	.09	tr cc? MN ox?	---	1	1	Dp	WK Alt, Sil'n, wk Qtz py unlets sp-wk py tr MoS_2, tr epidote
1228.4	9.5		2.62	94	.10				Sp-wk	.10			1	1	bio-Hf @ 1224.0-1224.7	Dp as above, increase in small xenos. bio Hf, bleached along py uns. Chlo insipient feld? xyls sp py, cpy?
1237.2	8.8		2.62	100	.08				Sp	.08			1	1		Dp as above, small bio Hf xenos frequent, wk Alt, wk Sil'n along fracs sp py tr MoS_2
1247.6	10.4		2.61	96	.11				1	.11			1	1	Mz? 1243.6' 1247.0'	Dp as above w/ some xenos of Pinal. The Mz? is full of small cavities prob. resulting from Alt. of feld or Matrix, Mod Alt, Sil'n. Sp Py, Tr-Sp Cpy, MoS_2
1255.3	7.7		2.79	99	1.27	.06	13.7 @ 1.36 / 0.04		.06	Wk	1.21	tr MoS_2	Wk-Mod chlor	Mod diss Cal	Chlor. Hf @ 1247.0'	ST Alt, Mod-St Chlor, wk-Mod Gar. wk epidote wk-Mod py + Cpy sp MoS_2 the rk is primarily a Hf w/ xenos becoming TT. Locally the rk appears to be a bx (original comp prob. a Mart.)
1259.6	4.3		2.85	100	1.85	.01		.01	Sp-wk	1.84		—	1	1	TT @ 1255'	br Gar. w/ wk Chlor. in patches. Mod cal in unlets + diss. sp Py
1261.3	1.7		2.59	88	.52	.01		.01	tr-Sp	.51			tr-Sp chlor	sp cal on fracs	Dp 1259.6 Chlor Qtzite 1264 grading into Sil. Hf circa 1263, Dp @ 1267'	Dp-Mod Alt, Sil'n, wk py, cpy, tr MoS_2 Meta Sed - Lt gy-grn Sil slt st - dk gy sp suls
1271.0	9.5		2.65	98	.11				1	.11			tr-Sp clay-ser	1		Gy-Grn to Mottled dk br-gy tr tot suls. Dp CT irreg poss. steep.
																WK-Mod Alt, Sil'n sp tot suls, tr MoS_2
1280.4	9.4		2.63	92	.13				1	.13		—	Sp clay-ser, Sp-wk chlor	1	layering -60° Hf 1274.9-1278.7 then Dp Chlor Hf @ 1280.4 CT ≈ 60°	As above, dk gy slt St (Hf), bleached along qtz-py uns Wk py Sp Cpy tr MoS_2
1289.6	9.2		2.90	93	.53	.01		.01	Sp-wk	.52		tr MoS_2	Sp chlor			Dk grn chlor. Hf bleached along py uns. grades into lt grn. limy Hf w/ sp patchy Gar. sp py, Cpy increasing toward end run.
1293.1	3.5		2.86	87	.55	.01	25.5 @ 0.43 / 0.01	.01		.54		—	Wk-Mod chlor		TT @ 1289.6 Dp @ 1293.1	limy chlor Hf grades abruptly into TT composed of brn Gar. sp suls patchy chlor. some chlor along uns
1301.3	8.2		2.64	99	.12				Sp	.12			Sp clay-ser, chlor		good CT -15°	Good CT @ -15° shows slicks due to slight movement. WK-Mod Alt. Mod-St Sil'n wispy xenos wk py tr Cpy
1305.9	4.6		2.94	98	.68	.01		.01	Wk-Mod	.67			Wk chlor		Chlor. Hf @ 1301.3 good CT @ -30°	Chlor Hf grades into TT, then into Dp w/ no def. CT. Then into a silisic b w/ patchy Gar. WK py, Cpy increasing at end run
1311.6	5.7		2.64	92	.26				Sp-wk	.26?			Sp-wk clay ser chlor sp'sp.	Sp cal. ON fracs	Dp @ 1306.1 CT @ 40° Hz @ 1309.6	Dp - wk-Mod Alt, Sil'n wk intrusive bx sp-wk py Qtz Mz wk-Mod Alt, sp bio Dp-like appearance
1315.0	3.4		2.73	92	.17				Wk(-)	.17			Sp chlor	1	Chlor Hf @ 1311.6 @ -15°	Sil. Hf grades into chlor Hf, bleached on qtz-py unlets, chlor on py unlets sp py, sp cpy, tr M
1322.7	7.7		2.77	98	.23				Wk	.23			1	1	Dp @ 1322.7, CT approx 15-20°	Chlor Hf as above sp py sp-wk cpy tr MoS_2 on Qtz Unlets sp Cal. on unlets + diss
1332.7	10.5		2.63	91	.06				Sp-wk	.06			Sp-wk clay-ser chlor	1		Wk-Mod Alt, Mod Sil'n, tr-Sp py, tr MoS_2 wk xenos sp chlor, cal'n
1335.2	2.5		2.62	93	.06				1	.06			1	1		As above
1344.1	8.9		2.65	98	.05				1	.05			1	1		As above
1353.1	9.0		2.64	98	.05				1	.05			1	1		As above
1362.2	9.1		2.61	95	.05				1	.05			1	1	Ande @ 1360.8 CT ≈ 50°	
1370.8	8.6		2.61	100	.03				-tr?	.03?			tr-Sp chlor	1	Ande Chlor Hf 1378.4 Ct. ≈ 60°	Dense Gray w/ uniformly distributed patches of Chlor (?); Calcite on fracs
1378.4	8.6		2.65	98	.02				—	.02?			1	1	Chlor Hf w/ invading Dp to 1384.5' Dp @ 1384.5'	As Above, Flt. circa 1371.7'
1389.5	11.1		2.61	82	.06				Sp-wk	.06			Mod clay ser	wk cal on fracs		Locally st. chlor, locally dense + Si.; Rk is Mod Bx Near M. w/ Ande; As Approach 1384.5' more + more Dp invade fingering, and becomes dominantly chlor Dp.
1398.4	9.4		2.76	86	.11				1	.11			Sp-wk clay ser, tr chlor	1	Chlor. Hf 1394.5	Sp Cpy + Py, tr MoS_2, Evidence of Fling 1386.8 - 1389.0'
1402.3	3.4		2.58	97	.17				1	.17		tr MoS_2	St chlor		Chlor Hf	WK-Mod Alt, wk Sil'n, Sp Sulfs.; Dp has a mega: Seal of Assimilated Sed. Microlith Orthoclase @ 1398.5; Sed 1398.5
1407.7	5.4		2.65	99	.09				1	.09			Sp-wk clay-ser chlor	1	D @ 1402.2	Lt Grn to Dk Grn Chlor. Hf. Sp-wk Cpy, Tr MoS_2
1415.6	7.9		2.66	100	.15				Wk	.15			1	1		WK Alt, wk-Mod Sil'n, sp Chlor; Tr-Sp Cpy + Py.
1425.4	9.8		2.64	95	.05				Sp-wk	.05			1	1	layering -70°	As above, 1" py w/ assay w/ Mod epidote, Circa 1411.4
1430.8	5.4		2.62	96	.07				1	.07			1	1		As above, sp py, tr MoS_2 "paint"
1434.2	3.4		2.72	94	1.51	.02	23.4 @ 1.51 / .02	.02	Wk	1.49			Mod chlor		limy chlor Hf @ 1430.8	As above
1443.0	8.8		2.82	97	.10				Sp-wk	.10			Sp Gar wk-Mod chlor			limy chlor Hf, Mod py, Cpy in uns + diss about 5' of Dp @ start of run, then pyrox? Hf w/ chlor grading into a lt grn silic Hf (sil size grain) tr py, sp-wk cpy on unlets
1451.7	8.7		2.78	100	.07				Sp	.07				Sp cal on unlets	No lime in rk, only cal uns	Patchy gar for 2 feet of run, then sil. lt grn Hf as above. Sp epidote assoc. w/ cpy. Sp py Sp-wk cpy along unlets
1461.0	9.3		2.80	87	.13				tr	.13		sp hem	Sp chlor	wk cal on unlets		As above, gar patches along some unlets. Calcite unlets are hydro-thermal as cpy xyls are found in them

Final Depth 1582.4
Collar Elevation 3124.3
Coordinates 36170.5 N, 19155.2 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-17
Sheet No. 3 of 3
Date Completed 12-1-66
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration		Rock Type	Remarks
1469.4	8.4	BxWL	3.00	98	.07				tr	.07		X	Sp Chlor		Sil. Chlor. Hf	Sil. Chlor Hf. HgrN prob originally a quartzose silt stone. Tr py Sp Cpy assoc w/chlor. Tr MoS2 disp non MoS2 units
1479.0	9.6		2.88	80	.09				Tr	.09		X	Chlor wk-Mod		Bx 1472.5 @ 1478	Silica appears to decrease towards end run rk becomes more chlor. w/ patchy gar. Sp Cpy assoc w/ chlor, tr MoS2
1488.0	9.0		3.24	84	.04				Tr	.04		X	Sp Chlor		Diop? Hf @ 1480.8'	Chlor Hf grades within 3' into py-tan rk. Some gar? present. rest of rk comp. of 1' colored calc-sil pass disp. wk cal wks tr Cpy
1497.4	9.4		2.68	100	.15				Tr	.15		X Tr Specular	wk Garnet Sp Chlor		Mrb @ 1491.0 TT @ 1495.2	Hf as above There is a 1' chlor. zone between the Hf & Mrb carrying wk cpy CT @ 55° Mrb-Mod xyline w/ tr py cpy. TT CT @ 70° sp cpy tr MoS2
1506.4	9.0		2.73	100	.19				Tr	.19		X	Tr Chlor		Mrb @ 1497.2	Mrb CT low angle Mrb-Mod Xyline w/ patchy gar pass along silty beds Sp Cpy assoc w/ gar + an web-work of unlets in Mrb
1515.2	8.8		3.01	100	.21				Tr	.21		X	wk Gar wk Chlor Sp Clay		Diop? Hf @ 1506.5'	CT w/ Mrb somewhat gradational. Patchy Tr zones w/ wk inter-Xyline cpy w/ tarnish, overall - sp-wk cpy tr py, MoS2
1524.8	9.6		2.86	92	.21				Tr	.21		Tr MoS2	Sp Gar Sp Chlor		Sil. Chlor Hf @ 1517.6	HgrN sil. Chlor. Hf as above circulitic? Tr py, cpy MoS2 MoS2 on qtz VNS
1532.6	7.8		2.70	92	.39				Tr	.39		X Sp Specularite	Sp Chlor		Bx. Bx 1528.8-1528.8 Mrb @ 1529.4	Bx - frags of sil chlor Hf + Diop? Hf in sil Matrix. Gar near Mrb CT wk-Mod cpy, Gar w/ sp-wk cpy Mrb-Mod xyline unlets of cpy py?
1536.0	3.4		2.76	95	.13				Tr	.13			Sp Chlor		Chlor Hf @ 1532.6	Sheared Chlor Hf tr py cpy, MoS2 pre min. shearing, Qtz + Cal along
1541.0	5.0		3.29	100	.40	.03		.03	Tr	.37		Tr MoS2 Tr EMS	wk-Mod Gar		Diop? Hf @ 1536.4 Mrb @ 1539.4	Diop? Hf grading into Tr for 2' above Mrb CT wk cpy assoc. w/ SMDS Chlor in TT Overall Min - Sp-wk cpy, Tr py MoS2
1552.9	11.9		2.71	83	.06				Tr	.06		Tr MoS2 X Tr Spec.	Sp Chlor wk-Mod Gar		Mottled Gar. - Calc-Silicate @ 1542.5'	Mrb. w/ frags. lined w/ Chlor + sp cpy TO 1549.0' Then a mottled brn. Gar - light TAN CALC. Silicate RK. CONTAINING Tr Sp cpy, Tr MoS2, Tr Spodumeite
1561.0	8.1		2.94	100	.07				Tr	.07		Tr MoS2	Gar wk-Mod		Hf-Mrb @ 1553.2 Mrb @ 1556.3 Gar. Tem. Hf to 1558.5 Calc-Silicate 1558.5	The Hf-Mrb contains wk cpy. The Remainder of the units
1571.0	10.0		3.06	90	.02				Tr	.02		Sp Spec Tr MoS2	Tr Chlor		Gar.; Calc-Silicate Hornfels Tr-Sp 1563.5 - Tem. Gar. Hf to 1568.5	Continued Qtz, Tr-Sp Sulfs + Specularite The hornfels in Tr increases in Gar Cont Downward. Tr Sulfs
1580.4	9.4		3.32	87	.14				Tr	.14		Sp MoS2	wk-Mod Chlor		Gar. Bx. Gar. Tr. @ 1574.5' Chlor Hf @ 1574.1'	The calc-sil. Hf is v. fine grained The last foot of the calc-sil-Hf becomes strongly chlor. The Tr is primarily composed of sp. Bin Gar w/some Brn Gar, it contains wk rem. MoS2 - Sp Specular. The marble is clean & contains minor specularite - or x.
1582.4	2.0		2.66	99	.12				Tr	.12		Tr-Sp MoS2	"			Clean marble w/ some chlor developed along fracs; Tr Sulfs
E.O.H.			Avg Rec'y	93%												

Final Depth 623.0
Collar Elevation 2598.77
Coordinates 40252.95 N, 14867.22
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-217
Sheet No. 1 of 3
Date Completed 11-2-66
Logged By JAB + N.R.N

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: Clay sericite	Lim, Hem	Rock Type	Remarks
0.0 - 10.0	10.0	RB+ NC collar	–	–	–	–	–	–	–	–	–	–	–	–	Dp	Wk Alt, Argillization of feld, bio Alt to chlor, sp xenos, sp^lim on fracs acetic
16.0	6.0		2.63	95	.04			.04					Sp to wk clay SER	sp lim, Mn Ox		As above
26.9	10.9		2.39	75	.03			.03					wk-mod clay-ser		sply Alt+ broken Dp? 18.5-25'	As above, Circa 19.5' Alt st, poss mylonitic text wk limonite work alt sulf.d. tr Mn ox
35.0	8.1		2.63	100	.04			.04	tr			tr grn cu ox	tr-sp clay-ser	tr-sp lim, Mn Ox	Sub circa 27'	Wk Alt, heavily Mod silin obliterates text. sp py, tr cg cu ox tr-sp lim Mn on fracs
44.6	9.6		2.66	81	.04			.04	tr			–	1	1		Wk Alt, appears to be mainly chlor. wk silin tr-sp py diss. tr cc?
53.7	9.1		2.64	89	.02			.02	tr				1	tr lim		As above, a few small xenos may be calcareous in division sp-wk stringers
60.5	6.8		2.57	98	.11			tr	wk	.11		×	sp-wk clay	tr lim	Meta-seds @ 54' Dp circa 60'	Somewhat brecciated grn ht, ft, all show frequent tends to be brown carb. Inpk Lime w/acid, wk epidote assoc. w/py in some pieces sl py, sp cpy wk sp cc
67.9	7.4		2.64	84	.05				sp	.05			sp-wk Mod-ser	1		Wk reddish hem from leaching. Cnt of Dp-sed is good ft. Wk Alt, hint of and k spar cpy in phenos Mod xenos, increasing Tange of sp seeds
77.0	9.1		2.65	95	.03			–	sp	.03			Mod clay sp SER	–		Sp-wk Alt, sp-wk Alt mainly along inlets No 2nd k spar, sp-wk py to lim on fra
86.4	9.4		2.65	93	.02			–	sp	.02			1	–		Wk chloritic Alt, increase in qtz frags, several qtz xenos up to .8" long tr-sp py
95.8	9.4		2.66	94	.04			–	sp	.04			1	–	Bx dike 92.4 – 94.9 @ 60°?	Alt as above Pr Min bx dike 92.9-94.9, contain some alt frags, suggests seds below
103.9	8.1		2.66	100	.03			–	sp-wk	.03			1	–	bx dike 95.8 – 97.1	Alt as above, bx dike related to above described, py in dike sp-wk elsewhere, wk
112.7	8.8		2.65	95	.03			–	sp-wk	.03			wk clay sp-ser	–		Wk Alt, wk silin, sp-py, diss & on fracs
121.3	8.6		2.66	88	.02			–	wk	.02			wk clay wk-ser	–	Pit zone 117.6 – @ ≥ 50°	As above Alt increases slightly in the Pit zone
129.1	7.8		2.65	97	.04			–	1	.04			wk clay sp ser	–	bx dike @ 126.1 to 127.9 @ ≥ 80°	Alt as above. bx dike contains Metased frags, particularly Dp of lt grn Chlor. Alt w/ mod py, dark dike, Dp – tr-sp
138.5	9.4		2.65	96	.04			–	sp	.04			sp clay – ser	–		Wk Alt sp-wk silin, bx content increases to about 40-50 circa 132', 2" xenos of a [illegible] [illegible] Incr. gis may be due to absorption of clay-type sediments by Dp
147.7	9.2		2.64	99	.08			–	1	.08			1	–		Norm Dp, wk Alt, wk-Mod silin, sp py, sp-wk cpy on hair-like veins @ 75°
156.3	8.6		2.63	98	.18			–	1	.18			1	–	Sheer zone, Dp min qtz stringers	Alt as above, tr-sp py sp cpy on steeply dipping qtz inlets Pr Min. Shear zone intruded by very fine qtz-cpy inlets up to 1" wide
164.5	8.2		2.64	92	.47	.02		.02	1	.45			1	–		Dp, inch thickest inlet is 2". Cpy predominates w/ minor py, wk and k spar along fracs
172.7	8.2		2.64	97	.19			–	1	.19			sp-wk clay, sp-ser	–	end of shear zone	Wk Alt wk-Mod silin, Qtz vns fall off in No. but still present. sp py, wk cpy several 2" bands of and k spar dip @ 15°
181.7	9.0		2.64	99	.06			–	1	.06			1	–		Wk Alt Mainly chloritic, 1 and k spar band as above, wk and bk alone py only remaining ship phenos tr-sp py, cpy
190.8	9.1		2.65	99	.07			–	1	.07			1	–	3rd xeno @ 189.6	Dp as above, 2" 3rd xeno completely Alt to epidote @ 189.6' sp-wk py
195.9	5.1		2.65	93	.04			–	1	.04			sp clay ser	–		Dp as above, slight increase in py, cpy along fracs, some cal along hairline cpy is good in all alt of Hf by Dp. 2nd 2.2' Hf is an grn chlor w/ some epidote
201.4	5.5		2.94	88	.18			–	1	.18			sp wk clay Mod Garnet	–	Hf @ 198.7' CT ≥ 50°	197.9 – 201.4 Hf is fair to mottled grn w/ gar, epidote + disp. veins wk py, cpy
208.6	7.2		2.91	100	.05			–	tr-sp	.05			1 wk Garnet	–	Bedding? @ 30°	Lt grn Hf, blebs + xls of gar, pyroxene? epidote + blebs of qtz in Hf is grnd tr to 3%
216.5	7.9		2.99	100	.09			–	sp	.09			sp-wk clay-sp ser	–	Clean fine grained Qtzite @ 214.5	V.Lt. Grd. Hornblendic Siltstone to 214.5' then clean fine grained Qtzite.
226.2	9.7		2.62	86	.03			–	tr-sl	.03			Mod-st clay, fine sp-ser	–	Cataclastic Dp @ 220.6 (?)	Hf. contains sp-py, tr-sp cpy + c.c.. Qtzite barren
234.5	8.3		2.62	89	.02			–	sp	.02			Mod-st bk grn clay	–		Qtzite + siliceous siltstone Hf to 220.6 then Dp w/ 25° intrusive contact. wk silin. Dp is highly sheared, mod alto. sp py, tr cpy. Mod-st silin. Quite bkn. Somewhat reheaded but many openings, chlor. and grn talc like clay on fracs. sp py, tr cpy.
242.3	7.8		2.69	97	.02			–	1	.02			1	–		As above tex not apparent. From 237.6' on rk is quite brecciated and highly alto. st, qtz veining. Sing of rock in this zone has a hf like appearance. A 40° dipping lineation of qtz stringers and chlorite in zone
252.0	9.7		2.99	89	.06			–	sp	.06		.008 Mo ×	Sp chlor sp-wk gar ser		Limey Greenstone Hf @ 244.1 Fine Grained Chlor. Marble @ 244.9 (?)	sp py, tr cpy. Highly alto Dp to 244.1, st, chlor in grnd mass, sp py tr cpy. Chlor. Greenst. Limey hf or tactite @ 244.1. Local concentrations of chlor + hematite and locally st. epidote concentrations. Rk cut by nwn. calcite veinlets. tr-sp py, tr cpy, tr sp Mo? (1). Passible contact @ 244.9. Fine grained v.lt. grn chlor. Marble (?) w/45° contact. No garnet in marble. tr-sp py, tr cpy
260.8	8.6		2.96	100	.01				tr	.01?		×	sp-wk gar			Rk is quite fine grained + becomes quite siliceous. A long prismatic or blade mineral which may be tremolite occures in local concentrations. Rk becomes moderately garnetite starting around 257.0', between 254.0' and 264.2' shows a reheaded pebble bx tex., in the vicinity of 269.5' there is 1/4" alternating bands of garnet and the siliceous material which may represent bedding. Dip approx 20°. tr py, cpy, Mo?
267.3	6.5		2.97	82	.02				tr	.02?		×	sp-wk chlor		Sherrer Qtzite circa 265	As above to 264.9' then a good qtzite, clean probably Sherrer.
276.0	8.7		2.68	94	.01				sp	.01?		×	sp-tr chlor		lim chlor. Hf circa 273.1'	Transition was gradual taking place over several feet.
284.4	8.4		2.63	100	.04				sp	.04?		×	wk chlor		Qtzite @ 275.4 Mo @ 283.4 + 87	Chert qtzite grades into lt grn limy hf w/ patchy gar + epidote tr sp, cpy Qtzitic Hf w/ sp chlor, epidote, gar + lime on fracs. So ... Mo? ... x above

Final Depth 623.0
Collar Elevation 2598.77
Coordinates 40252.95 N, 14867.22 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-217
Sheet No. 2 of 3
Date Completed 11-2-66
Logged By JAB + N.R.N.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Gar, Chlor, epidote, clay, Ser	LIM HEM	Rock Type	Remarks
293.1	8.7		2.64	93	.03				tr	.03?	—	X	–	tr diss Lim BAA	P.M. ANDESITE @ 294.0'	DENSE OX. P.M. ANDESITE W SMALL LATHLIKE FELDS. INTRUDES ALONG A 65°
301.6	8.5		2.60	95	.04				sp	.04?	—	X	Sp chlor		65° FOLIT. 1.5' Dp circa 293.6'	CONTACT. REMNANTS OF QTZ. MZ IN P.M. AND. DIKE. Tr PY, SP V. FIND MAG
306.3	4.7		2.68	93	.04				1	.04?	—	X	Sp-wk chlor		QTZ. MZ @ 306.8 45° CONT SED @ 306.3	P.M. AND. W/ 1.5' INTERVAL OF Dp CIRA 293.6, RK BECOMES VESICULAR
320.0	13.7		3.37	88	.02				1	.02?	—	X	Sp chlor clay		ALT SEDS. @ 306.3	TOWARDS END OF RUN. PY AND MAGNETITE AS ABOVE QTZ. MZ @ 307.8, RK PRIMARILY ANALOGOUS W/ FEW MOD GRAINED FELD + QTZ EYES. ABUND. CHLOR. SP EPIDOTE, V. FINE CALCITE VNLTS. SP PY, TR CPY.
329.2	9.2		3.34	92	.02				1	.02?	—	X .027	Mod-ST gar		POSSIBLE SED 55°	SEDIMENTS REC. FINE GRAINED + CALCAREOUS TO 308.5' THEN A ST. EPIDOTE BAND (2") FOLLOWED BY A LT. BROWN, FINE GRAINED TT. BRO. ATTITUDE 66° TR-SP PY, LOCALLY SP HEMATITE
338.2	9.0		2.63	98	.03				1	.03		X	Sp clay-ser			DENSE LT. TAN-LT. GRN TT., CUT BY THIN CALCITE VNS. LOCAL HIGH CONCENTRATIONS OF CHLOR AND EPIDOTE, SP. DISSIM MOM + SP VEINING. SP PY
346.6	8.4		2.60	100	.03				1	.03		X	Sp chlor ST Gar		TT ± 320' DP @ 329.2 ALT SEDS @ 344.7'	@ 000 Dp W/ DENSE GLASSY MATRIX. FELD. FRAGS + QTZ EYES SMALL WK. ALT, SP EPIDOTE, TR-SP PY.
356.3	9.7		3.52	89	.02				1	.02		X	1 1	Sp-wk varying hem		WK ALT, QK CHLOR ON FRAMS. OF DP, WK 2nd K-SPAR IN GRND MASS. LOCAL SED. INCLUSIONS. INTRUSIVE CONT W/SED. DENSE, FINE GRAINED WKLY CHLORITIZED, GRANULIZED Hf OF TT., CUT BY FREQUENT CALCITE VNS. SP PY, TR-SP CP
365.0	8.7		3.22	92	.02				1	.02		X	Wk-Mod chlor Mod gar	sp hem	CUT BY SOME 362.5 - 368.0'	LT BRN. TT W/MOD CHLOR DECREASING TO SPARSE AT END OF RUN. CHLORITIZED AREAS ALSO CONTAIN WK EPIDOTE + HEMATITE, LESS CHLOR. PORTION IS ALSO LESS GARNETIZED W/ IRREGULAR PATCHES OF LT. GRN. CALCITE. SP-WK AMTS. OF RHODONITE UNDERGROUND W/ GARNET. TR PY + CPY.
374.0	9.0		2.69	100	.02				1	.02		X	Sp chlor, gar	—	SILT. STONE @ 369.4	RK IS ABOUT 1/2 GARNET AND 1/2 LT. GRN CALCAREOUS MAT, chlor PY SP-WK IN VNLTS + DISSIM. SP-WK MOM. ASSOC W/ PY, SP RHODONITE. FLT ZONE FILLED W/ DK. GRN CHLOR + CALCITE VNLETS SURROUND THE FRAGS. FLT. ZONE DIPS 20°
381.8	7.8		2.72	100	.02				1	.02?		wk – X	Sp chlor	—		RK IS BRN W CHLOR. GAR. CONTENT DROPS OFF DRAMMATICALLY. TR-SP PY, TR CPY. TR-SP RHODONITE SILTS. SLIGHTLY ALT BUT NOT A HS. NON REACTIVE, TR SULFIDES. TR CLEAN SILICA SILTSTONE. CUT BY FEW VISIBLE CALCITE VNLETS. NO SULFS.
390.0	8.2		2.71	97	.03				1	.03?		X	1		BEDDING (?) 55°	RK BECOMES GREEN. APPARENT-LY V. FINE MINERALIZATION. LOCAL PATCHES ARE STRONGLY CHLOR. + CONTAIN MOD PY. @ 389.0 RK BECOMES LT. FINE-GRN + SLIGHTLY FRAGMENTAL
399.0	9.0		2.66	100	.03				1	.03		wk – X	Sp chlor, gar	—		LT PINKISH SILTSTONE W/ SCATTERED ST. GARNET CONCENTRATIONS. RK IS VARIOUSLY CHLORITIZED IN WHAT SEEM MANNER, 6" BX ZONE CIRCA 398.5 LAST FOOT OF RUN IS GARNETITE + SIMILAR TO RK @ 356.3', SP SULFS.
408.3	9.3		3.43	93	.01				1	.01		X	Wk-Mod GAR + CHLOR	—		WKLY CHLOR. TT, ENTIRE MIXED IN GRN GARNET + LT. GRN SLIGHTLY CALCITIC MATERIAL
417.4	9.1		3.25	100	.01				1	.01		wk – X	Wk-Mod GAR TR CHLOR	—		3" CHLOR-CALCITE ZONE, DIP APPROX 45° @ 405.3' (WK FLT.), SP-WK EPIDOTE, SP PY, TR
425.8	8.4		3.34	100	.01				Sp-wk	.01		wk-x	Wk GAR			DENSE LT. GRN-GRN T.T. W/ EXCEPTION OF INTERVAL 411.4 - 418.4' WHERE RK IS A META SILICIC. SILTSTONE. REMAINDER CONTAINS SP-WK CHLOR, TR-SP EPIDOTE, SP-WK PY, TR-SP MOM
433.8	8.0		3.17	99	.02				1	.02		Tr-sp MoS2 wk-x	Sp-wk chlor SP GAR TR CHLOR	—	DP DIKE (6") @ 431.7'	META-SILICIC SILTSTONE. SP-WK GRANULIZATION, THE RK IS V. PALE GREY W/ WISP + PATCHES OF LT. GRN. CLAY. SP CALCITE VNLETS, SP PY.
448.1	9.3		3.31	98	.01				Sp	.01		X	SP GAR		DP (?) 433.1' - 436.6'	META-SILICIC SILTSTONE. SP GARNET, TR SP EPIDOTE, SP QTZ VNLETS. DP(?) DIKE @ 431.7 FOR 8" BELOW DIKE WK DISSIM MOM. OVERALL, TR-SP PY, TR-SP MoS2 SILICEOUS SILTSTONE + TT., QUESTIONABLE Dp 433.1-436.6, FEW FRAGS OF FELD INDICATE, AND MANY QTZ. EYES, RK IS SIMILAR TO A QTZ PEBBLE CONGL. NO MARK INDICATE. MAKES APPROX 40° CONT W/ UNDERLYING SED. CONTACT SHOWS CATACLASTIC BRECCIATING + ROLLING. 4" WHITE QTZ VN @ 433.8'. MANY HIGH ANG QTZ VNLETS THROUGHOUT RUN. SP PY, TR-S/ MoS2
451.4	8.3		2.69	100	.01				Sp	.01			Wk CLAY-SER SP CHLOR		Mz @ 444.2'	TT W/ SP PY + SOME PYRRHOTITE? Dp to 8T, Mz: WK Alt, wk-Mod s.lim ≈ 2% bio
462.1	10.7		2.69	98	.01				wk	.01			Wk CLAY SER SP CHLOR			Mz AS ABOVE, Qtz VNS SP-ABSENT ≈ 2% epidote
465.3	3.2		2.94	100	.15				Sp-wk	.15		X	Wk CHLOR SP CLAY		1 lim Hf @ 462.1 ≈ 85°	1 lim Hf, some gar, chlor, sp py
471.1	5.8		2.63	98	.01				Tr	.01					P.M. Ande @ 465.2 @ 55°	Hf-And ct: ≈ 1/4" Hf bx, And. slightly bleached for 1 1/2 inch. Ande - sp very fine diss. py
475.8	4.7		2.65	95	.01				1	.01		.122 Mo	Sp-wk CHLOR		1 lim Hf @ 471.1 CT @ 58	CT very sharp slight chloritization of Hf, Hf is silicious w/ Mod-st lim. Dp dip 16° below CT, sp-wk MoS2 on fracts + disc out from Tr Hf, Sil St - very fine diss py
484.9	9.1		2.62	95	.03				Wk	.03			Wk TALC		Sil St @ 474.4' Dp circa 481'	
493.6	8.7		2.65	97	.04				1	.04		Sp – X	Mod CHLOR + TALC		Dp + interbed lim Hf Tr circa 490'	DK SILT ST W/ VERY py grades into Sil. Silt. Dp: Circa 481
502.0	8.4		2.66	100	.03				Sp	.03			Mod CHLOR WK CLAY		Dp dark circa 494' Mod. HEM - 497.8 Dip 45° Sed dip 50-506'	Dp darkens toward Hf sic frags. SP-WK py ASSOC W/ chlor
508.2	6.2		2.73	100	.03				Sp-wk	.03			SP CHLOR			Silt St has WK-Mod finly diss py. It appears to be bxiated + intruded by Dp? bx frags in dk "sil st". The bulk Dp - sil st interval may actually be all Dp. SP - WK finely diss py
513.0	4.8		3.40	94	.08				Sp	.08		X	Mod GAR SP CHLOR		Hf @ 509.0	
522.2	9.2		2.62	74	.04				tr	.04?		Sp – X	Sp SER, calcite		Gradational INTERGRAINED AND @ 513.3'	Lt grn lim Hf w/ pads of gar. SP-WK Cpy ASSOC W/ chlor circa CT
531.2	9.0		2.55	93	.04				1	.04		tr – X	1			MOD ALTERED FINE GRAINED ANDESITE (HERE TO FORE CALLED PRE MIN). INTRUDES INTO ABOVE SEDS. 60° CONT. AND SHOWS EFFECTS OF HYDROTHERMAL ALT. ALONG CONTACT AND ALONG A FEW FRACS AND CALCITE VNLETS. RK IS CUT BY FREQUENT CALCITE VNLETS MOD. MoS2 IS FOUND IN AND.-SED CONTACT ZONE, OBVIOUSLY LATER THAN INTRUSION CPY IN SP AMTS. IS FOUND ASSOC. W/ THE CALCITE VNLETS.
																WK-MOD ALT, LOCALLY SS, CALCITE VNLETS + VESICULE FILLING WE-MOD FLOW DISTORTED FELD. LATHS DIP APPROX 50°, SED CONTA. @ 530.6', TR MoS2, TR-SP APY, WE V. FINE DISSIM MAGNETITE

Final Depth 623.0
Collar Elevation 2598.77
Coordinates 40252.95N, 14867.22E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-217
Sheet No. 3 of 3
Date Completed 11-2-66
Logged By JAB + N.R.N

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SER	LIM HEM	Rock Type	Remarks
540.3	9.1	NX wl	2.67	96	.02				tr?	.02?			tr ser, chlor	tr hem		Sp-wk Alt, wk Calcite veining, tr cpy, Mod + Fine Dissim Mag
549.9	9.6		2.59	88	.02				1	.02?			tr ser sp chlor	1		As Above
556.9	7.0		2.62	100	.03				1	.03			1 tr chlor	1		As Above
566.4	9.5		2.56	92	.06				1	.06		blk Sph .92 zn	wk gar	tr spec hem	ALTD LIMBY SEDS @ 567.4	Andesite as above. First 8" of seds st. alto to garnet-chlor. Contains mod hem + sphalerite, wk cpy. The rk then becomes a fairly clean ms w/ only wk local chlor + sp dissim garnet. @ 564.9 the rk becomes a garnetite. This zone of change has a 2" wide band of v. fine sphalerite w/ wk cpy.
575.0	8.6		3.33	93	.03				1	.03		.03 zn	1		Andesite @ 574.2 Marble 576.0	Possible bedding 30° To 574.2 the rk is a low-grade hornfelsic garnetite which has been mod. shattered + healed. Contains sp local concentrations of sphalerite + tr. Lower contact of bnd. near vertical. Marble is rather pure to circa 587.0 where rk becomes moderately garnetized
588.4	13.4		2.75	93	.02				tr	.02?			tr gar			
597.0	8.6		2.83	100	.03				1	.03?			sp-wk gar			Intermixed clean marble + moderately garnetized zones. A 1½" qtz vein dipping 15° @ 593.1'. tr sphalerite
606.0	9.0		2.73	98											bedding? ~55°	White medium xline mrb. slight grn mottling in places tr gar. pass bedding ~55
613.8	7.8		3.02	97											SIT ST @ 606.0 Mrb @ 611.8, chert? dip ~65°	lt gy to grnish slt st of slt size qtz, sp gar in lower portion tr pyr sulfs
623.0	9.2		2.76	96												lt gy mrb w/ ½" chert? bands, thin mrb. circa 621 two bands of gar dip @ 65° dk gy mrb @ cont run. tr pyr.s
EOH			Avg Rock													

