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TOMBSTONE MINING DISTRICT

Cochise County, Arizona

Block 5

Geology/Drilling

(In area of Mutual Interest)

Asarco Drilling

Logs, Geochem.

Tombstone
Block
Reps

REPORT - DRILLING

120

ASARCO Incorporated
Tucson Arizona

August 26, 1975

TO: W. L. Kurtz

FROM: J. R. King

Charleston Project
Cochise County, Arizona

This report is submitted on the Charleston Project with all drill hole logs and assays attached. A geologic and land status map shows the drill hole locations relative to the Stewart Mines, Ltd. property.

SUMMARY AND CONCLUSIONS

Between March 25, 1974 and August 8, 1975, ASARCO Incorporated drilled four holes, totalling 13,347 feet, on the land held in partnership with Stewart Mines, Limited. Three of the holes (Chs-1, 2, & 3) were diamond drill holes, all located in sec. 30 (see Att. A). The fourth drill hole (CP-1) is a rotary hole, 395 feet deep, located in sec. 36.

No economic mineralization was encountered and the last diamond drill hole, Chs-3, was terminated on August 8, 1975.

GENERAL GEOLOGY

The Charleston Mining District encompasses roughly thirty square miles and premineral bedrock within this area consists of Cretaceous clastic and volcanic rock and Laramide intrusives (see Att. A). Sedimentary rocks of the Cretaceous Bisbee Group crop out approximately 1.5 miles to the east and southeast of the old Charleston Lead Mine. Sedimentary rocks of the Bisbee Group were also encountered at depth in the Charleston drill holes. Volcanics of the Cretaceous Bronco Formation overlie the Bisbee sediments. Intruding both of the above are Laramide granodiorite and andesite porphyry dikes and plugs.

DRILL HOLE SUMMARY

DDH Chs-1 was collared on March 25, 1974 and was terminated at a depth of 4002' on July 10th after drilling 1000' of NC core, 1947' of NX core, and 1055' of BX core. Attachment B is the geologic log for the hole and Attachment C lists all the assays for the hole. The hole was collared in strongly altered and mineralized breccia and was bottomed in weakly altered and mineralized granodiorite porphyry. The best assay was ten feet (2844-2854') of .41% Cu.

121

DDH Chs-2 was collared on July 15, 1974 and was abandoned because of caving at 3415 feet after drilling 1012' of NC core, 1990' of NX core, and 413' of BX core. A wedge was set at 2496' and drill hole Chs-2W was initiated on November 21, 1974. Drill hole Chs-2W was drilled to a depth of 5028 feet (March 5, 1975). Attachments D & E are the geologic logs and assays, respectively, for drill holes Chs-2 & 2W. Drill hole Chs-2 was collared in "Uncle Sam" porphyry, penetrated into "Bronco" volcanics at approximately 650', Bisbee Group sediments at 1327', and probable Paleozoic marbles at 4828'. No economic mineralization was encountered, although one small ten-foot intercept of 1% copper was encountered at 4205-4215'.

Drill hole Chs-3 was collared on June 9, 1975 and bottomed on August 8, 1975 at a depth of 3003 feet. NC core drilling was stopped at 631 feet and NX core drilling continued to the bottom of the hole. Attachments F & G are the geologic log and assays, respectively, of the hole. The geology of the hole is similar to DDH Chs-1. The significant difference between the holes is that Chs-3 intercepted much lower copper grade mineralization. The best assay was 940 ppm (2789-2799').

GEOCHEMISTRY

Attachment H shows the geochemical sample sites and Attachment I lists the geochemical values for these samples.

GEOPHYSICAL

No geophysical surveys were conducted for ASARCO Incorporated over the property.

LAND STATUS

A land status map outlining the land held by Stewart Mines, Limited accompanies this report as Attachment J.

John R. King

John R. King

JRK:lb
Atts.

CHS#1 LOGS

CH2 1852 (sample labelled CHS-2)

The original rock was a mudstone or claystone composed largely of argillic material. Detrital grains are widely scattered in a massive, crudely bedded fabric. These are small grains that are subangular to subround. Most common are quartz and mafites (mostly hornblende), with minor plagioclase. The rock has been hornfelsed by epizonal thermal metamorphism.

Most of the rock is now a dense cryptocrystalline mass of pennine, quartz, and feldspars stippled uniformly with earthy clots of epidote. Incipient veinlets, zones of crystal growth, cut the fabric carrying the same minerals - quartz, pennine, epidote - as the matrix but of enlarged grain size. Pyrite is sparingly disseminated throughout the matrix with no associated nearby recrystallization. One spherule has developed and consists of cherty quartz and small quartz crystalloblasts formed around detrital quartz. This patch is purged of pennine but is rich in coarse poikiloblastic epidote, interstitial calcite, and pyrite.

CHS - 1 1810

The original rock was a porphyry, probably a quartz monzonite. There were numerous subhedral phenocrysts of plagioclase, and less of rounded β quartz, thick biotite books, and an occasional hornblende prism. These are randomly oriented in a granular matrix that was probably quartz-orthoclase. Epizonal alteration has been strong.

Coarse shreddy sericite replaces feldspars in matrix and phenocrysts alike. It also rims biotite and hornblende prisms that have been pseudomorphosed by clinochlore and accessory rutile. Sericite in the matrix tends to be pushed into the interstices of enlarged quartz grains. Pyrite tends to be concentrated in veins with crystalloblasts of anhydrite.

Minerals are present in the following estimated amounts: quartz 35%, sericite 54%, anhydrite 2%, pyrite 4%, clinochlore 4%, plagioclase tr., rutile 0.5%.

CHS - 1 2765

The rock is a breccia of varied fragments including coarse andesite among more numerous chunks of porphyry - probably a quartz monzonite originally. The original nature of the matrix is uncertain owing to intense alteration and K-metasomatism.

First coarse secondary biotite formed at the expense of mafites in the fragments; it is most abundnat in the andesite. As a result of continued growth, the biotite may attack plagioclase as well. A later epizonal event relates to veining by granular quartz associated with pyrite and anhydrite. Quartz has been introduced in the vein walls, growing to a granular aggregate with sericite (derived from feldspars) trapped in the interstices. Further from the veins, sericite attacks plagioclase and biotite has retrogressed to clinochlore. This episode seems to have ended with veining by pyrite-anhydrite-calcite.

CHS - 1 3862

The rock is a granodiorite porphyry with numerous subhedral phenocrysts of plagioclase and thick biotite books set at random in a granular quartz - feldspar matrix. A few phenocrysts of β quartz and hornblende were noted. Orthoclase rarely mantles and corrodes plagioclase phenocrysts. Hydrothermal alteration is moderate.

Early crushed zones developed in the fabric were characterized by growth of secondary biotite in plagioclase and growth of orthoclase. Disseminated pyrite relates to this event as well as retrograde sericitization of plagioclase. Some biotite and all hornblende were chloritized at this time. A last event is veining by coarse stilbite and interstitial calcite. These are evidently retrograde minerals derived in large measure from plagioclase.

Percentages of minerals present are as follows: quartz 20%, orthoclase 12%, plagioclase 34%, sericite 5%, calcite 6%, clinochlore 8%, stilbite 9%, pyrite 2%, magnetite 0.5%, biotite 3%, rutile 0.5%, apatite tr., zircon tr..

CHS - 2 4061

The rock is an andesite with a pilotaxitic structure. It was originally composed of swarms of well aligned plagioclase laths and small interstitial grains of mafites. Flowage alignment wraps around large subhedral plagioclase phenocrysts. The rock seems to have experienced some autobrecciation. Hydrothermal alteration and K-metasomatism have been moderate.

Most of the rock is unaffected except where cut by a network of granulated zones. In these, tiny scales of secondary biotite have formed at the expense of plagioclase and mafites; the biotite may be accompanied by lenses or pods of new, fresh orthoclase. Coarser orthoclase also occurs in well-defined veins with pyrite and late interstitial calcite. The walls of such veins show sericitization of plagioclase and retrograde alteration of biotite to clinochlore.

CHS - 3 2616

The rock is an intrusive breccia of intermediate composition. It carries innumerable phenocrysts of plagioclase and some β quartz and thick biotite books. These lie in a dense microgranular matrix of quartz and orthoclase that may embay or corrode phenocrysts. There is a crude flowage alignment to the matrix, and it carries numerous, partly resorbed xenoliths. Most of these appear to be cognate granophyres. The rock is quite fresh with epizonal alteration expressed only along fractures or veinlets.

Veinlets generally carry orthoclase and albite euhedrons; which it is depends on whether the vein cuts plagioclase (albite) or the matrix (orthoclase). Additional gangue minerals include calcite and clinochlore. Pyrite is rare in the veins and was also observed mantling accessory magnetite in the vein walls. Elsewhere in the rock alteration is confined to minor calcite and hydromicas in plagioclase and partial chloritization of biotite.

GEOLOGIC LO

Depth
Elevation
Coordinates
Inclination Vertical

Project Charleston

HOLE NO. Chs-1
Sheet No.
Date Completed
Logged by J R Kim

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	22																		PLUG BIT
22	181	159	NC		+85	6-8	3/1		+				✓	+				U.S. por	oxidized to ≈15 alter is intense, lo cavities occas small fault 181-1
181	228	47	NC		"	5-7	3/1		+				✓	+				An por	PRAB dike
228	278	50	NC		"	4-3	3/1		+				✓	+				Δ	Heterolithic lars with open cavit
278	356	78	NC		"	7	3/1		+				+	✓				(An por) Δ	as above. less cavities small 236 & 284.
356	450	94	NC		"	6-8	3/1		+				+	✓				Δ	good breccia w/ NATURE as w/
450	505	55	NC		"	3-5	4/1	100/1	+	tr			+			tr		An por	mix Gd por a becoming more ch mag as diss & c pass fault 470-4
505	690	185	NC		"	5-7	3/1	100/1	+	tr			+					Δ	beautiful hetero breccia as seen outcrop
690	811	121	NC		"	4-6	2/1		+				+					An por	breccia in part alter decreasing CaCO3 occasional fract.
811	831	20	NC		"	6	4/1		+				+					Gd por	less gmss, light color, alter sev same intensity
831	916	85	NC		"	4-5	2/1	20/1	+	tr			+			✓		And por	somewhat flui & brecciated, cpy both diss & fract
916	950	34	NC		"	3-4	1/1	15/1	+	✓	?		+			tr		Gd por	well mineral bu alter decreasi silic in

CHS #1

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GEOLOGIC LOG

Project Charleston

Chs-1

Sheet No.

Date Completed

Logged by J. R. King

To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
860	10	NC		-25	4	1/2		+				+			tr		Δ	intrusive breccia mod to strong al
1000	40	NC		+85	5	2/1		+				+			tr		Gd por	as before sw faults 967, 998
1021	21	NX		+85	5	2/1		+				+			tr		"	as above
1411	390	NX		+85	3	1/2	20/1	+	tr			✓			✓	✓	An por	alter - weak to v chl increasing
1658	247	NX		+85	2-4	1/3	15/1	+	✓			+		tr	✓	✓	Δ	intrusive heter breccia no op cavities
1829	171	NX		+85	2	1/1	15/1	+	tr			+			✓	✓	Gd por	1507-17, 1610-12 as before show several zones o brecciation go gouge 1792-1800
2151	322	NX		+85	3	1/2	20/1	+	tr			+			tr	✓	Gd por	as before alter mod to strong
2312	161	NX		+85	4	1/2	25/1	+	tr			+				+	Δ-Gd por	variable por breccia, alter
2392	80	NX		+85	5	1/1	30/1	+	tr		?Gn	+				+	Gd por	small fault-2307 alter strong
2617	225	NX		+85	4	1/2	15/1	+	✓			+			✓	✓	Δ-Gd por	as above alter mod-stron heterolith breccia part, some stockw vning
2879	262	NX		+85	3	1/3	10/1	+	✓			+		tr	tr	tr	Δ	Heterolith breccia gd por - mix - an alter mod to stu
2947	68	NX		+85	2	1/4	20/1			?		+		tr	✓	tr	Gd por	as before alter wk to mo
		END OF HX																

GEOLOGIC LOG

Project [illegible] Chs. 1

Date Completed

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From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Frac	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
47	3005	58	Bx		+85	2	1/4	20/1	+	✓	?		+		?	+r		Gd por	as before [illegible]
																			-2747, alteratic
																			weak to modes
05	3038	33	Bx		+70°	2	?												cataclastic - broken - fau
38	3469	431	Bx		+85°	1-2	1/4	10/1	+	✓			+		+r	✓		Gd por -	mix An por, al
																			weak to moder
69	3605	136	Bx		+85	2	1/3	7/1	+	✓	?		+		✓	+r			cpy more abun
																		Gd por -	mix An por
																			as above. some
05	3656	51	Bx		+65	2	1/2	20/1	+	+r									zones of better c
																		fault	zone
656	3749	93	Bx		+85	1-2	1/1	30/1	+	+r			+		✓	+r		Gd por	with some zon
																			An por (3600-14
749	3890	141	Bx		+85	1	1/2	15/1	+	✓	?		+		✓	+r			alteration we
																		Gd por	as above, s
																			fault 3892 c
890	4002	52	Bx		+85	2	1/2	10/1	+	✓	?		+		✓	✓			weak
	TD																	Gd por.	mix an por a
																			before alter
																			weak small -
																			3913, 3922.

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ASARCO

GEOLOGIC LOG

Project Charleston

HOLE NO. Chs 1
Sheet No. 1
Date Completed
Logged by AR King

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	22																		Plug Bit
22	181	159	NC		+85	6-8	3/1		+				✓	+				U.S. por	oxidized to ≈150' alter is intense, breccia cavities occas. pres small fault 181-186
181	228	47	NC		"	5-7	3/1		+				✓	+				An por	PROB dike
228	278	50	NC		"	4-8	3/1		+				✓	+				Δ	Heterolithic breccia
278	356	78	NC		"	7	3/1		+				+	✓				(An por) Δ	with open cavities as above. less OPEN cavities, small faults 236 & 284.
356	450	94	NC		"	6-8	3/1		+				+	✓				Δ	good breccia w/ fluid NATURE as w/ min
450	505	55	NC		"	3-5	4/1	100/1	+	tr			+			tr		An por	min Gd por, alter becoming more chl, mag as diss & uns. pass fault 470-490
505	690	185	NC		"	5-7	3/1	100/1	+	tr			+					Δ	beautiful heterolith breccia as seen in outcrop
690	811	121	NC		"	4-6	2/1		+				+					An por	breccia in part alter decreasing in in $CaCO_3$ occurring along fract.
811	831	20	NC		"	6	4/1		+				+					Gd por	less gmss, lighter color, alter remains same intensity
831	916	85	NC		"	4-5	2/1	20/1	+	tr			+			✓		And por	somewhat fluidized & brecciated, cpy both diss & fract.
916	950	34	NC		"	3-4	1/1	15/1	+	✓	?		+			tr		Gd por	well mineral but alter. decreasing silic in u[redacted]