Final Depth 915.2
Collar Elevation 2561.28
Coordinates 41857.28 N 15086.02 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. C-216
Sheet No. 1 of 3
Date Completed 10-14-66
Logged By JAB, NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay serici te	lim hem	Rock Type	Remarks
0.0 - 73.0	73.0	RB	—	0	–					–			–		–	Rock Bit
81.3	8.3	NXWL	2.58	100	.04	.04		.04				Tr. Cuprite	WK CLAY	WK-MOD LIM SP JAR	Dp	WK-Mod Alt, WK lim, hem on fracs and enlets tr HEM
90.8	7.5		2.58	93	.04			.03			.01		WK-MOD CLAY-SER	MOD LIM TR JAR	Patchy Sets Close Bk	As above, sp py to cc
99.1	8.3		2.65	91	.07			.03		.02	.02		/	WK MOD LIM TR JAR SP LIM	Sulf circa 91'	Mod Alt, wk-Mod py, sp cc to spy, wk lim on fracs
107.2	8.1		2.60	88	.09			.03		.04	.02		/			Alt + Min as above, cc mainly on fracs, sp lim on fracs to 2' of run then cha
115.3	8.1		2.65	77	.06			.02		.02	.02		WK-MOD CLAY SP TALC	SP LIM		Mod Alt, wk py, tr cc texture almost obliterated by Alt.
123.2	7.9		2.64	77	.03			–	(Nil)	.03	tr		SP-WK clay-ser	tr lim		Mod Alt, wk Silf; sp-wk Py, tr cp. Sulfs Dissim + on fracs
133.7	10.5		2.66	62	.02				1	.02	–		/	–	BIOT. Dp	wk-Mod Alt, 4% Alt Biot, wk Qtz. vuing, sp talc; wk Py, tr cpy
142.0	8.3		2.65	87	.02				SP(+)	.02			/		/	wk-Mod Alt, Mod Silf, 4% Biot, sp-wk Py, tr cpy
149.0	7.0		2.63	65	.02				1	.02			/		/	Mod Alt, All other feature as above
156.5	7.5		2.63	93	.04				1	.04			/		/	Mod Alt, Mod Silf, 4% Alt Biot, wk-Mod Py, sp cpy, tr cc
164.3	7.8		2.63	91	.04				SP-WK	.04			/			Mod-st Silf, wk-Mod Py, sp cpy
171.5	7.2		2.64	98	.03				sp-wk	.03			WK TALC			Mod-st Silf, Med + fine feldspar frags abundant, sp-wk Py
179.1	7.6		2.65	89	.03				wk	.03			/			As above; the larger feld frags are larger than normal (1/4"), 68° cont. @ 177.4'. Below Rk has 20% 2nd Biot + Mod-st Py.
186.6	7.5		2.65	92	.03				sp-wk	.03			/			60° die Qtz vu @ 179.1, Rk st. silf + has been shattered. Tex poor, Alt zone @ 8
195.6	9.0		2.64	77	.05				wk	.05			/		Mz or G.D.P. @ 189.1'	Dp wk Silf 3% prim Biot, ~~Cpy~~ 20% prim Biot, wk Dissim Py, tr cpy
202.7	7.1		2.64	100	.10				wk	.10			SP-WK CLAY-SER SP-WK TALC	WK-Mod Lim	Mz	SP-WK Alt, 20% Biot; wk Dissim Py, sp-wk cpy
210.3	7.6		2.69	93	.09				1	.09			/			Sp-wk Alt, wk-Mod Silf 20% fresh Biot; wk Py; Rk is somewhat
217.5	7.2		2.65	89	.07				wk	.07			/		Dp circa 217.5	shattered. Small flt. circa 205. S-wk Alt, sp-wk Silf; wk Py, tr-sp cpy; Tex masked by Silf
225.0	7.5		2.65	90	.07				1	.07			SP-WK CLAY SP-WK TALC		DP	Mod Silf dp, sp Alt, local high Biot - Py concentrations, xono or pinal
233.2	8.2		2.66	97	.03				1	.03			SP-WK CLAY SP TALC		Biot DP	wk-Mod Silf dp, sp wk Alt, 10% prim Biot, occas xonos - looks vagu like Mz.
241.3	8.1		2.65	97	.04				Sp-wk	.04			/			As above. Biot 5%; sp-wk Py, tr cpy
249.7	8.4		2.66	93	.04				wk	.04			SP-WK CLAY SER + TALC			As above
257.9	8.2		2.64	94	.03				wk	.03			/		Normal Dp	Wk Alt, Silf, nun phenos, many show crackling or brecciation in places, tr-sp
266.9	9.0		2.64	89	.03				wk	.03			/			As above, sp xonos, laxering in Dp appears to be low angl
274.6	7.7		2.67	93	.03				wk	.03			/			As above about 25-30°
282.7	8.1		2.63	100	.06				wk	.06			SP-WK CLAY SER WK TALC			As above, toward end rud silf'n becomes Mod + py is sparse
291.0	8.3		2.64	94	.05				wk	.05			/ MOD TALC			Silfed Dp, sp-wk Alt, distinct tex, feldsp show in-place shattering; sp Py
298.9	7.9		2.63	100	.09				wk	.09			/		Chlor Hf 294.7	Dp As Above, Dense-chloritic Rk, wk Py along fracs, bleaching along veinlets
306.6	7.7		2.64	93	.16				wk	.16			/		Dp @ 305.7	Hf As Above, Dp wk-Mod Silf'n, wk Alt + sp chlor, tex indistinct
314.2	7.6		2.63	96	.04				wk	.04			/			sp-wk Alt, wk Silf'n, 2% Biot, sp-wk Py
321.8	7.6		2.64	99	.07				wk	.07			/			As Above - sparse 2nd K-spar along fracs
330.3	8.5		2.65	96	.05				wk	.05			/			Sp-wk Alt, tr Silf'n, 5% Biot, sp Py, tr cpy; Rk has been bkn + reno
338.0	7.7		2.64	97	.02				sp-wk	.02			/			Bk zone 331.2', most features as above; few feld phenos > 1/4"; Py sp-wk
345.4	7.4		2.65	99	.03				Sp-wk	.03			/			wk Alt, wk Silf'n, sp Py, sp cpy, tr MoS2
352.6	7.2		2.66	98	.04				wk	.04			/			Bkn + recemented, wkly silfed, 40° Qtz vuing @ 351.4', Intn shear @ 352.4'
361.8	9.2		2.63	94	.03				wk	.03			WK CLAY-SER			Mod silfed + highly shattered, wk Py, tr-sp cpy; tr MoS2
364.5	2.7		2.65	97	.02				wk	.02			/			All as above
372.3	7.8		2.64	98	.04				wk-Mod	.04			Sp-wk clay ser			Sp-wk Alt, wk-mod Silf'n, sp wk Py, tr cpy, tr-sp MoS2

Final Depth 915.2
Collar Elevation 2561.28
Coordinates 41857.28N, 15086.02E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-216
Sheet No. 2 of 3
Date Completed 10-14-66
Logged By J.A.B. N.R.N.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SER	LIM HEM	Rock Type	Remarks
380.8	8.5		2.62	94	.09				wk	.09			Sp-wk clay-ser mod talc			Sp-wk Alt, Mod Sil'n, wk talc; 70° dip Smear @ 379.6' to end
388.6	7.8		2.63	98	.03				wk	.03						Alt + Sil'n As Above, Sp-wk Py, Tr-Sp CPy, Tr MoSz
397.1	8.5		2.64	95	.02				wk	.02						Sp-wk Alt, wk alt Biot, wk-Mod Sil'n, Sp-wk Py, Tr-Sp CPy + Mo
408.7	11.6		2.65	95	.04				Sp-wk	.04			Sp-clay ser mod talc			Sp-wk Alt; wk Sil'n, 8% Alt Biot, Sp-wk Py Tr-Sp CPy + MoSz
415.7	7.0		2.64	100	.03				wk	.03						Alt Sp-wk, wk-mod Sil'n, 70° Flt @ 409.3', Min As Above
423.4	7.7		2.63	100	.06				wk	.06						As Above, Tex is indistinct Moddled Dk Grn
431.5	8.1		2.63	99	.04				Sp-wk	.04						As Above
440.4	8.9		2.65	98	.03				Sp	.03						Sp-wk Alt, wk Sil'n, 10% Alterd Biot, Sp-wk Py, Tr-Sp CPy, Tr-Sp Mo
448.7	8.3		2.64	98	.03				Sp-wk	.03						As Above, Mod Frags 35-50°, Alt Along Frags
457.5	8.8		2.65	96	.02					.02						As Above
465.5	8.0		2.65	98	.04					.04						Sp-wk Alt, Mod Sil, Sp Alt Biot, Nrow Vert Flt @ 464'
472.9	7.4		2.64	97	.05				wk	.05					Mz @ 471.7'	Sp-wk Py, Tr CPy + MoSz; Dp As Above; Mz wkly Alt, wk Sil'n, wk-Mod Py, Sp CPy; Mz intruded along near vertical zone.
481.8	8.9		2.62	92	.11				wk-Mod	.11			wk-clay-ser			Mz w/trace Dp, wk Alt, wk-Mod Sil'n, wk-Mod Py, Sp CPy, Tr MoSz
489.2	7.4		2.65	99	.08					.08						Sp-wk Alt, wk Sil'n, wk-Mod Py, Sp-CPy, Tr MoSz. Fair Tex
497.4	8.2		2.65	98	.07					.07			wk-Mod clay-ser			Sp-wk Alt, Sil'n patchy some Sp + some wk, Min. As Above
505.4	8.3		2.58	98	.06					.06			wk-Mod clay-ser + talc			Sp-wk Alt, Sp Sil'n, Min As Above; Rk is Bkn w/some Gouge. Small flt. @ 499.9'
514.5	8.8		2.65	83	.08					.08						Wk-Mod Alt, wk silw, wk py sp cpy sp to absent qtz uns
524.2	9.7		2.61	74	.05					.05			Mod clay ser wk-Mod talc			As above, all bio Alt to hydromica, poor core rec. Numerous sticks. Sp Qtz uns
535.9	11.7		2.64	61	.09					.09			Mod-st clay -ser			As above poor core rec. wk-Mod Cl py, sp cpy tr-absent qtz +
541.6	5.7		2.67	96	.07					.07						Wk-Mod Alt, Mod(?) Sil'n, wk-Mod(?) py, sp cpy, Seams quite hard all bio Alt to hydromica
549.8	8.2		2.65	96	.04				wk	.04						Wk-Mod Alt, wk-Mod Sil'n, wk-Mod discim Py, Sp CPy
558.6	8.8		2.64	92	.03				wk-Mod	.03			Mod-st clay -ser wk-Mod talc			As Above, Rk has Dvk Grn Cast from talc-at Bhole
566.7	8.1		2.65	96	.04					.04			wk-Mod clay-ser wk-talc			Wk Alt, Sp Sil'n, wk Py, Sp-wk CPy; Bore Loss Alt; Rk Finer Grained
576.4	9.7		2.65	94	.08				wk	.08			Mod ser wk talc			Wk-Mod Alt, Sp Sil'n, wk Py, Tr-Sp CPy; High Angle Flt @ 574 268.0' St. Py zone @ 572.9'
584.0	7.6		2.57	100	.06				wk	.06						Wk Alt, Sp-wk Sil'n; wk Py, Sp CPy; Flt zone 582.5'-583.8'
592.0	8.0		2.56	96	.06				wk-Mod	.06			Mod-st ser-Sp clay			Wk-Mod Alt, Sp Sil'n, wk Py, Tr-Sp CPy; Felds Alt to Lt Grn Talc like clay
602.9	10.9		2.61	75	.08				wk	.08						Mod Alt, Tr Sil'n, wk Py, Tr-Sp CPy Felds As Above; Rk is Bkn + Granular throughout. Flt Plain Angle 600.8'
611.2	8.3		2.62	100	.10				wk-Mod	.10			wk-Mod clay-clay Sp talc			Alt Mod, wk Sil'n, wk Py, Tr-Sp CPy; Rk Shows Alt of Felds along old frags
619.9	8.7		2.63	93	.08					.08			wk ser-clay			Wk Alt, wk Sil'n, Min As Above; 2' Spacing on 65° Frags w/ Grn Clay Seams
630.2	10.3		2.63	77	.21					.21			Mod clay-clay wk talc			Alt Mod - Felds Alt to Grn. Talcy Clay; Granulated Zone 624-625.3' Flt (?)
633.2	8.0		2.59	38	.14				Sp	.14			St chlor		Chlor Hf Zone 631.2-634.2	Chlor Hf w/ Thin Calcite veinlets; Sp Py, Tr CPy.
641.0	7.8		2.58	79	.09				Sp-wk	.09			Mod-st ser + clay		Mz	Mod Alt, wk Py, Tr-Sp CPy; Rk Bkn + Sheared, Flt zone 638.4-640.4
652.7	11.7		2.57	64	.08				wk	.08			Mod-st ser mod clay			Mod-st Alt, Sp Py, Tr CPy, Rk is quite Bkn + somewhat Gouge towards end of R
661.8	9.1		2.51	90	.09					.09			Mod ser mod clay			St Alt, Sp Py - Alt, Bkn + crumbly nature of Rk the result of strong faulting. No attitude attainable
669.4	7.6		2.51	100	.14					.14			Mod-st ser mod clay			Rk Continues to be extremely altered + granulated; Sp Py, Tr-Sp MoSz
678.1	8.7		2.62	100	.16					.16			wk ser mod clay	Tr pyrite		Rk Continues to be Bkn + Gouge to 675.4', remainder is wkly. Alto. Sp/Silded, Sp/Min.
686.2	8.1		2.44	100	.12					.12			Sp-wk clay-ser Tr pyrite		Alteration of Rhyolite Dikes 681.7-687.2	Rk is still Mz but appears to be of a different phase. Finer grained w/less Biot, but darker @ 681.7' Rk becomes ssly alt, sslv silded, clay occurs in conchoidal micro-frags around sites of original felds. Tr hydromica after biot. Sp Py, Tr-Sp CP.
695.3	9.1		2.41	96	.10					.10				Tr pyrite	Late Phase Mz 687.2-692.6	Sp-wk Alt, Sp Sil'n; Fine grained Dk Gnd Mass w/ med grained felds + biot. Sp-wk Py + CPy. Sulds assoc. w/ a lt yellowish-grn vitreous min. Possibly epidote. This Rk occurs intervisibly w/ what has been the normal Mz in this hole. This shows distinct alt.
704.3	9.0		2.65	90	.13					.13			Wk-Mod ser, clay tr-epidote			Thu is again quite bkn, but not gouge, Sp-wk Py, Tr CPy

Final Depth 915.2
Collar Elevation 2561.28
Coordinates 41857.28 N, 15086.02 E
Inclination VERTICAL

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-216
Sheet No. 3 of 3
Date Completed 10-14-66
Logged By JAB, NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Ser	Lim Hem	Rock Type	Remarks
713.8	9.5	B STANDARD	2.67	99	.07				WK	.07			sp clay	—	M2	MED GRAINED EQUIGRANULAR, 5% BIOT, Sp-WK ALT CONTROLED BY FRGS, sp sil'n Sp PY Tr-SP CPY
722.3	8.5		2.70	100	.08				1	.08			1	—		FELD-ALT WK; BIOT ALT Mod-ST w/SOME EMPTY CAVITIES; MINOR 2nd K-SPAR, WK PY, Sp CPY, SP EPIDOTE, ALT + SIL'N
730.8	8.5		2.70	93	.13				WK(+)	.13			1	—		As Above, WK PY, Sp CPY, Sp EPIDOTE
740.0	7.2		2.67	95	.10				1	.10			1	—		FELD ALT WK, BIOT ALT Mod, SIL'N Mod, WK PY, Sp CPY, MINOR 2nd FELD + SP EPIDOTE
748.8	8.8		2.66	98	.13				1	.13			sp clay - SER			MOD ALT, Mod-ST SIL'N; WK PY ASSOCIATED W/ EPIDOTE, Tr-Sp CPY, VAGUE TEX
757.0	8.2	NX WL	2.66	98	.12				1	.12			1	—		WK-Mod ALT, Mod + Mod-ST SIL'N, WK PY, Tr-Sp CPY; MINERALIZED ZONE FROM 753'
765.7	8.7		2.67	94	.12				WK-MOD	.12			1	—		WK-Mod ALT + SIL'N, Sp-WK PY, Tr-Sp CPY; RK IS SOMBRUM FINER GRAINED
777.0	11.3		2.59	85	.24				1	.24			1		MIRALITIC MZ TO 270.0' ALT. SED @ 776.0-779.5	MIRALITIC PORTION CONTAINS A SED. KEND ALSO HAS CLEAR 3% DISSIM MAGNETITE, PY MOD CPY SP-WK EPITOTE 3%. RK HAS A HIGH SPEC. GRAVITY - ROUNDED RK THROUGH
780.5	3.5		3.12	99	.16				Mod	.16			1			ZONE APPEARS BRECIATED AND IS HIGHLY MIRALITIC; SILICEOUS SED FRAGS ARE SURROUNDED BY HIGH MAGNETITE + EPIDOTE CONCENTRATIONS, SP-WK PY, Tr CPY
786.9	6.4		2.67	98	.15				Mod.	.15			1			COARSER GRAINED, LESS SILICIED VARIETY OF MZ, INTRUDING ALONG A 70° CONTACT RK HAS Mod CLAY (GRN); SP-WK PY, Tr-SP CPY, REMAINDER OF RK ~~[illegible]~~ MZ
794.8	7.9		2.68	100	.10				WK-Mod(+)	.10			1			MZ #2 ≈ 5-7% rather fine bio. PYCRUS only show up on FRACS w/ Alt to clay? WK-Mod PY Tr CPY, SP-WK EPIDOTE
802.6	7.8		2.67	94	.09				WK	.09			WK-Mod clay-SER sp clay - SER			INTERMIXED MZ #1 + MZ #2 (ALT. SILIFICATION DIFFERENCES) #1 HAS MOD CLAY SER, WK SIL'N, #2 SHOWS ONLY MINOR CLAY SER + Tr SIL'N, - BOTH CONTAINING SP-WK PY + SP CPY.
811.2	8.6		2.64	95	.11				WK-Mod(-)	.11		tr epidote				Mod Silified MZ, WK-Mod ALT, Sp-WK 2nd K-SPAR; WK PY, Sp CPY, TEX DEVEL. MOD
820.3	9.1		2.60	95	.13				WK	.13		1	1			Mod-ALT + Silified, RK HAS A PSUEDO MIRALITIC TEX (CONTAINS ALTD BIOT), WK(+) PY, Sp CPY
828.3	8.0		2.68	98	.11				1	.11		1	1			Mod ALT, Mod-ST SIL'N; WK(+) PY IN MED GRAINED DISSEMINATIONS, Sp(+) CPY NUMEROUS CAVITIES ALTER BIOT
836.8	8.5		2.73	96	.19				WK-Mod	.19		1	1			Mod ALT, Mod-ST SIL'N, WK-Mod PY, SP-WK CPY; CAVITIES AS ABOVE
845.8	9.0		2.69	83	.15				1	.15		1	1			As above to 841.4 THEN SILIFICATION DECREASES RAPIDLY TO THE POINT OF SPARSE AT THE END OF RUN. UNSILIFIED RK SHOWS MED GRAINED FELDS. ALT. TO A LT. GREEN
854.1	8.3		2.62	95	.18				WK	.18			WK clay-ser			O-AT SET IN A V. FINE GRAINED CRYSTALLINE INTERGROWN GROUNDMASS, 15-20% BIOT WK PY, SP CPY.
862.0	7.9		2.63	100	.11				WK(-)	.11		tr epidote	1			As above ground mass rather quartzose up to 5% qtz blebs More fold rich
871.1	9.1		2.64	92	.12				sp-WK	.12		1	1			LESS QTZ MZ #2 CT STEP MIN AS ABOVE RK reverts to more qtz rich MZ, Sp-WK PY, Sp Cpy
881.2	10.1		2.65	89	.10				WK(+)	.16		1	sp clay-ser			As above, sp-WK and K spar flooding along fracs
889.2	8.0		2.59	97	.15				WK	.15		1	1			As above
898.5	9.3		2.59	88	.13				1	.13		1	1			WK Alt, Mod Sil'N, about 5% fairly fresh bio, text obliterated by Sil'N WK PY, sp-WK epidote w/ small
907.4	8.9		2.63	93	.11				1 (-)	.11		—	WK clay-ser			As above Along fissure inlets where argillization has taken place, felds a
915.2	7.8		2.62	91	.12				Sp-WK	.12		—	1			As above with + show good perch And elsewhere text is masked by sil'N
BOH																WK-Mod Alt, WK Sil'N, text more prom. RK is qtz Mz As was suggested above possible assay runs but masked by Si

Final Depth 262.3
Collar Elevation 2516.11
Coordinates 42687.48 N. 15964.01 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-215
Sheet No. 1 of 1
Date Completed 9-14-66
Logged By N.R.N. & J.A.B.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Ser	Lim Hem	Rock Type	Remarks
0.0-14.2	14.2	RB	—	—	—	—	—	—	—	—	—	—	—	—	—	ROCK BIT
21.9	7.7		2.55	91	.27	.19		.27	No visable sulfides				sp-clay ser.	sp-wk lim limonite evidence	BIOTITE DACITE P.	WK ALT, Sp silif; WK LIM; WK CUOX, Sp MnO; Mod FRAC; 3% BIOT
29.6	7.7		2.54	91	.42	.31		.42	" " "							WK ALT, Sp SILIF, WK-Mod CHLOR After BIOT; Sp LIM; WK CUOX; RK HAS NOTICED Tr
37.6	7.4		2.46	90	.34	.22		.34	" " "						DP	WK ALT, Sp-WK Sil'n, Sp LIM, Sp-WK CUOX, Tr MnO; ONLY LOCAL BIOT; RK QUITE Br
45.1	8.1		2.44	89	.24	.15		.24	tr ice sulfides			Sp MnOx				WK ALT, Sp-WK Sil'n, Sp LIM, Sp-WK CUOX
53.3	8.2		2.51	88	.49	.39		.49	No visable sulfides			Sp-WK chrys. on fracs				WK ALT, Sp-WK Sil'n, Sp LIM; WK CUOX & Tr TURQ; RK HAS MANY Small VUGS from 45.1-46.7
61.3	8.0		2.60	92	.44	.35		.40	—		.04?	Sp MnOx				WK ALT Sp WK Sil'n. WK Xcks of Sil Minerals? Sp-WK limonite and CUOX on f. Sp MnOx
69.2	7.9		2.61	91	.42	.33	31.8 @ 0.44 /all	.42	No visable sulfides		.02?					As above, decreasing Xenos, Sp. 2nd? K-spar. IN OB phenos
76.9	7.7		2.61	88	.41	.36		.39	tr visable		sulfides					As above, WK(c) qtz veining, wk pervasive Sil'n.
84.5	7.6		2.60	88	.26	.22		.22	tr		.04					WK Alt, Sp lim Jar, P/N CUOX on fracs, Slightly biotitic DP OR in cavity, tabular ON fine qtz veinlets that form a stockwork thru the rk
93.3	8.8		2.58	77	.30	.22		.22	No visable sulfides		.08?				Mz @ 99.1' Circa 91'	As above, Core broken to pebbles (angular) due to probable fill
104.1	10.8		2.56	76	.20			.15	tr	—	.05?					WK ALT, Sp Lim + HAR, CUOX on fracs; Some 2nd K-Spar; few Qtz eyes; Tr REM SULF
112.9	8.8		2.61	96	.25			.20	tr-sp	—	.05?				INTER MIXED SULF + LEACHED Mz @ 119.3' DP SULF 117.8 DP @ 123.4	As ABOVE; RK has dull grn Mottled APPEAR. Tr Py + CC. SULFS STILL MOSTLY LEACHED
120.3	7.4		2.55	100	.30	.09		.09	WK	.07	.14	tr MoS2				DP As ABOVE. Mz WK ALT, Bioc New CHLOR; Mod Py, WK CPY, Sp CC; Tr MoS2 veinlets
128.1	7.8		2.55	92	.41	.08		.08 Below	1	.16	.17	1				Mz As ABOVE. Dp WK ALT, WK Sil'n; Sp Py, Sp CUOX on fracs, Sp LIM + HAR. SULF PARTIALLY LEACHED
136.2	8.1		2.54	96	.22	.14		.14	sp	—	.08	—			Mixed cap + sulf @ 124'	WK Alt, Sp cpy, cc tr py. ~~Sp-WK LIM ON fracs + diss thru rk~~, sp ch ON fracs
144.5	8.3		2.56	91	.44	.14	42.5 @ 0.43 /all	.14 chrys	Sp-WK	.15	.15	—				As above
155.0	10.5		2.56	75	.58	.13		.13	1	.10	.35				Clean, Sulf 154.0 Mz circa 157.5	Mod Alt, WK Sil'n ~~Sp-WK py, WK(c) cpy, Sp-WK cc tr MoS2, Sp-WK lim~~ ON fracs, tr to Un
162.8	7.8		2.55	90	.48	.03		.03	WK-Mod	.10	.35		WK-Mod (c) clay-Ser	tr lim		WK-Mod Alt, WK Sil'n WK py, WK + cpy diss in blebs, Sp-WK cc, Sp ch ON fracs
170.1	7.3		2.61	92	.27	.05		.05	Sp-WK	.05	.17		Sp-WK clay-Ser	Sp-WK lim	Dp circa 164.3	DK bio-rich Dp (Granodiorite ?) xeno. of fabric in rk, Sp py, cc, Sp lim, Qz 40° on fracs
177.8	7.7		2.56	96	.14	.		tr	sp	tr	.14		Sp-WK clay, ser, chlor	tr lim		As above, def. Dp, bio. shows gently dipping layering tr py, cc, hints of 2nd K-spar along tiny qtz v
183.1	5.3		2.61	84	.17			1	1	.04	.13			Sp lim		As above. Intense Sil'n 182' to end of box @ 183.1'
194.7	11.6		2.58	69	.28			—	Sp-WK	.18	.10	tr MoS2		tr lim	Mz @ 183.5 - 192.2 Dp intense Sil'n @ 192.1'	WK-Mod Alt, phenos smaller than normal, tr-sp py, sp-WK cpy tr cc
203.7	9.0		2.58	94	.12				Sp	.06	.06	1	Sp ser talc? Mod. Ser.? chlor? talc? WK-Mod	—		Dp grades into intensely Silif rk @ ≈ 197', tr of AK text sp py, cpy, tr cc, MoS2
211.8	8.1		2.59	100	.16				1	.10	.06	1				As above, poss pre-silif bx, slight chlor, tiny grn color patches post silin qtz vns up to 1" thick
220.8	9.0		2.60	92	.11				1	.08	.05	1	Clay-Ser WK-Mod			As above, patchy poss AK text, No post silin qtz vns
228.3	7.5		2.58	100	.28				Sp-WK	.20	.08	1	clay-Ser		AK	TEX. BECOMES DISTINCT. WK ALT, WK-Mod Silif, 1" post silif QTZ-MoS2 VN. 90°
																WK Py, Sp-WK MoS2 + Sp-WK CPY ASSOC. W/ QTZ. VNS., MINOR DISSEM
237.3	9.0		2.57	93	.15				1	.10	.05	1				AK. SLIGHTLY CHLOR. NUMEROUS Silif BANDS ¼-½" dipping from 5°-50°
																OCCASIONAL PATCHES 2nd K-SPAR.; Sp Py + CPY, Tr-Sp MoS2.
246.4	9.1		2.65	82	.28					.20	.08	1			Mz 242.4' - 244.6	Sp-WK ALT, WK-Mod Silif, Sp CHLOR; Sp-Py, Sp-WK CPY, Tr-Sp MoS2
															AK	Py + CPY As Inf. GRAINED DISSEM. Mz DIKE WK ALT + Sp MINERALIZED
255.3	8.9		2.59	100	.23				1	.21	.02	1	WK clay ser			WK ALT, WK-Mod Silif, PATCHY 2nd K-SPAR, Sp CHLOR, ~~FRESH BIOT (?)~~ NOT BIOT 253.8'
																Sp-WK CPY, Sp Py, Tr-Sp MoS2. 250.8-251.6 Mod MINERALIZED
262.3	7.0		2.67	87	.22				Sp	.20	.02					WK ALT, WK Silif, Sp 2nd K-SPAR. Sp Py, Sp-WK CPY, Tr-Sp MoS2
EOH																

Final Depth 377.9
Collar Elevation 2653.86
Coordinates 40710.41 N, 16,776.78 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-214
Sheet No. 1 of 2
Date Completed 9-6-66
Logged By N.R.N. + J.A.B

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SER	LIM HEM	Rock Type	Remarks
0.0-20.0		Rk. Bit	—	—	—	—	—	—	—	—	—	—	—	—	—	ROCK BIT
29.5	9.5				.10			.10	—	—	—	—	Mod CLAY SER	WK-MOD LIM + HEM	AK	WK. JAR RK HAS NUM. LARGE QT: ALT Mod, Sil'n Mod; WK-Mod LIM + HEM; GRAINS.
38.3	8.8				.34			.34	—	—	—	—	WK-MOD CLAY SP-WK SER	WK-MOD LIM Tr HEM	Dp @ 31.3	ALT + Sil'n SAME; WK LIM + HEM, Sp JAR; AK TEK TO 31.3 THEN DP
47.2	8.9				.16			.16	—	—	—	—		WK LIM Tr HEM Tr JAR	DP	ALT Mod, Sil'n Mod; LIM, HEM + JAR As ABOVE; WK QTZ VN. 1/2" 60° DIP
56.1	8.9				.28			.28	—	—	—	—	WK-Mod CLAY-SER	WK LIM SP HEM-JAR	FINE GRAINED AK @ 48.7'	RK HAS A FINE GRAINED INTRUSIVE T ALT MOD, Sil'n WK; WK LIM ON FRACS, Sp HEM + JAR; Tr CuOx; RK brk. + Recemented W/ Li
64.7	8.6				.14			.13	Tr	—	.01	—		WK-MOD LIM SP-WK JAR Tr HEM	FINE GRAINED AK (?)	ALT Mod, Sil'n WK-Mod, WK LIM ON FRACS, HEM STAIN WK, Sp JAR; POSSIBLE FLT X 63.8' PROCEEDING RK PUSSIBLY PP
73.8	9.1				.08			.07	Sp	—	.01	—	WK-MOD CLAY-SER	WK LIM SP-WK JAR Tr LIM	DP (?) @ 68.7'-70'	ALT Mod, Sil'n Mod; Sp-WK Lim, Sp JAR, Mod-ST HEM; TRY. BECOMES MOR DRIVE @ 68.7'
82.7	8.9				.27			.12	WK-Mod	.02	.13	—	/	/	SULFE @ 83.3	POSSIBLE PLT. Sil PEBBLE DIKE ALT WK-Mod, WK Sil'n; WK LIM, Sp JAR + BOM; Sp-WK PY, WK-Mod CC, SR CPY; SULF FI
91.7	9.0				.59	.06		.06	WK-Mod	.09	.44	—	/	WK LIM SP-JAR	AK	THIN (3") ALT WK-Mod, Sil'n WK-Mod; Sp-WK LIM; Mod PY, WK CC, Sp-WK CPY; PEBBLE DIKE @
100.3	8.6				.37	.04		.04	/	.08	.25	—	WK CLAY SER	SPARSE LIM +		PEBBLE DIKE 90.0-101' ALT WK-Mod, Sil'n Sp-WK; Sp LIM; WK-Mod PY, Sp-WK CC, Tr CPY, ROUNDED PEBBLES 1/2"
108.4	8.1				.52	.02	52.2 @ 0.48 0.03	.02	/	.08	.42	—	Sp-WK CLAY	SPARSE LIM	GRANO-DIORITE @ 101.7'-111.2	ALT WK; Tr LIM; Mod fine disem PY, Sp CPY, Sp-WK CC;
117.6	9.2				.56	.02		.02	/	.06	.48	Tr NATIVE	WK-MOD CLAY	SP LIM	AK DP @ 111.2	OP HAS VAGUE PEBBLY TEX ALT WK; Tr LIM; SULFE W.G.D. AS ABOVE, IN DP WK-Mod PY, WK CC, Tr CPY
126.3	8.7				.40	.03		.03	WK	.08	.29	Sp MATIVE	/	SP LIM SPEC NATIVE	AK FINE GRAINED	ALT WK; Sil'n WK; PY Sp-WK, CC Tr; Tr CPY; RK STILL CONTAINS DP PEBBLES
134.9	8.6				.41	.03		.03	WK-Mod	.08	.22	NATIVE .08	SP-WK CLAY	Tr LIM	/	Sp-WK PY, SP CC + CPY RK QTZ BRK 126.6-130 POSSIBLE FALT; BECOME STRONGLY Sil'f @ 132' ALSO PEBB
141.6	6.7				.25			.01	WK-Mod	.18	.06	Tr MoS2	/	—	/	ST Sil'f; WK-Mod PY, Sp-WK CPY, SP CC, Tr MoS2; STILL PEBBLY
149.1	7.5				.25			Tr	Mod	.22	.03	/	/	—	FINE GRAINED AK (?)	WK ALT + Sil'n, Mod QTZ VEINING: WK PY, SP-WK PY, SP CC, Tr MoS2, Tr NATIVE TGR. FINE GRAINED EQUIGRANULAR INTRUSIVE. ANHYDRITE layers of 2nd BIOT. GIVE SLIGHT D INTRUSE SIL'd. from 134'-158'
157.3	8.2				.31			—	/	.28	.03	/	/	—		WK CLAY-SER, Mod Sil'f + VEING, WK-Mod ALT 2nd BIOT; WK PY, SP CPY, Tr CC + MoS2
166.4	7.				.16			—	/	.13	.03	/	/	—		COMBINATION of 2nd BIOT + Sil'f GIVE DEFINITION to PEBBLY BRECCIA NATURE of RK. WK CLAY-SER, WK-Mod Sil'f, SP-WK QTZ VEINING; Mod 2nd BIOT; WK-MOD PY, SP-WK CPY, Tr CC + MOS
175.3	8.9				.17			—	/	.14	.03	/	/	—		WK CLAY-SER, WK Sil'n, Sp 2nd BIOT; SP-WK PY, SP CPY, Tr CC + MoS2.
183.9	8.6				.16			.01	/	.15	Tr	/	WK CLAY SER			Mod. CLAY ALT, Mod Sil'n; WK 2nd. BIOT ALTERING TO CHLOR, Mod PY, Sp-WK CPY, T
192.7	8.8				.08			Tr	Mod	.07	.01	Sp MoS2	/			WK-Mod ALT, WK-Mod Sil'n, WK 2nd BIOT.; Mod PY, Sp-WK CPY, Tr CC + MoS2
201.3	8.6				.10			Tr	Mod	.09	.01	/	/			WK ALT, Mod Sil'n, Sp-WK 2nd BIOT; Mod PY, Sp-WK CPY, Tr MoS2
213.6	12.3				.12			—	/	.11	.01	/	/			WK ALT. Mod Sil'n; Mod PY, Sp-WK CPY, Sp Moly
221.9	8.3				.10			—	WK-Mod	.09	.01	/	WK CLAY Mod TALC			WK ALT, Sp Sil'n, Sp 2nd BIOT.; WK PY, Sp CPY, Tr MoS2; SULFE WITH DISEM + BLOB
230.9	9.0				.19			—	WK-Mod	.19	Tr	/	/			Sp-WK ALT + Sil'n; Mod PY, Sp-WK CPY, Tr MoS2; 4" FLT @ 224.7' - RK is SHATTERED APPE
240.1	9.2				.24			Tr	/	.24	Tr	Sp-WK MoS2	Mod CLAY + TALC			WK ALT, Sp-WK 2nd BIOT (CHLOR); Mod PY, Sp-WK CPY, Tr MoS2
248.8	8.7				.22			Tr	/	.22	Tr	/	Sp-WK CLAY			WK ALT, WK-Mod Sil'n, Mod 2nd BIOT; Mod-ST PY, Sp-WK CPY, Sp MoS2
254.9	6.1				.19			/	/	.19	Tr	WK MoS2	WK CLAY + TALC			Sp-WK ALT, WK-Mod Sil'n, Mod 2nd BIOT; Mod PY, Sp CPY, Sp MoS2
262.6	7.7				.24			/	Mod	.24	Tr	/	WK CLAY WK-Mod TALC			Sp-WK ALT, Sp-WK Sil'n, WK-Mod 2nd BIOT; Mod-ST PY, Sp-WK CPY, Tr MoS2
270.7	8.1				.33	.01		.01	Mod	.32	/	/	WK-Mod CLAY + TALC			Sp-WK ALT., WK Sil'n, WK 2nd BIOT; ST PY, Sp-WK CPY, Tr MoS2; 70° FLT @ 269
281.0	10.3				.40	.01		.01	WK	.39	/	/	/			Sp-WK ALT, WK Sil'n (INVASION + VEINING), WK 2nd BIOT; St. PY, Sp-WK PY, Sp Mo
289.6	8.6				.23	.01		.01	/	.22	/	MoS2 Sp-WK	/			Sp-WK ALT, WK Sil'n; Mod-ST PY, Sp CPY, Tr-Sp MoS2; RK BKN ALONG HIGH ANGLE
297.4	7.8				.28			.01	WK-Mod	.27	/	/	WK CLAY + CHLOR			Sp-WK ALT, WK Sil'f, Mod 2nd BIOT ALT TO CHLOR + HYDROMICA; Sp PY, WK CPY Sp MoS2
305.8	8.4				.28			.01	WK	.27	/	Sp MoS2	/			Sp-WK CLAY + Sil'n, Mod 2nd BIOT AS ABOVE; Mod PY, Sp-WK CPY, Tr MoS2 TGR. MED. GRAINED EQUIGRANULAR INTRUSIVE, RK is SLIGHTLY PORPHYITIC
314.2	8.4				.35	.01		.01	WK-Mod	.24	/	Tr MoS2	/			WK ALT, Sp-WK Sil'n, A70 BIOT.; Mod-ST PY, Sp CPY, St. PYRITIZED ZEOLITIC SEDIME 312.4'-316.3'
322.5	8.3				.44	.01	16.8 @ 0.43 0.011	.01	WK-Mod	.33	.10	/	Mod CLAY + TALC SER			Sp-WK ALT, Sp Sil'n, A70 BIOT; ST PY, Sp CPY, Tr-Sp MoS2; PY + CPY CLOSELY ASSOCIA WITH BIOT. RK is SLIGHTLY PORPHYITIC AND FERG. INTENSITY INCREASING GENERALLY SHARE
331.0	8.5				.49	.01		.01	WK-Mod	.38	.10	/	/			WK ALT, Sp-WK Sil'n, BIOT ALMOST COMPLETELY DESTROYED; Mod PY, Sp CPY, Tr MoS2 RK is QUITE SHATTERED. MOVEMENT APPARENTLY ALONG MANY CLOSE SPACED 70° PLANES
340.0	9.0				.21			.01	WK	.20	Tr	/	/			WK ALT, SP-WK. QTZ VEING, Sp Sil'n; ST PY, Sp-CPY, Tr MoS2; RK STILL SOMEWHAT SHATTERE
349.3	9.3				.25	.01		.01	WK-Mod	.24	Tr	/	/			WK ALT, Sp-WK QTZ VEING, WK Sil'n, Mod TALC ON FRACS; ST PY, Sp CPY, Tr MoS2
358.7	9.4				.42	.01		.01	WK	.39	.02	Sp MoS2 Tr BARITE	/			WK ALT., Mod Sil'n.; WK 2nd K-SPAR; WK-Mod PY, CPY Sp-WK; RK is Mod. MICROLIT FINE GRAINED IN GRAI SED. ALT + BIO