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GEOLOGIC LOG

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Sheet No.
Date Completed
Logged by J. R. King

Project Charleston

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization					Alteration					Rock	Remarks
								Ratio	Py	Cpy	Mo	Others	Phy	Arg	Pot	Mag	Anhy		
950	960	10	NC		-85	4	1/2		+				+			tr		Δ	intrusive breccia mod to strong alter
960	1000	40	NC		+85	5	2/1		+				+			tr		Gd por	as before, small faults 967, 998.
1000	1021	21	NX		+85	5	2/1		+				+			tr		"	as above
1021	1411	390	NX		+85	3	1/2	20/1	+	tr			✓			✓	✓	An por	alter - weak to mod, chl increasing
1411	1658	247	NX		+85	2-4	1/3	15/1	+	✓			+		tr	✓	✓	Δ	intrusive heterolithic breccia, no open cavities, faulting 1507-17, 1610-12
1658	1829	171	NX		+85	2	1/1	15/1	+	tr			+			✓	✓	Gd por	as before, shows several zones of brecciation, good gouge 1792-1800, 182[illegible]
1829	2151	322	NX		+85	3	1/2	20/1	+	tr			+			tr	✓	Gd por	as before, alter. mod to strong
2151	2312	161	NX		+85	4	1/2	25/1	+	tr			+				+	Δ-Gd por	variable por & breccia, alter str[illegible]
2312	2392	80	NX		+85	5	1/1	30/1	+	tr		?GN	+				+	Gd por	small fault - 2307 alter strong
2392	2617	225	NX		+85	4	1/2	15/1	+	✓			+			✓	✓	Δ-Gd por	as above alter mod - strong heterolith breccia in part, some stockwork veining.
2617	2879	262	NX		+85	3	1/3	10/1	+	✓			+		tr	tr	tr	Δ	Heterolith breccia & gd por - mix - an por alter mod to strong
2879	2947	68	NX		+85	2	1/4	20/1			?		+		tr	✓	tr	Gd por	as before alter wk to mod.
			END OF NX																

ASARCO

GEOLOGIC LOG

[redacted] NO. [redacted]

Sheet No.

Date Completed

Logged by J.R.K. & S.R.

Project Charleston

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
47	3025	58	Bx		+85	2	1/4	20/1	+	✓	?		+		?	tr		Gd por	as before. An por 2-2967, alteration weak to moderate
3025	3038	33	Bx		+70°	2	?											cataclastic - brecciated - faulted	
3038	3469	431	Bx		+85°	1-2	1/4	10/1	+	✓			+		tr	✓		Gd por -	mix An por, alter weak to moderate cpy more abundant
3469	3605	136	Bx		+85	2	1/3	8/1	+	✓	?		+		✓	tr		Gd por -	mix An por as above, some zones of better cpy
3605	3656	51	Bx		+65	2	1/2	20/1	+	tr								fault	zone
3656	3749	93	Bx		+85	1-2	1/1	30/1	+	tr			+		✓	tr		Gd por	with some zones An por (3600-14). alteration weak
3749	3890	141	Bx		+85	1	1/2	15/1	+	✓	?		+		✓	tr		Gd por	as above. small fault 3890, alter. weak.
3890	4002	52	Bx		+85	2	1/2	10/1	+	✓	?		+		✓	✓		Gd por.	mix an por as before. alteration weak. small faults 3913, 3932,
	TD																		

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

310

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	As ppm			
1	Chs-1 68-75	<0.2	25	30	20	10				
2	143-152	<0.2	40	30	25	8				
3	164-169 tr Co ?	<0.2	310	25	30	4				
4	194-199		105	75	125	4				
5	321-326		255	120	100	6	5			
6	Chs-1 398-403	<0.2	255	110	185	16				

J. R. K.
APR 2 - 1974

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:
Trace analysis

CERTIFIED BY:
Registered Assayer Certificate No. 9425 William L. Lehmbeck Date Signed 4/24/74 Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
4/20/74	4/24/74	740711

311

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CP-1 240-250		<0.2	15	50	185	2
2	CP-1 330-350		0.2	15	65	180	2
3	CP-1 370-395		<0.2	15	25	90	2
4	Chs-2 4351-4356	<0.02	<0.2	10	45	40	8
5	4470-4479	<0.02	<0.2	100	5	30	2
6	4742-4747	<0.02	<0.2	15	65	70	2
7	4971-4980	<0.02	<0.2	25	15	50	24
8	Chs-2 5012-5021	<0.02	<0.2	35	50	320	2

? Chs #1

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK

TO: American Smelting & Refining Company

REMARKS:

CERTIFIED BY:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

312

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
1	CHS-1 520-528			300	45	70	8			
2	591-599			280	40	130	10			
3	692-700			180	105	200	4			
4	792-800			450	25	95	8			
5	CHS-1 923-933	<0.02	<0.2	330	60	80	14			

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
4/26/74	4/30/74	740759

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

313

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu ppm	Pb ppm	Zn ppm	Mo ppm					
1	CHS-1 983-993	400	60	50	30					
2	CHS-1 1087-1097	600	25	20	14					
3	CHS-1 1257-1267	850	45	60	36					
4	CHS-1 1347-1357	750	45	60	40					

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:
Trace analysis

CERTIFIED BY: LL...BECK

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
5/2/74	5/7/74	740816

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

314

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CHS-1	1442-1452	950	50	55	22
2		1552-1562	900	40	35	18
3		1632-1642	1350	35	20	14
4	CHS-1	1745-1754	20	30	5	22

O:

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:

Trace analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
5/9/74	5/14/74	740857

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

315

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
1	CHS-1 1857-1867			235	15	10	2			
2	1948-1958			610	35	40	6			
3	1996-2006			475	20	5	4			
4	2041-2051	<0.02	<0.2	135	20	5	30			
5	CHS-1 2124-2134			1200	20	5	12			

TO:

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. J. R. King

REMARKS:

Trace analysis

CERTIFIED BY: Charles E. Thompson

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
5/17/74	5/22/74	740923

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

316

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	As ppm		
1	CHS-1 2207-2217			60	10	5	< 2			
2	2280-2290			630	10	10	2			
3	2380-2390	<0.02	<0.2	620	10	5	10	28		
4	CHS-1 2455-2465			1150	10	10	20			

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John R. King

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
5/31/74	6/6/74	741018

317

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %	Pb ppm	Zn ppm	Mo ppm					
1	CHS-1 2612-2622	0.19	20	20	18					
2	CHS-1 2525-2535	0.19	1000	85	12					

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John R. King

REMARKS:
Trace analysis
Copper - single analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
6/7/74	6/13/74	74-1060

318

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9426

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Cu %	Pb ppm	Zn ppm	Mo ppm	As ppm		
	Series Chs-1:									
1	2684-2694		>2000	0.19	20	20	22			
2	2787-2797		>2000	0.13	15	15	16			
3	2844-2854		>2000	0.41	15	20	16			
4	2919-2929	< 0.2	950		25	15	10			
5	2525-2535 (from 741062)	< 0.2						5		

D:

American Smelting & Refining Co.
Southwestern Exploration Division
P. O. Box 5747
Tucson, Arizona 85703

Attn: Mr. John R. King

REMARKS:

Trace analysis
3 Copper single analysis

CERTIFIED BY:

REGISTERED ASSAYER
CERTIFICATE NO. 9427
WILLIAM L. LEHMBECK
DATE SIGNED 6-17-74
Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
6/13/74	6/17/74	741098

SKYLINE LABS, INC.
Hawley & Hawley Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

319

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Au ppm	Cu ppm	Cu %	Pb ppm	Zn ppm	Mo ppm			
1	Chs-1	3011-3021	<0.02	425		15	15	< 2			
2		3102-3112		495		10	15	2			
3		3231-3241		1300		10	30	< 2			
4		3305-3315		>2000	0.20	15	40	6			
5		3401-3411	<0.02	>2000	0.25	15	15	10			
6	Chs-1	3459-3469	<0.02	>2000	0.21	10	35	< 2			

D:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. W. L. Kurtz

REMARKS:
Trace analysis
3 Copper - single analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
6/28/74	6/29/74	741212

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

320

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu ppm	Cu %	Pb ppm	Zn ppm	Mo ppm				
1	Chs-1	3545-3554	>2000	0.23	10	25	14				
2	Chs-1	3626-3636	500		85	110	6				
3	Chs-1	3710-3719	435		220	240	6				

O:

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. Steven R. Davis

REMARKS:

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK RESIGNED 7/9/74 Arizona U.S.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
7/5/74	7/9/74	741246

321

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %	Pb ppm	Zn ppm	Mo ppm
1	Chs-1 3849-3858	0.23	15	35	18
2	Chs-1 3905-3914	0.26	45	160	4

J. R. K.
JUL 19 1974

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 7/12/74 Arizona U.S.A.

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S.R. Davis

REMARKS:

CERTIFIED BY: William L. Lehmbeck

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
7/9/74	7/12/74	741282

322

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %
1	CHS - 1 2535-2545	0.08
2	2545-2555	0.09
3	2555-2565	0.20
4	2565-2575	0.15
5	2575-2585	0.13
6	2585-2595	0.16
7	2595-2605	0.08
8	2605-2612	0.15
9	2622-2632	0.14
10	2632-2642	0.13
11	2642-2652	0.21
12	CHS - 1 2652-2662	0.17

American Smelting & Refining Co.
Southwestern Exploration Division
P. O. Box 5747
Tucson, Arizona 85703

Attn: Mr. W. L. Kurtz

REMARKS: Single determinations

CERTIFIED BY:

DATE REC'D: 8/5/74

DATE COMPL.: 8/13/74

JOB NUMBER: 741520

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

323

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %
	Series CHS-1	
1	2662-2672	0.11
2	2672-2684	0.11
3	2694-2705	0.30
4	2705-2715	0.15
5	2715-2725	0.16
6	2725-2735	0.18
7	2735-2745	0.21
8	2745-2755	0.21
9	2755-2765	0.17
10	2765-2775	0.19
11	2775-2787	0.25
12	2797-2807	0.22
13	2807-2817	0.20
14	2817-2827	0.22
15	2827-2837	0.18
16	2837-2844	0.17

J. R. K.

AUG 2 0 1974

0060

JRK

TO: American Smelting & Refining Co.
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attention: Mr. John R. King

REMARKS: Single determinations

CERTIFIED BY: William L. Lehmbeck 8/23/74

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
8/22/74	8/23/74	741656

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

324

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %
1	CHS - 1 2854-2865	0.26
2	2865-2875	0.24
3	2875-2885	0.15
4	2885-2895	0.18
5	2895-2905	0.12
6	2905-2915	0.10
7	2915-2919	0.10
8	2929-2940	0.14
9	2940-2950	0.12
10	2950-2960	0.12
11	2960-2970	0.11
12	2970-2980	0.09
13	2980-2990	0.05
14	2990-3000	0.05
15	3000-3011	0.05
16	3021-3030	0.03
17	3030-3040	0.05
18	3040-3050	0.04
19	3050-3060	0.04
20	3060-3070	0.04
21	3070-3080	0.04
22	3080-3090	0.10
23	3090-3103	0.08
24	3112-3120	0.06
25	3120-3130	0.04
26	3130-3140	0.09
27	3140-3150	0.09
28	CHS - 1 3150-3160	0.09

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John King

REMARKS:
Single analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
8/26/74	8/29/74	741694

325

SKYLINE LABS, INC.
Hawley & Hawley Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu %
1	CHS-1	3160-3170	0.05
2		3170-3180	0.05
3		3180-3190	0.13
4		3190-3200	0.12
5		3200-3210	0.10
6		3210-3220	0.14
7		3220-3232 *	0.11
8		3242-3250 **	0.09
9		3250-3260	0.16
10		3260-3270	0.08
11		3270-3280	0.10
12		3280-3290	0.14
13		3290-3305	0.20
14		3315-3325	0.19
15		3325-3335	0.20
16		3335-3345	0.09
17		3345-3355	0.06
18		3355-3365	0.15
19		3365-3375	0.20
20		3375-3385	0.22
21		3385-3401	0.25
22		3411-3420	0.25
23		3420-3430	0.20
24		3430-3440	0.09
25		3440-3450	0.16
26		3450-3459	0.18
27		3469-3480	0.26
28		3480-3490	0.24
29		3490-3500	0.28
30		3500-3510	0.19
31		3510-3520	0.29
32		3520-3530	0.15
33		3530-3545	0.33
34		3554-3565	0.26
35	CHS-1	3565-3575	0.16

J:
American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

CERTIFIED BY:

* Sample marked 3220-3231
** Sample marked 3241-3250

DATE REC'D: | DATE COMPL.: | JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

326

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Cu %
36	CHS-1	3575-3585	0.35
37		3585-3595	0.32
38		3595-3605	0.22
39		3605-3615	0.07
40		3615-3626	0.09
41		3636-3645	0.05
42		3645-3655	0.02
43		3655-3665	0.04
44		3665-3675	0.03
45		3675-3685	0.01
46		3685-3695	0.01
47		3695-3710	0.03
48		3719-3730	0.07
49		3730-3740	0.01
50		3740-3750	0.02
51		3750-3760	0.03
52		3760-3770	0.03
53		3770-3780	0.02
54		3780-3790	0.03
55		3790-3800	0.04
56		3800-3810	0.03
57		3810-3820	0.04
58		3820-3830	0.07
59		3830-3840	0.06
60		3840-3849	0.12
61		3858-3870	0.07
62		3870-3880	0.07
63		3880-3890	0.06
64		3890-3905	0.08
65		3914-3925	0.21
66		3925-3935	0.08
67		3935-3945	0.17
68		3945-3955	0.15
69		3955-3965	0.09
70		3965-3979	0.22
71	CHS-1	3988-3992	0.09

REMARKS:

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 9/23/74 Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
9/13/74	9/23/74	741873

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

327

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	As ppm						
1	Chs-1 3979-3988	<0.02	0.6	< 1						
2	Chs-1 3992-4002	<0.02	0.8	< 1						

O:

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S.R. Davis

REMARKS:

Trace analysis

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK Arizona U.S.A.

DATE REC'D:

DATE COMPL.: 7/29/74

JOB NUMBER: 741301-A

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu %	Pb ppm	Zn ppm	Mo ppm	Au	Ag	As		
1	Chs-1 3979-3988	0.20	25	65	4					
2	Chs-1 3992-4002	0.16	20	230	4					

Running for Au Ag As

J. R. K.

JUL 19 1974

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S. R. Davis

REMARKS:

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE ISSUED 7/16/74 Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
7/11/74	7/16/74	741301

CHS #2 LOGS

CHS - 1 3862

The rock is a granodiorite porphyry with numerous subhedral phenocrysts of plagioclase and thick biotite books set at random in a granular quartz - feldspar matrix. A few phenocrysts of β quartz and hornblende were noted. Orthoclase rarely mantles and corrodes plagioclase phenocrysts. Hydrothermal alteration is moderate.