Final Depth 377.9
Collar Elevation 2653.86
Coordinates 40 710.41 N, 16,776.78 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-214
Sheet No. 2 of 2
Date Completed 9-6-66
Logged By N.R.N. + L.A.B.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other	CLAY SER	HEM LIM		
367.9	9.2				.17			.01	wk-Mod	.16	Tr	Sp MoS2	wk CLAY-SER	—	AK	Sp-wk ALT, wk-Mod Sil'n, Sp 2nd K-Sp'n; Py wk-Mod, Sp-wk CPY, Sp MoS2 70° SLIP PLANES @ 30/15 +3
373.8	5.9				.33			.01	wk-Mod	.32	Tr	Sp MoS2	wk CLAY-SER Mod TALC			wk ALT, wk-Mod Sil'n; wk-Mod Py, Sp-wk CPY, Tr MoS2; SULFS ON FRACS
377.9	4.0				.13			.01	wk	.12	—	Tr MoS2	wk CLAY wk TALC			wk ALT, Mod Sil'n; wk-Mod Py, Sp CPY

Final Depth 136.7'
Collar Elevation 2577.80
Coordinates 41610.89.N, 16647.34 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-213
Sheet No. 1 of
Date Completed 8-24-66
Logged By NRN, JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SER	HEM LIM	Rock Type	Remarks
0.0 - 5.0	5.0	RB													—	Rock Bit
15.6	10.6	N&WL			.06			.06	–	–	–		Mod CLAY SER	Mod LIM WK HEM Tr LIM	Dp	Mod-ST ALT, Sp Sil'n; wk-Mod LIM+HEM, Sp JAR, Tr LIM
26.4	10.8				.04			.04	–	–	–		Tr	Tr JAR		WK-Mod ALT, Sp Sil'n, WK-Mod LIM+HEM Sp JAR
34.4	8.0				.05			.04	Tr	–	.01		WK CLAY SER	WK LIM Tr HEM Tr JAR	Sp SULF @ ≈ 30'	ALT, Sil'n As Above, wk HEM+LIM, Mod JAR ON FRACS; Tr-Sp PY, CPY & C.C
43.3	8.9				.10			.10	–	–	–		Mod-ST CLAY-SER	Mod-ST LIM WK HEM	FLT. GOUGE	ALT WK, Sil'n Sp; No SULF EVIDENT; FLT ZONE MAT. 38' ON DOWN, LIMONITIC GOUGE
49.6	6.3				.08			.06	Tr	–	.02		WK CLAY SER	WK LIM Tr HEM Sp JAR	Sulf Circa 48'	FLT MAT AS ABOVE WITH SOME DISSEM PY
59.1	9.5				.57			.11	Sp-WK	?	.46		Mod clay-ser	—		FLT GOUGE ENDS @ 60.8; TALC + CLAY; WK-Mod PY, Tr CC
68.1	9.0				.18			.01	1	.17	tr		Wk clay ser	—	Dp	WK Mod ALT, Sp CHLOR; Sp-WK PY & CPY; RK broken
77.7	9.6				.25			.01	1	.22	.02		1			WK Mod ALT, Sp SERPENTINE; WK PY, SP-WK CPY, Tr C.C.
84.3	6.6				.13			tr	1	.13	tr		1			WK Mod ALT, Sp SERPENTINE; Sp-WK PY, Tr-Sp CPY, Tr CC
92.6	8.3				.16			—	1	.16	tr?		1			WK Mod ALT, Sp SERP; WK PY, Sp CPY, Tr CC
102.2	11.6				.10			—	1	.10	1	Tr MoS_2	WK CLAY SER. WK TALC			WK-Mod ALT, Sp Sil'n, Sp WK GEN. CLAY (SERP) (TALC); Sp-WK PY, Tr-Sp CPY, Tr MoS_2
118.5	14.3				.16			—	1	.16	Tr	Sp MoS_2	1			ALT As Above, GEN. CLAY WK; WK PY, SP-WK CPY, SP MoS_2 IN QTZ VNLETS
127.9	9.4				.14			—	1	.14	1	1	1			ALT WK-Mod, GEN CLAY Sp-WK; MIN AS ABOVE; RK SHATTERED
136.7	8.8				.09			—	1	.09	1	Tr MoS_2	1			RK BECOMES MOTTLED + TEX SAME AS IN D-212 WITH HIGH BIOT. + 2nd K-SPAR RK COULD POSSIBLY BE GRANO-DIORITE
EOH																

Final Depth 199.1
Collar Elevation 2560.70
Coordinates 41927.32 N, 16466.99 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-212
Sheet No. 1
Date Completed 8-24-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
0.0-35.0	35.0	RB	—	0	—	—	—	—	—	—	—	—	—	—	—	Rock Bit
43.6	8.6				.31	.16		.16	tr vis	sulfides	.15?		wk-Mod clay	wk-Mod lim	Mz op @ 39.5'	Mz-Mod-St Alt, wk lim, Dp-wk-Mod Alt sp lim on fracs
52.0	8.4				.45	.27		.45?	No vis	sulfides			wk-Mod clay wk chlor	wk lim	Mixed Mz & Dp bio rich Mz @ 48.2'	Ctzone between Mz & Dp to 48.2', Mod-St Alt, bio rich. Mz w/ phenos 1/4" or less
60.8	8.8				.19	.11		.19 bik	"	"					Mz	wk-Mod Alt, wk lim Mostly exotic along fracs
69.8	9.0				.89	.17	17.1 @ 0.73 0.11	.17	Sp	.36	.37		wk clay ser, chlor	Sp-wk lim	suls @ 63.0'	wk Alt, sp-wk py, cc tr? cpy sp lim
77.9	8.1				.56	.05		.05	wk	.20	.31		wk clay ser	tr-sp lim	Dp @ 72.4 – 74.9	wk Alt, wk-sp Qtz veining but increasing in Dp sp-wk py diss sp tr sp cc
86.7	8.8				.38	.03		.03	1	.20	.15		wk clay ser, sp chlor	tr lim		wk Alt, sp Qtz veining, sp diss py tr-sp cpy, cc tr lim
95.6	8.9				.28			.02	1	.18	.08		1		Mz to 88.1 then Dp	RK type May be granodiorite wk Alt, wk sil'n & Dp; sp Py & cPy, tr cc, tr lim
104.1	8.5				.21			.02	1	.16	.03	Tr MoS2	1		Dp	wk-Mod Alt, wk-Mod sil'n; sp-wk Py, sp cPy, tr cc & MoS2
112.3	8.2				.16			.01	wk-Mod	.14	.01	Tr MoS2	sp-wk clay sec & chl'n			RK Has indistinct tex, Alt wk, sil'n wk-Mod; sp Py & cPy, tr cc; Dp or Granod RK is either or Mottled appearance
121.7	9.4				.15			.01	wk	.11	.03		1			RK As Above, Secondary K-spar veinlets & wisps combine w/ Qtz & chlor to give
130.0	8.3				.18			—	wk	.15	.03	1	1			Mod Alt, wk sil'n, wk chlor, sp-wk py, cpy, tr cc texture as above
138.5	8.5				.13			—	Sp-wk	.09	.04	1	sp clay sec & chlor			Alt as above, sp-wk py, cpy sp MoS2, tr cc, 2nd K-spar on fracs, fine web-like appear.
146.4	7.9				.14			—	Sp-wk	.12	.02	1	1			Alt as above, chlor in dk ground mass increasing w/ depth 11 core
154.4	8.0				.13			—	wk	.11	.02	1	sp clay sec & sp-wk chlor		Mz-150.5'-153.6	Mod Alt, wk sec chlor wk py, sp-wk cpy tr cc, MoS2 Mz-aplitic frag w/ accessional phenos of feld & bi
162.8	8.4				.13			—	sp-wk	.10	.03	1	1		Dp (?)	wk-Mod Alt, Mod sil'n, wk chlor; sp Py, tr-sp cPy, tr cc & MoS2
172.0	9.2				.15			—	wk	.12	.03	wk MoS2	sp clay sp-wk sec			coarse grained Dp(?) w/ mottled tex & zenos. May be intruding a fin grained diorite(?) RK found between 166.7' and 170.0; Min & Alt as above
180.9	8.9				.13			—	wk-Mod	.13	Tr	wk MoS2	1			Same mottled Rock; 15% biotite, num Qtz-K-spar veinlets; wk Py, sp-wk cPy Tr MoS2
189.7	8.8				.21			—	wk	.20	.01	sp MoS2	1			wk-Mod Alt & sil'n, wk-Mod 2nd-K-spar; wk Py, sp-wk cPy, Tr MoS2
199.1	9.4				.14			—	1	.13	.01	sp-wk MoS2	1			As Above; 2nd K-spar both in veinlets and diss in grains
E.O.H.																E.O.H.

Final Depth 173.0
Collar Elevation 2629.02
Coordinates 41310.96 N, 16460.02 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-211
Sheet No. 1
Date Completed 8-18-66
Logged By JAB + NRN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: Clay Sericite	Lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	—	0	—	—	—	—	—	—	—	—	—	—	—	Rock Bit
18.9	13.9	NXWL			.03			.03	-	-	-		St clay wk ser	wk lim sp hem tr lim	Dp sp	Mod-St Alt, Wk lim, hem, sp lim on fracs + uns, sp-wk clay on unlets
27.7	8.8				.03			.02	sp	-	.01	Tr Cu Pitch	Mod clay wk ser	wk-mod lim sp hem	Mz @ ± 266	Alt + Min as above, Mz - Mod-St Alt, wk lim, sp hem on fracs + U.
36.8	9.1				.05			.02	sp-wk	Tr	.03		Mod clay sp ser	wk-mod lim sp hem	sp Suls	Mod Alt, sp py, cc tr cpy in patches wk-mod lim on unlets, sp he
45.0	8.2				.35			.02	wk lt.	.03	.30		Mod clay - ser	wk lim		wk-mod Alt, wk Sil'n; wk py, sp-wk c.c., Tr cpy; Rk quite broken w lim unlets on fract
54.2	9.2				.13			.02	wk	tr	.11				Cerro Diorite (?) Dp(?) Silicified G. D.(?)	wk-mod Alt; wk-mod py, sp-wk c.c., Tr cpy; Equigranular sugh porp Tex-lacks Fe
62.5	8.3				.09			.02	wk-mod	!	.07					wk-mod Alt, wk Sil'n; wk py, sp c.c., Tr cpy; Rock less porp + more Dp like
74.4	11.9				.09			.02	!	!	.07		Mod ser w clay			wk-mod Alt; wk-mod py, sp c.c., cpy; sulf well dissem in chlor, patchy still lim on
79.1	4.7				.09			.02	!	!	.07					All features same except Rk is weakly silicified - fracs
86.9	7.8				.08			.01	wk(+)	.05	.02		wk ser, chlor, clay	sp-wk lim on fracs		wk Sil'n; wk-mod Alt; wk-mod py, Tr cpy, cc; lim on fracs rude @ 85°; Tex variable. Field P. Blotches of chlo serpentine on fr
94.4	7.5				.13			tr	!	.13	tr		Mod chlor sp-wk clay sil	tr lim		wk Alt, wk-mod Sil'n; wk mod py, sp cpy, Tr c.c.; Non equigranular
102.6	8.2				.18				wk	.18?	!					Rk is mod silif, brok + rehealed; mod chlor-serp; wk py, sp cpy, Tr cc
112.3	9.7				.11				!	.11	!					All features same; Tex is indistinguishable
119.3	7.0				.14				sp-wk	.14	!					Rk is mod silif, broken + rehealed; wk chlor; wk py, tr-sp cpy; Tex. Faint G.D.
131.1	11.8				.21				wk(+)	.21	!		Mod-St chlor sp-wk	—		Most features same as above; Bk zone 121'-126'; Fair G.D. Tex
140.3	9.2				.16				wk	.16	!		Mod chlor sp-wk black ser	—		wk Alt, sp sil'n, wk chlor; mod py, sp cpy
147.6	7.3				.18				wk-mod	.18	!		wk-mod ser, clay	—	Mz approx 143	Alt as above, wk-mod py, sp-wk cpy - Mz - Mod Alt ≈ 3-5% primary qtz diss
155.6	8.0				.18				wk	.18	tr?		wk-mod ser-clay sp-wk chlor		Dino/Schist @ 150.3 Dp @ 152.8	Mz as above, schist - St sil, qtz-bio gneissic rk, relict contorted strata. wk-mod py, wk cpy, Tr Mos
163.7	8.1				.09				sp-wk	.09	—		wk-mod ser-clay		Mz-157.4-158.6 St sil'd @ 161 Mz dikelet @ 162.6	Dp - odd coarsely xline qtz in fine aphanitic matrix. Dp as above, typical Dp text @ 160.7, wisps of add. text, persist across at for about 2"
173.0	9.3				.11				!	.11	—		!		AK?	Complete sil'n except for wisps of AK? text. tr py, cpy, Mos
EOH																As above

Final Depth 331.7
Collar Elevation 2615.08
Coordinates 41932.70 N, 15911.39 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-210
Sheet No. 1 of 2
Date Completed 8-18-66
Logged By JAB, NN

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay sericite	lim hem	Rock Type	Remarks
0.0 - 2.0	2.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
10.7	8.7	NXW			.05			.05					Wk-Mod ser, clay	Wk lim sp hem	Dp	Wk-Mod ALT, Sp-wk Sil'n; Sp LIM + HEM, Tr JAR; Tr TURQ
21.8	11.1				.10			.10					Mod clay ser	/ /		GOUGE FROM 19.2 - 26.3 Wk-Mod ALT, Sp Sil'n; Wk. LIM, Sp HEM + Tr. JAR; Tr. TURQ
31.1	9.3				.06			.06					Wk-Mod clay-ser	Wk lim		GOOD DP TEX. Wk-Mod ALT, Sp Sil'n; Wk. LIM, Wk HEM, Sp. JAR, Tr. LEM.
39.9	8.8				.05			.05					/	Wk lim Wk hem		Mod ALT, Sp Sil'n; Wk. LIM & HEM, Sp JAR; SOMEWHAT MIROLITIC
49.3	9.4				.06			.06					/	Wk lim Wk hem tr LEM		Wk-Mod ALT, Sp Sil'n; Wk LIM, Wk-Mod HEM, Wk JAR; Mod XENOS
59.0	9.7				.05			.05				tr turq	/	Wk-Mod lim tr jar		Wk-Mod ALT, Sp-wk Sil'n; Sp LIM, HEM + JAR; Tr PY & C.C at Bottom of
68.0	9.0				.09			.06 .04 turq .05					/	Wk lim tr jar	MONZ DIKE 66.9' - 73.1	Dp is Wk-Mod ALT, Mod Sil'n, Wk LIM, Sp-wk HEM STAIN; Sp CuOx; Tr SULF MONZ-MOD CLAY ALT; Wk LIM, Tr HEM; Sp CuOx, Tr SULF (LEACHED)
79.8	11.8				.12			.08 turq					/	Wk lim		MONZ - Mod-ST ALT, Wk Sil'n; Wk LIM, Tr-Sp HEM; Wk CuOx, Tr SULF ( ) Dp - Wk-Mod ALT, Wk-Mod Sil'n; Sp-wk LIM, Tr HEM, Tr SULF ( )
87.9	8.1				.13			.13					Mod clay-ser	/		RK QUITE BROKE
92.1	4.2				.67	.53		.67	No	visable	sulfides		St clay ser	/	Dp	Wk-Mod ALT, Wk Sil'n; Sp LIM, Wk-Mod HEM STAIN; Sp CuOx; SOMEWHAT GOUG
102.6	10.5				1.30	1.11		1.30	"	"	"	Wk Mal. Mod grn chrk on clay	Wk-Mod clay	Sp-wk lim	PM. ANDESITE @ 92.1-102.6	Mod ALT, Wk Sil'n; RK BROKEN + HEALED WITH LIME GREEN TALC LIKE CLAY. NUMEROUS DISS-M Aphanitic DK GREEN RK; DK GREEN CLAY ON NUMEROUS FRACS; HEM(?) GRAINS
108.9	6.3				.30	.20		.30	"	"	"	Sp-wk grn chrk on clay	Mod clay	Wk lim	Dp	Wk-Mod ALT, Mod Sil'n; Sp LIM, Wk HEM STAIN; NO SULFS EVIDENT
118.4	9.5				.12			.10	Sp	tr	.02		Wk-Mod clay-ser	Wk-Mod lim	SULF @ 117.8 Dp (?) (?) GRAND DIOR PR	BIOTITE Wk-Mod ALT, Mod Sil'n; Wk LIM, Sp HEM; Sp PY, Tr-Sp C.C. + CPY; RICH Dp
126.9	8.5				.20			.02	Sp-wk	.09	.04		Sp-wk clay-ser	Wk lim on fracs		RK HAS IN FEW XENOS BUT LARGE QT XENS. HAS 10% BIOTITE Wk ALT, Sp Sil'n; Wk PY, Sp CC, Tr CPY; HIGH BIOTITE RO
136.1	9.2				.22			.02	1	.10	.10			/	Dp	Wk-Mod ALT, Wk Sil'n; Sp LIM; Wk PY, Sp-wk CPY, Sp C.C., Tr MoS2; DIORITE LIKE ZE
144.9	8.8				.22			.02	1	.09	.11			/		Wk-Mod ALT, Mod Sil'n; Sp HM; Sp-wk PY, Tr-Sp C.C. & CPY
154.0	9.1				.14			.01	1	.10	.04	tr MoS2		Sp-wk lim on fracs		8% BIOTITE Wk-Mod ALT, Wk-Mod Sil'n; Sp LIM; Wk PY, Sp C.C. + CPY; FELD. PORPHYRY
163.1	9.1				.18			—	SP	.15	.03			tr lim		Wk-Mod ALT, Mod Sil'n; Wk-Mod PY, Sp-wk C.C. & CPY, Tr MoS2
171.7	8.6				.22				Sp-wk	.20	.02					High BIOTITE - ROCK COME AGAIN Mod ALT; Wk Sil'n; Wk PY, Sp-wk CPY, Sp C.C.; LOOKS LIKE A GRAND DIORITE
180.2	8.5				.36	.01		.01	Wk (+)	.25	.10	tr MoS2	Wk-Mod ser-clay			Wk-Mod ALT, Wk Sil'N, Sp py, cpy, Sp-wk CC on fracs long, thin leaf like bio partially layered by flow
188.6	8.4				.57	.01		.01	1	.40	.16	1				Alt as above, Wk py, cpy, sp-wk CC on fracs, biotite as above Dp has
196.7	8.1				.12				Wk	.12	–	1				SOMEWHAT PORPH TEXT. Wk-Mod Alt, Complete Sil'N 190.4-194.9, SP PY, CPY, Tr CC Dp is dk gy + porphyritic
206.9	10.2				.09				1	.09	–	1	Sp-wk clay-ser			Wk Alt, Wk(+) Sil'N, Wk py, cpy diss thru bio rich matrix tr MoS2, CC
215.6	8.7				.29			—	Wk-Mod	.29	–	Tr MoS2	1			Wk ALT, Wk Sil'N; Sp-wk PY, Wk CPY as above, Tr MoS2, C.C.
218.1	2.5				.19			—	Wk	.19	–	1	Sp-wk CLAY			Wk ALT, Wk Sil'N; Sp-wk PY, CPY, Tr C.C. + MoS2
227.1	9.0				.11			—	Sp-wk	.11	–	1	1			Wk ALT, Wk-Mod Sil'N; Sp PY, CPY, Tr C.C. + MoS2; 1" WIDE DENSE WHITE VEIN from 222-234'
236.4	9.3				.25			–	Wk	.13	.12	1	1			Wk ALT, Mod Sil'N; Sp PY, Wk CPY, Tr MoS2; QTZ VEIN IN + OUT OF CORE
239.0	2.6				.30			–	Wk-Mod	.20	.10	1	Sp-wk CLAY Sp SER			ALL FEATURES AS ABOVE
247.6	8.6				.23			–	Wk	.20	.03	1	1			Wk Alt, Wk-Mod Sil'N, Wk-Mod XENOS, RK is porphyritic w/ayle up to .1" 3%
255.9	8.3				.15			–	Wk-Mod	.14	.01	1	1 Sp-wk SER			Wk Alt, Mod to St Sil'N, Wk py, sp-wk cpy, tr MoS2, some large XENOS (leaf-like, alligned ay alike)
267.9	12.0				.15			–	1	.14	.01	1	1			Wk-Mod Alt, Sil'N, Wk py, cpy, tr MoS2 increas size of phenocrysts
277.7	9.8				.26				1	.26	tr	1	Wk clay ser			Wk ALT, Mod Sil'n, Wk PY, Sp CPY, Tr MoS2, TEX SAME AS ABOVE text appears granodiorite-like but ser'd
286.8	9.1				.11				1	.11	1	1	1		AK(?) 277.7 - 285.5 - Dp	Wk PY, CPY, Tr MoS2 IN AK ST Sil'd WITH VAGUE AK TEX TO 285.5 THEN Sil'd Dp; Wk PY & CPY, SP MoS2 IN CONTACT-APPROX 5° (INTRUSIVE)
295.1	8.3				.13				1	.13	–	1	Wk-Mod ser			Dp to 287.7 THEN AK(?); Mod-St Sil'd; Sp PY, Sp-wk CPY, Tr-Sp MoS2
300.0	4.9				.13				1	.13	–	1	Wk ser		Dp	Poor RECOVERY: Wk ALT, Sp COLOR, Wk Sil'd; Wk PY & CPY; Tr-Sp MoS2
309.1	9.1				.19				Wk	.19	tr	1	1		BIOT. Dp	Wk ALT, Mod Sil'n, Sp-wk PY, Sp CPY, Tr CC, Sp MoS2; 3% ORIGINAL BIO
317.4	8.3				.27				Wk-Mod	.27	1	1	1		AK, XENO. 309.0 - 309.8 SILF	Wk ALT, Wk-Mod Sil'n; Wk PY + CPY, Tr MoS2; SEV. 1/4" BIOT.-CPY VEINS DIPPING @ 60°
325.9	8.5				.16				Sp-wk	.16	–	1	1		Dp SILF	Wk ALT, Mod-St. Sil'd; Sp-wk PY + CPY, Tr MoS2; RK QUITE BROKEN
330.2	4.3				.11				Sp	.11	tr	1				

Final Depth 331.7
Collar Elevation 2615.08
Coordinates 41 932.70 N, 15911.39 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-210
Sheet No. 2 of 2
Date Completed Aug 18, 1966
Logged By J.A.B + N.R.N.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu			Mineralization					Alteration		Rock Type	Remarks
					Total	Non-S	Average	Oxides	Pyrite	Cpy	Cc	Other	Clay Sericite	Lim Hem		
331.7	1.5				.12				sp	.12	tr	tr Moly	wk clay sel.	— /	Dp	wk alt, wk silic; wk py, sp-wk cpy

Final Depth 223.0
Collar Elevation 2645.56
Coordinates 41456.52N, 16380.82E
Inclination VERTICAL

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-209
Sheet No. 1
Date Completed 8-11-66
Logged By N.N. JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SERICITE	LIM HEM	Rock Type	Remarks
0.0-5.0	5.0	RB	—	0	—	—	—	—	—	—	—	—	—	—	—	ROCK BIT
20.2	15.2	NX WL	2.43	57	.10			.10	—				SP CLAY SER	SP LIM MOD-ST HEM, SP LLM	Dp	MOD. ALT., MOD HEM, WK DISS LLM CAVITIES, WK CLAY ON FRACS
34.0	13.8		2.34	52	.05			.05						SP-WK LIM MOD-ST HEM SP LLM		MOD-ST ALT, WK LIM, MOD HEM STAIN, WK-MOD LLM ON FRACS + VNLETS; Dp
44.1	10.1		2.30	71	.04			.04								ALT-ST, LLM, HEM + LIM AS ABOVE, WK-MOD ALUN ON OVE LARGE VN @ 42.8'
52.0	7.9		2.59	91	.03			.03					MOD CLAY SER	WK-MOD LIM WK HEM TR-SP LLM		MOD ALT, WK SIL'N ALONG QTZ-PY VNLETS, WK-MOD LIM, WK HEM, SP CC ON MOD FRACS
60.2	8.2		2.59	91	.04			.04						MOD LIM WK JAR SP LLM		Mod ALT, WK SIL'N, WK-Mod LIM ON FRACS + VNLETS, WK HEM STAIN TR LLM
70.0	9.8		2.52	76	.05			.05						SP ABM TR LLM		ALT AS ABOVE, WK LIM, WK HEM, SP LLM, TR CuOX, TYPICAL Dp TEX
79.5	9.5		2.29	83	.06			.06					ST. CLAY SER	WK LIM SP HEM TR LLM		ST ALT, WK LIM, HEM + JAR; WK CuOX, SP TURQ; GOUGEY MATERIAL (PLY. PROM 70-83'
83.0	3.5		2.42	69	.07			.07					ST. CLAY SER			Mod-ST. ALT.; WK LIM; WK CuOX, SP TURQ
88.3	5.3		2.53	89	.07			.07					MOD CLAY-SER	WK-MOD LIM SP HEM SP JAR		Mod-ST CLAY ALT, SP SIL'N; SP LIM + HEM; SP-WK TURQ
95.5	7.2		2.48	85	.09			.09				Tr MoD				Mod CLAY ALT; WK LIM + HEM, Tr CuOX + TURQ
99.9	4.4		2.58	83	.60	.03		.03	MOD	.02	.55		MOD CLAY SP SER	Tr HEM	MONZ DIKE 96.5-99.9 SUBSES. SILICIFIED AK (?)	Mod ALT; WK-Mod PY, WK C.C., SP CPY, Tr TURQ; IMMED SUL AT MONZ C
105.4	5.5		2.62	84	.25	.02		.02	SP-WK	.02	.21		MOD CLAY WK SER	SP HEM Tr JAR		INTENSELY SILICIFIED, TEX DESTROYED, WK PY, SP C.C., Tr CPY
111.4	6.0		2.62	85	.25			.02	WK	.06	.17			SP LIM Tr JAR		Mod ALT OF REMAINING FELDS.; WK PY, SP C.C., Tr CPY
113.5	2.1		2.55	81	.21			.03	WK-MOD	.03	.15		MOD-ST CLAY MOD SER	—		WK-Mod ALT; WK PY, SP WK C.C., SP CPY, Tr-SP TURQ
116.6	3.1		2.64	85	.34			.03		.04	.27			—		ALL FEATURES AS ABOVE
121.8	5.2		2.64	93	.26			.02	WK	.08	.16		SP CLAY WK SER	Tr LIM		WK PY + CPY, SP C.C.
126.1	4.3		2.64	89	.23			.02	WK	.02	.18		SP-WK SER			WK-Mod PY, WK CPY, SP C.C.
135.8	9.7		2.64	89	.12			tr	WK(?)	.12			tr-sp clay WK ser	tr LIM		MIN AS ABOVE; pre MIN(?) BX CIRC 135' OK MAY BE INTENSELY SILI AK. AROUND 135' patchy feld WITH TEX BEGING TO SHOW UP
144.4	8.6		2.66	98	.65	tr		1	sp-WK	.60	.05					Sp-WK PY, WK CPY, SP C.C. IN blebs + VNLETS, MORE AK LIKE TEX CIRCA
153.1	8.7		2.64	93	.21			1	1	.21	tr					END OF RU As Above Patchy TEXT CONTINUES Intermittently
161.2	8.1		2.65	99	.14			—	1	.14	1	tr MoS2	tr-sp clay WK ser	—		SIL'N AS ABOVE, WK PY, Tr-SP CPY, Sp patchy AK TEXT
169.4	8.7		2.65	95	.23				1	.23	1				Ak	As Above, TEXT BECOMING MORE discernable
178.6	8.7		2.63	99	.20				1	.20	1		WK clay-ser			SIL'N ST BUT NOT COMPLETE replacements ABOVE, TEX AK
187.4	8.8		2.62	93	.14				1	.14	1					ST Alt, Mod SIL'N, SP-WK PY, SP CPY, tr MoS2 SP GRN CLAY, WK PY, SP CPY
195.7	8.3		2.62	98	.17				1	.17	—		WK-Mod ser-clay			Alt as above, WK PY, WK CPY, sp diss chlor, Mainly @ qtz-feld bound
203.2	7.5		2.73	100	.17				WK	.17						As above
212.3	9.1		2.65	92	.13				1	.13						ST Alt, Mod SIL'N, WK PY, SP CPY
221.7	9.4		2.64	93	.16				1	.16						As above, SP CPY, tr MoS2
223.0	1.4		2.63	98	.07				1	.07			Mod ser			Mod ST ALT; Mod-ST SIL'N; SP-WK PY, SP CPY
		Avg	Rec'y =	85%												END OF HOLE

Note: This hole is inconclusive for the determination of presence or absence of a chalcocite blanket because of the occurrance of the impermeable silicified zone, probably related to a fault zone, which blocked supergene enrichment

Final Depth 382.2
Collar Elevation 2357.92
Coordinates 42230.29 N, 16107.48 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-208
Sheet No. 1 of 2
Date Completed 8-8-66
Logged By BNW, NN, JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Nan-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
34.0	34.0	rb													rock bit	
44.0	10.0	NXwl	2.53	73	.20			.20	·				wk clay	wk jar + lim	M2	Wk-mod alt, jar. on frac's, good M2 text, sp epidot
53.8	9.8		2.47	88	.54	.42		.42	No vis	sh/s	.12?		1	1	Dp ca. 42.5 Bx @ 45.0	Wk CuOx on bx frac's, bx w/ qtz-rich frags, Dp silicif end of
62.5	8.7		2.56	92	.56	.45	27.6 @ .61 / .43	.45	"	"	.11?	Wk-Mod wk CuOx on frac's	sp clay	1	Porph. intr. @ 61.5	wk CuOx on frac's + in vugs, Dp silicified, porph w/ hbl.
74.5	12.0		2.53	69	.58	.39		.39			.19	–	1	1		wk CuOx throut, sp py, tr cc, rock type?, st. sil'n, sp c
82.4	7.9		2.57	96	.74	.44		.44	tr		.30		1	1		Definite porph for 4' then st. sil'n, sp py, v. wk cc, jar + CuOx m
90.1	7.7		2.59	96	.61	.11		.11	sp	.10	.40		1	1	Dp (?) at 82.4	Zenos indicate Dp, but Rx has Mod Green Color Frm Chlorite; Sil'n mod; M&N as Abo
98.8	8.7		2.56	88	.79	.08		.08	tr-sp	tr	.71		1	wk lim	D P (cont)	Sp clay, wk-mod sil'n; sp py, c.c., tr CuOx; Good Dp Tex, Less chlorite
107.6	8.8		2.58	74	.84	.08		.08	1	tr	.76	tr MoS2	1	1		Sp. clay, wk sil'n; sp py, c.c., tr cpy, tr MoS2; Rx Dr. Hbl-Biotite
115.9	8.3		2.56	92	.56	.05	59 @ .65 / .06	.05	1	.04	.47	1	1	1		Rx. virtually same, some chloritic patches, few ¼" qtz vng. Dip 70°
123.4	7.5		2.56	96	.70	.05		.05	1	.02	.63	t	1	1		Sp clay, Mod sil'n; sp py, c.c., tr cpy + MoS2; Rx has wk green color
132.4	9.0		2.55	86	.55	.01		.01	sp	.20	.24	–	1	1		sp clay, wk. sil'n, wk. chlor; wk py, sp-wk c.c., tr. cpy
134.7	2.3		2.54	94	.44	.02		.02		.01	.41	tr MoS2	1	1		Clay, sil'n + chlor same as above; sp. py + c.c., tr cpy
141.0	6.3		2.61	42	.51	.01		.01	wk	.01	.49	1	sp-wk clay + ser	sp lim		Sp-wk clay, wk sil'n; wk py, tr c.c. + cpy
145.6	4.6		2.52	91	.36	.02		.02	sp	.01	.33	1	1	—	Porph intr @ 141.0	Sp clay, Biotite now hydromica, some chlorite; sp-wk cpy, sp c.c.
155.5	9.9		2.53	63	.24			.01	sp	.02	.21	1	1	—	Silicified int (?)	Mod-st. sil'n, wk. clay, wk. chlor; sp-wk py, sp. c.c. + cpy
163.0	7.5		2.54	90	.13			.01	wk	.08	.04	1	sp clay & sp ser	—	Dp	wk. sil'n, sp. clay, wk chlor; sp-wk. py, sp. cpy, tr c.c.
172.8	9.8		2.56	73	.12			.01	sp	.06	.05	1	1	—		wk-mod sil'n, sp. clay; sp-wk py, sp cpy, tr-wk c.c.; Rx Breaks + Crumb
182.4	9.6		2.56	93	.14				sp-wk	.06	.08		Mod clay-ser			Mod clay, wk sil'n; wk. py, sp-wk cpy, tr cc; Rx still crumbles
190.1	7.7		2.56	76	.14				wk	.06	.08		wk-mod clay-ser			wk. clay, wk sil'n; wk py, sp-wk cpy, tr-sp. c.c.; some c.c. on frac's
192.5	2.4		2.64	68	.17				wk(+)	.05	.12	—	1		Monz. porph dike @ 190.1	Sp-wk clay; wk-mod py, wk cpy; sulf along frac's + disem in biotite
195.2	2.7		2.61	81	.26				1	.16	.10	tr MoS2	wk clay ser			All features as above
206.1	10.9		2.63	48	.13				wk-mod (c)py	.06	.07	–	1		Dp @ 85.2	wk clay, wk sil'n; sp-wk py, sp cpy; more Monz @ 209'
217.5	11.4		2.53	57	.11				wk	.04	.07	–	wk-mod clay, ser			wk clay, mod-wk sil'n; wk py, sp cpy, tr c.c.; some white qtz veins 2
230.0	12.5		2.56	54	.13				1	.03	.10	tr MoS2	1		Monz Dike 225-228	Flt. Bx @ ≈ 222'; Dacite as above; Monz is wk.ly alt, no sil'n; sp-wk py, sp cpy, tr MoS2 + c.c.
239.6	9.6		2.57	65	.09				sp-wk	.03	.06	1	1		Dp	Mod sil'n, sp clay; sp-wk py, sp cpy, tr MoS2 + c.c.; Rx Quite Crumbly
249.6	10.0		2.42	67	.10				sp	?	.10	?	Mod-st clay-ser			wk-mod sil'n, wk clay; wk py, wk-mod c.c., tr MoS2; like a coarse sand
258.7	9.1		2.56	81	.12				tr	12			1		Alaskite (?) intrusive Dp (?)	Mod clay, sp sil'n; sp-wk py, tr-sp cpy, tr c.c.; Intrusive Tex. approx 80-9 qtz. equal amt non-k, fell
267.8	9.1		2.53	92	.09				1	.09	tr?	tr MoS2	1			Mod. clay, wk-mod sil'n; sp. py, sp cpy, tr c.c. + MoS2
276.2	8.4		2.62	92	.08				tr-sp	.09			Mod clay-ser			Mod clay, wk-mod sil'n; sp-wk py, cpy, tr c.c. + MoS2
286.1	9.9		2.61	75	.11				1	.11			1			wk-mod clay, wk. sil'n, sp. py, sp-wk cpy, tr c.c. + MoS2
295.1	9.0		2.61	99	.12				1	.12	–		1			All features as above
305.3	10.2		2.58	62	.14				1	.14		.0296 Sp-wk MoS2	1			Has slightly pasty tex. wk-mod clay, mod sil'n; sp. py, tr-sp cpy, tr c.c., wk MoS2
310.1	4.8		2.58	99	.09				1	.09		.0246 Sp MoS2	1			wk. clay, tr ser, wk-mod sil'n; sp py, tr-sp cpy, wk MoS2
318.3	8.2		2.60	92	.10				1	.10	tr cc	.0232 tr MoS2	1			All as above; gouge zone 311.8 – 313.3
326.7	8.4		2.58	97	.03				1	.03		.0068 Wk MoS2	st ser clay			wk clay, mod-st sil'n; sp py, tr-sp cpy, wk MoS2; Quite vuggy some Molly in vugs
335.9	9.2		2.59	93	.11				sp-wk	.11		tr MoS2	Mod. st ser-clay			wk clay, sp sil'n; tr-sp py, sp cpy, tr c.c., tr MoS2
345.0	9.1		2.56	92	.10				1	.10		1			AK	wk-mod clay; sp-wk py, sp cpy, tr c.c., tr MoS2
354.5	9.5		2.59	80	.11				1	.11		1	st ser clay		Snd. or sp (@ ≈ 356)	wk-mod clay, wk-mod sil'n; sp-wk py, sp cpy, tr MoS2; Rx is brecciated Possible Flt. Movement
[illegible]	[illegible]		2.57	67	.47	.01			1	.47		1	sp clay			Rock is fine textured and well

Final Depth 382.2
Collar Elevation 2357.92
Coordinates 42230.69 N, 16107.48 E
Inclination VERTICAL

ASARCO

GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-208
Sheet No. 2 of 2
Date Completed 8-8-66
Logged By BNW, NN, JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	limonite hem	Rock Type	Remarks
373.1	7.0		2.51	74	.33				Wk	.33	-		Mod-St ser clay sp-wk diss chlor		SED (?) BX DIKE	Mod-ST ALT, WK CHLOR; Sp PY & CPY, Tr-Sp O.C., Tr MoSz BX DIKE WITH ALASKITE FRGS. IN AA
375.8	2.7		2.62	98	.05				1	.05			Mod-St ser		373.1-375.8 DARK APHANITIC INTRUSIVE (?)	WK ALT; Mod PY, Sp CPY & O.C.; APHANITIC PY RICH GROUNDMASS SIMMILAR TO PORPHYRITIC ANDESITE BUT SUBSTANTIALLY MINERA
382.2	6.4		2.62	97	.03				WK	.03			Sp clay ser		375.8	Mod ALT; Mod PY; This Rock is older than the above BX Dike
EOH																
		Avg.	Rec'y =	79%												

Final Depth 255.7
Collar Elevation 2607.47
Coordinates 41758.51 N, 16183.03 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-207
Sheet No. 1 of 1
Date Completed 8-2-66
Logged By N.N, BNW, JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SERICITE	LIM. HEM.	Rock Type	Remarks
0.0-5.0	5.0	rb.	–	–	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
14.0	9.0	NX wl	2.48	90	0.02			0.02					MOD CLAY-SER	WK-Mod LIM Mod HEM TR LIM	DP	ALT. MOD; LIM + HEM (but somewhat pervasive staining felo- tonfolled by fracs); ALL SULFS HAVE BEEN LEACHED, Tr CuOx
26.0	12.0		2.48	74	.03			.03					"	WK-Mod LIM + HEM	"	ALT. MOD; INTENSITY OF LIM + HEM. DECREAS; NO SULFES, Tr CuOx
35.2	9.2		2.48	84	.05			.05					MOD-ST CLAY WK-SER	SP-WK LIM WK-MOD HEM SP-WK LIM	"	ALT MOD WITH SOM SILICIFIE; JAROSITE IN FRAC, HEM DISPERSED from FRACS; LIM ON FRACS.; No Su
44.4	9.2		2.21	102+1	.05			.05	tr				MOD-CLAY WK-SER	SP LIM WK HEM TR LIM	"	ALT WK-MOD, SILICIFIE SAME; 1/4" JARO VEINLETS X 70, HEM. WK + CONTROLLED BY FRACS. (1/4" - 1" ZENOX PRESENT); Tr S
55.0	10.6		2.47	77	.06			.06					"	"	"	ALT + MIN AS ABOVE; BROKEN + highly ALT. ZONE 44.4-49'; No Core 53.8-55.0'
62.7	7.7		2.47	97	.08			.03	sp		0.05		"	"	Sulfs @ 55'	ALT + SILICIFIE SAME AS ABOVE; Sp PY, Tr-Sp C.C.; SULFS STILL MOSTLY LEACHED (Rock Mod. BROKEN)
70.7	8.0		2.45	99	.17			.05	sp		.12		MOD CLAY WK-SER	—	"	ALT SAME TO 66' THEN STRONG TO 70.7; WK-PY, SP C.C., Tr CPY; (SOME LEACHING) ALTERED ZONE LESS SULFS.
77.9	7.2		2.65	88	1.00	0.01		.01	sp		.99		MOD-ST CLAY	—	DP (?)	ALT Mod-ST.; Mod PY, WK-Mod C.C., Sp-WK CPY; ROCK BROKEN + SOFT
85.9	8.0		2.58	82	.49	tr		tr	sp		.49		MOD-ST CLAY WK SER	—	"	ALT Mod-ST.; Mod-ST PY, Mod C.C., WK CPY; ROCK BROKEN + SOFT; SULF WELL DISIM
94.0	8.1		2.49	96	1.17	.01		.01			1.16	sp-WK tr on fracs	"	—	MONZ @ 85.9	ALT MOD-ST; Mod-ST PY, Mod C.C., WK CPY, SP TURQUIS; 2mm FELD PHENOS IN PLAT MATRIX
96.7	2.7		2.54	91	2.33	.01	67.5' @	.01	sp-WK	.30	2.03	WK(-) PYR split each BK fracs tr TURQ on fracs	"	—	"	ALT SAME; MIN. SAME; SULF FINE GRAINED + well DISIM; SLIGHT QTZ VEINING
105.8	9.1		2.59	87	.77	Nil	.78 / .01	Nil	sp		.77	tr TURQ on FRACS	"	•	MONZ (?)	ALT ST. (QUITE CRUMBLY); PY. WK-Mod WKCC, Sp-WK. CPY, SP TURQ.
114.2	8.4		2.49	94	.50	.01		.01	tr-Sp		.49	1	MOD CLAY WK SER	—	DP @ 105	ALT Mod-ST.; WK. PY, SP-WK C.C., Sp CPY; RK STILL CRUMBLY IN ZONES
122.0	7.8		2.51	96	.54	.01		.01	sp		.53	1	WK-MOD CLAY Sp-SER	—	DP	ALT WK-Mod; WK PY, Sp. C.C. + CPY; RK HAS WK GREENISH CAST
130.1	8.1		2.52	98	.76	.04		.04	tr	tr-sp	.72	-	"	Sp lim	SILICIFIED DP	ALT WK-Mod; WK PY, Sp. C.C., CPY; RK HAS 2 % BIOTITE ALTERING TO CHLORITE.
138.2	8.1		2.48	95	.51	.02		.02	sp	.03	.46		"	Sp lim	SILICIFIED DP	ALT SAME; MIN SAME; RK SOMEWHAT BROKEN
146.5	8.3		2.56	94	.18				sp-WK	tr	.18?		sp clay, tr ser	—		WK-mod sil'n, sp py, tr c.c, vague text may be Dp
156.1	9.6		2.57	76	.13				1	.07?	.06?		1	—	Mz by 155'	WK sil'n in patches, rk not Dp at end of run, sp min.
164.2	8.1		2.61	91	.16				sp-WK(-)	.08	.08?		tr ser	—	Mz?	Mod sil'n thruout, sp py + cpy, text vague
172.8	8.6		2.57	88	.20				sp	.10?	.10?	tr MoSz	1	—		Mod-st sil'n w/ crushed zones, rk type? sp py, tr cpy, cc?
180.2	7.4		2.60	97	.15				1	.16	tr	1	1	—		Mod-st sil'n, v. sp py, tr cpy, vuggy rk in places
188.2	9.0		2.63	95	.13				sp-WK	.13		-	1	—	Qtz Mz ?	Mod s.i'n v.sp. PY, tr CPY; SECONDARY K-feldspar ALONG FRACS
196.2	8.0		2.59	97	.20				1	.20			1	—		Mod sil'n, Sp. PY, Tr CPY; PORPH. TEX SOMEWHAT OBSCURED BY SIL'N
204.7	8.5		2.60	93	.25				1	.25		tr MoSz	1	—		Mod-ST. sil'n; WK PY, Sp-WK CPY; MOST SULF ALONG FRAC, SOME DISIM
212.9	8.2		2.62	98	.24				1	.24		—	—	—	SILICIFIED DP (?)	Mod-ST sil'n; WK PY, Sp-WK CPY; VAGUE (INTR) PORPH TEX EVIDENT
221.5	8.6		2.59	86	.20				1	.20		-	WK CLAY	—		Mod sil'n, WK CLAY; ~~Sp~~ WK PY, SP-WK CPY.
230.1	8.6		2.59	88	.17				1	.17		tr MoSz	1	—		WK-Mod sil'n, WK CLAY; MIN SAME AS ABOVE; THIS ROCK COULD BE THE GRANODIORITE
239.5	9.4		2.59	82	.20				1	.20		1	1	—		mod sil'n, WK CLAY; MIN SAME
242.6	3.1		2.55	91	.14				1	.14		1	1	—		ALL FEATURE SAME AS ABOVE
251.0	8.4		2.62	91	.13				WK	.13		1	1	—		Mod sil'n, WK CLAY; WK PY, Sp-WK CPY; OCCASIONAL VAGUE PORPH. TEX
255.7	4.7		2.59	97	.17				sp-WK	.17		1	1	—		Mod sil'n, sp-WK CLAY; WK. PY, Sp-WK. CPY; TEX SIMILIAR
E.O.H			Avg. Rec'y	90%												

Final Depth 232.0
Collar Elevation 2610.31
Coordinates 41269.89 N, 17510.48 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-206
Sheet No. 1
Date Completed 7-28-66
Logged By J.A.B., N.V., B.N.W.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Sericite	Lim Hem	Rock Type	Remarks
0.0 - 17.4	17.4	R.B.	—	—	—	—	—	—	—	—	—	—	—	—	—	ROCK BIT
27.3	9.9	NXWL	2.46	84	0.08			0.08					Mod c-s	Mod Lim wk Hem	DP	ALT - Mod-Str. ; LIM wk-Mod , HEM Sp-wk , NO SULFS ; Mn-Fe STAIN IN Br ZONES
36.2	8.9		2.46	92	.05			0.03	sp		.02		Mod-Str Clay-SER	wk-Mod Lim wk HEM	"	ALT AS ABOVE ; LIM wk-Mod, HEM wk , NO SULFS ; TEX - SOM ZONES 1/4" , 1/4-1/2" QTZ VE
44.7	8.5		2.47	96	.05			.05					Mod Clay-SER	wk LIM + HEM	"	ALT Mod , wk LIM + HEM , Tr PY ; Gouge ZONE @ ≈ 41-43' ; Clay ON fra
52.8	8.1		2.54	96	.20			.10	sp	tr	.10		"	"	Suls @ ≈ 50'	ALT Mod ; wk LIM + HEM , Sp-wk PY , sp CC , Tr CPY ; SULF begin @ ≈ 50'
54.8	2.0		2.52	97	.78	.03		.03	wk	tr	.75		"	SP LIM + HEM	"	FLT. ZONE 54.8 - 58.4' ALT Mod ; Sp LIM + HEM IN FLT. ZONE ; WK PY, WK C.C. , sp CPY ; C.C. COATING NUM FRAC
58.4	3.6		2.22	96	.54	.03		.03	sp		.51		Mod-ST CLAY-SER	wk-LIM SP-HEM	SP(?) @ 57.8	ALT Mod-ST. ; WK LIM ON FRAC ; WK PY , C.C. ; Sp CPY ; CLAY + C.C. ON FRACS
70.0	8.6		2.50	95	.66	.02		.02	tr		.64		"	SP LIM	"	MIN. FLT. GOUGE FROM 67 - 74' ALT. AS ABOVE ; LIM AS ABOVE ; WK PY ; wk-~~mod~~ C.C. , Sp-wk CPY.
76.1	9.1		2.51	86	1.16	.06		.06	tr		1.10		Mod CLAY-SER	"	SP(?) - DP(?)	RK. CONTINUES TO BE BROKEN + GOUGY ALT. SAME ; LIM. SAME ; wk PY + C.C. , Sp CPY ;
86.1	10.0		2.49	82	1.21	.07		.07	sp	.10	1.04		"	"	BP(?)	RK STILL BKN. BUT LESS GOUGY ALT. SAME , LIM SAME ; wk PY + C.C. ; Sp CPY ; SECONDARY QTZ + FELD @ ≈ 93'
94.3	8.2		2.48	95	.89	.02	82.2@	.02	sp	.04	.83		"	SP LIM	SP(?)	ALT. SAME ; LIM. SP on FRAC ; wk PY , wk C.C. ; Sp CPY ;
102.1	7.8		2.57	91	1.07	.01	.80 .02	.01	tr	.05	1.01		"	"	SP(?)	ALT. Mod ; LIM. SAME ; wk PY , sp-wk C.C. ; Sp CPY ; FE-MAGS LESS ALT. TO C.
110.3	8.2		2.57	96	.71	.01		.01	sp	.10	.60		"	"	"	ALT. Mod, LIM. SAME ; wk PY + C.C. ; Sp CPY ; SULFS IN VEINLETS
118.2	7.9		2.55	95	.60	tr		tr	wk	.10	.50		"	—	SILICIF + RE-HEATED DP(?)	ALT. MOD ; LIM. ABSENT ; wk-Mod PY , wk-C.C. ; sp-wk CPY
126.7	8.5		2.55	89	.50	nil		nil	sp	.03	.47		"	—	SILICIFIED + OXIDIZED BIO-DP(?)	ROCK CONTAINS NO NOTICEABLE FERROMAGS ALT. MOD ; MINERALIZATION SAME ; ABOUT 3% ALT. BIO. , TEX SUBHEDRAL EQUIGRANU
131.2	4.5		2.57	96	.35	.01		.01	wk	.20	.14		"	—	"	ALT MOD ; wk-PY , Sp-wk C.C. + CPY ; TEX AFFECTED BY MONZ. STRINGERS @ ≈ 13
135.0	3.8		2.60	99	.42	.01		.01	wk	.25	.16		wk-Mod CLAY-SER	—	MONZONITE DIKE	ALT. wk-MOD ; wk PY , Sp-wk. C.C. + CPY
142.8	7.8		2.52	98	.29	.01		.01	wk	.20	.09		"	—	EITHER ALT. + SILIC MONZ OR DP	ALT. wk-MOD ; wk-Mod PY , Sp.-wk. C.C. + CPY ;
150.8	8.0		2.60	95	.22				wk	.12	.10		"	—	"	ALT. wk-MOD ; wk-Mod PY , ~~sp~~ wk. C.C. + CPY , Tr MoS2 ; SULF ON FRACS + IN BIOTITE
158.8	8.0		2.58	94	.16				sp-wk	.08	.08		"	—	"	ALT. MOD ; wk-Mod PY , wk. CPY ; sp C.C. ~~sp C.C. + CPY~~ , Tr MoS2 ; MORE INTENSELY SILICIF FROM 155
166.5	7.7		2.50	100	.19				sp	.11	.08		"	—	"	ALT. MOD ; wk-PY , Sp-wk. CPY , Sp. C.C. ; SILICIFICATION SAME
175.4	7.7		2.63	91	.20				sp	.15	.05		sp clay, tr ser		Mz?	Mod-st sil'n, wk py, k-metasomatism, bx dkst @ 173.4, sp c
183.9	8.5		2.59	98	.19				wk	.15	.04		"		good Mz @ 178.1	As above to 173.4, then Mz wk alt w/ wk py, tr cpy. Grades into s CFS. M
192.0	8.1		2.63	95	.16				sp-wk	.14	.02		tr clay SER			Mz w/ silicif. zones showing remnant Mz text, tr cc, cp
199.7	7.7		2.61	96	.16				sp	.16	tr		"			As above, mod sil'n, qtz vns, sp cc, tr cpy
207.8	8.1		2.55	91	.13				sp	.10	.03		"			As above w/ tr cc, sp cpy. Silicif rk vaguely resembles DP but is.
216.7	8.9		2.57	89	.22				sp-wk	.18	.04		"			Sil'n moderate + in zones, sp-wk cpy, wk py.
224.0	7.3		2.61	100	.18					.18	tr?		"			ALL FEATURES SAME AS ABOVE
232.0	8.0		2.64	98	.22					.22	"		"			SIL BECOMES STRONG IN ZONES DESTROYING TEXTURE ; MIN SAME
E.O.H.			Avg. Rec'y = 93%													

Final Depth 202.3'
Collar Elevation 2642.85
Coordinates 41305.82N, 16813.08E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D 205
Sheet No. 1 of 1
Date Completed 7-23-6
Logged By N.N + BNW

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: CLAY SERICITE	LIM. HEM	Rock Type	Remarks
0.0-5.0	5.0	RB	—	0		—	—	—	—	—	—	—	—	—	—	ROCK BIT
15.7	10.7	NXWL	2.40	76	.06			.06					Mod CLAY-SER	WK-MOD LIM MOD-HEM	DP? Mz?	Text. small .1 mm feld phenos, 2-3% bio IN GOODS, 5% qtz phenos, Text almost Sp-like MOD-STR. ALT - WK-MOD LIM in frac. HEM PERVASIVE - NO SULF + Tr CUOX
27.6	11.9		2.51	59	.04			.06	Tr				—	WK-LIM + HEM Tr LIM	DP Tr py @ ≈ 18.5' Sulfs @ 33'	ALT MOD - BOTH LIM + HEM LOCALIZE AROUND FRAC - AGGREGATED SULFS. APPEARING Sulf @ ≈ 33' - STILL SOMEWHAT LEACHED
36.4	8.8		2.50	87	.05			.04	Sp	Tr	.01		MOD clay-SER	WK-LIM SP-WK HEM	DP	ALT AS ABOVE - LIM ON FRAC - WK PY + C.C. Tr CUOX + CPY
45.0	8.6		2.57	94	.06			.04	Sp	Tr	.02		MOD clay-SER	WK-MOD LIM-HEM	DP	EX MORE STRON FOLIATION ≈ 40° ALT AS ABOVE - + LIM + HEM LOCALIZED ON FRAC - SOM SILICAN FRAC - WK PY + CC
53.7	8.7		2.61	93	.16			.04	Sp-WK	Tr	.12		"	SP-WK LIM-HEM	DP	ALT WK-MOD - MINOR LIM-HEM - WK PY, CC - Tr CPY - BIOT INCREASES TO 2-3%
62.0	8.3		2.57	90	.07			.02	Sp-WK	Tr	.05		"	WK LIM-HEM	DP	ALT AS ABOVE - WK LIM-HEM - SP-WK PY + C.C. - Tr CPY - TEX fine POR - few ZONES
69.5	7.5		2.62	96	.25			.02	Sp-WK	.04 Tr-Sp	.19	Tr MoS_2	"	Tr LIM-HEM	"	ALT AS ABOVE - SP-LIM - Tr HEM - WK PY + C.C, Sp CPY -
79.6	10.1		2.63	73	.11			.01	WK	.06	.04	Tr MoS_2	"	"	"	ALT AS ABOVE; SP LIM on frac; WK PY, Sp-WK CC, Sp CPY. MIN ON FRACT. DISIM IN BIO.
88.0	8.4		2.64	94	.10			Tr	WK	.08	.02	"	"	Tr LIM	"	ALT A-BIT WEAKER; Tr LIM on frac; WK PY, Sp C.C + CPY; COMMENTED BY CL RK QUITE BK + fr.
97.0	9.0		2.66	94	.07			Tr	WK-MOD	.06	.01	"	WK-MOD clay-SER	—	SILICEOUS DP	ALT AS ABOVE; No LIM or HEM; Mod PY, Sp CPY, Tr C.C; QUITE A BIT OF SECONDARY SILIC Tr MoS_2 sulf disim + ASSOC w/chlor
105.7	8.7		2.63	90	.09			Tr	WK-MOD	.08	.01	"	"	—	"	ALT AS ABOVE; AS ABOVE; MIN AS ABOVE - NO ENRICHMENT - STILL SOME SECONDARY FELD
113.6	7.9		2.64	100+%	.07				WK	.07	tr	"	"	—	BIOTITE DP	ALT WK-MOD; WK PY, Sp CPY, Tr CC - OCCURANCE AS ABOVE RK SOMEWHAT BRK + RECEN BY Either CLAY OR FELD
122.3	8.7		2.67	90	.09				1	.09	1		"	—	DP	ALT WK-MOD; WK PY, Sp CPY; Sulfs both disim + ALONG FRACS
130.0	7.7		2.74	93	.13			Tr	WK-MOD	.12	.01		"	—	"	ALT WK-MOD; MIN AS ABOVE WITH ADDITION OF SOME MoS_2
137.7	7.7		2.73	90	.21				1	.20	.01	Tr MoS_2	"	—	"	ALT WK-MOD; INCREASE IN SULFIDS - WK-MOD PY, WK CPY, Tr-Sp MoS_2 INCREASED MINERALIZATION ABOVE
146.3	8.6		2.78	91	.08				WK	.06	.02		"	—	"	ALT WK-MOD; MIN AS ABOVE; TEXTURE SLIGHTLY MORE COARSE
153.6	7.3		2.67	94	.10				MOD	.08	.02		"	—	DP? Mz?	ALT AS ABOVE; MIN AS ABOVE; TEX SAME; MORE BIOTITE
160.9	7.3		2.64	98	.11				WK	.09	.02	tr MoS_2	"	—	DP	ALT MOD; WK PY, Sp C.C, CPY, Tr MoS_2;
163.1	2.2		2.64	93	.13				WK-MOD	.11	.02		sp clay ser.	—	"	ALL ASPECTS AS ABOVE
168.5	5.4		2.68	97	.15				1	.12	.03		wk ser.	—	BIOTITE DP? PORPHYRITIC DIKE	CONTACT AT 163.1 BIO. DP CONTAINS FRAGS. OF PREVIOUSLY logged DP ALT WK-MOD; WK-MOD PY, Sp-WK C.C, CPY, Tr MoS_2; SULF on frac + in Both
178.0	9.5		2.66	88	.26				1	.25	.01		"	—	"	BIOTITE DECREASING - ALT AS ABOVE; WK-MOD PY, WK CPY, Sp-WK C.C, Tr MoS_2; OCCURANCE AS
187.0	9.0		2.65	93	.16				1	.15	.01		"	—	DP	ALT AS ABOVE; WK-PY, CPY, Sp-CC; NUMEROUS ZONES @ 189.3
194.8	7.6		2.64	99	.11				WK	.11	tr		"	—	"	ALT WK-MOD; WK PY, Sp-WK CPY, Tr C.C, MoS_2; SULFS DISIM ASSOC WITH BIOTITE SOMEWHAT SILICIFIED
200.6	5.8		2.65	96	.26				1	.21	.05	tr MoS_2	"	—	"	EVERYTHING AS ABOVE
202.3	1.7		2.65	98	.11				1	.11	tr		"	—	"	" " "

Aver. rec'y = 89%

E. O. H.

Final Depth 367.0'
Collar Elevation 2657.02
Coordinates 41302.29 N, 17182.00 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-204
Sheet No. 1 of 2
Date Completed 7-22-66
Logged By J. AB. - N.N.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SERICITE	LIM HEM	Rock Type	Remarks
0.0 - 5.5	5.5	RB	—	0	—	—	—	—	—	—	—	—	—	—	—	Rock Bit
14.2	8.7	NXWL	2.55	89	.06			.06					Wk clay-ser	Wk-Mod lim, sp hem	Dp	Wk-Mod Alt, wk lim, sp hem, tr cuox
22.9	8.7		2.49	89	.05			.05					Wk-Mod clay-ser	Wk-Mod lim-hem tr LLM		Wk-Mod Alt, wk-Mod hem, wk lim sp-wk LLM
31.9	9.0		2.46	88	.06			.06								Wk-Mod Alt, wk-Mod hem, wk lim
40.7	8.8		2.54	95	.04			.04	tr		tr	tr grn cuox		Wk lim, wk-Mod hem		Alt as above, wk xenos of unde porphyry + sil. metaseds, wk-Mod hem, wk tr cuox
50.1	9.4		2.57	94	.06			.06						Wk-Mod lim, hem		Wk-Mod Alt, wk sil'n, wk-Mod hem & tr lim, wk lim on fracs
59.2	9.1		2.56	94	.07			.06	tr		.01			Wk(+) lim, hem	Patchy Suls	Wk Alt, sp-wk lim, hem, sp py, cc, sp-wk cuox on fracs + unl
67.0	7.8		2.45	98	.28	.03		.03			.25?				Sp patchy suls	Wk-Mod Alt, wk lim, sp hem, sp py, cc tr grn cuox (Mal?)
76.7	9.7		2.54	91	.66	.05		.05	sp		.61			tr lim	Suls @ 67	Wk-Mod Alt sp-wk py wk-Mod cc tr cpy sp lim tr cuox
85.5	8.8		2.59	86	.82	.03	35.8 @ .75/.05	.03	sp-wk		.79			sp lim		Wk-Mod Alt, sp-wk py, wk(+) cc, sp cpy, sp lim on fracs
94.5	9.0		2.65	78	.87	.08		.08	t	.05	.74			sp-wk lim		Alt as above, sp-wk py, wk-Mod(-) cc, sp cpy in .25" blebs on tr cuox lim ex
102.8	8.3		2.63	82	.65	.03		.03	wk	.20	.42					Wk-Mod Alt, wk py, wk cc, sp-wk cpy, tr lim on fracs
111.6	8.8		2.63	92	.22			.01	t	.18	.03		wk clay ser	tr lim		Wk-Mod Alt, wk-Mod py in .25" blebs along fracs, wk cpy in smaller bleb sp cc, tr lim
120.6	9.0		2.77	91	.35			.02	sp-wk	.15	.18?		wk-Mod clay-ser		1' flt bx @ 118.1	Alt + Min as above, sp cc
133.4	12.8		2.63	62	.33			.01	wk	.31	.01			sp lim		Wk-Mod Alt, wk py, sp-wk cpy tr cc, tr lim on fracs
141.8	8.4		2.63	95	.25			tr	t	.24	.01		wk-Mod clay-ser	tr lim		Alt as above, cpy in long blebs along fracs, tr cc
150.6	8.8		2.67	94	.36			t	wk(-)	.26	.10?					As above
158.8	8.2		2.63	100	.30				t	.22	.08	tr MoS2				Wk-Mod Alt, sp sil'n, sp-wk diss py, sp-wk cpy, suls assoc w/alt bio tr cc
168.1	9.3		2.68	93	.28				wk	.24	.04			—		As above. cpy veinlets dipping ≈ 30° widen to .2" to .3" cpy bl
177.7	9.6		2.61	95	.16				t	.16	tr					As above, slightly less cpy
181.3	3.6		2.63	99	.09				t	.09	t		wk clay ser			Wk-Mod Alt, wk(+) sil'n, sp diss py, tr cpy, cc
190.2	8.9		2.63	90	.20		138.7 @ .30/.01		sp-wk	.20	tr?					Wk-Mod Alt, wk py tr cpy patchy vuggy text, vugs being about .1"
198.3	8.1		2.60	98	.34				wk	.34	tr		sp-wk clay-ser			Wk-Mod Alt, wk py, wk cpy in .2" blebs along fracs, tr cc, MoS2
203.6	5.3		2.59	76	.25	.01		.01	t	.24	t				Alt? 1.5' core loss @ 203'	As above, slightly less cpy
211.8	8.2		2.22	59	.42	.01		.01	sp-wk	.40	.01?	tr MoS2	wk clay-ser		Mirolitic or vuggy DPD 203.4	Wk-Mod Alt, wk py, cpy, tr MoS2? cc, RK contains about 10-20% cavities formed as rk cooled
216.7	4.9		2.24	100	.27	.01		.01	t	.26	tr					As above? core reduced to mud coated gravel.
224.1	7.4		2.60	66	.42			tr	t	.39	.03					Wk-Mod Alt, wk py, cpy, RK composed of rounded bx in places, rest is u text
232.3	8.2		2.61	85	.35			t	wk	.32	.03					Alt + Min as above, rk has consistency of coarse sand + can be broken with the fingers
236.4	4.1		2.19	56	.54			t	wk	.51	.03					As above, rk slightly more solid + is about 20% mirolitic cavities
241.5	5.1		2.63	97	.35			t	wk	.35	Tr				Solid - Non Mirolitic DPD RT 236.4	Wk(+) Alt, Mod sil'n, wk-Mod(-) py wk cpy assoc w/ py
249.8	8.3		2.63	97	.17				sp-wk	.17	Tr.					Wk(+) Alt, Mod sil'n, sp py, sp-wk cpy in .1"-.2" blebs wk-Mod qtz
255.5	5.7		2.62	78	.09				wk	.09	Tr.					As above; vns w/ vuggy text, some qtz xyls .3" inch in length
264.3	8.8		2.62	92	.25				t	.25		tr MoS2				As above, wk py, wk(+) cpy in .1" to .2" blebs assoc w/ concrete bi over
271.2	6.9		2.59	96	.19			tr	wk-Mod	.19	tr	t				As above, wk cpy, core composed of ≈ 1/4 milky qtz occurring in vns 1" to 2" wide vugs contain qtz xyls up to .4"
277.7	6.5		2.62	91	.15				wk	.15	tr	tr gn				As above, sp py-cpy in the qtz, Most Min. is diss in Dp along the vns
285.8	8.1		2.62	94	.12				t	.11	.01	tr MoS2				Wk Alt, Mod-st sil'n, Min and qtz veining as above + tr MoS2
294.0	8.2		2.69	88	.17				sp-wk	.15	.02					As above, slightly less cpy + more MoS2, qtz vns are mainly vert w/a few low angle vns
298.0	4.0		2.59	85	.32				t	.30	.02					As above

Sheet # 2 of 2

Final Depth 367.0'
Collar Elevation 2657.02
Coordinates 41302.29N 17182.00E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-204
Sheet No. 2 of 2
Date Completed 7-22-66
Logged By J.A.B - N.N.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration CLAY SERICITE	LIM HEM	Rock Type	Remarks
298.0-306.7	8.7	NXWL	2.63	91	.23				sp	.22	.01	tr MoS_2	wk Ser, sp clay		Dp	WK-Mod Alt, Mod-St silin, Sp py, wk(+) cpy, tr MoS_2 Vuggy white Qtz vns as ab
315.2	8.5		2.61	95	.26				wk	.25	.01	v.sp gn, sph?	1			WK Alt, St Silin Qtz vns compose 1/8 of core, sp-wk py, wk(+) cpy tr MoS_2 gn, sph
324.2	9.0		2.64	88	.18				sp	.18	tr	sp MoS_2	1			As above, Qtz vns coarsely xyline w/ xyls .3-.4" long in some vugs, cpy mainly as diss, blebs + grains in Dp
332.5	8.3		2.62	99	.18				wk	.29	tr		wk Ser			As above, no vns gn or sph
340.5	8.0		2.65	97	.29				sp-wk	.26	.03	tr MoS_2	1			WK Alt, Mod-St silin, wk py, wk(+) cpy diss in Dp, tr MoS_2, sph? Qtz vns as a
348.6	8.1		2.61	95	.20				sp	.15	.05	tr MoS_2	1			WK Alt, St Silin, sp-wk py, sp cpy, tr MoS_2 Qtz vns as above
354.4	6.8		2.64	96	.21				wk	.18	.03	tr MoS_2	mod Ser			WK Alt, wk-Mod silin, sp-wk py sp cpy tr MoS_2, Milky Qtz vns increas by two stringers
362.7	8.3		2.60	89	.17				wk	.14	.03		1			Alt as above, wk py, sp + cpy tr MoS_2, Qtz vns pick up Dp
367.0	4.3		2.60	95	.35				sp-wk	.30	.05					Alt as above, wk py sp-wk cpy tr MoS_2 1 3inch section of qtz vn
		Core rec. aver.			89%											

Page 1 of 2 — Continued on Page 2

End of hole

Final Depth 223.8
Collar Elevation 2713.80
Coordinates 40980.67N, 17,718.84E
Inclination vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. 0-203
Sheet No. 1
Date Completed 7-15-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
14.8	9.8	NXWL	2.54	87	.06			.06	tr		tr		sp clay ser	wk-Mod lim	Dp	Fr-Wk Alt, rk is fr between fracs + retalus blk calcs sp xeno wk lim on fracs
23.7	8.9		2.54	86	.07			.07	1		1		1	1		As above, wk-Mod xenos Mod silin along some uns
33.2	9.5		2.55	78	.06			.06	1		1		sp-wk clay-ser	1	sp sulfides Mz @ ≈ 32.2	Fr-Wk Alt, Dp is dk gy except on fracs tr-sp py tr cc, sp wk
41.8	8.6		2.98	75	.06			.06	1		1	Sp gen Cu	1	1	Dp @ 37.8	Wk-Mod Alt, wk silin, wk diss py, Sp-wk cpy-cc, wk lim on fr
52.5	10.7		2.41	68	.05			.05	1		1		wk-Mod clay-ser	1	Mz @ 46.5	Wk-Mod Alt, sp tot suls as above, wk lim on fracs, Mz – wk-Mod
60.9	8.4		2.53	94	.06			.06	–		–		Wk clay-ser	1	Patchy suls Dp @ 58.0	No uns suls wk Wk-Mod alt, wk silin along uns, wk py, sp wk cc tr cpy Dp – wk-Mod
70.0	9.1		2.55	93	.09			.05	sp		.04		1	wk (+) lim wk (–) hem		wk xenos lim
78.3	8.3		2.66	94	.21			.03	wk	.01	.17		wk + clay ser	wk lim	Suls @ 70'	Wk Alt, wk py, sp cc tr cpy MoS2 sp-wk lim on fracs sp xe
86.7	8.4		2.63	87	.38	.03		.03	1	tr-sp	.35		1	sp lim		Wk Alt, wk-Mod xenos, sp-wk py, cc on fracs sp lim on fr
89.7	3.0		2.63	98	.42	.03		.03	1	tr	.39	tr MoS2	1	1		Alt + Min as above, tr cpy
95.3	5.6		2.73	97	.99	.07	18.0 @ .78 .05	.07	1	.04	.88	1	1	1	Bio. Qtz(–) Mz @ 89.7	Wk Alt, ≈ 2" subhedral plag phenos in medium saline bio. ground wk Mod diss py, sp-wk cp
104.7	9.4		2.67	75	.76	.04		.04	wk(+)	.10	.62		1	1		Alt + Min as above, wk(–) cc on fracs sp lim on fracs
114.7	10.0		2.69	81	.27	.03		.03	1	.02	.22		1	1	Dp @ ≈ 112'	Wk Alt, wk to Mod silin, rk is silica cem. bx in part wk py sp cc tr cpy
124.1	9.4		2.67	93	.11			.02	1	.05	.04		1	sp-wk lim		Mod Alt, silin, Mod(–) py on 1/4 inch qtz py uns tr-sp cc sp lim on fracs
132.5	8.4		2.69	100	.07				st	.07			sp-wk clay-ser	tr lim	Mz @ 130.9	Dp – wk-Mod Alt, Mod silin, wk-Mod py Mz wk-Mod Alt, wk silin wk py tr MoS2
141.3	8.8		2.70	95	.13				wk	.13			1	1	Mz	Alt as above, wk py tr MoS2, plag subhedral corroded + argillic
150.4	9.1		2.73	95	.11				wk(+)	.11	tr		1	1		As above, up to .2", sp qtz blebs about 10% phenos sp bio b
158.9	8.5		2.70	93	.18				sp-wk	.18	1		1	1		Alt, as above, wk py, sp cpy tr MoS2, cc?
169.5	10.6		2.68	75	.30				wk	.29	.01		1	1		As above, text appears almost sp-like in places
179.1	9.6		2.74	81	.20				1	.20	tr		1	1		Wk-Mod Alt, wk silin, wk py sp cpy tr MoS2
187.7	8.6		2.69	91	.19				1	.15	.04?		1	1		As above
195.5	7.8		2.68	98	.23				1	.22	.01	tr MoS2	1	–		As above
204.0	8.5		2.69	93	.26				1	.26	tr		1			As above
213.0	9.0		2.69	88	.25				1	.25			1		P.M. flt bx @ 205.8-207.8	patchy Dp Alt + Min as above
221.3	8.3		2.68	96	.19				sp-wk	.19	tr		1		Mz	Alt Above, Dk gy, ground mass, subhedral to anhedral phenos
223.8	2.5		2.65	94	.32				1	.32			1			composing ≈ 10% rk. Alt appears to favor center of phenos.
E.O.H.		Ave. Rec. = 88														

Final Depth 213.0
Collar Elevation 2653.10
Coordinates 40678.80N, 16990.66E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-20
Sheet No. 1
Date Completed 7-13-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Sericite	lim hem	Rock Type	Remarks
0.0-6.0	6.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
17.3	11.3	NXWL	2.54	66	.10			.10					wk clay sericite	wk lim sp hem	Dp	sp-wk lim, sp wk hem, wk clay-ser, tr cuox
26.4	9.1		2.51	81	.14			.14					wk-Mod clay, ser	wk-Mod lim sp-wk hem		wk Alt., Yel+Brn lim, hem. spread out from fract., rk, well brkn (Pst. Min)
35.0	8.6		2.52	86	.13			.13								wk-Mod Alt, wk lim, hem, along inlets sp clay on fracs tr cuox
41.2	6.2		2.58	52	.21	.12		.21	NO VIS	sulfides				wk lim	tr suls	wk-Mod Alt, wk lim, hem, sp-wk cuox on wk clay on fracs tr-sp leached suls
46.2	5.0		2.56	81	.51	.41		.51 Mal					wk clay-ser		dk bio (chlor) rich DPW/Sp xong	Alt as above, sp-wk lim, lim pseudomorphs aft py, tr-sp suls
55.2	9.0		2.60	94	.58	.21		.21 Mal	sp	.10	.27			wk lim, jar	Suls	Alt as above, wk silin along inlets wk(-) py wk cc sp cpy, Mnax wk lim tr cuox
63.3	8.1		2.62	97	.50	.14		.14	sp	.10	.26					Alt as above, wk py, cc tr-sp cpy sp-wk lim on fracs w/wk grn clay
71.1	7.8		2.59	99	.53	.12	65 @ 57 .11	.12		.04	.37			sp-wk lim, jar		wk-Mod(-) Alt wk py, cc sp cpy wk lim on fracs bio (alt to chlor) 3-
80.8	9.7		2.66	80	.50	.03		.03	sp-wk	.10	.37			tr-sp lim, jar		wk-Mod(-) Alt. wk py, cc, cpy, (all on fract), wk lim on fract
88.1	7.3		2.66	81	.34	.01		.01		.05	.28					Alt as above, suls as above, sp wk lim on fract, secondary fld. on
90.0	1.9		2.48	88	.82	.05		.05	tr?	–	.77		Mod clay chlor		FLT ZONE	Mod-Str. Alt., wk py, cpy, wk-Mod cc, Mod-Str. chlor. Md talc
97.3	7.3		2.61	93	1.01	.04		.04	wk(-)	tr?	97		wk-Mod clay-ser	tr lim on fracs	S.P. (?) @ 97.3'	wk-Mod Alt., wk-Mod py, wk-Mod cpy, cc, spl. bio. but well diss.
106.2	8.9		2.61	91	.52	.01		.01		.26	.25			–	S.P. w/ DP @ 98A + 105 DP @ 107	– sp (text) Med. Gr. fld. + Biot. fld. (embayed) corroded – Grnd mass fn. Gr. felt bio
112.2	6.0		2.61	47	.23	.01		.01		.16	.06		wk clay ser.			wk Alt of both DP + SP, SP miner. as above – DP wk py, sp-wk cc, cpy
116.3	4.1		2.64	91	.27	.01		.01		.22	.04				DP	wk Alt. – wk py, sp-wk c.c., cpy, chl + talc on frac
126.4	10.1		2.60	80	.15				wk	.13	.02					wk Alt, bio only wk Alt, rk is dk gy except along fracs, wk py sp cpy, c
134.8	8.4		2.62	82	.16					.14	.02					Alt as above, sp-wk py sp cpy, tr cc, MoS2
143.4	8.6		2.60	96	.24					.18	.06					wk-Mod Alt, wk py, cc, sp-wk cpy, tr MoS2
151.8	8.4		2.67	91	.14				wk(-)	.09	.05					wk-Mod Alt, wk silin, wk py, sp-wk cpy, cc on fracs, tr Mo
160.5	8.7		2.63	92	.10				wk	.10	tr		sp clay-ser			wk-Mod Alt, wk(-) silin, wk py, tr sp cpy tr cc
169.4	8.9		2.65	93	.22					.12	.10	tr MoS2	sp-wk clay-ser			wk-Mod Alt, wk(-) silin, wk(-) py sp cpy no vis cc
179.0	9.6		2.68	82	.22					.16	.06					As above
189.5	10.5		2.64	81	.23					.21	.02					wk-Mod Alt, wk silin, wk(-) py, wk(-) cpy (diss) tr cc
198.1	8.6		2.64	100	.38					.38	tr		sp clay ser			wk-Mod Alt equigranular text, grnd plag intergrown wk 3% alt bio, sp-wk py wk cpy
207.0	8.9		2.71	95	.25					.25						wk-Mod Alt, silin, wk diss py, sp-wk diss cpy tr MoS2 on 1" qtz vn
213.0	6.0		2.60	95	.14					.14						As above
E.O.H.		Ave. Rec. = 85														

Final Depth 205.0
Collar Elevation 2742.69
Coordinates 40044.12 N, 17,145.69 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-201
Sheet No. 1
Date Completed 7-8-66
Logged By J A B

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	hem lim	Rock Type	Remarks
5.5	5.5	RB	—	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
14.1	8.6	NXW	2.51	87	.09			.09	–	–			WK-Mod clay-ser	WK-Mod lim	Dp, MzDMK	WK-Mod Alt, WK br lim, on fracs WK grnish stain
22.8	8.7		2.54	88	.11			.11				sp grn cuox in clay	1	tr hem	DpQz 16'	As above Mz contains only slightly alt. bio
31.4	8.6		2.56	90	.08			.08				1	1	tr lim		Alt as above, sp-wk lim stain, 1 frac shows lim aft py
39.2	7.8		2.54	96	.09			.09				tr grn cuox in clay	1	WK-Mod lim tr hem		WK-Mod(-) Alt, wk lim stain throughout, sp lim aft diss sulf
48.3	9.1		2.53	95	.08			.08					1	WK lim		As above, tr CuOx on fracs
57.5	9.2		2.56	93	.11			.11				tr targ on fracs	1	WK-Mod lim sp hem tr lim	Sp. 48.7-58.8	Sp-Mod Alt, Dp as above, lim etc. as above
66.7	9.2		2.56	96	.11			.08	sp	tr	.03	1	1	WK-Mod lim	patchy sulf circa 66' sulf @ 67.5'	WK-Mod Alt, WK lim stain sp-wk lim aft sulf, tr tuco, sp cov tr cc, tr cpy on frac
75.5	8.8		2.57	100	.18			.04	sp-wk	1	.14	sp cuox on fracs or Mz	1	WK lim		Alt as above, sp-wk py, cc, sp cpy sp cu ox, lim on fracs
84.4	8.9		2.56	100 +2	.27			.05	1	.01	.21	—	1	1		WK-Mod Alt, sp-wk py, cc, sp cpy, tr cuox, sp lim ox fra
93.1	8.7		2.65	95	.34	.04		.04	wk.	.06	.25		1	sp lim	Tr Mz on frac @ 82.6	WK-Mod(-) Alt, sp(+) py wk cc, sp cpy sp lim wk jar on fracs
98.7	5.6		2.57	95	.50	.04		.04	sp-wk	.15	.31		1	1	Mz @ 93.6 -97.0	Dp as above, Mz - wk(+) Alt, all bio almost fresh sp py sp-wk cc cpy frac.
107.6	8.9		2.62	95	.26	.02		.02	wk.	.08	.16		1	Tr lim	Dp	Finely xyline almost Aplitic tex, wk py WK-Mod cc sp cpy
116.0	8.4		2.59	96	.29			.02	wk	.03	.24		1	1		WK-Mod Alt, text as above, wk py, wk-Mod cc, sp-wk cpy, tr lim
124.2	8.2		2.63	94	.26			.01	wk.	.02	.23		1	Tr. lim		Alt as above, wk(+) py wk cc sp-wk cpy tr lim
132.8	8.6		2.62	95	.16			—	sp-wk	.01	.15		1	Tr. hem Tr. lim		WK-Mod Alt, wk py, wk(+) cc sp-wk cpy sp lim on frac
142.4	9.6		2.61	90	.25			.01	sp	.02	.22		1	Tr lim		Alt as above, wk py, cc, sp-wk cpy sp lim on fra
147.0	4.6		2.63	95	.26	.01		.01	sp-wk	.01	.24		1	Tr hem Tr lim		As above
150.5	3.5		2.63	98	.44	.01		.01	wk-Md	.28	.23		1	Tr lim	HFD 147.0 -150.2	DK grN HF. Mod py tr cpy, cc good ig contact w/Dp
159.6	9.1		2.59	94	.16			.01	sp	.02	.13		1	Tr lim	Dp	WK-Mod Alt, wk py, cc, sp cpy tr MoS2 sp lim on fracs
168.0	8.4		2.63	99	.09				sp-wk	.09	tr	tr MoS2	WK clay ser	1		WK-Mod Alt, wk py sp-wk cc, sp cpy, tr MoS2 Native Cu on frac
177.0	9.0		2.64	91	.11				wk(-)	.11	1	wk grn chloritic clay assoc. w/py	1			Alt as above, patchy silin along cavity wk py tr spec sp cpy tr MoS2
185.4	8.4		2.62	100	.07				1	.07	1	tr MoS2	1	tr lim		WK-Mod Alt, wk py, tr cc, tr-sp cpy tr MoS2
193.7	8.3		2.58	100	.08				1	.08	1	1	1			As above
203.7	10.0		2.63	93	.07				wk	.07	1	1	1			As above
205.0	1.3		2.65	85	.09				1	.09	—	1	1			As above no vis cc
E.O.H.			Ave. Rec. = 95													

Final Depth 276.7
Collar Elevation 2797.93
Coordinates 40821.93 N, 17424.68 E
Inclination Vertical

ASARCO

GEOLOGIC - ASSAY LOG

Property Silver Bell

HOLE NO. D-200
Sheet No. 1
Date Completed 7-7-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: Clay sericite	lim hem	Rock Type	Remarks
6.0-5.0	5.0		–	–	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
13.6	8.6		2.52	94	.04			.04					sp clay ser	WK-Mod lim, sp-wk hem	Dp	WK-Mod Alt, WK lim, hem on fracs
21.7	8.1		2.51	92	.07			.07						sp-wk lim		Alt as above, WK-Mod hem, WK lim tr cc
30.2	8.5		2.47	92	.04			.04					WK clay ser	WK-Mod hem WK lim tr hem		Alt as above, sp hem, sp-wk lim on fracs tr tot suls
38.9	8.7		2.49	96	.05			.05					WK-Mod clay-ser	WK-Mod hem WK lim		WK-Mod Alt, WK hem stain, sp-wk lim, sp Alun, py replaced lim where diss in isolated cuts
47.7	8.8		2.48	92	.04			.04				tr grn CuOx				Alt as above, WK-Mod hem stain WK lim, tr LLM, grn CuOx
55.9	8.2		2.50	89	.06			.06						WK-Mod lim		As above, No grn CuOx, core broken, hem Mainly on fracs
65.2	9.3		2.54	83	.07			.07				tr grn CuOx		WK hem WK-Mod lim tr LLM		WK(+) Alt. Dp retains dk gy color except on fracs, WK xenos, WK lim hem, tr grn CuOx
72.9	7.7		2.52	88	.06			.06								As above, tr suls
81.0	8.1		2.52	95	.06			.06								Flow layering dips @ 40° Alt as above WK-Mod hem WK lim
90.1	9.1		2.54	92	.24			.06	sp	tr	.18			WK lim	Patchy suls	WK(+) Alt, WK hem, lim, tr CuOx sp py, WK cc tr cpy
99.1	9.0		2.54	94	.20			.06			.14					As above, sp cpy
108.2	9.1		2.58	92	.28			.05			.23					WK Alt, WK xenos, sp-wk lim, hem, sp-wk py, cc, sp cpy
116.9	8.7		2.62	94	.25			.05			.20		sp-wk clay-ser	WK-Mod lim		As above, WK lim, No hem, Dp-dk, bio rich qtz poor
125.2	8.3		2.60	99	.28			.05			.23	tr grn CuOx				WK Alt, WK lim, sp py tr-sp cc tr cpy
133.4	8.2		2.64	92	.39	.03		.03 Mal	WK	.10	.26			sp-wk lim	Suls w/ lim on fracs	WK Alt, WK lim, WK py cc sp cpy, tr MoS2
142.1	8.7		2.64	93	.61	.04		.04		.04	.53		WK clay ser	WK lim		As above
150.6	8.5		2.61	86	.70	.06		.06		tr	.64					As above, core very broken
158.1	7.5		2.65	92	.63	.05		.05			.58					WK-Mod(-) Alt, WK py WK(+) cc, sp cpy tr MoS2 WK(+) lim
167.3	9.2		2.64	83	1.59	.23		.23			1.36	grn CuOx in clay see oxide assay			bio. Qtz Mz @ 159.6'	WK+ Alt, sp-wk py, Mod(-) cc disp on fracs, tr cpy tr CuOx Rk that borders on Spa sp jar
170.4	3.1		2.64	91	1.46	.37	-70.3' @ 1.14 0-24	.37			1.09		WK-Mod clay-ser			WK-Mod Alt, increasing qtz content, WK py cc, tr cpy
179.5	9.1		2.65	87	1.28	.36		.36			.92					WK-Mod(-) Alt WK(+) py, WK cc, sp-WK lim, jar on fracs
187.0	7.5		2.67	98	1.33	.38		.38		.05	.90					Alt as above, WK py, sp-WK cc, tr cpy, MoS2 lim as abo.
195.7	8.7		2.63	100	1.31	.41		.41		.10	.80					WK-Mod Alt, WK py WK cc, sp cpy tr MoS2, sp lim on fracs
203.7	8.0		2.63	83	1.51	.34		.34	sp	.10	1.07					Alt as above, WK-Mod cc, sp py sp lim on fracs
214.8	11.1		2.62	74	.38	.02		.02	WK	.18	.18	tr grn CuOx in clay		sp lim	Dp @ 204.8'	WK-Mod Alt sp-wk py, tr-sp cc, cpy tr MoS2 Mz-like text @ 214.8'
217.3	2.5		2.61	83	.14			tr	sp-WK	.10	.04	–		–		Alt as above, WK(+) py, tr-sp cc, cpy tr MoS2
221.0	3.7		2.54	99	.38	.02		.02	WK	.20	.16				Mz @ 214.8 Dp @ 220.1	Mz-porphyry w/dark biotitic ground mass, WK py sp cc sp-WK cpy tr MoS
229.7	8.7		2.63	91	.12			tr		.11	.01					WK-Mod Alt, WK py tr cc, cpy, MoS2
238.3	8.6		2.62	90	.18					.18	tr		WK clay-ser			Alt as above, WK-Mod py, tr cc, sp cpy tr MoS2, WK xe
241.2	2.9		2.62	100	.12					.12			sp-WK clay-ser			Alt as above, WK py, tr cc, sp cpy tr MoS2
249.6	8.4		2.60	98	.14			–	WK.	.02	.12				layering in Dp @ 45°	WK Alt, Dp retains it's blk color except along vns WK py sp cpy
258.5	8.9		2.64	94	.13			–	sp-wk.	.09	.04		WK-clay-ser			As above
267.9	9.4		2.62	90	.19			–	sp	.16	.03		sp-WK clay-ser			As above
275.7	7.8		2.61	97	.14			–	sp	.13	.01		WK-Mod ser			As above, tr MoS2 core broken to 1" fragments
276.7	1.0		2.63	100	.05				WK	.05	tr		WK, Mod clay-ser			WK-Mod Alt. sp-WK py
E.O.H.			Ave. Rec = 91													

Final Depth 294.0
Collar Elevation 2711.89
Coordinates 4019969 N, 17452.48 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-199
Sheet No. 1
Date Completed 6-30-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
0.0-8.2	8.2	RB	-	0	–	-	–	–	–	–	–	–	–	–	–	Rock Bit
18.7	10.5		2.46	71	.11			.11 turq				tr turq	sp-wk clay-ser	wk(+) hem wk lim	Dp	Mod(-) Alt, wk-Mod hem, mainly stain, sp-wk lim, tr LLM MnOx
27.7	9.0		2.44	92	.04			.04					wk clay ser	wk-Mod hem wk lim tr LLM		Alt As above, Mod(-) hem stain, wk lim on fracs tr LLM WK MnOx
36.2	8.5		2.43	92	.07			.07						wk hem lim tr LLM		Alt as above, wk-Mod hem, wk lim on fracs tr-sp LLM, sp MnOx
45.0	8.8		2.48	89	.04			.04						wk-Mod hem wk lim		As above, wk clay along fracs
54.3	9.3		2.45	79	.06			.06					wk-tr clay ser	" "		As above, sp-wk clay " "
62.8	8.5		2.50	91	.07			.07	tr				wk-Mod clay, ser	wk lim tr hem tr jar		Wk-Mod(+) Alt, wk+ hem, lim along fracs tr LLM, sp-wk grn clay
69.4	6.6		2.51	100+12	.18			.04	sp		.14		wk clay ser	sp-hem wk lim	Sils @ 66.5	Wk-Mod Alt, sp-wk hem stain, sp lim, sp-wk py cc
72.7	8.3		2.56	73	.44	.08		.03	sp-wk	–	.41			tr lim		Wk-Mod Alt, sp-wk and k spar, sp-wk py, wk-Mod(+) cc tr MoS2
87.1	9.4		2.62	82	.65	.07		.07	tr-sp py		.58	tr MoS2				Wk-Mod(+) Alt, wk-Mod finely diss py, Mod cc tr cpy sp lim
93.8	6.7		2.62	52	.64	.10		.10			.54					As above
101.3	7.5		2.54	97	.84	.12	48.6 @ .65/.07	.12		tr	.72			sp lim	Sil @ 93.8 stone	Dk grn-gy to lt grn where alt, sp py mainly diss wk cc diss + no lime frac
106.3	5.0		2.55	86	.82	.12		.12	tr py tr-sp		.70			sp-wk lim	Dp @ 101.3	Wk-Mod Alt, wk chlor, sp py wk cc tr cpy sp lim
115.0	8.7		2.52	90	.61	.04		.04			.51	tr MoS2				Wk-Mod(+) Alt, min as above, rk broken + Alt along slicks
123.8	8.8		2.66	88	.35	.02		.02	sp		.33		wk-Mod clay-ser	—		Alt as above, sp-wk py, wk(+) cc, tr sp cpy, sp lim
131.4	7.6		2.61	99	.19			tr		tr	.19		sp clay ser			Wk-Mod Alt, sp-wk py wk(-) cc, sp cpy
139.4	8.0		2.60	95	.26	tr			sp-wk		.26	tr	wk-Mod clay-ser		Mo @ 136.1 broken fit zone 136.1-139.2	Alt as above, wk py, sp-wk cc tr cpy, MoS2
148.6	9.2		2.65	93	.44	.01	9.2 @ .44/.01	.01		.28?	.28?					Wk-Mod Alt, wk py sp cpy, cc, tr MoS2 sp grn clay
156.3	7.7		2.68	100+1	.17	.01		.01		.16	tr?		wk clay-ser			Alt as above, wk-Mod py diss thru rk + assoc w/chlor bio
164.0	7.7		2.66	94	.20			.01		.19		.0284 Mo				Wk Alt, wk-Mod finely diss py, cpy, tr MoS2 cc, tr-sp cc, cpy, rk is dk gy to blk, 3-15% finely diss bio
172.3	8.3		2.66	89	.22			.01		.21						As above, slightly less cpy, py is seen, some may be 2nd? growing between bio plates in essentially fresh xyls
180.3	8.0		2.65	90	.25			tr	wk	.25			sp-wk clay-ser			Alt as above, wk(+) py sp-wk cpy tr MoS2
188.5	8.2		2.67	98	.15			—		.15			sp clay ser			As above, rk contains 1-2% rounded qtz "eyes" similar to D
197.0	8.5		2.64	97	.20				wk-Mod	.19	.01		sp-wk clay-ser	tr jar		As above, text resembles Dp
207.9	10.9		2.70	78	.36	tr		tr		.36	tr				Dp poorly like 205.9-206.5	Wk Alt, wk-Mod finely diss py, cpy
212.2	4.3		2.72	91	.58	Nil	4.3 @ .58/Nil	Nil		.58						As above
223.9	11.7		2.60	98	.21	tr		tr	wk(+)	.21		tr MoS2	sp clay-ser		Dp @ 212.2	Wk Alt, sp py tr-sp cpy, tr cc
226.0	2.1		2.70	53	.24					.24					Hf @ 224.1 Dp @ 226.0	Blk Hf?, lt gy-grn along hair-line wkness, sp(+) py, cpy, tr MoS2
234.2	8.2		2.66	70	.22					.22						Wk Alt, wk(+) silin, sp-wk py, sp cpy
243.0	8.8		2.62	91	.17				sp-wk	.17					3" poorly like 245.8	As above, tr MoS2
252.0	9.0		2.65	98	.17					.17						Wk-Mod Alt, wk silin, wk(-) py sp cpy wk Moly wkness tr
261.1	9.1		2.61	100+2	.14					.14						As above
269.9	8.8		2.67	99	.20					.20						As above
278.9	9.0		2.62	92	.28					.28			sp-wk clay-ser			As above
287.0	8.1		2.62	91	.38					.38	tr?					As above, rk broken from small flts
294.0	7.0		2.64	93	.21				wk	.21						As above
EOH			Avg. Rec'y	89%												

Final Depth 248.9'
Collar Elevation 2742.87'
Coordinates 40,682.75 N, 17363.10 E
Inclination vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-197
Sheet No. 1
Date Completed 6-24-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Sericite	lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	-	0	-	-	-	-	-	-	-	-	-	-	-	Rock Bit
13.1	8.1	NX w/	2.53	87	.07			.07					wk-Mod clay, ser	wk-Mod lim sp hem	Dp	Mod(-) Alt, wk lim mainly on fracs, wk(+) hem as diss stain sp lim tr cuox
20.4	7.3		2.53	93	.08			.08					1	wk hem tr lim		Alt as above, wk lim, hem on fracs tr lim, cuox
29.1	8.7		2.52	87	.06			.06				tr grn cuox	1	wk lim 1		Alt as above, sp-wk lim, wk+ hem, sp-wk lim. tr cuox
37.4	8.3		2.51	85	.07			.07					1	1 sp lim		Alt as above, sp-wk lim wk(+) hem sp-wk(+) lim tr cuox
48.5	11.1		2.53	83	.05			.05				tr grn cuox	1	sp-wk lim wk-Mod hem sp lim		wk-Mod Alt, wk lim, hem on fracs & inlets tr-sp lim
57.5	9.0		2.50	93	.11			.05	sp		.06	tr grn cuox	1	wk hem 1		wk-Mod Alt sp 2nd kspar, wk hem, lim, sp-wk lim tr cuox
65.1	7.6		2.54	100	.09			.09	-			tr-sp	1	sp lim tr lim	Patchy Suls	wk-Mod Alt, sp 2nd kspar, sp lim, wk hem, sp py tr cc
74.2	9.1		2.58	94	.36	.02		.08	wk		.34	tr grn cuox	sp-wk clay-ser	sp-wk lim wk hem sp lim	Suls to 66.1	wk Alt, sp lim, sp-wk hem, wk very fine qtz py inlets, sp py, cc
82.6	8.4		2.64	96	.72	.04		.04	sp	.04	.66	sp grn cuox	1	sp lim		wk Alt, wk 2nd K spar on fracs, sp py wk cc, cpy on inlets, sp
90.8	8.2		2.60	96	.66	.11		.11	tr-sp		.50	1	wk clay ser	sp lim sp wk ox		wk Alt, wk 2nd K spar, sp py cc sp lim, tr cuox
99.0	8.2		2.60	94	1.11	.28		.28	tr		.83?	sp-wk grn cuox	1	sp-wk lim 1		As above, to 2' of grnish aphanitic rk in cont of FHN - May be 1
106.8	7.8		2.60	95	.85	.20		.20	sp-wk	tr	.65	tr grn cuox	1	1		wk Alt, wk 2nd K spar on fracs, wk py, cc, sp cpy tr MoS2 2" frac of
115.3	8.5		2.61	93	.73	.12		.12	1	1	.61	1	1	sp-wk lim		wk Alt sp 2nd kspar on inlets, sp-wk py, cc, sp cpy sp lim
123.4	8.1		2.60	95	.80	.03		.03	1		.77		sp clay ser	sp lim, jar		As above, flt bx zone 119.6 - 121.5 chlor alt on slicks
132.1	8.7		2.62	92	.18	.01		.01	1	tr	.47		1	sp-wk lim		wk(-) Alt, sp-wk py sp-wk cc on fracs, sp-wk lim on fracs
140.8	8.7		2.63	93	.23			tr	1	.05	.18		1	tr lim		wk somewhat phlogitic Alt, sp-wk py, sp cc on fracs tr lim,
149.5	8.7		2.64	92	.18			—	1	.12	.06	tr MoS2	1	-		wk Alt, wk diss py tr cc, tr(+) MoS2 tr-sp 2nd K spar last 1/2
158.2	8.7		2.67	93	.17				1	.16	.01	1	1	-		wk Alt. wk 2nd K spar along inlets, wk py sp cpy cc
165.3	7.1		2.62	100	.14				1	.14	tr	1	1			wk Alt, sil'n along qtz-py inlets wk py sp cpy, cc tr MoS2
175.6	10.3		2.61	86	.17				1	.17	1	1	1			wk Alt, wk py, tr cc, sp(+) cpy, 2nd K spar on inlets
183.8	8.2		2.63	97	.10				1	.10	1	1	1			Alt as above, sp-wk py. tr cc sp cpy
193.6	9.8		2.64	84	.19				wk	.19	1	1	1			wk Alt, wk qtz-py veining, wk py tr cc sp cpy tr MoS2
201.6	8.0		2.64	95	.15				sp-wk	.15	1	1	1			As above, tr? cc
209.4	7.8		2.70	98	.19				1	.19	1		tr-sp clay-ser		Mz @ 205.8	Dp as above, Mz - porpha wk-Mod(+) Alt, MoS2 ? in cont of Alt plag
217.4	8.0		2.72	95	.20				wk	.20			1		Dp @ 209.4	Mz-Dp cont gradational wk-Mod Alt, sp-wk py, sp cpy, tr MoS2
225.8	8.4		2.69	99	.18				1	.18			1			Alt as above, Dp slight more porph. wk py tr cc, sp cpy, tr MoS2
233.9	8.1		2.69	100	.12				wk(-)	.12		tr MoS2	1			As above
242.8	8.9		2.63	97	.19				1	.19		1	wk clay ser		Text intermediate between Mz + Dp	As above, rk broken + brecciated in places, steep angle slicks
246.6	2.8		2.62	95	.19				1	.19		1	1			Porphyritic dacite, wk-Mod Alt, wk py sp cpy
248.9	3.3		2.60	95	.19				1	.19		1	1		Mz @ 245.6	Mod(-) Alt, wk-Mod py sp cpy tr? cc.
E.O.H.			Avg. Rec'g	93%												

Final Depth 326.0
Collar Elevation 2907.34'
Coordinates 39,577.75 N, 17845.07 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-198
Sheet No. 1
Date Completed 6-24-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay sericite	lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	-	0	–	-	-	–	-	-	-	-	-	-	–	Rock Bit
15.0	10.0	NX wl	2.44	84	.04			.04		tr			Mod clay ser	sp lim wk-Mod hem tr LLM	Dp	Mod Alt, sp-wk lim, wk-Mod hem stain in ground mass tr LLM
24.0	9.0		2.43	92	.04			.04		1			1	1		As above tr turq on Alun vn
32.9	8.9		2.48	91	.05			.05				sp grn cu ox	1	wk lim wk hem wk LLM		As above, wk-Mod Alun vnlets
42.2	9.3		2.35	92	.04			.04					1	sp-wk lim wk-Mod hem tr LLM		Mod Alt, sp lim Mod hem sp LLM sp Alun vnlets
51.7	9.5		2.35	91	.04			.04					1	sp lim 1		Mod Alt, wk-Mod qtz + Alun vns, sp lim Mod hem stain tr sp
60.7	9.0		2.51	90	.06			.06					1	Mod hem tr-sp LLM		As above
69.5	8.8		2.45	96	.07			.07				tr-sp cu ox	1	wk-Mod lim wk-Mod hem 1		Alt As above, wk lim, wk hem along fracs sp LLM wk-Mod Alun
73.3	3.8		2.47	89	.08			.08				tr turq	1	tr hem		As above, sp turq on Alun vnlets
82.3	9.0		2.49	90	.10			.10				sp turq	1	wk lim wk hem		Mod Alt, sp lim, sp-wk hem, wk-Mod clay on vnlets tr turq
90.2	7.9		2.35	99	.07			.07	tr		tr	1	1	wk hem tr LLM		Alt as above, sp lim, wk+ hem, tr sulf dendrun
98.1	7.9		2.51	93	.59	.02		.02	1		.57		Mod-st clay-ser	sp lim	Sub @ 98.0'	Mod-st Alt, sp lim stain, tr py Mod cc diss + on fracs
107.0	8.9		2.51	89	.44	.01		.01	sp		.43		Mod clay ser	1		Mod(-) Alt, wk py. wk-Mod cc on py sp lim stain tr Cu
115.3	8.3		2.52	93	1.00	.02		.02	wk		.98		1	sp-wk lim		wk-Mod(+) Alt, wk py wk-Mod cc on py, diss on fracs, sp lim, tr Cu
123.1	7.8		2.62	97	.44	.05	67.5	.05	1		.39		wk-Mod (+) clay ser	sp lim		As above, dacite is mainly porphyritic w/ about 3-8% qtz eyes
132.0	8.9		2.52	90	.63	.01	@ .58/.02	.01	sp-wk		.62		1	1	fluidized bx dike @ 2.132	wk-Mod(+) Alt, wk py wk-Mod cc tr-sp cpy, bx rounded, sp Mo seeds most is Dp
140.8	8.8		2.52	94	.49	.01		.01	wk		.48	tr turq.	1	tr lim	Dp @ 2.132.	wk-Mod Alt, wk py wk(+) cc, tr cpy
149.4	8.6		2.58	95	.34	.01		.01	sp-wk		.33	tr grn cu ox	wk clay ser	tr jar sp lim		wk+ Alt wk(+) py wk cc wk-Mod qtz-py vns
157.7	8.3		2.52	100	.70	.01		.01	1		.69	1	1	tr lim		wk(+) Alt wk py, cc tr cu ox, increase in qtz eyes 1-2% bio
167.1	9.4		2.61	89	.29	.01	or	.01	1		.28	sp-wk grn cu ox	1	sp-wk jar wk lim		As above, sp cu ox
176.2	9.1		2.66	92	.32	.01	158.3 @ .53/.01	.01	1	tr	.31	tr-sp grn cu ox	sp-wk clay ser	1		wk Alt sp-wk py, cc, sp lim, jar silic clay on fracs
185.0	8.8		2.60	91	.35	.02		.02	1		.33	1	1	sp jar sp lim		As above, tr cu ox
193.8	8.8		2.57	94	.42	.02		.02	1	tr	.40	–	1	1		As above, sp-wk cc mainly on fracs
202.7	8.9		2.61	94	.50	.01		.01	1	1	.49		1	tr jar sp lim		wk Alt, sp-wk qtz-py veining, sp-wk py wk(-) cc on fracs tr lim Cu ox
211.7	9.0		2.60	92	.42	.01		.01	wk		.41		1	sp-wk lim		As above
219.9	8.2		2.66	98	.48	.01	63.5 @ .58/.01	.01	1		.47	sp grn cu ox	wk clay ser	1		wk-Mod(-) Alt, sp-wk py, wk+ cc on fracs, last 4' run broken + Mod Alt
228.7	8.8		2.64	92	.62	.01		.01	1		.61	tr turq	1	1		Alt as above wk py, wk-Mod cc, tr MoS2 sp lim tr cu ox
239.5	10.8		2.66	99	.47	tr		tr	1		.47	1	sp-wk clay-ser	tr lim	Sp @ 238.0 cnt broken	1st 15' run broken + Mod, wk Alt, sp-wk py, wk cc tr MoS2 tr lim
248.5	9.0		2.69	90	1.13	.02		.02	wk-Mod	.31	.80		wk clay ser	tr lim		wk Alt, wk py diss in bio + on fracs, wk(-) cc tr cpy MoS2 on vnlets
255.5	7.0		2.74	100+	.31	.02		.02	1	.25	.04		1	sp lim	Dp @ 255.5 cnt @ horiz	As above
261.0	4.0		2.66	95	.17			tr	wk(+)	.15	.02		sp clay ser	tr lim		wk-Mod Alt wk py + sp cc, sp(-) cpy
269.7	8.7		2.65	94	.18				wk-Mod	.16	.02		sp-wk clay-ser	sp lim		wk(+) Alt, wk py tr cc, cpy, MoS2 sp lim on fracs
278.4	8.7		2.66	95	.13				1	.13	tr		1	1		Alt as above, sp-wk py tr cc, cpy MoS2, tr-sp lim on fracs
287.0	8.6		2.64	95	.13				wk	.13	1		wk clay ser	wk lim		wk-Mod Alt, wk py tr cc, cpy, MoS2 sp lim on fracs
294.3	7.3		2.57	100	.14				sp-wk	.12	.02		1	1	Pm-Min Flt bx 287.5-291.5	Dp as above, flt bx of Dp frags, pg weakly cem by silica
303.4	9.1		2.60	96	.10				1	.10	–		wk-Mod clay-ser	1	Mz @ 294.3	wk-Mod Alt, chlor aft bio, clay aft. feld. wk diss py, sp in fld xls Poly Dp
311.3	7.9		2.69	97	.06				wk	.06			wk clay ser	sp lim		As above
319.9	8.6		2.62	93	.09				wk(-)	.09			sp-wk clay-ser	tr lim	Dp @ 313.8	Mz as above, Dp – wk-Mod Alt, sp-wk py tr ? cpy
326.0	6.1		2.66	98	.09				1	.09			1	1		As above, wk bio. interstitial to qtz + plag xls
E.O.H.			Avg. Rec %	93%												

Final Depth 305.0
Collar Elevation 2895.47'
Coordinates 39583.87 N, 17,622.54 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-196
Sheet No. 1
Date Completed 6-17-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: Clay Sericite	Lim hem	Rock Type	Remarks
0.0-6.0	6.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
15.6	9.6	NXWL	2.61	82	.09			.09					Mod clay Ser	WK-Mod lim, hem	HF Dp @ 7.7	HF-Mod Alt, Mod-st lim tr LLM Dp - WK-Mod Alt, WK hem Alt, sp lim
24.7	9.1		2.56	87	.06			.06						WK lim, hem		WK-Mod Alt, WK lim on fracs, sp-WK hem, WK-Mod Alun sp turq
33.1	8.4		2.54	92	.04			.04					WK-Mod clay ser sp Alun			As above, tr turq
41.6	8.5		2.49	96	.05			.05					WK-Mod clay, ser	WK lim WK-Mod hem		Alt as above, WK lim, hem, sp LLM tr cu ox sp Alun
62.0	10.4		2.54	84	.05			.05						tr LLM		Mod Alt, Mod hem, WK LLM, sp lim WK-Mod clay on vns
62.4	10.4		2.50	82	.04			.04					WK-Mod (+) clay, ser			WK-Mod Alt, WK(+) lim on fracs, WK hem sp turq
71.2	8.8		2.34	98	.14			.04	sp	tr	.10				Patchy Sulf	Alt as above, WK py sp-WK cc tr cpy WK hem sp lim
75.4	4.2		2.46	90	.06			.06	–	–				sp-WK LLM		As above
80.9	5.5		2.57	88	.45	.03	.45/.03	.03	WK	.08	.34			tr lim	Sulf @ 75.4'	WK-Mod Alt, WK py WK-Mod cc sp cpy, sp-WK cu ox on fracs
89.6	8.7		2.54	94	.13			.04	sp-WK	tr	.09			sp-WK lim, hem tr LLM		WK-Mod Alt, WK-Mod py cc, WK lim, WK cu ox on fracs tr lim
99.9	10.3		2.34	88	.09			.09					Mod clay	WK-Mod lim WK hem tr LLM	Sulf @ 99.9	Alt as above, WK hem on fracs & vnlets WK lim, sp cu ox tr tot sul.
108.0	8.1		2.58	98	.32			.02	WK py		.30		Mod clay ser	tr lim		WK-Mod Alt WK-Mod Qtz vnlets, WK(+) py, WK-Mod cc, sp cu ox lim, anh.
117.2	9.2		2.71	85	.62	.02	.62/.02	.02			.60			sp lim		WK-Mod Alt, WK-Mod py Mod(+) cc on py tr lim, cu ox on fracs
130.0	12.8		2.78	67	.34	.02		.02			.34					Alt + Min as above, tr MoS2
139.4	9.4		2.72	88	.23			.01	WK(+)		.22					WK-Mod Alt, Sil'n along qtz vns, WK-Mod py, Mod(+) cc, tr lim, Cu O.
148.6	9.2		2.62	87	.49	.02		.02	WK		.47		WK-Mod clay-Ser		bx dike @ 150.0-152.8'	Alt + Min as above, Post Min fluidized bx dike, fracs of MoS2
156.9	8.3		2.68	93	.52	.02		.02	WK(+)	.03	.47			sp-WK lim		WK-Mod Alt, WK py cc sp cpy sp lim, Cu ox on fracs
159.9	3.0		2.68	96	.38	.01	43.5 @ .62/.03	.01	WK-Mod	.02	.35			sp lim		WK-Mod Alt WK-Mod py, WK(+) cc, sp cpy tr lim, Cu ox on fracs
165.7	5.8		2.74	93	.64	.06		.06	WK	.08	.50		WK-Mod clay-Ser sp-WK chlor	sp lim	Sp @ 160 Int @ 35°	WK Alt, sp and Kspar in plag
174.5	8.8		2.65	88	.61	.04		.04	1	.04	.53	sp Cu ox	Mod ser clay WK chlor	sp lim		WK Alt, WK py cc, tr cpy, sp lim, Cu ox on fracs
182.9	8.4		2.60	92	.92	.03		.03	WK+	.14	.75				Dp @ 178.5	Sp As above Dp - WK-Mod Alt, Sil'n on qtz vnlets WK py cc
191.9	9.0		2.63	96	.39	.02		.02	WK-Mod	.10	.18		WK-Mod clay-Ser	sp-WK lim		WK-Mod Alt, Sil'n along qtz-py vns, WK py sp-WK cpy tr sp, tr MoS2
200.8	8.9		2.64	95	.31			.01	WK-Mod(+)	.20	.10		WK clay ser	tr lim	Sil. Sp? 200.7	As above, tr cc
209.8	9.0		2.67	95	.30			tr	WK-Mod	.25	.05				Dp @ 206.4	Sp? only sp phenos in Aphanitic ground mass WK py sp cpy, Dp as above
219.0	9.2		2.69	89	.21			tr		.21			Sp clay ser			WK-Mod Alt, WK Sil'n on WK Qtz vns, WK py sp(+) cpy tr cc
227.3	8.3		2.68	95	.18				WK	.18						As above
235.7	8.4		2.69	95	.16					.16						As above
244.1	8.4		2.61	97	.13					.13	tr					As above, tr MoS2
256.3	12.2		2.65	73	.16					.16					Pre Min bx @ 256.3 Int @ 25°	WK-Mod Alt, WK py tr cpy MoS2
265.9	9.6		2.81	89	.13				WK(+)	.13		tr sphalerite			Dp @ 260.5 Include @ 266.7'	Dp as above bx - prob flt bx, angular frag in silf qz WK py x vlts inf
274.9	9.0		2.86	88	.20				WK-Mod	.18	.02	tr MoS2				WK(+) Alt, Mainly clay alt of feld. Angular bx in silf qz floor matrix WK-Mod py, tr sphalerite w/py, sp cpy
283.8	8.9		2.85	89	.07				WK(+)	.07	–				Dp @ 280.2	bx as above, alt frags of Dp, Dp - WK Alt, Sil'n, WK py, tr sp cpy
292.2	8.4		2.67	97	.14				WK-Mod	.14						WK-Mod Alt, WK Sil'n, tr 5% hydromica aff bio w/py cpy in vlts, Min as above
301.0	8.8		2.66	96	.12					.12						WK Alt, Sil'n, sp-WK py, sp cpy, bio as above in aplite-like masses rather than vlts
305.0	4.0		2.65	97	.13					.13						As above, Alt slightly weaker
		Avg.	Rec'y	89%												

Final Depth 247.4
Collar Elevation 2868.45'
Coordinates 39434.89 N, 17374.79 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-195
Sheet No. 1
Date Completed 6-11-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock B.T
17.1	12.1	NX w/	2.59	69	0.23			0.23				Mod chlor Alt of bio	WK	Mod lim Mod hem	Qtzite Sp ? @ 11.3 Sp tr @ 16.0	Qtzite - No vis bedding, wk-mod hem, tr lim, Sp - St Alt, st hem stain tr Cu
28.4	11.3		2.60	72	.27	0.18		.18			.09			WK hem		As above, WK-Mod transported lim wk cu ox on fracs
37.7	9.3		2.55	92	.57	.33	19.2 @ .51/.24	.33			.24		Mod-st	WK lim tr LLM WK hem	Dp @ 28.4 Sp @ 36.1	Dp - St Alt, st grn clay Alt, wk lim, Sp - Mod-St Alt, WK-Mod
47.6	9.9		2.42	87	.46	.15		.15			.31		Mod	Tr LLM		Mod Alt wk lim, st chlor after bio in ground mass.
57.1	9.5		2.50	90	.29	.08		.08	No vis	Sulfs	.21?		WK-Mod	WK-Mod lim		WK-Mod Alt, WK lim on fracs
67.0	9.9		2.49	85	.26	.07		.07			.19?					As above, Sp qtz veining Sp indicated sulfide conten
76.3	9.3		2.50	90	.42	.12		.12			.30?		Mod			As above
85.1	8.8		2.51	94	.28	.10		.10			.18?		WK-Mod	WK@lim		As above
94.5	9.4		2.53	94	.18			.18						WK-Mod lim	Mz @ 92.5	As above Mz WK-Mod Alt, WK lim on fracs
103.3	8.8		2.50	95	.12			.12					WK		Sp @ 96.5 Mz @ z 103.0 Cut @ 90° Sp @ 106.7	Mz as above, Sp - WK-Mod Alt, tr sulfs patchy st LLM WK lim on fracs
109.5	6.2		2.56	92	.19			.08	Sp-WK		.11				Cut @ 60°±	Mz + Sp Alt as above,
113.1	3.6		2.66	94	.38	.08		.08			.30	WK chlor Alt of bio		WK lim Sp jar	Sulfs @ 109.5	WK-Mod Alt, Sp-WK py, cpy, cc diss thru bio xyls in ground m WK lim on fracs
121.7	8.6		2.62	95	.45	.05	8.6 @ .45/.05	.05	WK	.10	.30			WK lim		WK Alt, WK py tr-Sp cpy, cc diss in bio Sp lim on f
129.9	8.2		2.67	100	.29	.02		.02		.17	.10?					WK Alt, Sp-WK py cpy, tr-Sp cc diss in bio tr lim on fracs
138.9	9.0		2.70	89	.28			.02		.16	.10				Dp @ z 136.6	Sp as above, Dp cut @ a 89° WK Alt, Sp-WK py Sp cpy w/
148.2	9.3		2.70	89	.21			.01		.20	tr			tr lim	Sp @ z 148.2	Dp as above
156.9	8.7		2.66	96	.33			.04		.15	.14?			WK lim		WK Alt Sp-WK py, Cpy diss in bio xyls + on hairline unlets
164.6	7.7		2.69	100	.23			.01		.22	tr?		Sp-WK	tr lim		As above
173.4	8.8		2.70	89	.23			.02		.10	.11				@ 173.1 @	70° Sp As above, Dp - WK Alt, Mod silin, wk py, good ig a
182.5	9.1		2.63	88	.24			.01		.20	.03		Sp		Mz	WK Alt tr 2nd K sper on unlets, WK diss py Sp-WK cpy
190.8	8.3		2.61	91	.21			tr		.21	tr?			–		Alt as above, rk hard almost flinty, WK diss py Sp-WK cpy
199.7	8.9		2.60	91	.30					.30				tr lim		As above
209.0	9.3		2.63	89	.31					.31						As above, py + cpy are randomly diss in ground mass
217.8	8.8		2.63	94	.34					.33	.01?					As above, rk is cut by Sp py - qtz unlets
230.4	12.6		2.67	68	.21					.21	tr				Dp @ 232.7 bx dike @ 237.1	WK-Mod Alt Sp WK py Sp cpy tr cc, WK qtz bx zone 222 -
240.1	9.7		2.66	88	.26			tr		.18	.08			Sp-WK lim		Mod Alt, WK silin, WK py, Sp cc on fracs tr lim tr Mas
247.4	7.3		2.66	95	.25					.25	tr			tr lim		WK-Mod Alt, WK py, Sp cc WK(+) cpy, diss + on unlets tr
EOH			Avg. Rec'y	88%												

Final Depth 237.6
Collar Elevation 2792.46
Coordinates 40685.55 N, 17718.70 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-194
Sheet No.
Date Completed 6-14-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay ser	lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
15.7	10.7	NXwl	2.13	85	.13			.13				sp turquois	st clay	sp-wk lim	Dp Sp @ ≈ 180'	st clay Alt sp lim, wk jar sp-wk cu ox (chrg?)
25.5	9.8		2.47	83	.21			.21								st Alt, as above, sp lim, sp-wk cu ox (chrg)
35.8	10.3		2.54	80	.13			.13						wk lim, mod hem jar	? Sp, Hf Dp?	Complete Alt, tr alt to clay w/ st hem + jar, wk qtz wk sp lim
45.0	9.2		2.38	94	.13			.13						wk jar	Dp @ ≈ 35.3'	st Alt sp-wk lim, hem stain wk turquois on fracs
55.4	10.4		2.58	93	.40	.04	17.7' @ .49/.04	.04	wk	.03	.33		wk-mod clay, ser	wk lim sp hem	Smls @ 45.6	Mod Alt, patchy clay smls wk py wk(+) cc tr cpy wk lim hem sp turq
62.7	7.3		2.65	100	.62	.03		.03	wk-mod	.15	.44			wk lim sp jar	Sp @ ≈ 55'	wk-mod Alt, wide spaced phenos, wk finly diss py sp cpy sp wk
71.5	8.8		2.67	96	.23	.02		.02	wk	.01	.20		wk clay ser	wk lim	Dp @ 70'	Alt as above, sp-wk py tr cpy, cc wk lim aff py on vns
80.7	9.2		2.66	91	.14					.01	.13			sp-wk jar		wk Alt, wk-mod Sil'n, sp-wk py sp cc, cpy wk lim hem on fracs
89.6	8.9		2.70	93	.14					tr	.14	tr MoS2			Mineralized bx dike 6.7' @ 57° Dp @ 88.6	Dp - wk Alt, mod-st Sil'n, wk diss py tr cc cpy MoS2, sp lim on fracs
98.5	8.9		2.68	95	.16					.04	.12			wk lim	bx @ 94.7	Dp as above, bx frags sub to well rounded MZ + Dp frags wk py tr cpy cc tr lim on
107.8	9.3		2.73	91	.16					.01	.15				Dp @ 107.2	As above
116.9	9.1		2.71	90	.18				wk +	.03	.15					wk Alt, mod-st Sil'n, wk diss py tr cpy MoS2 wk lim on fracs
125.9	9.0		2.70	93	.28	.01		.01		.22	.05			tr lim		wk-mod Alt, wk Sil'n, wk diss py, sp-wk cpy tr cc sp lim on fracs
134.8	8.9		2.69	92	.48	.01	8.9' @ .48/.01	.01		.22	.26	–		–		As above
143.0	8.2		2.65	93	.20			tr	wk	.12	.08					As above, sp cpy
151.8	8.8		2.66	89	.22					.18	.14			tr lim		wk Alt, Sil'n, sp-wk py, tr-sp cpy tr lim on fracs
160.0	8.2		2.68	95	.37	.01		.01		.20	.16			sp-wk lim		Alt as above, wk py, sp cpy, tr cc, lim on fracs
168.5	8.5		2.63	93	.50	.01		.01	sp-wk	.46	.03		sp-wk clay	sp lim		wk Alt, wk Sil'n along qtz-py vns, sp-wk py cc sp cpy tr lim on fr
175.4	6.9		2.64	100	.31	.01	31.6' @ .59/.01	.01		.20	.10					As above, most cc on fracs
183.2	7.8		2.62	100	.98	.02		.02		.71	.25					As above
191.6	8.4		2.63	95	.54	.01		.01		.26	.27					sp-wk Alt wk xenos, sp Sil'n sp py sp-wk cc on fr tr cpy
199.6	8.0		2.64	100	.26	.01		.01		.08	.17		sp-wk clay			As above cc mainly on py, sp cpy
208.0	8.4		2.65	94	.24			tr	wk	.20	.04			tr lim		wk Alt, Sil'n, wk py, sp cpy, tr cc, MoS2 tr lim on fracs
217.0	9.0		2.65	89	.17					.17	tr					As above
225.3	8.3		2.65	93	.16					.16				–		As above
235.3	10.0		2.66	81	.18				sp-wk	.18		tr MoS2	sp clay			As above
237.6	2.3		2.65	88	.20					.20						wk Alt, Sil'n wk py sp cpy, tr MoS2
EOH		Avg	Rec'y	92%												

Final Depth 305.0
Collar Elevation 2909.66
Coordinates 39577.19 N, 18,012.00 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-193
Sheet No. 1
Date Completed 6-6-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
13.4	8.4	NXWL	2.44	95	0.03			0.03					Mod	wk-mod lim Mod LLM	Dp	Mod Alt, wk-Mod clay on fracs, wk-Mod hem stain, sp LIM on fr
22.0	8.6		2.46	94	.04			.04						Mod lim		Mod Alt, wk-Mod sil'n, wk clay + Alun on lets, wk hem, wk-Mod tr LLM
26.0	4.0		2.41	95	.04			.04							Patchy suls	Alt as above, wk-Mod hem, wk lim, sp-wk LLM
35.9	9.9		2.43	84	.04			.04	Tr-sp							wk-Mod Alt, wk-Mod lim, Alun on fracs, wk-Mod hem sp py, tr c
44.2	8.3		2.42	100	.05			.05								As above
53.8	9.6		2.40	89	.04			.03	Tr-sp		.01					As above, tr-sp cuox on fracs
65.3	11.5		2.40	89	.06			.06						wk LLM		As above
71.4	6.1		2.53	97	.39	0.02		.02	Tr-sp		.37			sp lim	Suls @ 65.3	wk-Mod Alt, wk ab uns, wk py wk(+) cc tr lim, CuOx on fracs
80.2	8.8		2.62	92	.34	.02		.02	~~sp-wk~~ wk		.32			wk lim		As above
89.2	9.0		2.63	94	.44	.02		.02	sp-wk		.42			sp-wk lim		As above, wk xenos in core, 1 frag shows bbl xyls
98.2	9.0		2.63	95	.31	.02		.02			.29		wk-mod	wk lim, Jar		As above, 2" fluidized bx dike @ 80.0' w/ wk-Mod py cc, tr c
106.5	8.3		2.63	100	.21			.01			.20					wk(+) Alt, wk py sp-wk cc, tr lim, Cu ox on fracs wk xen
115.2	8.7		2.61	96	.27			.02			.25					wk-Mod (-) Alt, wk py, wk+ cc sp-wk lim, cu ox on fracs
124.1	8.9		2.64	94	.22			.02			.20					As above, cu mainly on fracs, tr 2nd K spar
132.7	8.6		2.66	95	.29			.02			.27					As above, wk-Mod cc
141.8	9.1		2.65	90	.28	.02		.02			.26					wk-Mod Alt, wk py wk-Mod cc, diss + on fracs sp lim tr CuOx
150.8	9.0		2.57	98	.65	.03		.03			.62		Mod		Dp bx @ 142.2'	Mod Alt Angular frags in rk float? Matrix wk-Mod py Mod diss tr cpy
159.1	8.3		2.68	95	.55	.01		.01			.54			sp lim		As above, bxiation slightly more intense, tr Cu ox neuis c
167.9	8.8		2.65	94	.68	.02		.02	sp		.66			sp lim, Jar		As above. poss frag of Mz
176.6	8.7		2.66	97	.59	.02		.02	sp-wk	.02	.55			wk lim		As above, fracs Angular to sub Angular, poss frag of meta-
184.4	7.8		2.65	97	.58	Tr	86.9 @ .61/.01	Tr	wk		.58	86.9 @ .61/.01		sp lim		No vis. bx but sev. ggy-st alt. areas may be bx. wk cc o.
193.6	9.2		2.54	92	.52	.02		.02	sp-wk		.50		wk-mod	wk lim	End of Bx @ 186.	Bx fades ≈ 186. Xeno's in Dp. RK wk-mod alt, wk py, sp-wk
202.4	8.8		2.54	96	1.03	.01		.01			1.02					wk alt, many xeno's. wk py, tr cc, sp? cpy. Part. leach on fr.
211.1	8.7		2.65	97	.98	.01		.01			.97					As above but wk cc on py. No vis cpy.
220.6	9.5		2.63	91	.16	Tr		Tr	wk		.16		wk			wk alt or. alt, sp and K-spar sp alt, num. qtz-ser vnlts. wk py, most frac's part. leached.
228.7	8.1		2.63	100	.41	.01		.01			.40					As above.
237.8	9.1		2.61	95	.08			Tr		.04	.04					As above except wk-mod py (sev. ¼" vnlts)
247.1	9.3		2.64	96	.12					.12	Tr					wk Alt, tr xenos, sp-wk py tr? cc no vis cpy tr lim on fracs
256.2	9.1		2.67	96	.10					.10				sp lim, Jar		As above, tr cpy, small xeno shows calc-silicate alt
265.6	9.4		2.69	94	.05					.05						wk Alt, wk ab-py uning, wk py sp cpy tr? cc, tr Mos2
274.0	8.4		2.63	99	.10					.10		Tr Mos2				As above, sp Mz text circa 271'
282.6	8.6		2.66	95	.10					.10			sp-wk			As above, tr lim on fracs
287.5	4.9		2.74	98	.11					.11			sp			wk Alt, wk py tr? cpy rk dk gy to bk increasing bio
292.6	5.1		2.74	95	.40	.01		.01		.39					Bx Sp @ 287.5	wk Alt ≈ 10% diss bio xyls, wk-Mod py assoc w/ bio tr cpy
300.9	8.3		2.72	98	.14					.14						Alt as above, Mod py diss assoc w/ bio, + on vnlets tr? cpy
305.0	4.1		2.72	98	.25					.25				Tr-sp Jar, lim		As above, tr cpy, sp text in bk bio-rich matrix
EOH			Avg Rec'y	95%												

Final Depth 190.9
Collar Elevation 2680.20
Coordinates 40,947.21N, 16996.98E
Inclination Vert

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-192
Sheet No. 1
Date Completed 6-3-66
Logged By J.A.B.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Ser.	Lim hem	Rock Type	Remarks
0.0-5.0	5.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
13.7	8.7	NXwl	2.58	88	0.04			0.03	Tr-Sp		.01		wk-mod	Mod lim Mod LLm	DP	WK-Mod Alt, wk silin mainly on qtz outlets, patchy sulf tr py, cpy wk lim, hem
22.8	9.1		2.59	86	.03			.03					1			Alt+silin as above, wk lim, wk-mod hem mainly on fracs
31.8	9.0		2.51	89	.05			.05					1	wk LLm	patchy sulf	wk-Mod Alt, wk silin, sp-wk py, tr cpy, cc, wk lim sp-wk he. No dis sul
41.4	9.6		2.51	82	.04			.04					1	sp LLm	All cap	Wk-Mod Alt, sp-wk lim, hem on outlets tr cc
51.3	9.9		2.49	87	.08			.08					1			WK-Mod Alt, wk(+) hem 1st 1/2 run, rest shows wk lim last 1/2 run is sp by slight hem no reason why
60.8	9.5		2.51	81	.10			.10					1			WK-Mod Alt, wk lim, sp hem stain
70.0	9.2		2.57	85	.10			.05	sp		.05		Mod	wk LLm	Sulfs @ 68.5	WK-Mod Alt, patchy silin on qtz vns, sp-wk lim, wk hem stain
78.3	8.3		2.60	91	.26	0.03		.03	1		.23		1	wk-mod lim sp LLm		sp py, cc last 2' of run WK-Mod Alt, wk py sp-wk cc tr-sp lim on fracs
87.1	8.8		2.58	86	.56	.07	25.2' @ .55/.05	Mod .07	1	Tr	.49		wk-mod	sp-wk lim		Alt as above, wk py, cc sp lim on fracs
95.4	8.3		2.62	88	.41	.03		.03	1		.38		1	sp lim		Alt as above, sp py, wk cc, tr lim on fracs
103.5	8.1		2.63	88	.67	.04		.04	sp-wk		.63		1	wk lim		As above, wk py sp cc
112.2	8.7		2.64	93	.22			.01	1	.02	.19		wk	sp lim		WK Alt, sp-wk py, tr cc, sp xenos tr lim on fracs
120.7	8.5		2.68	94	.12				wk	.12	Tr	Tr MoSe	1	Tr lim		WK Alt. wk py tr cc sp(+) cpy diss + on outlets
130.1	9.4		2.65	83	.09				1	.09			1			Alt as above, sp-wk py tr cc, cpy
138.5	8.4		2.61	94	.09				1	.09		Tr MoSe	1			WK(+) Alt, wk diss py No vis cc or cpy
146.3	7.8		2.61	99	.16				1	.16			1			WK(+) Alt, sp-wk diss py, tr-sp cpy tr cc
154.1	7.8		2.63	99	.16				1	.16		Tr MoSe	1			As above, tr cpy, cc
163.5	9.4		2.59	89	.38				1	.38			1			WK alt, sp chlor on frac's WK py, sp cpy, diss & vnlts.
172.4	8.9		2.58	92	.08				1	.08			1			As above. sp chlor. alt of rk itself.
181.1	8.7		2.62	96	.09				1	.09			1			As preceeding. Total chlor. wk.
190.9	9.8		2.61	93	.15				1	.15			1			As above plus wk 2nd K-Spar
		Avg	Rec'y	89%												

Note: Py fine-grained, diss.

Final Depth 233.2
Collar Elevation 2,749.84
Coordinates 40,026.50 N 17,547.68 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-191
Sheet No. 1 of
Date Completed 5-31-66
Logged By J.A.B.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay, Ser.	Lim.	Rock Type	Remarks
4.4	4.4	R.B.	—	—	—								—	—	—	Rockbit
13.4	9.0	NXW	2.55	92	0.09			0.09					WK-Mod	Mod lim WK LLM WK SPM	Dp Mz @ 10.3, Ct Dp @ 19.7 B. Mz @ 21.2	Dp WK-mod alt, lowL, hem stain. Mz WK-mod alt, dk, Leach hem. ct and phenos.
23.1	9.7		2.49	90	.13			.13					1	Mod LLM Mod lim		Mz as above. Dp ct sharp, lowL. Then dk, v/ "sooty" rk w/ many x m
32.1	9.0		2.57	88	.15			.15					Wk clay		bio. Mz	Dk gy Mz, trends toward sp text. 5-7% bio, w/ bio in ground m.
41.3	9.2		2.57	89	.12			.11	tr-sp		.01		1	WK-Mod lim	Suls cirre 36.7	prob. accounting for dk color, WK lim, WK py, disp throughout WK-Mod AH.
60.1	8.8		2.43	96	.15			.09	sp-wk		.06	tr gr & CuOx	1	1	CAP Dp @ 48.8	blebs, As above, WK-Mod AH, WK py sp cc tr cpy Dp - WK-Mod AH No
59.7	9.6		2.47	85	.13			.13				1	WK-Mod clay	WK lim sp LLM sp MCM		WK-Mod w/ sporadic Mod AH, sp-WK qtz veining, tr Mz, WK lim, tr
68.2	8.5		2.57	97	.18			.12			.06	1	1	tr MCM sp-wk lim	Suls ≈ 64'	AH as above, sp-WK diss cc, tr py. last ½ run tr cu ox lim
76.3	8.1		2.64	95	.77	.21		.21			.56	1	Mod clay			WK-Mod AH, WK py, WK-mod cc tr sp cpy tr cu ox, lim
86.0	9.7		2.62	85	.77	.13		.13	Tr	.02	.62		1	1		WK-Mod AH, WK py, WK(+) cc, tr cpy, tr lim, cu ox
94.1	8.1		2.59	100	.97	.32		.32	sp		.65		WK-Mod clay, ser	WK-Mod LLM, Jar		Mod AH, WK-Mod 2ND K spar above unlots WK py WK cc, sp-WK
102.8	8.7		2.59	90	.91	.13	51.6 @ .15/.14	.13	1		.78		1	1		AH as above, WK py, cc, lim on fracs, tr MoS2
111.6	8.8		2.51	92	.46	.03		.03	1	.03	.40		1	1		AH as above, WK py, sp cc lim on fracs tr MoS2
119.8	8.2		2.60	95	.62	.03		.03	sp-wk	.15	.44		1	1		WK-Mod AH, sp 2ND K spar, WK-Mod chlor, sp-WK py cc, tr cpy
128.6	8.8		2.64	89	.28	.02		.02	1	.05	.21		1	sp lim, Jar		WK AH, Sil'N, WK py, tr cpy cc
138.1	9.5		2.64	87	.15				1	T-	.15		1			As above, tr MoS2
147.6	9.5		2.65	87	.17				wk	1	.17		1			As above, No vis MoS2
158.6	11.0		2.60	63	.12				sp-wk	.08	.04		1	-		WK AH, Sil'N, WK py diss throughout, tr cc, cpy, core very broken recovery poor
167.8	9.2		2.56	84	.15				1	.08	.07		1	-		WK AH, Sil'N, sp-WK py as above, tr-sp cpy, tr cc
176.1	8.3		2.59	93	.20				1	10	.10		WK clay WK ser			WK-Mod AH to Mod AH last ½ run, sp py, tr cpy tr? cc
186.0	9.9		2.63	80	.13				wk	.12	.01	tr MoS2	WK clay ser			WK-Mod AH, Sil'N, sp-WK diss py, sp cpy diss on unlots, tr MoS2
194.9	8.9		2.64	96	.14				1	.14	tr	1	1		tr sil bx @ 189.4-192.0	AH as above, sp-WK diss py, sp-WK cpy w/ tr cc, tr MoS2, sil bx in bx
203.2	8.3		2.67	100	.17				sp-wk	.17		1	1			WK-Mod AH, WK diss py, sp cpy, tr cc Dp ≈ 20% qtz rock ph NO XANDS
212.1	8.9		2.68	91	.15				wk	.15	Tr	Tr Spgal	1			WK-Mod AH, Sil'N MIN as above, tr MoS2
220.9	8.8		2.61	96	.17				1	.17		1	1		Mz 212-213.7	WK-Mod AH, Sil'N, WK py, cpy on qtz unlots
231.1	10.2		2.60	94	.08				sp-wk	.08		1	1			AH as above, WK py, sp cpy diss on qtz unlots tr cc
233.2	2.1		2.61	92	.21				wk	.21		1	1			WK-Mod AH, WK py, cpy tr MoS2 diss thru rk

Final Depth 227.6
Collar Elevation 2736.54'
Coordinates 40,975.80 N, 17,358.17 E
Inclination Vert.

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-190
Sheet No. 1
Date Completed 5-23-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay sericite	lim hem	Rock Type	Remarks
0.0-6.1	6.1	RB.	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
14.6	8.5	NXW	2.44	85%	0.06			0.06					wk-mod	Mod lim	Dp	Wk-Mod Alt, wk lim, tr hem sp-wk grn clay on fra
25.7	11.1		2.51	72	.04			.04					1	Sp hem	Mz @ 25.3-25.8	As above, sp hem
35.2	9.5		2.51	86	.09			.09					1	Tr lim?	Mz w/patches Dp to 32.4	Sp Mod Alt, Dp-wk-Mod Alt, wk lim, broken zone, 28.0-29
43.1	7.9		2.39	97	.13			.13					1	Mod lim Sp hem	@ 33.7, Mixt Dp, Sp Cut c+ ≈ 60°	Mixture of Dp cut by myriad of Sp dikes. Mod alt, leached. Tr cc.
51.6	8.5		2.51	92	.14			.14					Mod	Tr, hem	Dp @ 42.8'	Dp, wk-mod alt (-). Leached, mainly brn, tr hem stain, Jar.
60.1	8.5		2.51	93	.12			.12					wk-mod	Tr lim		wk-mod alt, most xends. 1/4" or less in size. Leached.
69.9	9.8		2.53	86	.09			.09					1			wk alt, much bio, wk 2nd K-spar. Most looks like "Sp" but xends up th
80.6	10.7		2.49	79	.08			.02	Tr-Sp		.06		1			Mostly "normal" Dp, but some as above sc. th last 1/2 cum. qtz-sc.
89.7	9.1		2.54	92	.10			.10					1			As above by high bio Dp in 1st half. Tr grn CuOx (Broch?) wk-mod al.
98.8	9.1		2.53	92	.41	0.06		.06	Sp-wk		.35		1	Mod lim	Mixed sulfs, cap altr. 90.8	wk alt, sp-wk cc & py mixed in leached frac's. Tr Brochantite?
105.2	6.4		2.55	100 +28	.31	.04		.04	1		.27		1	Sp hem		" " , gen. leached w/ sp cc. Sp 2nd K-Spar, wk sil'n
114.3	9.1		2.55	94	.28	.03		.03	1		.25		1	Tr lim wk-mod Tr, hem		As above. Tr grn CuOx
122.7	8.4		2.57	96	.89	.03		.03	1		.86		1		lim	wk-mod alt, sp-wk cc. Mostly leached. Sp-wk K-Spar. Tr grn CuOx
130.5	7.8		2.56	100	1.09	.10		.10	Sp		.99		1	=		As above, but sp cc.
140.1	9.6		2.55	90	1.00	.11		.11	1		.89		1	wk lim		wk alt, mostly leached w/ lim & Jar, sp-wk cc, sp 2nd K-sp
148.3	8.2		2.59	94	.33	.04		.04	Sp-wk		.29		wk	Sp lim		" " , sp leach., wk? cc ppt. on py. Tr CuOx
156.6	8.3		2.58	96	.53	.03	.85/.14	.03	1	.10	.40		1	wk lim		As preceding wk leach. sp 2nd K-spar
165.6	9.0		2.68	92	1.01	.17		.17	1	.05	.79		1	1	Mz @ 159.0 ct steep	Dp as above. Mz wk-mod alt, mod cc diss on py & in frac's.
174.8	9.2		2.62	92	1.12	.46		.46	Sp	Tr?	.66		1	wk-mod lim		Mz, as above.
177.7	2.9		2.62	93	.54	.13		.13	1	.03	.38		1	wk lim Tr hem		As above
186.1	8.4		2.61	96	.19			.04	Sp-wk	.10	.05		1	wk lim Jar		wk alt, brkn, tr-sp cc, sp. py. Plag phenos Jar. staine
194.7	8.6		2.63	95	.10			Tr	1	.10	Tr		1	Sp lim Jar		As above
202.3	7.6		2.65	100	.10			1	1	.10	1		1	Sp Jar		Sp alt, wk chlor on frac's. Sp py, tr cpy. Jar. stained fe
211.5	9.2		2.59	92	.12			1	1	.12	1		Sp-wk	1	Dp @ 208.3 ct mod chlorid.	Mz as above. Dp sp alt, wk chlor on frac's. Sp py, tr cpy
220.6	9.1		2.62	91	.10				wk	.10			1	Tr Jar		Sp alt, wk chlor, sp-wk py, tr-sp cpy. Vuggy in par
227.6	7.0		2.62	95	.10				Sp-wk	.10			1	1		As above
EOH		Avg	Rec'y	92%												

Final Depth 197.3'
Collar Elevation 2802.78'
Coordinates 40,338.56 N, 18,074.59 E
Inclination Vert.

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-189
Sheet No. 1
Date Completed 5-18-66
Logged By JAB

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay sericite	lim hem	Rock Type	Remarks
0.0-4.0	4.0	RB	-	0	-	-	-	-	-	-	-	-	—	-	-	Rock Bit
13.6	9.6	NXWL	2.49	88	0.04			0.04					WK-mod	Mod lim Sp hem	Dp	WK-Mod Alt, Silin WK-Mod lim on fracs, wk hem stain, sp Alun, xen
22.9	9.3		2.48	91	.05			.05					|	Sp Lim		WK-Mod Alt, Sil'n, WK-Mod lim, on fracs, wk hem stain WK-Mod xen
32.3	9.4		2.47	89	.06			.06					Mod	WK lim Tr Lim		WK-Mod Alt, wk Lim, WK-Mod Alun, on fracs, WK(L) hem
41.4	9.1		2.50	93	.04			.04					WK-mod	WK-mod lim WK Lim		As above, sp-wk Alun, on fracs
50.6	9.2		2.52	94	.08			.04	Tr		.04		|	WK lim Sp Lim	Patchy suls	WK-Mod Alt, sp lim, wk hem stain, sp-wk Alun, WK(L) xenos
58.8	8.2		2.56	96	.10			.04	Tr-Sp		.06		|	Mod lim Sp-wk Lim		Alt as above, sp lim, Alun on fracs WK(L) hem stain, 1st 3' WK wkpy, patchy sp-wk py, cc
67.4	8.6		2.54	95	.22			.02	|		.20		Mod	WK lim Sp Lim		Leached @ both ends, suls in middle. WK-mod alt, wk cc, wk-Mod cc, sp cpy
75.5	8.1		2.53	96	.18			.03	|		.15		|	|		As above.
83.7	8.2		2.53	97	.18			.04	Sp		.14		|	Tr Lim Tr hem	Mostly suls	As above only leach. ≥1' each end. wk cc, sp py, tr gen c
91.6	7.9		2.56	97	.11			.05	Tr		.06		WK-mod	Mod lim Sp hem	Mostly cap	Gen. leached w/ tr suls. WK-mod alt, mainly on fracs.
99.7	8.1		2.56	96	.68	0.04	33.3' @ .59/.05	.04	|		.64		|	Sp lim	Mostly suls	wk-mod alt, wk(?) cc, mainly on py, sp lim on fracs.
108.1	8.4		2.62	93	.58	.02		.02	Tr-Sp		.56		|	|		As above. Dk. cc appearing material may be chlor. in pa-
117.1	9.0		2.65	88	.53	.03		.03	|	Tr	.50		|	Sp Jar	SP? ≈ 108	Sp?, wk alt wk 2nd K-Spar, wk chlor. Sp cc, sp py? Core
124.9	7.8		2.65	100	.56	.13		.13	|		.43		Mod	|	Dp-Static HF? 124.9-130.3	St Alt, sp lim, core st. fract. WK-Mod py last 1½ - Dp - WK-Mod Alt, WK py
133.1	8.2		2.66	100	.20	.02		.02	Sp	.02	.16		WK-mod	Tr Lim |	Dp	WK-Mod Alt, wk chlor, sp-wk py tr? cc
141.0	7.9		2.66	98	.20			.01	Sp-wk	.17	.02		WK	Sp Jar		WK-Mod Alt, wk silin on qtz inlets wk py tr cc, cpy
149.5	8.5		2.68	96	.09				|	.09			Sp-wk	|		WK Alt, sp-wk py, cpy on inlets tr cc, rk lt dk gy sp
158.0	8.5		2.62	100	.07				wk	.07			|	|		WK Alt, rk dk gy, glassy, wk xenos, 20-25% qtz xenos sp py an
170.5	12.5		2.67	69	.08				|	.08			|	|		WK Alt, sp py wing sp-wk py sp cpy
178.8	8.3		2.67	92	.08				|	.08			|	|		As above
187.1	8.3		2.66	92	.08				Sp-wk	.08			|	Tr Jar		As above, tr MoS2
193.7	6.6		2.67	93	.07				|	.07			|			As above, No vis MoS2
197.3	3.6		2.64	89	.07				|	.07			|			" "
EOH			Avg Rec'y	93%												

Final Depth 198.4'
Collar Elevation 2781.90
Coordinates 40,192.50 N ; 17,814.76 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. [illegible]
Sheet No. 1 of 1
Date Completed 5-13-61
Logged By [illegible], CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay/sericite	lim/hem	Rock Type	Remarks
2.9	2.9	RB	–	0	–	–		–	–						–	[illegible]
12.2	9.3	NXW	2.45	90	0.03			0.03					wk-mod	Mod lim wk hem	DP	Wk-Mod Alt, wk lim on [illegible], Mod hem along ft [illegible] wk xenos [illegible]
22.4	10.2		2.43	81	.04			.04					1	1		Wk-Mod Alt, wk lim on Mod qtz [illegible], wk lim, Mod on [illegible], wk-Mod hem ft [illegible]
32.1	9.7		2.48	86	.03			.03	Tr		Tr		1	sp-wk lim		Wk-Mod Alt, sp-wk lim, wk hem, wk-Mod xenos
40.7	8.6		2.52	92	.02			.02					1	Sp lim		Wk-Mod Alt, sp-wk qtz [illegible], wk lim, hem, [illegible]
49.9	9.2		2.47	88	.06			.06					Mod wk-mod	Sp-wk lim		As above, slight increase of lim + hem, tr [illegible] wk xenos
59.8	9.9		2.54	83	.05			.05					1	1		Wk-Mod Alt, wk Mod lim, [illegible] so qtz [illegible], tr [illegible]
69.2	9.4		2.51	90	.07			.07					1	wk-mod lim Sp hem		Wk Alt, wk-Mod xenos, [illegible] at [illegible], wk lim on [illegible], wk [illegible]
78.8	8.6		2.55	96	.07			.07	Tr		Tr		1	Tr-sp lim		As above, tr sulfs
86.1	7.3		2.52	98	.09			.08	1		.01		1	Tr lim Tr hem		As above, no sulfs
95.2	9.1		2.64	91	.37	0.05		.05	Sp		.32		1	wk-mod lim Tr-sp hem	Sulfs [illegible]	Wk Mod Alt, Sp-wk py, cc, tr cpy, tr lim on fracs
103.5	8.3		2.61	97	.85	.17		.17	Tr-Sp		.68		wk	Mod lim		Wk-Mod Alt, sp py, sp-wk cc, sp lim on fracs
112.3	8.8		2.63	92	.28	.06		.06	Sp-wk	Tr wk cov.	.22		1	wk-mod lim, Var		Alt as above, tr sp py, cc, tr lim + [illegible]
120.4	8.1		2.68	94	.10				wk	.10	Tr		1	Tr Jar		As above
129.1	8.1		2.64	91	.07				Sp-wk	.07			1	1		Wk Alt, sp py, tr cc, sp [illegible]
137.0	7.9		2.66	97	.09				1	.09	Tr cov.		Sp-wk			Wk Alt, sp py, tr cc, sp cpy
145.6	8.6		2.79	88	.17				wk	.17			1		Y Sp? @ 191'	As above, Y Sp? – No sp but fine [illegible], [illegible] fine [illegible], wk [illegible]
153.8	8.6		2.71	97	.19				1	.19			1			Qtz blebs, wk-Mod py fine + along [illegible], sp xenos?
162.6	8.8		2.73	91	.28				1	.28		Tr MoS_2	1			As above
171.3	8.7		2.72	94	.15				1	.15		1	1		Dp @ 166.5'	Y Sp as above, Dp – wk Alt, tr [illegible] K-spar, sp py
180.5	9.2		2.67	91	.10				Sp-wk	.10		1	1			Sp alt, wk 2nd K-spar, wk chlor, sp py, tr MoS_2
188.8	8.3		2.67	94	.08				1	.08			1			As above + sil lay in sil'n
198.4	9.6		2.70	82	.11				1	.11			1			Upw num. xlno's. Sp alt, mainly as frac's. Sp 2nd K-spar, sp py, chl
E.O.H.		Avg. Rec'y = 91%														

Final Depth 305.6'
Collar Elevation 2998.27
Coordinates 39,428.76 N ; 18,106.56 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-187
Sheet No. 1 of 1
Date Completed 5-9-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Sericite	Lim Hem	Rock Type	Remarks
4.2	4.2	RB	–	0	-	-	-	-	-	-	-	-	-	-	—	Rock Bit
13.4	9.2	NXWL	2.52	92	0.03			.03					sp-wk clay-ser	wk lim wk-Mod hem sp-sec sp-wk lim	Dp	wk-Mod Alt wk qtz vning, sp-wk lim, Mod hem, wk Alun
22.7	9.3		2.50	87	.02			.01	tr	tr	.01			wk-sec	sp sulfs cite @ 22.6'	As above, sp tot sulfs @ end run
31.6	8.9		2.54	93	.02			.02							Patchy sulfs	wk Alt. silin on qtz vns, sp lim, wk hem tr Llm
41.5	9.9		2.47	84	.03			.03					wk-Mod clay-ser	wk lim wk-Mod hem sp-wk lim sec	qtl cap	wk-Mod Alt, silin. wk lim on fracs wk hem throuout.
51.1	9.6		2.48	90	.02			.02								Alt as above, wk lim on fracs, wk hem as above, wk white clay on lim
61.2	10.1		2.42	86	.02			.02						wk lim wk hem tr sec		wk Alt, wk silin on qtz vns, wk lim, hem, tr tot sulfs
70.3	9.1		2.42	93	.01			.01								wk-Mod Alt, wk silin on qtz inlets wk lim, hem. sp wk clay vns
81.0	10.7		2.44	86	.01			.01								As above, tr tot sulfs, (py, cc)
90.2	9.2		2.47	99	.02			.02						wk lim hem tr llm		Mod Alt, wk silin on qtz inlets, wk lim on inlets Mod hem stain
99.3	9.1		2.48	96	.02			.02						wk lim hem sec llm		wk-Mod clay on inlets wk-Mod Alt, silin, wk lim, wk-Mod hem
109.0	9.7		2.43	90	.03			.03					Mod	sp lim wk hem		wk-Mod Alt, wk qtz vning, sp wk lim wk hem wk clay vns
114.6	5.6		2.42	91	.05			.03	Tr		.02		wk-mod	wk hem	Patchy sulfs Sulfs @ 114.6	Alt as above, sp lim, wk hem, sp py tr cc, wk clay vns
117.9	3.3		2.47	87	.56	0.01		.01	Tr-sp		.55		Mod	tr lim		wk-Mod Alt, wk qtz inlets, wk py cc
127.3	9.4		2.47	94	.54	.01		.01	wk		.53					Alt as above, slight increase in qtz vning, wk py sp-wk cc, tr cpy
136.1	8.8		2.59	98	.41	N:1		N:1		Tr	.41					As above, increase cc to wk(+)
142.3	6.2		2.46	95	.71	.01	57.7'	.01			.70					wk-Mod Alt, wk qtz vns, wk py wk(+) cc tr cpy
144.7	2.4		2.37	99	.46	.01	@	.01	sp ~~sp-wk~~		.45		st		Mz @ 142.4	Mz carries 2-3% qtz blebs, Mod Alt, wk linely diss py, sp-wk cc
152.4	7.7		2.52	100	2.07	.03	.70/.01	.03	sp-wk		2.04		Mod			Mod Alt, wk diss py Mod somewhat patchy cc tr CuSO4
163.3	10.9		2.54	86	.42	.01		.01	wk		.41				Dp @ 152.4	wk-Mod Alt, wk silin on wk qtz vning, wk py wk cc
172.3	9.0		2.58	92	.45	.01		.01	sp-wk	Tr	.44	Tr MoS_2				wk-Mod Alt wk qtz-py vning w/ wk py cc, wk veins of qtz/fe + other mo seeds?
181.3	9.0		2.52	93	.31	.01		.01	wk		.30					As above, slight increase in cc, grain size & vein, veins + qtz blebs up to 3-4 mm
190.0	8.7		2.54	94	.24						.24	Tr MoS_2				As above
198.8	8.8		2.59	92	.28				sp-wk	.01	.27					As above
207.2	8.4		2.65	96	.30						.30					As above, mod alt bio. (hypocomia)
216.1	8.9		2.69	88	.25				wk		.25	Tr MoS_2				wk-Mod Alt, silin along qtz-py veinlets wk-Mod veins wk py sp-wk cc
225.1	9.0		2.69	90	.16						.16		wk-mod			As above
234.9	9.8		2.57	85	.40	.01		.01	wk-Mod		.39					wk Alt, wk qtz vning, wk py sp cc, wk-Mod veins w/ some quartz chert or silica inclusions
244.1	9.2		2.70	88	.17				wk		.17					Alt & Min as above, increase in veins "chert" ~~veins~~ is that in place may be from greater depth
253.3	9.2		2.69	88	.18						.18					As above
262.2	8.9		2.57	94	.21						.21					As above, foliation of dark veins in Dp suggest a dip of 40-45°
271.1	8.9		2.69	93	.07						.07		tr-sp	tr lim		wk Alt, sp-wk py frcs, foliation more pronounced, may indicate approach to base of Dp?
280.2	9.1		2.71	90	.04				sp-wk	.04?						wk Alt, sp-wk qtz vning, sp-wk py decrease in veins increase in veins
289.2	2.3		2.73	99	.05					.05?			tr			As above
290.8	8.3		2.69	97	.03					.03			tr-sp			wk Alt, Mod silin wk py wk drawn-out laminated ~~bit veins~~ Dip as above
299.9	9.1		2.64	91	.05				wk	.05			tr			As above, dip bending steps @ 296' sp cpy w/ qtz
305.6	5.7		2.64	95	.08					.08			tr-sp			wk Alt, silin wk py, tr cpy, MoS_2 Mod text w/ ~~pkg veins~~ small qtz veins
E.O.H.		Avg.	Rec'y=	91%												

Final Depth 320.2'
Collar Elevation 2921.42
Coordinates 39,902.45 N; 17,960.31 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-186
Sheet No. 1 of 1
Date Completed 5-10-61
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay sericite	lim hem	Rock Type	Remarks
5.0	5.0	RB	-	0	-	-	-	-	-	-	-	-	—	—	—	Rock Bit
13.8	8.8	NXW	2.40	96	.02			.02					WK-Mod clay sec	WK-Mod lim, sp lim	DP	Mod Alt, Mod hem stain, wk-Mod qtz veining, sp Alun
23.9	9.1		2.41	94	.03			.03					1	WK-Mod lim, sp lim, WK hem		As above
32.0	9.1		2.52	91	.03			.01					1	WK lim, sp lim, WK hem		Mod Alt, Sil'n, Mod hem stain WK lim, sp-WK Alun
41.1	9.1		2.45	94	.01			.01					1	WK hem, WK-Mod jar	Patchy Sulfs	WK-Mod Alt, Sil'n, sp py tr MoS2, sp-WK lim, hem, WK Al
50.3	9.2		2.49	96	.11			.02	tr-sp	tr	.09		1	WK lim, jar, WK hem		WK-Mod Alt, WK sil'n on qtz vns, WK py, cc, WK-Mod
60.0	9.7		2.63	91	.17			.02	Sp	.05	.10		1	Sp lim, hem, jar		WK-Mod Alt, WK sil'n on WK-Mod qtz vns, WK py, sp cc, sp hem, WK-Mod Alun
69.6	9.6		2.58	88	.06			.03	1	tr	.02?		1	sp lim, jar, WK hem, WK-Mod Alun	Sp @ 66.6	Dp-Mod Alt, sp py, WK-Mod hem stain, WK Alun, Sp-Mod Alt, WK-Mod, patchy Mod cc, WK Alun
78.6	9.0		2.34	100	.05			.05					Sp Mod clay sec, Mod-st dry sec	sp hem, WK-Mod lim, WK	All Cap	St Alt, mod v. fine qtz veining, Mod-st hem stain, WK-Mod Alun
87.5	8.9		2.34	97	.04			.04						sp hem, WK-Mod lim, WK		As above, speckled text, white around py cavities w/ hem, 1 mm ooi
96.3	8.8		2.28	93	.07			.07					1	Mod lim, WK hem, WK Alun	Vns	St Alt, sp clay inlets, Mod lim, hem
105.0	8.7		2.27	98	.06			.06					WK-Mod	sp lim, WK Alun	Dp @ 96.9 patchy Sulfs	Mod-St Alt, Mod qtz veining, WK lim, WK-Mod hem, WK Alun, sp tng w/ Alun
113.5	8.5		2.45	92	.04			.04	Sp		.02		1	WK hem, Jar		Mod-St Alt, WK-Mod sil'n on Mod qtz veining, Alun + tng as above, sp py, tr cc
122.3	8.8		2.63	86	.42	Nil		Nil	WK		.42		1	Tr lim	Sulfs @ 113'	WK-Mod Alt, WK(+) py WK (-) cc, tr cpy assocd w/ WK-Mod
133.8	11.5		2.62	74	.24	Tr		Tr	Sp-WK		.24		Mod			As above
143.2	9.4		2.63	84	.47	Nil		Nil	1		.47	Tr MoS2	1			WK-Mod Alt, WK sil'n along qtz vns, WK py cc tr cpy cu ok
154.6	11.4		2.58	79	.24	.01		.01	1	Tr	.23		1			WK-Mod Alt, WK sil'n on WK-Mod qtz inlets, WK clay inlets, WK py on vns
162.9	8.3		2.78	92	.40	.01		.01	1	.02	.37		1			Alt, sil'n as above, WK py cc, sp cpy tr cu ok on vns
171.8	8.9		2.75	87	.22	.01		.01	1	Tr	.21		1			Alt + Min as above. Dp text - finely veined w/ 3.2 mm qtz
180.9	9.1		2.76	87	.23			Tr	1		.23		1	Sp lim, jar		Alt + Min as above, slight increase in diss cc on py, tr
190.8	9.9		2.65	82	.29			Tr	1		.29		1	1		WK-Mod Alt, WK sil'n on qtz inlets, WK py, WK-Mod cc on inlets
199.5	8.7		2.58	93	.38	.01		.01	1		.37		1	1		As above, tr lim, grn iron stained clay + cuprite on fracs
208.3	8.8		2.60	92	.59	.01		.01	WK	Tr	.58		1	1		As above, tr cpy diss
217.4	9.1		2.70	89	.21			.01	1		.20		1	1		WK-Mod Alt, WK sil'n along inlets, WK py, WK diss cc on
225.8	8.4		2.67	95	.28			.01	1		.27		1	Sp-WK lim, tr-sp jar		Alt as above, WK-Mod py WK py as above, tr lim on fracs
234.5	8.7		2.78	87	.31	Nil		Nil	1		.31		1	tr lim		WK-Mod Alt, WK sil'n, WK xenos, WK py sp-WK cc on inlets, py tr lim
243.6	9.1		2.64	88	.52	.01		.01	1	tr	.51		1	1		As above
252.0	8.4		2.71	90	.17				1		.17		WK-Mod	1		As above, tr cpy
260.4	8.4		2.63	95	.10				1		.10		WK	Sp lim		WK-Mod Alt, sil'n WK-Mod py sp-WK cc tr cpy, tr lim
268.2	7.8		2.63	98	.07				1	.07?	tr		Sp-WK	1		WK-Mod Alt, sil'n, WK py tr cc, cpy tr-sp lim on fracs
276.9	8.7		2.73	95	.10				1	.10	tr?		Sp	1	Sp @ 270.6	Dp as above, Sp-WK-Mod Alt, sil'n, WK-Mod py tr cc, c
285.5	8.6		2.73	97	.17				1	.17			1	1		As above, text trends to Mz, but zones slightly larger
293.9	8.4		2.74	95	.18				1	.18			tr-Sp	1		typical Sp, WK Alt of zone, wing to grn oxide?
302.6	8.7		2.74	94	.18				1	.18			1	1		Mod Alt, sil'n, WK py tr cpy, cc text as above
312.2	9.6		2.76	90	.13				1	.13			1	1		As above, patchy st sil'n, Alt obliterates Mz text
320.2	8.0		2.76	96	.15				1	.15			1	1		Alt as above, WK py, tr cpy, cc tr lim on fracs
E.O.H.		Avg. Rec'y =		91%												

Final Depth 318.0'
Collar Elevation 2985.72
Coordinates 39,432.58 N ; 17,756.28 E
Inclination Vertical

ASARCO
GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-185
Sheet No. 1 of 1
Date Completed 5-3-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
8.8	8.8	RB	–	0	–	–	–		–	–	–	–			–	Rock Bit
19.0	10.2	NXWL	2.18	83	0.52	0.26		.26			.26?		Mod-st clay	st lim	Hf	grn Hf mainly clay pass. serpentine st lim stain nu v ox wol
29.0	10.0		2.16	87	.22	.04		.04			.18?				Dp@24.8	Hf as above, Dp-Mod Alt, wk lim, wk qtz veing tr cuox
37.5	8.5		2.52	94	.05			.05					wk-Mod clay	Mod lim wk-Mod hem		Mod Alt, wk(+) lim, hem stain, tr Alun, wk qtz veing
46.0	9.5		2.52	88	.02			.02	tr				wk-Mod clay-ser	wk lim " hem	Apl.@45.1	Mod Alt, wk-Mod lim wk Alun w/sp fuchsite, wk hem stain Apl @ and run, wk py cc, tr cp
56.0	9.0		2.59	92	.02			.02	1		tr		1	tr lim wk lim " hem		Mod Alt, wk silin on qtz veinlets wk-Mod lim, hem sp py cc wk Alun ons
65.6	9.6		2.47	92	.02			.02					1	wk lim sp hem tr lim	Dp @ 56.0	CT sharp. Dp in wk-mod alt, wk silin. Gen. wk leached tr py, cc and hem stain.
74.4	8.8		2.61	93	.02			.02					1	wk lim wk hem		wk-mod alt, st. qtz-ser. veing. wk alunite veing. Tr py, cc.
83.5	9.1		2.46	94	.02			.02					1	tr lim		As above except mod alunite veing.
92.2	9.2		2.54	93	.03			.03					Mod clay ser	wk-Mod lim " " hem		Mod Alt, wk lim, hem, Alun along fracs tr sulfs
102.1	9.4		2.50	98	.02			.02	tr		tr?		1	wk lim tr hem		wk-Mod Alt, wk lim, sp hem sp Alun on fracs
111.6	9.5		2.58	91	.03			.03	1		tr		1	wk lim wk-Mod hem tr lim	Sulfs @111.6	Mod Alt, wk lim, Mod hem, wk-Mod Alun on fracs tr py, cc
115.8	4.2		2.69	100	.26			—	wk-Mod		.26		1	—	-115.8	wk-Mod Alt, wk py, wk-Mod cc. sp cpy sulfs diss + on frac
121.0	5.2		2.49	100	.02			.02					1	wk lim wk-Mod hem tr ser	Apl. circa 119'	Mod Alt wk lim, wk-Mod hem sp sulfs
129.3	8.3		2.38	97	.03			.03					1	sp lim wk-Mod hem	Dp @ 122.0'	Mod Alt, Mod lim, hem sp Alun on unlets
138.9	9.6		2.33	94	.03			.03					Mod-st clay-ser	wk hem Mod-st hem sp lim		Mod alt, mod-st hem, wk lim, " " " , qtz-ser veing.
148.5	9.6		2.33	98	.09			.03	wk		.06		Mod clay ser	wk lim Mod hem tr lim	Sulfs @ 145.0	As above Sulfs have wk py, sp cc. Also ser. leached veins.
157.9	9.4		2.30	98	.04			.02	sp		.02		1	sp lim Mod hem Mod lim	cap @ 149.5	Sulfs as above. Cap is mod alt, st. hem, wk-mod lim, qtz veins
161.5	3.6		2.46	97	.05	.01		.01	tr		.04		st ser	tr lim Mod hem wk lim		As cap above. No qtz veins.
167.5	6.0		2.37	93	.71	.01	34.8' @ .68/.02	.01	wk		.70		Mod-st ser wk clay	—	Sul. CT @ 161.6 Mz @ 163.0 Dp 167.7 – 174.5	Dp mod. alt. CT ≈ 10-15°. Mz mod alt, wk py, wk cc on py.
177.5	10.0		2.48	90	.69	.01		.01	wk	.05	.63		Mod-st clay-ser			Alt as above. Dp in minor Mz. wk py, wk cc
187.2	9.7		2.48	98	.67	.02		.02	1	tr	.65	tr blue cuox	Mod-st clay wk epidote		Mz	Mz mod alt, last ½' still mod alt but at 2nd bio? maker and R. wk
196.3	9.1		2.63	92	.65	.03		.03	wk-Mod(+)		.62		Mod clay ser	sp lim		Mz not "normal" ≈ ½ way between "sp" & Mz. Ok. wk-mod alt, wk-mod
205.9	9.6		2.55	92	.22	.02		.02	1		.20		Mod-st clay ser			BK as above. Mod-st alt, wk-mod py, wk? cc.
215.8	8.9		2.56	97	.25	Nil		Nil	1	.25	tr?		wk clay ser	tr lim		alt decr to wk @ end w/ sp 2nd K-spar. wk-mod py, sp cc, tr cpy
223.5	8.7		2.70	96	.15				wk(+)	.15			sp-wk clay-ser	tr lim		Sp-wk alt, wk-mod py, sp. Jar. clay on fracs. Tr cc? sp cpy.
231.5	8.0		2.65	100	.20				1	.17	.03		1	1		As above
240.5	9.0		2.65	88	.27				wk	.17	.10		wk-Mod clay-ser			As above w/ sp 2nd K-spar to 234.1 then "normal" Mz, wk-mod alt, wk py, wk cc, T
250.2	9.7		2.63	92	.13				wk-Mod	.06	.07		1			wk-mod. alt, sp 2nd K-spar, wk py, sp cc. wk silin.
252.1	1.9		2.66	100	.14				1	.11	.03		wk clay-ser			As above.
261.0	8.9		2.64	93	.09				wk	.09			1			wk-Mod Alt, sp-wk py tr? cpy, 3-5% diss tr min which is p
269.3	8.3		2.63	98	.11				1	.11	Tr		wk-mod			Alt, bio. w/ sp assoc. py Alt as above, wk py
278.4	9.1		2.66	95	.14				wk-mod	.14	Tr?	Tr MoS2	1			wk-Mod Alt ≈ 5% Alt sio, wk py tr MoS2 on qtz vns
287.3	8.9		2.67	95	.12				1	.11	.01		1	Tr Ja-(?)		wk-Mod Alt. patchy Mod silin, wk py tr cpy tr Hf @ 286.4'
296.7	9.4		2.65	92	.11				1	.10	.01	Tr MoS2	1	1		wk-Mod Alt, silin, wk py, tr. cpy
306.3	9.6		2.65	92	.12				1	.11	.01	Tr Sp. hem	1	1		wk-Mod Alt, silin wk py tr cpy 3-5% Alt sio w/ assoc p
318.0	11.7		2.63	82	.23				1	.23		1	wk	1		As above, sp cpy
E.O.H.		Avg. Rec'y = 93%														

Final Depth 280.0'
Collar Elevation 2973.68
Coordinates 39,705.87 N; 18,218.87 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-184
Sheet No. 1 of 1
Date Completed 4-30-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	limonite hem	Rock Type	Remarks
5.0	5.0	RB	—	0	—			—					—	—	—	Rock Bit
14.5	9.5	NXwl	2.37	86	0.03			0.03					Mod	Mod LLm, Mod lim, wk hem	Mz	Mod clay Alt, s/lim diss. out from Mod Alt UNS, wk lim, Mod hem stain in ground mass
23.6	9.1		2.47	89	.03			.03								Mod clay, sec Alt, s/lim as above, wk-lim, Alun, on faces Mod hem stain
33.8	10.2		2.42	80	.02			.02						wk LLm, wk lim, wk-hem	Dp @ 26.0'	Mz as above, Dp - Mod Alt Sp lim, Alun on faces, Mod hem stain
39.4	5.6		2.48	82	.03			.03						wk-mod hem, mod lim		Mod Alt wk s/lim, wk+ lim, Mod hem stain thruout the ground mass
48.6	9.2		2.36	94	.04			.04						Sp hem, wk-mod lim	Mz 40.1 - 47.3 Sp sulfs	Mod alt, mod lim & hem. thru-out, ct's broken.
58.2	9.6		2.35	91	.04			.03	Sp		.01				Dp	As above + mod 1/4" alunite uns. sulfs @ 56.7', mainly sp py. Tr c
66.9	8.7		2.28	97	.12			.02			.10			Sp hem, Tr hem	Cp @ 60.7	Mod alt. sp thin alunite veins. wk py-cc in sul. zone. Cpy mod lim.
70.1	3.2		2.29	98	.06			.04	Tr		.02		Mod-st.			Mod-st alt. All cap. wk-mod lim.
79.2	9.1		2.50	94	.27			.01	sp-wk		.26		Mod	Tr lim, wk-mod LLm, Mod lim, wk hem	sulfs @ 70.1 Cap @ 79.2	Mod alt, sp-wk py, wk-mod cc, gen. on py. Tr-Sp $CuSO_4$
88.6	9.4		2.56	92	.04			.03	Tr-Sp		.01					" " gen. leached w/ mod lim, hem. Tr $CuSO_4$. Tr sulfs.
94.6	6.0		2.50	85	.29	0.02		.02	sp-wk		.27		Mod-st		sulfs. ct @ 88.6 Mz ≈ 97.8	Mod-st alt, wk-mod cc, py, cc v/fine-grained. Tr $CuSO_4$
102.8	8.2		2.55	94	.49	.02		.02	wk		.47					" " wk " " " " " ct. v/broken
111.1	8.3		2.49	98	.42	.01		.01	sp-wk		.41					as above, except wk py, wk cc, wk chlor?. Core v/broken
119.4	8.3		2.50	93	.49	.02		.02			.47					Mod-st Alt, wk py, wk cc finely diss. thruout rk tr blue cox
127.7	8.3		2.47	95	.62	.01	67.4' @ .59/.02	.01		.05	.56					As Above, poss. slight increase in cc to wk-mod
136.4	8.7		2.48	93	.64	.02		.02	wk	.10	.52					Mod-st Alt, wk-Mod py cc. tr cpy, blue cox
144.7	8.3		2.48	96	.62	.02		.02	sp-wk	.05	.55					As Above
153.3	8.6		2.60	93	.81	.02		.02		.02	.77					Mod-st Alt wk-Mod py cc finely diss thru RK
162.0	8.7		2.52	94	.50	.01	110.1' @ .53/.01	.01		.02	.47				Dp @ Tr @ 158.4	Mz As above Dp - Mod Alt wk py, cc along unlets
170.6	8.6		2.43	94	.38	.01		.01		-	.37		Mod			Mod alt, mod 1/16" veins, mod cc, sp wk py.
179.4	8.8		2.50	93	.34	.01		.01			.33					" " " , mod-st cc., sp-wk py, Tr $CuSO_4$
188.6	9.2		2.53	94	.28	.01		.01		tr	.27	tr Cu ox				As above
196.2	7.6		2.52	100	1.01	.01	16.1' @ .69/.02	.01		tr	1.00					wk-mod alt, mod cc, sp py, tr $CuSO_4$
204.7	8.5		2.59	92	.40	.02		.02			.38					As above
213.7	9.0		2.65	88	.24	.01		.01		tr	.23	tr Cu ox				wk. alt, w numerous X-cuts, wk-mod cc, sp-wk py, tr $CuSO_4$
221.2	7.5		2.65	100	.23			.01			.22		wk-Mod			As above plus wk 2nd ? bio.
228.9	7.7		2.64	99	.25			.01		.02	.22	tr Cu ox	wk			WK Alt, wk py sp cc tr? cpy
237.6	8.7		2.70	90	.06			.01	wk	.05	tr					WK Alt wk py on UNS tr cc, cpy
246.2	8.6		2.67	94	.07			tr		.07						As above, wk 2nd feld along unlets
253.5	7.3		2.67	100	.04				sp-wk	.04			sp-wk			As above
263.7	10.2		2.67	82	.03				sp	.03						As above
272.7	9.0		2.69	92	.04				wk	.04			sp			As above
280.0	7.3		2.65	93	.07					.07			tr-sp	tr lim		Dp, sp alt, wk-mod s/lim, wk 2nd K-spar on veins, num X-cut's. tr cpy. sp-wk py
E.O.H.		Avg. Rec'y =		92%												

Final Depth 274.4'
Collar Elevation 2697.20
Coordinates 40,352.54 N ; 17,521.62 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-183
Sheet No. 1 of 1
Date Completed 4-25-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay ser.	lim hem	Rock Type	Remarks
0.0 - 3.6	3.6	RB	—	—	—								—	—	—	Rock Bit
12.2	8.6	NXWL	2.50	91	0.05			0.05	-	-			Mod clay, ser	WK-Mod lim, sp hem	Dp	Mod Alt, wk-Mod lim, wk hem stain, wk Alun on fracs. sp qtz veins
21.6	9.4		2.41	89	.21			.21					1	WK-Mod lim wk hem	sp @ 17.5 - 18.0' Dp	Mod Alt wk-Mod lim, wk-Mod hem tr lim, qtz sp-st Alt wk tr hem
32.6	11.0		2.42	79	.20			.20					1	1		Mod Alt, Mod-st silin, wk-Mod hem wk lim @ 27.4 st Alt core reduced to gravel
41.5	8.9		2.36	93	.10	0.03		.03			.07		st clay ser?	sp-wk lim	Sp ?	st Alt wk lim, grn iron stain core reduced to gravel
52.8	11.3		2.34	77	.24	.15		.15			.09		1	wk lim tr cuox	1	As above, st Alt. RK is prob sp but ID is uncertain
56.0	3.2		2.31	85	.29	.20		.20			.09		1		Mz Suls @ 56.0	st Alt wk-Mod diss lim, wk hem
60.6	4.6		2.58	92	.77	.19	21.6' @ .73/.07	.19	tr		.58		Mod-st clay, ser	tr lim sp cuox		Mod-st Alt, tr-sp py, wk-Mod (t) cc
70.1	9.5		2.65	84	.85	.05		.05	1		.80		1	1		St Alt, Sp py, Mod cc, tr cpy tr lim on fracs
77.6	7.5		2.58	100	.54	.01		.01	sp-wk	tr	.53		Wk-Mod	tr-sp lim	Dp @ 70'	Wk-Mod Alt, silin, wk py sp-wk cc
84.4	68		2.58	100	.11	tr		tr	1	tr	.61		Wk clay, ser			Wk-Mod Alt, silin, wk py, sp cc, cpy
94.0	9.6		2.58	79	.11				sp		.11		1			As above
101.9	7.9		2.58	94	.08				wk		.08		1			Wk-Mod Alt, Mod silin, wk py tr cc, cpy, MoS2
111.0	9.1		2.58	86	.11				sp-wk	.06	.05		1			Wk-Mod Alt, silin wk(t) 2nd k spar sp-wk py, tr cc, cpy
120.0	9.0		2.57	93	.13				wk	.06	.08		1			As above, tr 2nd k spar
129.1	9.1		2.65	94	.15				1	.15			sp to wk			Wk-Mod Alt, patchy st silin sp-wk py, cpy tr cc, MoS2
138.1	9.0		2.59	91	.09				1	.09			1			Wk-Mod Alt, wk(t) 2nd k spar on inlets, sp-wk py sp cpy tr cc
147.2	9.1		2.66	89	.08				sp-wk	.08			1			Alt as above, sp-wk py sp cpy
155.3	8.1		2.67	97	.12				wk	.12			sp			Wk-Mod Alt, silin, wk py sp-wk cpy tr MoS2
164.2	8.9		2.70	91	.10				1	.10		tr MoS2	sp-wk			As Above
172.4	8.2		2.62	93	.09				sp-wk	.09		1	1			Wk-Mod Alt, wk silin, sp py tr cpy, cc? MoS2
180.4	8.0		2.63	96	.38				wk	.38			Mod ser, chlor.		Sp @ 173.5	Dp as above, sp-dk gy rk 2-5%, pknos rest ground Mass Nf-like sp-wk py, cpy tr MoS2
188.7	8.3		2.69	93	.29				1	.29			1		Dp @ 187.7	Sp as above, Dp-Wk-Mod Alt, silin, tr-sp py tr MoS2
196.7	8.0		2.63	98	.14				1	.14			wk ser,			As above
206.4	9.7		2.60	88	.33	Tr		Tr	1	.33			Mod ser, clay, chlor.			Wk-Mod Alt, silin, sp py, cpy MoS2, cont of run - wk brxiation wk-Mod chl
211.1	4.7		3.59	88	1.36	.01		.01	Mod	1.35			Mod-st		Hf? @ 207.8	Dp @ cnt. st Alt & silif. Mod cpy - Hf? dk grn-bk st-Mass py wk py, cpy wk-Mod chl
213.7	2.6		2.59	80	.28	.01		.01	wk	.27			wk-Mod		Dp @ 211.1	Mod Alt, Mod-st silin, Dp has qtzitic aspect tr-sp py, cpy
222.5	8.8		2.61	89	.11				sp-wk	.11			sp-wk			Wk-Mod Alt, silin, sp-wk py tr? cpy
230.3	7.8		2.52	100	.15				1	.15		tr MoS2	wk-mod			As above wk py
237.1	6.8		2.55	89	.18				wk	.18		1	1			Wk-Mod Alt, silin, wk py tr? cpy
246.3	9.2		2.59	88	.25				1	.25			1			As above
254.9	8.6		2.64	93	.36				1	.36		tr MoS2	1			Wk-Mod Alt, wk py wk(t) cpy assoc. w/ chlorite Alt last ½ run tr? cc
260.8	5.9		2.62	95	.30				1	.30			1			Alt As above chlor + cpy d up off toward end of run
269.9	9.1		2.61	95	.14				1	.12	.02		wk			Sp alt. RK almost fresh except for ser. on frac's. Mod Xeno mat. wk py, sp cpy, tr MoS2
274.4	4.5		2.60	95	.12				1	.12			sp-wk			As above. wk 2nd K-spar, sp chlor. wk silin.
EOH		Avg. Rec'y =		90%												

Final Depth 236.9'
Collar Elevation 2793.88
Coordinates 39,788.00 N ; 17,556.21 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-182
Sheet No. 1 of 1
Date Completed 4-18-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay ser	lim hem	Rock Type	Remarks
0.0 - 4.0	4.0	RB	-	0	-	-	-	-	-	-	-	-	-	-	-	Rock Bit
12.5	8.5	NXWL	2.49	91	0.09			0.09					Mod	wk lim wk LLM Mod hem	Dp	wk-Mod Alt, wk lim, wk + hem stain Sp-wk LLM on fracs
22.7	10.2	1	2.52	84	.06			.06					1	1 wk-mod lim		Mod Alt, wk lim wk-Mod hem stain, wk hem, LLM on fracs, sp-wk
32.1	9.4		2.55	94	.02			.02					1	wk lim wk-mod LLM		Mod Alt, wk-Mod lim, hem stain, tr CuOx, wk xenos Alunite
41.1	9.0		2.50	91	.03			.03					wk-mod	wk-mod lim		As above.
49.5	8.4		2.52	95	.06			.02	sp		.04		1	wk-mod lim	uls ≈ 44'	Alt as above, Wk lim, hem, tr cuOx wk py, Sp-wk cc, sp c
58.9	9.4		2.62	93	.11			.02	wk	Tr	.09		1	Mod lim sp lim		Wk-Mod Alt, wk-Mod py, WK(A) cc, wk c lim on fracs
68.2	9.3		2.62	95	.18			.02	1	.	.16		1	wk lim Tr LLM		Wk-Mod Alt, wk py, wk-Mod cc wk lim, tr cuOx
77.7	9.5		2.63	94	.12			.02	1		.10		wk	1		As above, rk appears to be ≈ 15% Qtz, wk-Mod cc
87.3	9.6		2.61	92	.12			.02	1		.10		wk-mod	wk-mod lim		As above, wk py, wk cc diss along xyl boundrys
96.0	8.7		2.66	94	.35	0.01		.01	1	.02	.32		wk	1	Mz ? @ 87.5'	Ct. Sil'd, grad? st f.gr. bio (2nd?) wk-mod alt py, wk-mod leaching of Mz, tr Mo
104.8	8.8		2.65	91	.40	.01		.01	sp-wk		.39		1	1		As above plus sp 2nd K-Spar. May actually be Coarse-gr. Sp instead
113.6	8.8		2.66	97	.26	Tr		Tr	wk	.03	.23		1	wk lim sp-wk lim		wk alt, partly leached, tr cc, tr cpy, sp-wk py. Incr. qtz
122.1	8.5		2.65	94	.10			1	1		.10		1		Dp @ 119.4 CT. Bx fr. 115.8-119.4	Sp-wk alt, mod. sil'n, sp-wk py, tr MoS_2. Bx mainly Mz? frag
131.5	9.4		2.63	94	.08				1	.06	.02		sp-wk	sp Jar		Sp alt, v/many xeno's. Sp 2nd K-spar. wk py.
140.6	9.1		2.62	94	.15				1	.13	.02	Tr MoS_2	1	1		As above. One aplitic Xeno.
149.6	9.0		2.74	89	.14				1	.12	.02	1	sp	Tr Jar.		Sp alt. qtz-felds. rich Dp in wk bio (2nd) Tr MoS_2, Sp cpy almost resembles A'K.
158.2	8.6		2.66	93	.14				1	.14		1	1			As above plus Sp 2nd K-spar.
167.5	9.3		2.65	92	.13				wk-mod	.13		1	1			As preceding + ½" py vn.
176.7	9.2		2.66	91	.21				wk	.21			1			As before. Alt almost fresh. wk-mod sil'n.
185.8	9.1		2.64	96	.13				1	.13			1		"Sp" @ 184.8	Dp as above. "Sp" black, fine-grained, in wk cpy.
197.7	11.9		2.72	78	.33				wk-mod	.33			sp-wk ser.			wk-Mod Alt, wk-Mod(+) py, tr-Sp cpy suls assoc w/ Alt bio
205.2	7.5		2.73	100	.24				1	.20	.04		1			Wk-Mod(+) Alt, wk-Mod py, sp-wk cpy tr cc Mz? ≈ 10% bio (Alt)
213.9	8.7		2.59	93	.16				1	.16			1		Dp @ 209.7	As above Dp Mod Alt wk-Mod sil'n, Sp-wk py sp cpy tr cc MoS_2
223.2	9.3		2.63	91	.07				wk	.07	Tr		Sp			Mod Alt, sil'n sp py tr cpy, MoS_2 cc
232.2	9.0		2.70	93	.12				1	.12			1			As above, Tr chlor.
236.9	4.7		2.61	95	.14				1	.14			1			Mod Alt, wk-Mod sil'n wk py sp chlor
E.O.H.		Avg. Rec'y =		92%												

Final Depth 382.8'
Collar Elevation 3129.80
Coordinates 39,020.15 N ; 17,938.06 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-181
Sheet No. 1 of 2
Date Completed 4-21-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu: Total	Non-S	Average	Mineralization: Oxides	Pyrite	Cpy	Cc	Other	Alteration: clay ser	lim hem	Rock Type	Remarks
5.0	5.0	R.B.	—	0	–	–	–	—	–	–	–	–	–	—	–	Rock Bit
14.0	9.0	NXWL	2.64	93	.02			.02				tr Cus.	Sp	Mod lim tr LLM	Qtzite	WK Alt, bleaching + silin along unlets WK lim, LLM after finely diss cc? tr cc, py tr CuOx
23.1	9.1		2.57	96	.02			.02					1	WK-Mod lim " " sp-WK LLM		Mod Alt, Ser of fld in Qtzite, Mod lim, hem stain, Mod lim. WK + LLM (Cu ss)
34.1	11.0		2.57	87	.03			.03					1			WK(+) Alt, WK lim, WK-Mod hem WK(+) finely diss LLM
43.6	9.5		2.62	94	.02			.02					1	WK-Mod LLM	Suls ≈ 35'	WK(+) Alt Sp py cc (poss. cov) cpy, WK lim, hem tr LLM on fracs
52.7	9.1		2.61	100	.01			.01					1	WK hem WK LLM WK lim		WK(+) Alt, Sp py tr-Sp cc, cpy, WK lim, hem, Sp LLM on fracs
62.1	9.4		2.63	93	.01			.01					Tr-Sp	sp-WK LLM		As above
71.3	9.2		2.63	95	.01			.01					1	WK-Mod hem WK-Mod LLM WK-Mod lim		As above, sp py, cc, tr-Sp cpy lim as above
80.3	9.0		2.62	95	.01			.01					Sp	Mod hem Mod LLM WK lim		WK(+) Alt, tr-sp py, cc, cpy → p lim, WK-Mod LLM on fracs
89.3	9.0		2.60	96	.01			.01					Tr-Sp		Cap ≈ 80'	sp flt bx in places WK-Mod Alt, WK-Mod(+) LLM on fracs
99.3	10.0		2.60	89	.04			.04?	Tr				1	WK-Mod hem WK-Mod lim		WK-Mod Alt, 3 thin beds of sltst, dip @ ≈ 35°, 1st part run LLM as above, tr suls
108.4	9.1		2.58	94	.05			.01	Sp			cov. .04	Tr	Tr hem Sp lim	Suls ≈ 100'	Alt as above Sp py tr? cc sp LLM, tr lim
117.7	9.3		2.65	91	.03			Tr	Sp-WK			.03	1	Sp Jar. WK lim, Jar		WK-Mod Alt, sp-WK py tr-sp cc, diss + on fracs sp lim tr MoS2
127.6	9.9		2.64	89	.01			Tr	Sp			.01	1	Sp hem		As above
136.6	9.0		2.63	95	.02			1	Sp-WK			.02	1	WK-mod lim, Jar		WK-Mod Alt, wk feld grains in qtzite (as above) sp py tr cc, Mos
145.8	9.2		2.66	94	.01			.01	1			Tr	1	Sp hem		Alt as above, Qtzite becoming coarse grained w/ 1/4" qtz grains, sp py tr cc
155.5	9.7		2.62	93	.01			.01	Sp			Tr MoS2	1	Sp-WK hem		As above
164.7	9.2		2.58	95	.01			.01	Sp-WK			1	1	WK-mod lim Sp hem		WK-Mod Alt, increase in porosity, sp lim, WK-Mod hem, sp-WK py
176.1	11.4		2.63	70	.01			.01	Sp				1	WK-Mod lim	Bedding ≈ 80°	Partly leached w/ tr clay on frac's. Sp-WK py, tr cov. tr cc
184.2	8.1		2.64	95	.02			Tr	Sp-WK	.02?	cov.		1	Sp lim Tr hem		" " w/ mod hem in diss + frac's. Sp py.
193.2	9.0		2.61	98	.02			1	Sp		.02	Tr MoS2	1	WK lim WK hem		Mostly leached w/ mod hem. Tr py.
202.1	8.9		2.63	96	.03			.01	1		.02	1	1	Sp hem		Mixed leach. + py. Occas. larger "pebble?" in qtzite. Appears to be s.i'd to of Dp.
211.8	9.7		2.60	91	.03			.01	1	.02?			1			Part. leached on some frac's. WK py. Occ. No. of Felds. phenos. Gening w/ qtz.
220.8	9.0		2.64	100	.03			Tr	1	.03	cov.		1			As above. Felds. phenos vary in size. Maybe s.i'd. Dp interbin
229.6	8.8		2.65	97	.08				w/r		.08		1	Sp lim Tr hem		As preceding but cc replacing py on / vnlt. Tr lim
238.4	8.8		2.70	96	.05				1		.05		1	Sp-w/r lim, Jar		St. s.i'd Dp w/ gray xenos, or qt w/ qtz pebbles + felds.
247.0	8.6		2.64	92	.04				Sp-WK		cc .04		1	—		Mod-St silin Sp-WK py tr cc. Qtzite is bxiated in places w/ silica
256.3	9.3		2.65	87	.08			.01	WK		.07		Sp	WK lim, Jar	Sp @ 241.3-250.3 + @ 255.3	Alt as above, Qtzite has smaller grain size, Sp-Mod Alt, WK-Mod py, cc
265.0	8.7		2.29	100	.22			.02	1		.20		WK	WK hem	Qtzite @ 262.4'	Sp-WK-Mod py cc, Mod-St Alt, Qtzite, Mod. silin lim diss + on fracs WK py tr cc
275.3	10.3		2.59	80	.09			.09					Mod	Mod lim Mod hem	Cap @ 265 Dp @ 271.2	Qtzite as above, v. coarse grains, WK lim. Dp - Qtzite cnt bxiated
285.1	9.8		2.53	87	.12	0.01		.01	Sp-WK		.11		St		Suls ≈ 277	Dp alt beyond recog. St Alt. Sp py Tr-sp cc, WK-Mod lim @ 1st part run
297.2	12.1		2.54	78	.88	.01		.01	1		.87		1			St Alt, WK-Mod py, cc diss + on unlets
306.3	9.1		2.59	96	.29	.01		.01	1	Tr	.28		Mod			WK-Mod Alt, WK + py, WK cc, Sp-WK cpy tr MoS2, Sulf diss + on WK-Mod Qtz vns
315.4	9.1		2.58	94	.16				1	.10	.06		WK			WK(+) Alt WK py, sp cc, tr cpy, MoS2 2.5" band of a 10% bxiite @ 310.5
325.6	10.2		2.61	80	.19				WK	.05	.14	Tr MoS2	WK-Mod			WK-Mod Alt, Silin WK py, Sp-WK cc tr cpy WK-Mod Qtz vning
334.4	8.8		2.60	100	.18				1		.18		1			As above Dp has abi fld % w/ qtz about 10-15% WK-Mod Qtz vning
343.6	9.2		2.55	93	.31	.01		.01	1		.30		Mod			Mod Alt, WK-Mod py WK(+) cc tr cpy, MoS2
353.3	9.7		2.62	90	.44	Tr		Tr	1	.02	.42	Tr MoS2	1		Sp @ 352.4	WK-Mod Alt, Silin, WK py, cc, tr cpy, MoS2 Sp - St Alt No vis text
359.6	6.3		2.62	87	.27	.01		.01	1		.27		1	Tr Jar.		St clay Alt, tr text vis WK-Mod py diss + on unlets. tr cc cpy

Final Depth 382.8'
Collar Elevation 3129.80
Coordinates 39,020.15 N ; 17,938.06 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-181
Sheet No. 2 of 2
Date Completed 4-21-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay ser	lim hem	Rock Type	Remarks
371.8	12.2	NXWl	2.59	72	.99	.02	39.21 @	.02	Wk-Mod	.60	.37		Str chlor ser, clay	tr jar	Sp-Hf?	Rk completely Alt to chloritic minerals, Ma vis text, Mod py, wk-mod cpy
376.7	5.1	BX	3.20	73	1.67	Tr	.75/.01	Tr	1	1.62	.05	Tr MoSe	Mod	1	1	Complete Alt, Silin str py Mod cpy, spec along steep to vert
382.8	3.9	1	2.69	76	.51	Tr		Tr	wk	.49	.02	1	wk		Dp @ 376.7	Mod Alt, wk silin, wk py, tr cpy, tr poss Hf on vert VN cnt @ 381.8'
E.O.H.		Avg. Rec'y =		90%												

Note: Hole stopped due to bad caving of rock & py. in Sp. However hole re-entered Dp & values began to decrease.

Final Depth 208.4'
Collar Elevation 2766.81
Coordinates 39,633.28 N ; 17,191.24 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-180
Sheet No. 1 of 1
Date Completed 4-12-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay Sericite	lim hem	Rock Type	Remarks
36.8	36.8	RB	—	0	-	-	-	-	-	-	-	-	—	—	-	Rock Bit
43.5	7.0	NXW1	2.55	95	0.34	0.13		0.13			.21?		wk	wk lim wk mod?	Mz	wk Alt sp lim on fracs. very poor looking cai
52.4	8.9		2.28	95	.51	.14	17.7' @ .46/.14	.14			.37?		Mod			As above, core reduced to sand in places
61.2	8.8		2.32	94	.40	.15		.15			.25?		wk			As above
70.2	9.0		2.59	8.8	.14	.02		.02	Tr-sp		.12		wk-mod			Fr-wk Alt, patchy unleached rk, sp lim mainly on fracs
80.1	9.9		2.59	82	.10	.03		.03			.07			Tr ½cm wk-mod lim		As above, sp Qtz veining
89.6	9.5		2.54	92	.60	.07	27.5' @ .51/.04	Ch-ys- .07	sp	.02	.51				Sols 84.4-88.6 Dp @ 87.4	1st 2' ran Mod-st Alt, broken to sand wk-Mod Alt, wk py cc sp cpy tr cuox
99.1	9.5		2.68	92	.48	.03		.03		.05	.40		wk	wk lim jar	Sols @ 91.8 Dp	Dp - wk-Mod Alt, 8-10% bio, w/ wk assoc py sp, cc,
107.6	8.5		2.67	96	.43	.01		.01	wk	.35	.07	tr MoS2		sp lim jar		wk-Mod Alt, wk py sp-wk cpy No vis cc. sp lim on frac
116.5	8.9		2.64	98	.15	tr		tr		.15	tr		sp-wk	tr lim		Mod Alt, wk sil'n, 8% br alt product of bio? w/assoc py, wk py sp cpy
125.9	9.4		2.67	93	.18	tr		tr		.18	tr					Alt as above, but weaker (wk-Mod) toward end run, wk py, sp-wk cpy tr MoS2
135.1	9.2		2.72	91	.65	.01	18.4' .87/.03	.01		.20	.44		wk(+)	sp lim		wk-Mod Alt, sil'n, wk py sp cpy, cc tr MoS2 sp Qtz-py wk
144.3	9.2		2.63	93	1.09	.05		.05		.20	.84		wk-Mod sp			wk-Mod Alt, wk py wk-Mod (-) cc tr cpy MoS2
153.3	9.0		2.89	90	.19	.01		.01	wk-Mod	.18	tr		wk-Mod sp	tr lim		wk-Mod Alt, Mod sil'n, wk-Mod py tr cpy cc, MoS2
162.5	9.2		2.66	96	.20				wk(+)	.20			wk			wk-Mod Alt, sil'n, wk-Mod Qtz py uns w/ wk+ py tr cpy, Mo
171.6	9.1		2.62	92	.19				wk	.19		Tr Sphal.				wk-Mod Alt, sil'n, wk py, sp-wk cpy No vis Qtz tr vis patchy, Ag'l. cutting Dp
180.5	8.9		2.66	95	.35					.35			Sp-wk Fresh-sp		Mz @ 173.2'	wk Alt, sil'n, Dp dk gy to bk, wk py on unlets, sp+cpy tr Mo.
188.9	8.4		2.63	95	.20					.20						As above, sexcal xenos in rk
197.3	8.4		2.65	96	.13					.13						As above, sp-wk cpy diss & on unlets
205.7	8.4		2.67	97	.18					.18		Tr MoS2			Dp @ 202.8'	wk Alt, sil'n, wk py as above sp-wk cpy
208.4	2.7		2.67	93	.20					.20						As above
EOH		Avg. Rec'y = 93%														

Final Depth 200.2'
Collar Elevation 2720.10
Coordinates 40,352.82 N ; 17,672.76 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property SILVER BELL

HOLE NO. D-179
Sheet No. 1 of 1
Date Completed 4-6-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay, Sericite	lim	Rock Type	Remarks
3.6	3.6	RB	—	-	—								—	—	—	Rock bit
16.3	12.7	NXW	2.39	70	0.07			0.07					Mod	Mod lim sp lim wk hem	Dp	wk-mod alt, st hem leaching becomes limonitic @ end.
28.4	12.1		2.45	68	.08			.08					Mod-st clay	Mod lim tr LLM wk lim		St clay Alt core can be broken between fingers, Mod lim, wk hem
37.5	9.1		2.44	89	.10			.10					1	1		Mod-st w/patchy st Alt, Mod lim wk-mod hem
47.8	10.3		2.45	81	.13			.13					1	Wk-Mod lim tr LLM wk-mod hem		Mod-St Alt, Mod lim, wk-Mod hem stain as above
56.3	8.5		2.49	92	.13			.13					Mod clay	Mod lim wk LLM wk hem tr lim		As above
64.6	8.3		2.53	92	.59	.07		.07	Wk		.52		1	tr hem	Suls 3 56.6	Mod Alt, wk hem, lim at start run wk py cc tr Cu ox, cpy
73.4	8.8		2.53	94	.55	.03		.03	1	.02	.50		1	tr lim		Mod Alt, wk py cc tr cpy, 6" pass Hf bx w/increase suls @ start run
82.3	8.9		2.50	89	.60	.03	59.5'	.03	tr-sp	tr	.57		1	1	bx dike z 73.6 - 81.3	St Alt, wk ?, py wk-Mod cc tr lim, core v. broken & sludgey
90.1	7.8		2.54	95	.61	.02	@	.02	Sp-wk	tr	.59		1		Dp	wk-Mod Alt sp-wk py, cc core broken to 1" chips
98.8	8.7		2.58	93	.58	.02	.54/.03	.02	1	tr	.56		Wk clay ser	tr lim		wk-Mod Alt wk py cc tr lim on fracs tr MoS_2
106.7	7.9		2.57	100	.32	.01		.01	Wk	1	.31		1	1		Alt as above, wk py cc tr-sp cpy tr MoS_2 tr lim
115.8	9.1		2.59	90	.53	.02		.02	1	.01	.50		1	1		wk-Mod Alt, wk py cc sp cpy tr MoS_2, lim on frac
123.9	8.1		2.62	97	.14	.01		.01	1	.08	.05		1	—		Wk Alt, wk(-) py sp cc rk very flinty
133.0	9.1		2.61	89	.18	.01		.01	1	.17	tr		1			Wk-Mod Alt, tr 2nd k spar rk very flinty, sp py tr cc
141.0	8.0		2.64	95	.16			.01	sp-wk	.17			1			Wk-Mod Alt, tr 2nd k spar along unlets, sp py
150.3	9.3		2.65	82	.23			.01	1	.23			Wk-Mod ser			As above, slight increase of py along uns
158.7	8.4		2.62	91	.33				1	.33			Wk clay ser			Wk-Mod Alt, wk py sp cpy w/py in uns
168.0	9.3		2.65	89	.27				wk	.27		tr MoS_2	1			Wk-Mod Alt, wk(-) py tr cpy, MoS_2
179.2	11.2		2.62	77	.13				sp	.13		1	1			Wk-Mod Alt, sp 2nd k spar, sp py, tr-sp cpy
190.9	11.7		2.63	72	.19				1	.10	.09	1	1			Wk-Mod Alt, sp py tr cpy
200.2	9.3		2.63	94	.22				sp-wk	.22		1	1			Alt as above, wk silin along py unlets, sp-wk py, tr cpy, MoS_2
EOH.		Avg.	Rec'y =	86%												

Final Depth 266.2'
Collar Elevation 2987.64
Coordinates 39,656.65 N; 18,384.63 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-178
Sheet No. 1 of 1
Date Completed 4-6-66
Logged By J.A.B., C.W.H.

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Sericite	Lim hem	Rock Type	Remarks
5.0	5.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
18.1	13.1	NXW	2.33	68	0.07			0.07					Mod-st.	Mod lim wk LLM Sp hem	Sp	Mod-st Alt, wk-mod lim, hem, LLM core broken to pebbles
27.7	9.6		2.31	96	.10			.10					|	| wk		Mod-st alt, mod-st lim, wk hem.
37.2	9.5		2.24	98	.05			.05					|	Mod LLM Tr hem	BX Dike @ 29.7	" " " " " " " Bx dike w Dp & "Sp" intercept
51.9	14.7		2.24	70	.03			.03					|	wk-mod lim wk-mod LLM (Sm)		Mixed Bx dike & "Sp" Mod-st. alt, wk leached vnlts, wk-mod hem stain
62.6	10.7		2.57	85	.02			.02					|	wk lim	Dp @ 54.3	As above to ct. Dp wk-mod alt, wk lim & Jar., tr hem.
71.9	9.3		2.43	97	.03			.03					wk-Mod	Mod lim, Jar Sp LLM Sp-wk hem		wk-mod alt, mod. hem. stain, num. alunite vnlts. qtz-ser-alun
81.0	9.1		2.54	99	.02			.02					Mod	|		" ", st qtz-ser-alunite vnlts. Mod Jar, wk hem stain
83.4	2.4		2.58	96	.04			.04					wk-mod	Tr LLM?		As above
86.1	2.7		2.53	93	.03			.03					|	wk lim Mod LLM Mod hem		wk-mod alt, mod qtz-ser-alun. vnlts. Mod hem stain
92.8	6.7		2.66	94	.30	0.02		.02	wk		.28		Mod-st	Tr lim-Jar	Sul ct @ 86.1 BX Dike 93.0	" " " " " " " Sp-wk py, wk? cc.
102.6	9.8		2.52	84	.39	.03		.03	Tr-Sp	.01	.35		|			Mod. alt. Mostly Dp but sc. patches "Sp". Bx cemented by clay & qtz. Sp-wk py cc.
111.7	9.1		2.62	89	.34	.02		.02	Tr	Tr?	.32		|		Dp @ 103.4	As above, then Dp w sc. xeno's. Mod. alt, alun. vnlts, wk py, wk cc, Tr CuSO4
120.4	8.7		2.54	91	.25			.01	Sp		.24	Tr Turgorite	Mod	Sp lim		wk-mod alt, Dp becoming dk, wk 2nd? b.o. & frac'd. wk py, Sp-wk cc
129.9	9.5		2.59	89	.17	.02		.02	|		.15	|	|	|		As above but better suls, Sev 1/8" gypsum vnlts.
140.1	10.2		2.58	88	.52	.04		.04	|		.48		Mod-st			Mod alt, mod b.o. Has "Sp" or Mz appearance, but still Dp. Mock xmo material. wk py, wk cc. Tr CuOx.
149.4	9.3		2.56	95	.18	.02		.02	|		.16	Tr Turg.	Mod			As above. Pinal schist frag's?
158.6	9.2		2.54	94	.39	.03		.03	Sp-wk		.36	|	|			Mod-st Alt, wk py wk-Mod (+) cc, Sp Cu ox on fracs
167.9	9.3		2.58	91	.25	.02		.02	|		.23		|			Mod Alt, wk py, wk-Mod cc, Sp Cu ox (Alt of cc) on fracs
176.3	8.4		2.54	98	.29	.02		.02	|		.27	|	|			Mod Alt, wk py, wk-Mod cc, tr cpy Sp Cu ox as above, qtz "eyes"
185.4	9.1		2.60	94	.42	.02	43.8' @ .53/.02	.02	|		.40	|	|			Alt as above, wk py, cc, tr cpy, Sp Cu ox. Dp are numerous but w. hard to see
193.0	7.6		2.60	100	.50	.03		.03	|		.47	|	|			As above, rk shows mod numerous xenoliths
202.0	9.0		2.65	89	.57	.02		.02	|		.55	|	wk-mod			Wk-Mod Alt, wk py, cc tr cpy, Cu ox on fracs
210.9	8.9		2.65	90	.33	.02		.02	|		.31		|			Wk-Mod Alt, wk py wk-Mod (-) cc, wk xenos
220.1	9.2		2.67	91	.82	.02		.02	|		.80		|			Wk-Mod Alt, wk py, wk cc on fracs. wk qtz veining w/ py as above
225.4	5.3		2.64	96	.20	.02		.02	|	.02	.16		wk			As above, core is dark in color, some pass chlor alt. little ser.
233.9	8.5		2.69	95	.05				|	.01	.04		|	Tr Jar		Wk-Mod Alt, wk py tr cpy sp-wk qtz veining sp xen.
242.8	8.9		2.67	91	.04				|	.04	Tr	Tr MoS2	|	|		As above, rk is dk gy except along qtz vns qtz "eyes" or vlt outstanding
252.0	9.2		2.66	86	.04				|	.04		|	|	|		As above sp-wk py
260.7	8.7		2.71	93	.04				|	.04		|	|	|		As above
266.2	5.5		2.69	89	.05				|	.05		|	|			Wk Alt wk py wk qtz-py veining no vis cpy
E.O.H.		Avg.	Rec'y=	90%												

Final Depth 213.3'
Collar Elevation 2792.61
Coordinates 39,153.62 N ; 17,377.37 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-177
Sheet No. 1 of 1
Date Completed 4-1-66
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay – % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration clay sericite	lim hem	Rock Type	Remarks
5.0	5.0	RB	–	0	–	–	–	–	–	–	–	–	–	–	–	Rock Bit
15.0	10.0	NXW	2.28	85	0.12			0.12					Mod	Mod lim WK LLM Mod hem	Dp	Mod Alt, WK lim Mod hem stain
28.6	13.6		2.47	50	.13			.13					Mod-st	sp LLM WK hem	Mz 15.8 -16.8, Dp	Mod Alt, WK lim tr LLM, WK hem stain
38.0	9.4		2.48	90	.22			chrys. .22					|	|		Mod-st Alt, sp lim, core broken to gravel, tr Cu ox
47.1	9.1		2.51	92	.09			.09					Mod	Tr LLM		Mod Alt, WK lim, WK hem stain
56.0	8.9		2.52	91	.06			.06					|	sp LLM		As above
66.0	10.0		2.55	88	.07			.07					|	WK-mod lim		WK-Mod Alt, sp-WK lim, hem stain, tr LLM WK stin along qtz vns
75.6	9.6		2.54	92	.07			.07					|	sp LLM sp hem		As above
85.9	10.3		2.50	89	.03			.03					|	Tr K-mod		Mod Alt, WK-Mod qtz vning w/ WK stin sp-WK lim WK hem stain
94.7	8.8		2.52	99	.09			.06	Tr		.03		|	Mod lim WK LLM WK hem	Patchy sulfs	Mod Alt, sp-WK py, cc in patchy sulfs WK-Mod lim, sp hem
104.1	9.4		2.57	89	.49	0.24		Mal, chrys .24	|		.25		Mod-st	Mod-st lim Mod LLM sp hem	Sulfs ≥ 99.9	Mod Alt, WK-Mod lim, sp py, WK cc sp cuox
112.0	7.9		2.58	100	.81	.10		.10	sp		.71		Mod	sp-WK lim sp-WK Jar		Mod Alt, WK chlor, sp py, sp-WK cc, tr cpy sp lim on fracs
122.1	10.1		2.58	84	.64	.07		.07	|	.05	.52		|	|		WK-Mod Alt, sp py sp-WK cc tr cpy sp lim on fracs
130.2	8.1		2.63	98	.52	.01	88.4'	.01	|	.20	.31		Mod-st	sp lim	Mz 122.0 - 129.0, Dp	WK alt, rest as above, mod ↑ bio
138.8	8.6		2.62	92	1.49	.05	@	.05	sp-wk	.20	1.24		|	sp Jar	Mz Dp @ 130.9	WK alt, patch poss Hf @ ct. sp-WK py, WK? cc tr cpy on fracs
148.8	10.0		2.68	87	.61	.01	.64/.05	.01	WK	.40	.20		Mod	sp Jar		sp-WK alt, rk dk. WK py, WK cpy, sp cc, tr MoSz?
158.2	9.4		2.71	92	.58	.01		.01	sp-WK	.38	.20		|	Tr Epidote		As above
167.1	8.9		2.71	96	.50	.01		.01	|	.40	.10		|	Tr lim sp Jar		As above except cc now tr. Also tr-sp Jar on fracs
175.1	8.0		2.64	96	.34	.01		.01	|	.34	Tr?		WK	|		Sp alt, sc Jar on fracs, some leaching. sp-WK cpy, WK py
183.1	8.0		2.67	96	.44	.01		.01	WK	.43	|	Tr MoSz	|	sp lim		Sp alt, sp cpy, WK-mod py, sp-WK lim, Jar.
191.0	7.9		2.67	100	.29	.01		.01	|	.29		|	|	Tr Jar		" " sp-WK cpy, " " Molim, Tr Jar, Tr MoSz
195.2	4.2		2.70	90	.32	.01		.01	|	.30	.01	|	Sp-WK			As above.
204.0	8.8		2.67	90	.30				|	.30			|	Tr Jar		Sp alt, rk dk, WK py, sp cpy, qtz vning.
213.3	9.3		2.58	90	.31				|	.31		Tr MoSz	Sp	|	Dp @ 207.1	As above to ct. Ct. sil'd. Dp sp alt, WK-mod F.G. 2nd K-Spar. WK py, tr cp Tr Mo
E.O.H.		Avg. Rec'y = 89%														

Final Depth 267.7'
Collar Elevation 2838.33
Coordinates 38,749.20 N ; 17,899.86 E
Inclination Vertical

ASARCO

GEOLOGIC – ASSAY LOG

Property Silver Bell

HOLE NO. D-176
Sheet No. 1 of 1
Date Completed 3-29-6
Logged By JAB, CWH

Depth	Interval	Core Size	Sp Grav	Core Rec %	Core Assay - % Cu Total	Non-S	Average	Mineralization Oxides	Pyrite	Cpy	Cc	Other	Alteration Clay Ser	lim	Rock Type	Remarks
5.0	5.0	RB	–	0	–	–	–	–	–		–	–	–	–	–	Rock Bit
15.2	10.2	NXWL	2.21	86	.10	.03		0.03			.07?		Mod	Mod lim WK Clay	Sp	Mod-St Alt WK-Mod Qtz uns, lim on fracs pervasive hem stain
26.3	11.1		2.33	78	.03			.03					1	WK lim Clay Sp hem	Pp	Mod Alt, Qtz uning, WK-Mod lim, hem stain Sp lim Alun
35.6	9.3		2.56	91	.12			Tr	Sp		.12		WK-Mod	Sp lim Mod lim WK hem	Patchy Suls	WK-Mod Alt, sp xenoliths, WK py sp cc WK hem st. WK lim on fracs WK-Mod Alun
46.0	10.4		2.51	86	.07			Tr	1		.07		Mod	WK lim WK-mod lim		As above, sp-WK cc, tr cpy
55.2	9.2		2.56	96	.12			Tr	1		.12		WK-Mod	Sp lim WK Clay Tr hem	Patchy cap along fracs	WK-Mod Alt, WK py WK-Mod (+) cc tr cpy, Sp-WK lim, hem
63.8	8.6		2.58	98	.25	.01		.01	Sp-WK		.24		1	WK, lim Sp hem	Sp @ 62.8' & 60°	WK-Mod Alun As above, Num. Alun unlets Mod Alt in sp, Mod cc
73.7	9.9		2.28	92	1.03	.02		.02	Sp		1.01		Mod-St	—		Mod-St Alt, WK Qtz uns, WK py, Mod(+) cc diss & on unlets
83.9	10.2		2.27	94	.74	.03		.03	Sp-WK		.71		1			Sp diss turquois near end run Mod-St Alt, WK Qtz uns, WK py Mod(+) cc as above Sp-WK diss CuOx
93.2	9.3		2.58	94	.50	.02	52.1' @ 75/.02	.02	WK		.48		Mod	Sp lim Sp-WK lim	DP @ 87.1	(turquois?) as above Sp-WK Alt WK py sp-WK cc, DP - WK-Mod Alt, WK py sp-WK cc
100.3	7.1		2.66	100	.84	.02		.02	1		.82		WK	1		WK-Mod Alt, Mod py uning w/ WK-Mod py, WK cc sp lim on fracs
101.9	1.6		2.52	100	.85	.01		.01	1		.84		1	1	Arkose? @ 100.3	WK Alt, WK-Mod (+) diss py, cc tr cpy
107.4	5.5		2.56	91	.60	.02		.02	1		.58		Mod	Sp lim	DP @ 101.1	Mod Alt WK py WK-Mod cc tr lim, jar CuOx
115.9	8.5		2.59	98	.71	.03		.03	1		.68		1	tr lim		Mod Alt, WK py Sp-WK cc tr lim, CuOx
125.0	9.1		2.60	92	.32	.02		.02	1		.30		1	Sp lim		As above, Sp lim on fracs, tr CuOx
133.5	8.5		2.64	95	.38	.02		.02	1	tr	.36		WK-Mod	1		As above, 2" thick bx dike w/rounded frags @ 125.9'
142.3	8.8		2.63	94	.34	.02		.02	1		.32		1	1		As above
152.8	8.5		2.60	94	.43	.02		.02	1		.41		Mod	tr		Mod Alt, WK py sp cc tr lim on fracs
160.0	9.2		2.60	87	.23			.01	1		.22		1	1		As above
168.8	8.8		2.61	95	.24			.01	1		.23		1	tr-Sp		As above small bx dike w/sand-size grains @ 168.5'
176.9	8.1		2.60	100	.26			.01	1		.25		WK-Mod	Sp-WK lim		As above
186.2	9.3		2.61	93	.35			.01	1	.10	.24	tr MoS2	1	Sp lim		WK Alt WK py sp cc, tr cpy, WK bio WK py-Qtz uns
194.3	8.1		2.64	100	.07				Sp-WK	.07		1	WK	tr lim		WK-Mod Alt, sdw WK 2nd Kspar along Qtz unlets, WK py tr cc cpy, MoS2
203.9	9.6		2.61	89	.06				1	.06		1	1	1		As above
212.7	8.8		2.63	96	.05				1	.05			1	1		WK-Mod Alt, sdw w/partial re'sorption of Qtz "eyes" WK 2nd Kspar
223.3	10.6		2.66	85	.09				WK	.09			1	1		Alt as above, WK py Sp-WK cpy, tr cc Alt as above
231.6	8.3		2.74	99	.16				WK-Mod	.16			Sp	1		WK-Mod Alt, WK sdw, WK py tr cpy, Mo, tr lim on fracs
240.0	8.4		2.76	97	.06				WK	.06			1	1		As above sp 2nd Kspar along Qtz uns
248.7	8.7		2.66	92	.06				1	.06			1	1		As above
257.7	9.0		2.65	93	.04				1	.04			1	1		As above
263.7	6.0		2.64	100	.12				1	.12			1	1		As above
267.7	4.0		2.65	95	.07				1	.07		Tr MoS2	1	Tr Jar		WK-Mod Alt, WK py tr 2nd Kspar, lim
EOH		Avg. Rec'y = 93%														