Early crushed zones developed in the fabric were characterized by growth of secondary biotite in plagioclase and growth of orthoclase. Disseminated pyrite relates to this event as well as retrograde sericitization of plagioclase. Some biotite and all hornblende were chloritized at this time. A last event is veining by coarse stilbite and interstitial calcite. These are evidently retrograde minerals derived in large measure from plagioclase.

Percentages of minerals present are as follows: quartz 20%, orthoclase 12%, plagioclase 34%, sericite 5%, calcite 6%, clinochlore 8%, stilbite 9%, pyrite 2%, magnetite 0.5%, biotite 3%, rutile 0.5%, apatite tr., zircon tr..

CHS - 2 4061

The rock is an andesite with a pilotaxitic structure. It was originally composed of swarms of well aligned plagioclase laths and small interstitial grains of mafites. Flowage alignment wraps around large subhedral plagioclase phenocrysts. The rock seems to have experienced some autobrecciation. Hydrothermal alteration and K-metasomatism have been moderate.

Most of the rock is unaffected except where cut by a network of granulated zones. In these, tiny scales of secondary biotite have formed at the expense of plagioclase and mafites; the biotite may be accompanied by lenses or pods of new, fresh orthoclase. Coarser orthoclase also occurs in well-defined veins with pyrite and late interstitial calcite. The walls of such veins show sericitization of plagioclase and retrograde alteration of biotite to clinochlore.

CHS - 3 2616

The rock is an intrusive breccia of intermediate composition. It carries innumerable phenocrysts of plagioclase and some β quartz and thick biotite books. These lie in a dense microgranular matrix of quartz and orthoclase that may embay or corrode phenocrysts. There is a crude flowage alignment to the matrix, and it carries numerous, partly resorbed xenoliths. Most of these appear to be cognate granophyres. The rock is quite fresh with epizonal alteration expressed only along fractures or veinlets.

Veinlets generally carry orthoclase and albite euhedrons; which it is depends on whether the vein cuts plagioclase (albite) or the matrix (orthoclase). Additional gangue minerals include calcite and clinochlore. Pyrite is rare in the veins and was also observed mantling accessory magnetite in the vein walls. Elsewhere in the rock alteration is confined to minor calcite and hydromicas in plagioclase and partial chloritization of biotite.

CH2 1852 (sample labelled CHS-2)

The original rock was a mudstone or claystone composed largely of argillic material. Detrital grains are widely scattered in a massive, crudely bedded fabric. These are small grains that are subangular to subround. Most common are quartz and mafites (mostly hornblende), with minor plagioclase. The rock has been hornfelsed by epizonal thermal metamorphism.

Most of the rock is now a dense cryptocrystalline mass of pennine, quartz, and feldspars stippled uniformly with earthy clots of epidote. Incipient veinlets, zones of crystal growth, cut the fabric carrying the same minerals - quartz, pennine, epidote - as the matrix but of enlarged grain size. Pyrite is sparingly disseminated throughout the matrix with no associated nearby recrystallization. One spherule has developed and consists of cherty quartz and small quartz crystalloblasts formed around detrital quartz. This patch is purged of pennine but is rich in coarse poikiloblastic epidote, interstitial calcite, and pyrite.

CHS - 1 1810

The original rock was a porphyry, probably a quartz monzonite. There were numerous subhedral phenocrysts of plagioclase, and less of rounded β quartz, thick biotite books, and an occasional hornblende prism. These are randomly oriented in a granular matrix that was probably quartz-orthoclase. Epizonal alteration has been strong.

Coarse shreddy sericite replaces feldspars in matrix and phenocrysts alike. It also rims biotite and hornblende prisms that have been pseudomorphosed by clinochlore and accessory rutile. Sericite in the matrix tends to be pushed into the interstices of enlarged quartz grains. Pyrite tends to be concentrated in veins with crystalloblasts of anhydrite.

Minerals are present in the following estimated amounts: quartz 35%, sericite 54%, anhydrite 2%, pyrite 4%, clinochlore 4%, plagioclase tr., rutile 0.5%.

CHS - 1 2765

The rock is a breccia of varied fragments including coarse andesite among more numerous chunks of porphyry - probably a quartz monzonite originally. The original nature of the matrix is uncertain owing to intense alteration and K-metasomatism.

First coarse secondary biotite formed at the expense of mafites in the fragments; it is most abundnat in the andesite. As a result of continued growth, the biotite may attack plagioclase as well. A later epizonal event relates to veining by granular quartz associated with pyrite and anhydrite. Quartz has been introduced in the vein walls, growing to a granular aggregate with sericite (derived from feldspars) trapped in the interstices. Further from the veins, sericite attacks plagioclase and biotite has retrogressed to clinochlore. This episode seems to have ended with veining by pyrite-anhydrite-calcite.

GEOLOGIC LO

Project Charleston Chs - 2 Date Completed Logged by A.R.K.

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	21																		Plug Bit
21	132		NC		+85	?	? 1/3	-					✓	+				Lus por	oxidized, with
																			of And por ex
																			132-159, alter
																			mod in Lus por,
																			in And por n
																			small faults 30, 8
																			103, 132-133, CO
182	619?		NC		+85	1-3	20/1		+				✓	+				Lus por	as above, al
																		"Little Sam"	variable wk-m
																			An por dikes
																			274-281 429-
																			pebble dikes freq
																			w/ above. F
																			66, 195-208, 28-2
																			267-274, 289, 3
																			376-403, 447, 46
619	1226		Nc		+85	1-3	20/1		+			tr GN Sph	+	+				Kbv	Bronco volcan
																			contact approx,
																			moderate mi
																			weaker. An f
			↓																768-808 98-923
			1012																1166 breccia
			Nx																1226 - strong a
226	1327		Nx		+90	1	20/1		+	tr		tr GN Sph	✓	+				An por	dike - variable
																			w/ some epido
1327	1355		Nx		+90	1-2	10/1		+				✓	+				Bisbee	sediments, silt
																			Bedding 10°, a
																			weak to mod.
1355	1407		Nx		+75	1	20/1		+					✓				An por	as above, epi
																			common mi
																			weak
																			CHS #2

GEOLOGIC LOG

Project Charleston — Chs-2

Sheet No.

Date Completed

Logged by JRK

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
07	1853		NX		+95	≥1	20/1		+				tr	✓				Bisbee	mudstones weak to mod; 1560-1579 1588 pebble dike 170 bedding 7°
53	1874		NX		95	1	20/1		+					+				An por	
74	2210		NX		95	≥1	25/1		+	?		tr ? Gn		✓			✓	Bisbee	sediment - as alter weak p flourite fault 92, bedding /
10	2268		NX		95	1-2	20/1		+					+			+	An por	breccia - pebbl dike in part, frags in A. s anhydrite VN
68	2307		NX		95	≥1	10/1		+					+				Bisbee	as above, mod mudstones, silts sandstone bed 12° dip
07	2352		NX		95	2-4	10/1		+				+	+				Peb dike	- fault zone
52	2949		NX		95	1-4	10/1		+	tr		tr Gn	✓	+				Bisbee	as above weak - mod b 15° numerous ftitite dikes 2 2503-40. 2572- 2592-2625; 267 2878-2903 epi
49	3033		?002 BX		25	3-6	10/1						+	✓		tr	✓	Anpor-	Gd por alter m bounded by a
33	3093		Bx		65													FAULT	involves both sed & intrusive rocks

[redacted] OL[redacted]IC [redacted]OG[redacted] Ch

Project Charlestown Chs-2 Date Completed Logged by JRK.

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Frach	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
Wedge			NX																
195	3415		3202		90														as described on page three
			BX																
			↓																
15	3895		BX		90	1-2	1/3		+	tr	tr	GN	+	✓			✓	BISBEE	siltst limesilt, s epidote g alter med to strong
345	4075		Bx			1-2	1/2		+				+		tr			An por	Gd por silicification r
225	4493		Bx		+90	1	1/1		+	tr	tr	GN	+		?		+	BISBEE	siltst alter strong silicification bedding 10°
193	4828		Bx		+90	≥1	2/1		+	tr	tr	GN	✓	✓				BISBEE	limest, congl alter to mod silic variable bedd 10°
328	4959		Bx		+85	≥1	2/1		+		tr	GN						Paleozoic	marble alter is weak bedding 5°
259	4980		4985 AX		+90	2-4	3/1		+				+					An por	fine grained r alteration poor core recovery silic noted
180	5028		AX		+90	.5-2	3/1		+	tr	tr	GN						Paleozoic	marble as before conta poor core recove alter wk, bedding 5 small fault 50

al. [redacted] -34[redacted] e[redacted] 02[redacted] [redacted] [redacted] [redacted] ASARCO [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] E NO. [redacted] [redacted] [redacted]

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ordinates

clination Vertical

GEOLOGIC LOG

Project Charleston

Sheet No. 1

Date Completed

Logged by JRK, SRC

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	21																		PLUG BIT
21	182		NC		+85	?	? 1/3	-					✓	+				Lus por	oxidized, with dikes of And por 80-100 132-159, alter is ... mod in Lus por, wk in And por, numerous small faults 30, 80-85, 103 132-133, CO3 ...
182	619?		NC		+85	1-3	20/1		+				✓	+				Lus por "Uncle Sam"	as above, alteration variable wk-mod, An por dikes 183-1.., 274-287, 429-463, pebble dikes freq. asso. w/ above, faults 166, 195-208, 219-221, 2.., 267-274, 289, 310, 3.., 326-403, 447, 460, 48..
619	1226		Nc ↓ 1012 Nx		+85	1-3	20/1		+			tr GN Sph	+	+				Kbv	bronco volcanics contact approx, alter moderate min some weaker. An por di.. 768-808, 919-923, 940-9.. 1166, breccia 118.. 1226 - strong alter
1226	1327		Nx		+90	1	20/1		+	tr		tr GN Sph	✓	+				An por	dike - variable ... w/ some epi.
1327	1355		Nx		+90	1-2	10/1		+				✓	+				BISBEE	sediments, silts-sa.. Bedding 10°, alter weak to mod.
1355	1407		Nx		+95	1	20/1		+					✓				An por	as above, epidote common, min very weak

[redacted]

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AMERCO

GEOLOGIC LOG

Project Charleston

Hole No. CHS-2
Sheet No.
Date Completed
Logged by JRK + S.R.C.

	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
2	1853		NX		+95	≥1	20/1		+				tr	✓				Bisbee	sediments [illegible] silt. mudstones alt weak to mod.; fault 1560-1579, 1588, 1646 pebble dike 1709, bedding 7°;
3	1874		NX		+95	1	20/1		+					+				An por	make dueto [illegible] scattered into phase and alter [illegible]
	2210		NX		+95	≥1	25/1		+	?		tr GN ?		✓			✓	Bisbee	sediments - as abo alter. weak poss. flourite, fault 2187 92, bedding 10°
0	2240		NX		95	1-2	20/1		+					+			+	An por	breccia - pebble dike in part, Bisbee frags in Δ, strong anhydrite UNINGS
8	2307		NX		95	≥1	10/1		+					+				Bisbee	as above, nodular mudstones, siltst. sandstone. bedding 12°
2	2352		NX		95	2-4	10/1		+				+	+				Peb dike	- fault zone
2	2949		NX		95	1-4	10/1		+	tr		tr GN [illegible]	✓	+				Bisbee	- as above alter weak - mod, bedding 15°, numerous an dlatite dikes, 2470-9 2503-40, 2572-76, 2592-2625, 2671-272 2878-2903 epi commo
19	3032		3002 BX		95	3-6	10/1						+	✓		tr	✓	Auper-Bd por	alter moderate bounded by a fault
33	3093		Bx		65													FAULT	involves both sediment + lower [illegible] rocks

[redacted] 3405 [redacted] RC [redacted]

GEOLOGIC LOG

Project Charleston

Hole No. Chs-2
Sheet No. 3
Date Completed
Logged by JRK

	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
3	3245		BX		90	1-4	15/1		+	tr		tr GN	✓	✓		tr	✓	BISBEE	[illegible] limey siltstones alter mod. bedding to, dike at 3112-3149.
5	3260		BX		90	2-4	5/1	50/1	+	tr			+		tr		tr	Au porp	as before, alter strong
	3415		BX		90	1-4	5/1		+	tr		tr GN SPH.	✓	+			tr	BISBEE	siltst, limey sit. limest., minor conglo alter is mod. epi common, silicified
							loss	hole	due	to	wash	at	3077					wedge	set for Chs-3111 at 3495

[redacted] ASARCO [redacted]

depth 5028
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GEOLOGIC LOG

Project Chalcocite

[redacted] NO. [redacted]
Sheet No. 4
Date Completed
Logged by JRK

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
[illegible]			NX																
35	3415		3202		40														as described on
			BX																page three
			↓																
15	3895		Bx		90	1-2	1/3		+	tr	tr	GN cpy	+	✓			✓	Bisbee	siltst limestone, sandy
																			calcite alter, patchy
																			prevalent alter
																			weak to strong
45	4000		Bx		90	1-2	1/2		+				+		tr			An por	[illegible]
																			[illegible]
																			silicification noted
25	4493		Bx		+90	1	1/1		+	tr		tr GN cpy	+		?		+	Bisbee	siltst. limest
																			alter strong -
																			silicification
																			bedding 10°.
93	4828		Bx		+90	≥1	2/1		+	tr		tr GN cpy	✓	✓				Bisbee	limest, sandy lim
																			stone. alter. wk
																			to mod. silicifiest
																			variable bedding
																			10°
28	4959		Bx		+25	≥1	2/1		+		tr	GN cpy						Paleozoic	marble
																			alter is weak
			↓																bedding 5°
57	4990		4985		+90	2-4	3/1		+				+					An por	fine grained mod
			AX																altered poor
			↓																core recovery on
																			contact silicification
																			noted
[illegible]	5028		AX		+80	.5-2	3/1		+	tr		tr GN cpy						Paleozoic	marble as
																			before contact
																			poor core recovery
																			otherwise alteration
																			wk, bedding 5°
																			small fault 5020-25

CHS-HZ ASSAYS

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CHS-2	50-60	<0.2	5	10	65	< 2
2		150-160	<0.2	35	15	95	< 2
3		250-260	<0.2	10	15	60	2
4		350-360	<0.2	5	10	75	< 2
5		450-460	<0.2	45	35	120	< 2
6		550-560	<0.2	10	50	65	< 2
7		650-660	<0.2	5	20	65	< 2
8		750-760	<0.2	5	20	65	< 2
9		850-860	<0.2	15	30	65	< 2
10	CHS-2	950-960	<0.2	5	35	35	< 2

TO:
American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S. R. Davis

REMARKS:

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
9/27/74	10/2/74	74-1050

339

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CHS-2	1050-1060	<0.2	10	65	75	2
2		1150-1160	<0.2	10	30	5	2
3		1250-1260	<0.2	55	15	130	< 2
4		1350-1360	<0.2	40	20	85	< 2
5		1450-1460	<0.2	5	15	35	2
6		1550-1560	<0.2	25	30	70	< 2
7		1650-1660	<0.2	5	10	35	< 2
8		1750-1760	<0.2	10	10	50	< 2
9		1850-1860	<0.2	15	50	130	2
10		1950-1960	<0.2	10	20	65	2
11		2050-2060	<0.2	5	15	70	2
12		2150-2160	<0.2	15	100	70	2
13		2190-2200	<0.2	5	20	5	2
14		2200-2210	<0.2	115	10	5	2
15		2210-2220	<0.2	35	15	50	2
16	CHS-2	2250-2260	<0.2	10	25	40	2

TO:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. S. R. Davis

REMARKS:

CERTIFIED BY: William L. Lehmbeck

REGISTERED ASSAYER CERTIFICATE NO. 9425 ARIZONA U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
9/30/74	10/7/74	741973

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

340

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm				
1	Chs-2 2911-2913	20.	485	5400	7600	< 2				

TO:

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

Trace analysis

CERTIFIED BY: William L. Lehmbeck

DATE REC'D:

DATE COMPL.:

JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

341

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	Chs-2 2988-2998	0.2	25	15	35	2
2	Chs-2 3243-3253	0.6	210	1800	2100	2
[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

CERTIFICATE OF ANALYSIS

Charles E. Thompson
Arizona Registered Assayer No. 942

William L. Lehmbeck
Arizona Registered Assayer No. 942

SAMPLE IDENTIFICATION	GOLD ppm	SILVER	COPPER	LEAD	ZINC ppm	MO ppm
Chs-2 3243-3253	<0.02					
[redacted]	[redacted]				[redacted]	[redacted]

TO:
American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John R. King

REMARKS:

2 Gold @ $2.50
1 Zinc - 1.25
1 Molybdenum - $1.50

CERTIFIED BY: William L. Lehmbeck
REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED 11/4/74 ARIZONA U.S.A.

CHARGES:
PREPARATION $
ANALYSIS $ 7.75

DATE REC'D:	DATE COMPL.:	JOB NUMBER:	$ 7.75
	11/11/74	742154-A	

TO:
American Smelting & Refining Company
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John King

REMARKS:

CERTIFIED BY: William L. Lehmbeck
REGISTERED ASSAYER CERTIFICATE NO. [illegible] WILLIAM L. LEHMBECK DATE SIGNED 11/4/74 ARIZONA U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
10/30/74	11/4/74	742154

342

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm			
1	Chs-2 3378-3388	<0.02	<0.2	55	55	250	< 2			

D:
American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

Attn.: Mr. John R. King

REMARKS:

CERTIFIED BY: William L. Lehmbeck

11/14/74

DATE REC'D: 11/6/74

DATE COMPL.: 11/14/74

JOB NUMBER: 74-2100

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

343

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu %	Pb ppm	Zn ppm	Mo ppm			
	Chs-2 W 4205-4215	<0.02	27	1.04	295	220	< 2			

O:
American Smelting & Refining Co.
Southwestern Exploration Div.
P. O. Box 5747
Tucson, Arizona 85703

Attn: Mr. John King

REMARKS:

CERTIFIED BY:

DATE REC'D:

DATE COMPL.:

JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

344

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu %	Pb ppm	Zn ppm				
1	Chs 4195-4205	<0.02	6.6	0.53	210	530				

American Smelting & Refining Company
Southwestern Exploration Division
P.O. Box 5747
Tucson, Arizona 85703

REMARKS:

CERTIFIED BY:

DATE REC'D:

DATE COMPL.:

JOB NUMBER:

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION		Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	CP-1	240-250		<0.2	15	50	185	2
2	CP-1	330-350		0.2	15	65	180	2
3	CP-1	370-395		<0.2	15	25	90	2
4	Chs-2	4351-4356	<0.02	<0.2	10	45	40	8
5		4470-4479	<0.02	<0.2	100	5	30	2
6		4742-4747	<0.02	<0.2	15	65	70	2
7		4971-4980	<0.02	<0.2	25	15	50	24
8	Chs-2	5012-5021	<0.02	<0.2	35	50	320	2

TO: American Smelting & Refining Company

REMARKS:

CERTIFICATION:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK

CHS #3 L065

CHS - 1 3862

The rock is a granodiorite porphyry with numerous subhedral phenocrysts of plagioclase and thick biotite books set at random in a granular quartz - feldspar matrix. A few phenocrysts of β quartz and hornblende were noted. Orthoclase rarely mantles and corrodes plagioclase phenocrysts. Hydrothermal alteration is moderate.

Early crushed zones developed in the fabric were characterized by growth of secondary biotite in plagioclase and growth of orthoclase. Disseminated pyrite relates to this event as well as retrograde sericitization of plagioclase. Some biotite and all hornblende were chloritized at this time. A last event is veining by coarse stilbite and interstitial calcite. These are evidently retrograde minerals derived in large measure from plagioclase.

Percentages of minerals present are as follows: quartz 20%, orthoclase 12%, plagioclase 34%, sericite 5%, calcite 6%, clinochlore 8%, stilbite 9%, pyrite 2%, magnetite 0.5%, biotite 3%, rutile 0.5%, apatite tr., zircon tr..

CHS - 2 4061

The rock is an andesite with a pilotaxitic structure. It was originally composed of swarms of well aligned plagioclase laths and small interstitial grains of mafites. Flowage alignment wraps around large subhedral plagioclase phenocrysts. The rock seems to have experienced some autobrecciation. Hydrothermal alteration and K-metasomatism have been moderate.

Most of the rock is unaffected except where cut by a network of granulated zones. In these, tiny scales of secondary biotite have formed at the expense of plagioclase and mafites; the biotite may be accompanied by lenses or pods of new, fresh orthoclase. Coarser orthoclase also occurs in well-defined veins with pyrite and late interstitial calcite. The walls of such veins show sericitization of plagioclase and retrograde alteration of biotite to clinochlore.

CHS - 3 2616

The rock is an intrusive breccia of intermediate composition. It carries innumerable phenocrysts of plagioclase and some β quartz and thick biotite books. These lie in a dense microgranular matrix of quartz and orthoclase that may embay or corrode phenocrysts. There is a crude flowage alignment to the matrix, and it carries numerous, partly resorbed xenoliths. Most of these appear to be cognate granophyres. The rock is quite fresh with epizonal alteration expressed only along fractures or veinlets.

Veinlets generally carry orthoclase and albite euhedrons; which it is depends on whether the vein cuts plagioclase (albite) or the matrix (orthoclase). Additional gangue minerals include calcite and clinochlore. Pyrite is rare in the veins and was also observed mantling accessory magnetite in the vein walls. Elsewhere in the rock alteration is confined to minor calcite and hydromicas in plagioclase and partial chloritization of biotite.

GEOLOGIC LO

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Project Charleston

Chs-3

Sheet No.
Date Completed
Logged by John R.

From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	2.3																		Plug B.F
2.3	115	92	NC		+80	1-4	–	–	+				+	+				Δ	Breccia w/ open oxidation to ~ 1 pred por + US
115	210	95	NC		+80	1-3	3/1		+					+				Dac por	dac-gd; phenos plag, Hb, Qtz Mc alter
210	560	350	NC		+75	3-6	5/1		+				+	✓				Gd por Δ	breccia in part, filling some alteration - strong faulting - 225, 255 335, 355, 458, 4
560	610	50	NC 631		+85	3-6	4/1		+									Gd por	as before relative
610	1070	460	NX		+85	2-5	3/1	100/1	+	tr		TR ON	+			tr	tr	Δ	heterolithic igne breccia frag. alter - st minor open cavit
970	1093	23	NX		+85	2-3	5/1		+				+					Dac por	as above excep no py phenos plag hb qtz
1093	1104	11	NX		+85	2-3	2/1		+				+					Δ	heterolithic brecc above alter decreasing
1104	1266	162	NX		+90	2-3	10/1		+			TR ON SPH	+				✓	Qtz Mz Por	with strong p dissem plag fa at 1260 otherwise sulfide VNING is NORMALLY NONE

CHS # 3

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Project Charleston

Chs - 3

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Date Completed

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From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
266	1484		NX		95	2	3/1	25/1	+	tr			+		tr	tr	✓	Gd-Por	with dissem py
																			faulting 1278,
																			some brecciation
484	1516		NX		90	2	3/1	20/1	+	✓		to GN	+			tr	✓	Δ	1453-1484 Heterolithic
																			breccia wi
516	1587		NX		95	1	4/1	20/1	+	✓			✓			tr	✓	An por	alter definite
																			decreasing
587	1930		NX		95	1-2	4/1	20/1	+	✓			✓			✓	✓	Gd-por	of An por of C
																			with K s
																			alter
																			wk to strong
																			ser twinning
																			An
930	2103		NX		95	1	8/1	15/1	+	✓			✓		tr	✓	✓	Gd-por	mix 1830-1930
																			relatively
																			unjointed K-pl
103	2340		NX		95	≤1	4/1	10/1	+	✓			✓		✓	✓	✓	Gd por	mix and por qu
																			possibly an intrus
																			breccia zone
340	2501		NX		95	1	3/1	15/1	+	✓			✓		✓	✓	tr	Gd por-	mix and por
																			rocks with K-
																			phenos; in Pa
																			rock shows defi
																			intrusive breccia
																			qtz veining &
																			veining prevail

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Project Charleston

Ch s - 3

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Sheet No.
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From	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
501	2910		NX		95	2	3/1	10/1	+	✓			+		✓	✓	✓	HYBRID	mod to strong [illegible] poc in places seen in Ch s hc before bxes in places f 3254
910	3003	93 TD	NX		95	<1	2/1	15/1	+	✓			tr		tr	tr	tr	Gd por	very fresh, Kspar phenos alter weak, no chlorite.

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[redacted] de[redacted] [redacted] A[redacted]RCO [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

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GEOLOGIC LOG

+ minor
+ abundant

Project Charleston

[redacted] NO. [redacted]

Sheet No. 1

Date Completed

Logged by John R. [illegible]

om	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
0	22																		Plug R.—
3	115	93	NC		+80	?1-4	–	–	+				+	+				Δ	Breccia w/ open cavitie oxidation to ≈ 150' pred. por ad + US por fr
15	210	95	NC		+80	1-3	3/1		+					+				Dac por	dec→qd; phenos of Pl, Ag, Hb, Qtz, Mag. Py alter & oxidation worse bottom 10' intense sert
210	560	350	NC		+75	2-6	5/1		+				+	✓				Qd por Δ	breccia in part, py-qz filling some cavities alteration - chlor fault, -225, 255, 310, 335, 355, 458, 490, 51
560	610	50	NC 631		+85	3-6	4/1		+									Qd por	as before except relative no breccia
610	1070	460	NX		+85	2-5	3/1	100/1	+	tr		TR GN SPH	+			tr	tr	Δ	heterolithic intrusive breccia pred. qd por stage alter - chlor minor open cavit. Δ ?
970	1092	23	NX		+85	2-3	5/1		+				+					Dac por	as above. except no py. chlor. only plag, hb, qtz,
1092	1104	11	NX		+85	2-3	2/1		+				+					Δ	heterolithic breccia as above. alter is decreasing
1104	1266	162	NX		+90	2-3	10/1		+			TR GN SPH	+				✓	Qtz Mz Por	with chlor, py. dissem. plag strongly intercalated. fault at 1260 otherwise rock is unfractured. sulfide veining is virtually NON EXISTENT

[redacted] 30[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

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GEOLOGIC LOG

Project Charlestown

.E NO. Chs-3
Sheet No. 2
Date Completed
Logged by LRK

n	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
62	1384	312	NX		+95	2	3/1	25/1	+	tr			+		tr	tr	✓	Gd-Por	with [illegible] also plag [illegible] [illegible] phenos. faulting 1278, 1302, [illegible] some brecciation since 1453-1484
54	1516	32	NX		+90	2	3/1	20/1	+	✓		tr GN [illegible]	+			tr	✓	A	Heterolithic igneous breccia with [illegible] soft-[illegible] clasts
6	1587	[illegible]	NX		+95	1	4/1	20/1	+	✓			✓			tr	✓	An por	alter definitely [illegible] [illegible] of An por of Ch-1
37	1930	343	NX		+95	1-2	4/1	20/1	+	✓			✓			✓	✓	Gd-por	with [illegible] K-spar phenos, alter [illegible] look to [illegible] [illegible] see twinning reflecting An por mix 1830-1930
30	2103	173	NX		+95	1	4/1	15/1	+	✓			✓		tr	✓	✓	Gd-por	[illegible] relatively unaltered K-phenos generally lacking [illegible]
23	2340	237	NX		+95	≤1	4/1	10/1	+	✓			✓		✓	✓	✓	Gd por	mix and por quite possibly a intrusive breccia zone
40	2501	399	NX		+95	1	2/1	15/1	+	✓			✓		✓	✓	tr	Gd por-	mix and [illegible] both rocks with K-spar phenos. in most rock show definite intrusive brecciation gts UNING & [illegible] UNING prevalent

[illegible]

[redacted] RC [redacted]

GEOLOGIC LOG

Depth [illegible]
[illegible]
[illegible]
[illegible]

[illegible] NO. [illegible]
Sheet No. 3
Date Completed
Logged by FRK

Project Chaffee

	To	Interval	Size	Spec	Recovery %	Total % Sulf.	Diss/Fract	Mineralization Ratio	Py	Cpy	Mo	Others	Alteration Phy	Arg	Pot	Mag	Anhy	Rock	Remarks
[illegible]	2910	[illegible]	NX		~95	2	3/1	10/1	+	✓			+		✓	✓	✓	HYBRID	[illegible] mod to strong. rock fr. weakly por in places not seen in the holes before brecciated in places. [illegible] 3754
[illegible]	3003	93	NX		~95	<1	3/1	5/1	+	✓			tr		tr	tr	tr	Qtz por	very fresh, with Kspar veins. alter weak. [illegible] no chlorite.
		TD																	

OAS #3 1559015

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm
1	Chs-3 201-211	<0.02	<0.2	220	140	165	2
2	602-610	<0.02	<0.2	110	65	65	8
3	948-958	<0.02	<0.2	60	70	80	8
4	1213-1223	<0.02	<0.2	50	30	45	2
5	1486-1496	<0.02	3.2	870	820	1850	14
6	1577-1587	<0.02	0.2	185	35	110	6
7	2167-2176	<0.02	<0.2	295	40	50	16
8	2789-2799	<0.02	<0.2	940	70	55	12

American Smelting & Refining Company
Southwestern Exploration Division
P. O. Box 5747
Tucson, Arizona 85703
Attn: Mr. John R. King

REMARKS:
Trace analysis

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA U.S.A.

DATE REC'D: | DATE COMPL.: | JOB NUMBER: