REPORT ON THE

CLIFTON - GOLD HILL AREA PROPERTY

TOOELE COUNTY, UTAH

for

AMERICAN CONSOLIDATED MINING COMPANY

The MINING HOUSE Inc.

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Toronto, Canada
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1.0 EXECUTIVE SUMMARY

The Mining House Inc. (**MINING HOUSE**) has concluded a site visit and a review of the existing database on the property holdings of American Consolidated Mining Company (**ACMC**) located in the Gold Hill/Clifton Mining District, Tooele County, Utah. The property consists of over 7,000 acres, is favourably located in a non-environmentally sensitive area, and is comprised of rock types and structures that are similar to many producing mining areas in the western United States.

The Clifton/Gold Hill Mining District has produced gold, copper, arsenic and tungsten and minor amounts of lead, zinc, silver and bismuth. The total recorded production from 1901 to 1964 included 25,000 oz Au, 832,000 oz Ag, 1,700 short tons copper and minor quantities of lead and zinc. Complete bismuth and tungsten production statistics are not available.

On the basis of the examination it is believed that the **ACMC** property package has a good potential to develop economic deposits of base and precious metals that could occur as either replacement type bodies, large bulk mineable porphyry style deposits or as epithermal deposits. In particular it is the opinion of the **MINING HOUSE** that the **ACMC** property has the potential to host significant precious metal deposits which potentially could include contact metosomatic (skarn) gold-sulphide deposits, structurally controlled epithermal-mesothermal vein-type deposits and sediment-hosted, disseminated precious metal deposits.

The property area contains numerous structural and lithologic characteristics favourable to the formation of the latter deposits, including abundant structurally controlled, pervasive hydrothermal alteration and numerous well mineralized structures. Several past producing mines are also located within the property boundaries. All past exploration activity on the property appears to have been very limited in scope and concentrated solely on specific local target areas. As such, previous exploration efforts have been lacking in an overall understanding of how the various mineralized areas relate to the lithology and structures within the property.

Based on its evaluation, the **MINING HOUSE** believes that there are definite structural and lithologic controls that govern the emplacement of mineralization on the property. It is further believed that these controlling factors can be understood and used to advantage in developing the area once their spatial relationships are mapped and plotted.

In order to develop the property to its full potential the **MINING HOUSE** firmly believes that the property must first be geologically mapped in detail so that relevant structures can be identified and the limits of the various rock units identified. To this end the **MINING HOUSE** proposes a property-wide reconnaissance program of mapping and orientation geochemical sampling. The reconnaissance survey shall be conducted in sufficient detail as to outline target areas for more advanced follow-up exploration. An airborne geophysics survey is also recommended as a stand-alone complement to the reconnaissance ground surveys. After the reconnaissance survey, the property would be divided into distinct target areas that could stand-alone as individual exploration projects. The data generated would make it possible to formulate exploration programs that will result in a maximum realization of the property's potential. By completing the detailed reconnaissance work, the "value" of the target areas could be more readily assessed as could the magnitude of the actual exploration expenditures that should be incurred.

The follow-up target specific exploration projects are tentatively scheduled in two phases. Phase I exploration would consist of detailed geological, geophysical and geochemical surveys. Phase II, contingent on Phase I results would consist of exploratory diamond drilling of targets generated in the reconnaissance and Phase I exploration.

In addition to the recommendation for a geological/geophysical reconnaissance program over the entire property, five exploration targets can, based on the extent of the existing database, now be selected for further exploration work. These targets include areas where previous work has been conducted and additional work is warranted and new areas that were either previously overlooked, forgotten or undiscovered prior to the site visit. The work plans and proposed budgets for these advanced exploration targets are at this point tentative. On completion of the reconnaissance the required work and budgets could be more accurately assessed. The areas are as follows:

- Yellow Hammer Mine Area
- Lucy L Mine Area
- Southern Shear Zone Area
- Beryllium Veins Area
- Bridge Vein Area

Reported historical production at the Yellow Hammer mine has included:

1917	1,646 lbs scheelite ore at 69.5% WO_3
1939-45	$25,000 to $45,000
1954-55	400 tons producing 97 units WO_3
1958	1,500 tons sorted Cu oxide and sulphide ore with scheelite
1970	15,000 tons - Silver Star Queen Mines
1986	50,000 tons - **ACMC**

The **MINING HOUSE** considers the exploration potential at the Yellow Hammer mine may be restricted to yet undefined, discrete, high grade mineralized bodies lying along strike and at depth in the main structure that controls the known mineralization in the pit. The minimum strike length of this structure is on the order of 1500 feet, and to date only about 500 feet in the immediate area has been tested to a depth of approximately 200 feet.

Significant historical underground development has been completed at the Lucy L Mine. The main target of the mine was a gold-bismuth quartz vein and to a lesser extent a distinct tungsten-copper lode. The Lucy L mine may be related to a larger, yet unrecognized, regional structure and as such there is potential for additional as yet undiscovered subparallel ore shoots. A major quartz-amphibole veined structure trends north from the Lucky Day Knob toward the Lucy L mine area. A sample of quartz-amphibole vein material collected by **ACMC** personnel returned 0.162 oz Au/ton, 2.038 oz Ag/ton and 4.74% Cu. The Polestar adit and Keno shaft may have accessed this vein structure. The Lucy L-Lucky Day Knob area is considered a prime exploration target and it is strongly recommended that detailed mapping and sampling be undertaken in this area to determine structural relationships and the nature of the gold mineralization. The area has the potential to develop significant gold reserves.

The **MINING HOUSE** recognizes the Southern Shear Zone system to be a major structural trend in the south and southeastern portion of the property. Two major shear zones in this system are the Ivanhole-Southern Confederate shear and the Horizontal Veins shear. Mineralization includes lead, silver and gold. A high grade sample collected by **MINING HOUSE** from the "Spanish Mine" portal on the Ivanhole-Southern Confederate shear returned 0.148 oz Au/ton, 5.08 oz Ag/ton and 13.31% Pb. A quartz vein sample collected by **MINING HOUSE** personnel from the Ivanhole shear returned 0.074 oz Au/ton and 1.888 oz Ag/ton. Both shears are considered viable targets to develop significant reserves. The shears will however, require detailed exploration including mapping, sampling and ground geophysics in order to determine their full potential and whether diamond drilling is warranted.

The **MINING HOUSE** considers the Beryllium Veins area to be an excellent target for low grade disseminated gold mineralization. Previous sampling in this area returned values of 0.02 to 10.0 oz Au/ton. Unfortunately no documented, systematic mapping or sampling has been conducted over the area so the relationship between structure and gold distribution is not understood.

During the site visit, **MINING HOUSE** personnel encountered a pronounced northerly trending structure in the draw between the Yellow Hammer and the Reaper mines. The structure, here-in-after referred to as the Bridge Vein, is estimated to be in excess of 60 feet in width and was traced for a minimum strike length of 1,000 feet. As little or no work has been documented on this structure and because the structure is intensely silicified, **MINING HOUSE** personnel collected four representative grab samples across the width of the veined structure. The results of these samples averaged 0.116 oz Au/ton and ranged from 0.064 to 0.236 oz Au/ton. This area is considered a prime exploration target and it is strongly recommended that detailed mapping and sampling be undertaken in this area to determine structural relationships and the nature of the gold mineralization. The area has the potential to develop significant gold reserves as the structure appears to be quite large.

The above areas represent highlights of the immediate exploration potential of the property based on a property visit of several days and a review of the existing database in ACMC's office. At present, the **MINING HOUSE** does not rank highly exploration areas such as the Clifton-Herat and the Kiewit disseminated gold zone; however the true potential of these and other areas may become more apparent after the property has been mapped and interpreted in its entirety and results from current test work become available.

The **MINING HOUSE** has prepared a preliminary budget estimate of $64,000 to complete the reconnaissance exploration program. An airborne geophysical survey could be completed over the property for an estimated additional $42,000.

In addition to the above recommended reconnaissance and airborne geophysical exploration programs, the **MINING HOUSE** recommends follow-up, stand-alone exploration programs for the five previously described target areas which it believes will warrant additional exploration following the above property-wide preliminary exploration. Each program is multi-phased with the first phase consisting of follow-up to the regional work including detailed mapping, sampling and ground geophysics on the immediate target area. The second phase, contingent on the results of the first phase would comprise exploratory diamond drilling. Table 1.1 summarizes proposed budget expenditures on each tentative target area.

TABLE 1.1: SUMMARY OF PROPOSED TARGET AREAS

TARGET AREA	COMMODITY SOUGHT	POTENTIAL	PROPOSED EXPENDITURES		
Yellow Hammer Mine Area	Cu, W, Au	Structurally controlled small tonnage, high grade "pods" in main Yellow Hammer structure and possible parallel structures.	Phase I Reserve Definition Drilling	$150,000	
			Phase Ia Reserve Definition Drilling	$114,000	
			Phase II Reserve Definition Drilling	$145,000	$409,000
Lucy L Mine Area	Au, (Ag, W?)	Subparallel ore shoots in Lucy L mine area. North-trending vein structure between Lucy L mine and Lucky Day Knob has good potential for significant gold.	Phase I Ground Surveys	$42,000	
			Phase II Diamond Drilling	$94,000	$136,000
Southern Shear Zone Area	Au, Ag, (Pb, Zn)	Shear zone related quartz-carbonate vein-hosted precious and base metal deposits.	Phase I Ground Surveys	$42,000	
			Phase II Diamond Drilling	$94,000	$136,000
Beryllium Veins Area	Au, (Be)	Vein-hosted and possibly bulk tonnage disseminated gold mineralization.	Phase I Ground Surveys	$27,000	
			Phase II Diamond Drilling	$81,000	$108,000
Bridge Vein System	Au, (Be)	Vein-hosted and possibly bulk tonnage disseminated gold mineralization.	Phase I Ground Surveys	$26,500	
			Phase II Diamond Drilling	$59,500	$86,000
				GRAND TOTAL	$875,000

The **MINING HOUSE** however is of the opinion that the potential of the property is in the development of a large bulk tonnage operation.

2.0 INTRODUCTION

The Mining House Inc. (the **MINING HOUSE**) was requested by American Consolidated Mining Co. (**ACMC**) to prepare a qualifying report on its mining claims in the Gold Hill district, Utah. The purpose of the study was to compile and evaluate all available historic data and to develop a long-term phased exploration program for the entire property. Specific areas would be outlined that could be developed and packaged as individual exploration targets. The data compilation was supplemented by on-site investigations to verify the data and exploration potential of the property.

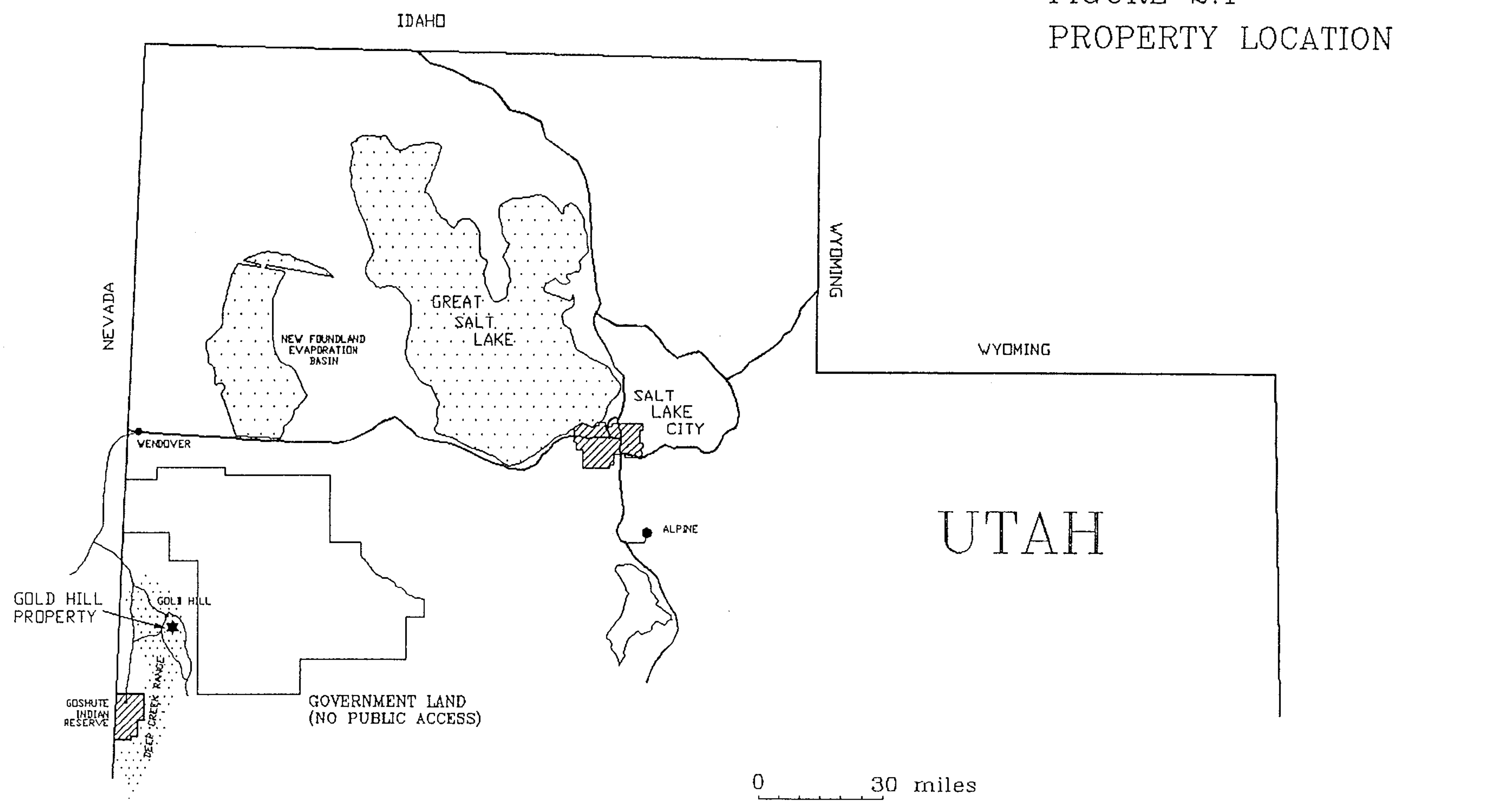
In order to accomplish the scope of work set out by **ACMC**, the **MINING HOUSE** provided a team consisting of a senior mining geologist, John V. Tully and two exploration geologists, Richard W. Evoy and Ian D. Trinder. The team conducted a field examination of the property during the period of February 14 to 22, 1991. During this period, **MINING HOUSE** personnel spent five days conducting field investigations and four days reviewing available data at **ACMC**'s corporate office in Alpine, Utah. Additional data compilation and report writing was completed in the **MINING HOUSE**'s Toronto office.

2.1 PROPERTY LOCATION, DESCRIPTION AND ACCESS

The ACMC property lies in the Gold Hill/Clifton Mining District and straddles the Gold Hill and Clifton 7.5' quadrangles, Tooele County, northwest Utah (Figure 2.1). It lies in the east central part of the Great Basin section of the Basin and Range Province, at the north end of Deep Creek Mountains. The area is characterized by highly dissected hills of relatively low relief. The village of Gold Hill, immediately north of the property, has an elevation of 5,321 feet. The area is bounded to the east by the Great Salt Lake Desert at an altitude of approximately 4,300 feet, to the north by Dutch Mountain with an elevation of 7,735 feet, to the west by Clifton Flat at an approximate elevation of 6,600 feet and to the south by Montezuma Peak with an elevation of 7,369 feet. The relatively low hills at the ghost town of Clifton, located in the south part of the property, merge westward into Ochre Mountain which has an elevation of 7,541 feet.

Access to the property is by alternate I 93, a paved two lane highway, south 24.6 miles from Wendover, Nevada to the Ibapah Road. The Ibapah Road, a paved two lane highway is then taken east a distance of 15.7 miles to the Gold Hill turn-off. A gravel all-weather road provides access to the village of Gold Hill, 11.2 miles to the southeast. An all-weather road leading south from Gold Hill provides access to the property. The Yellow Hammer mine is located approximately 5 miles south of Gold Hill. Numerous trails provide access to most parts of the property. The trails are generally passable with a high-centered two-wheel drive vehicle although a four-wheel drive is preferable.

FIGURE 2.1
PROPERTY LOCATION



Climate of the Gold Hill area is semi-arid with hot summers and mild winters. Fieldwork can generally be conducted throughout the year.

2.2 CLAIM OWNERSHIP

American Consolidated Mining Company (ACMC) was formed as a Utah Corporation on November 1, 1980. Subsequent to becoming a public corporation ACMC acquired the property holdings of BEO (a limited partnership), American Strategic Minerals Inc., and others during the period of 1980 and 1981. The acquisition of these properties allowed ACMC to assemble a nearly contiguous property package (Figure 2.2) consisting of approximately 350 patented and unpatented claims totalling roughly 7000 acres.

The **MINING HOUSE** has not examined title to the claims nor substantiated their physical boundaries and, accordingly, expresses no opinion as to validity of the title and property description.

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2.3 SCOPE OF WORK

The scope of work, as established for the project, is as follows:

1) Chronologically tabulate, within a single document, all available data pertaining to historic exploration and mining programs completed on the various prospects in the property area.

2) Assess all available geological/geotechnical data, reserve estimates, and other relevant data.

3) Provide an opinion as to the exploration potential of more advanced prospects such as the Yellow Hammer deposit as well as the regional potential of the claim area.

4) Outline a conceptual exploration program that will develop the property in an orderly manner and will lead to the early recognition of the most favourable areas for concentrated exploration expenditures.

5) Recommend immediate priority exploration programs with budgets and schedules.

3.0 REGIONAL HISTORY

Historically the Clifton-Gold Hill area has undergone extensive mining activity, dating back to the late 1800's. About 1857, when travel to California through Overland Canyon was greatest, galena rich samples attracted the attention of travellers and some stayed to prospect for minerals. Prospectors gradually moved northward from Overland Canyon finding and developing many rich surface deposits (Figure 3.1). As a result, the town of Clifton and the Clifton (Gold Hill) Mining District were gradually established (El-Shatoury and Whelan, 1970).

Placer gold was discovered in Gold Hill in 1858, but prospectors were hampered by repeated Indian attacks and the area was abandoned; the village not re-established until 1869 (Heylmun, 1990).

In 1872, a lead smelter was constructed at Clifton and 1,500 tons of high-grade lead-silver ore was treated (Gold Hill Standard, 1917). The smelter at Clifton was moved to Gold Hill in 1874 where an additional 500 tons of ore from the Western Utah Copper Company was treated and produced four carloads of lead-silver ore (El-Shatoury and Whelan, 1970).

The mining boom in Gold Hill, however, did not begin until 1892 when Col. J.F. Woodman built a mill and smelter at Gold Hill and removed $300,000 in gold and silver

FIGURE 3.1 LEGEND

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF UTAH
UTAH GEOLOGICAL AND
MINERALOGICAL SURVEY

GOLD HILL QUADRANGLE

TOOELE COUNTY, UTAH

INDEX NUMBER	DEPOSIT NAME	COMMODITY
1	Windsor Claim	Unidentified
2	Garrison Mines	Pb, Ag, Cu, Ba, Zn
3	New Year-Roy Claims	Cu
4	January Claim	Ba
5	February Claim	Cu
6	Monster-Creon Adits	Pb,Ba
7	Tunnel Claim	Ba
8	Evans Mine	Pb,Ag,Ba
9	Rea Claim	Ag,Cu
10	Uncle Sam Claim	Pb,Ag,Ba
11	Iron Claim	Pb,Ag,Cu
12	Chester Claim	Cu
13	Lost Horse Prospects	Cu
14	Dutch Summit Adits	Unidentified
15	Silver Hill Mine	Ag,Pb
16	Unidentified Prospect	As,Cu
17	Unidentified Prospect	Unidentified
18	Gold Hill Pass Prospect	Unidentified
19	Ulmer-Lucky Strike Prospects	Unidentified
20	Little Valley Prospect	Unidentified
21	Badger Hole Claim	Unidentified
22	Star Dust #2 Claim	W,Zn
23	Tucson Prospect	Cu,Au, W
24	Star Dust Lode Claim	W
25	E.H.B. Lode Deposit	W, Zn,Cu
26	Norman Scott Claim	W
27	B. Estelle Claim	W,Zn
28	Star Dust Extension Claim	W
29	Tuolumne Claim	W,Cu, Au
30	Unidentified Prospect	Cu,Zn
31	Copper Cup Claim	W,Cu
32	Pool Canyon Prospects	Unidentified
33	Jolly John Claim	Unidentified
34	Unfinished Dream #1 Claim	Pb,Cu, Vrm
35	Grab-It-Here Claim	Pb
36	Unfinished Dream #2 Claim	Cu, Pb
37	Tobar Claim	W,Cu
38	Last Chance #2 Lode Claim	W
39	Fraction Lode Claims	W
40	Blue Lead Claim	Pb

INDEX NUMBER	DEPOSIT NAME	COMMODITY
41	Cardiff Claims	Pb, Ag
42	Option #1 Claim	Cu
43	Pay Rock Prospect	Pb, As
44	Tribune Gulch Prospects	Unidentified
45	Lead King Prospect	Unidentified
46	Copper Hill Deposit	Cu, Pb, Au, As
47	Unidentified Prospect	Unidentified
48	Walla Walla Prospect	Au, Ag, Pb, Zn, As
49	Unidentified Prospect	Unidentified
50	Unidentified Prospect	Ba
51	Unidentified Prospect	Unidentified
52	Imperial Deposit	Au, Cu, Pb,
53	Alice No. 2 Deposit	Cu
54	Cane Spring Mill	--
55	Cane Springs Mine	Au, Ag, Cu, Pb
56	Oregon Prospect	Cu, As
57	Unidentified Prospect	Unidentified
58	North Wash Prospects	Cu
59	Glendale Mill	--
60	Ochre Springs Prospects	Ba
61	Spring Hill Lode Claim	Ba
62	Brown Rock Prospects	Ba, Fe
63	Gold Belt Prospect	Pb
64	Rube Lead Mine	Pb, Ag
65	Rube Lead Mine	Au, Ag, Pb
66	Napoleon Mining Co. Property	Au, Ag, Cu
67	Silver and Gold Mining Co. Property	Au, Ag, Pb
68		
69		
70		
71	Christmas Mining Co. Prospect	Ag, Pb, Cu, Ba
72	Wilfong Claim	Mo, W
73	Gold Hill Standard Prospect	Pb, Ag
74	Alvarado Mine	Au, Ag, Cu
75	Murphy-Lucky Strike Prospects	Au, Ag, Cu
76	Unidentified Prospect	Unidentified
77	Homestead Claim	Unidentified
78	Gem Claims	Au
79	Boston Prospect	Au, Ag, Pb
80	Incomparable No. 1 and 2 Claims	Au, Ag, Pb
81	Maple Claims	Au, Ag, Cu
82	Western Pacific Claim Group	Au
83	Copperopolis Mine	Cu, Au, Ag, Pb, W
84	Rose Towsley Claim	Cu, Au
85	Black Bird Claim	Unidentified
86	Gold Hill (Western Utah) Mine	Cu, Pb, Ag, Au, As
87	Western Utah Extension Mine	Ag, Cu, Zn, As
88	Southern Belle Claim Group	Au
89	Wilson Prospect	Au
90	Glenda Mine	Au, Pb, Cu, As

INDEX NUMBER	DEPOSIT NAME	COMMODITY
91	U.S. Mine	As, Pb, Ag, Cu, Zn
92	Last Dime Claim	Au, Cu
93	Bonnemort Mine	Au, Cu
94	Gold Hill Wash Prospect	Unidentified
95	Undine Mine	Au, Ag, Cu, Pb
96	Frankie West Prospect	Au, Cu
97	Frankie Mine	Au, Ag, Cu, W
98	Lucy L North Prospect	Au
99	Lucy L Mine	Au, W, Bi, Cu
100	Unidentified Prospect	Cu
101	Moonlight Prospect	Au
102	Hidden Treasure Prospect	Cu
103	Hattie No. 35 Claim	Unidentified
104	Success Fraction Claim	Au
105	Queen Prospect	Au
106	Lucky Boy Claims	Unidentified
107	Cash Boy Mine	Ag, Pb, Cu
108	Unidentified Prospect	Au, Cu
109	Success Mine	Ag, Pb, Cu
110	Success Annex Prospect	Unidentified
111	Climax Mine	Ag, Pb, Cu, Zn, Be
112	Troy Prospect	Au, Be, Cu, Pb
113	Sec. 18 Barite Prospect	Ba
114	New Baltimore Mine	Ag, Pb, Zn, Cu
115	Senate Claim	Unidentified
116	Polestar Mine	Ag, Au, Cu
117	Sunny South Claim	Au
118	Copper Bloom Prospect	Au, Ag, Bi, Cu, W
119	Keno Claim	Ag, Cu, Au
120	Gold Bond Prospect	Au, Ag, Bi, Cu, W
121	Calaveras Mine	Au, Ag, Cu
122	Rustler Prospect	Au, Cu, Mo, W
123	Rodenhouse Wash Beryllium Deposits	Be
124	Andalusite Hornfels Area	Andalusite
125	Subsurface Brines	Brines

Key to Map Symbols

Metals Deposit

Brine Deposit

Unidentified Deposit

Other Deposit

Associated Workings

Area of Beryllium Deposits

Andalusite Hornfels Area

UNITED STATES
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GEOLOGICAL SURVEY

STATE OF UTAH
UTAH GEOLOGICAL AND
MINERALOGICAL SURVEY

CLIFTON QUADRANGLE

TOOELE, COUNTY, UTAH

INDEX NUMBER	DEPOSIT NAME	COMMODITY
1	Unknown	Gold, Copper
2	Unknown	Gold, Copper
3	Wilson Consolidated Mine	Gold, Bismuth, Tungsten Copper, Lead
4	Centennial-Enterprise	Gold, Silver, Copper Tungsten, Iron
5	Yellow Hammer North	Gold, Silver, Copper Tungsten
6	Yellow Hammer Mine	Gold, Copper, Silver, Tungsten, Molybdenum, Beryllium
7	Reaper Mine	Tungsten, Molybdenum, Gold, Barite, Beryllium, Lead
8	Doctor Claim	Tungsten, Copper, Bismuth
9	Miantonoma	Gold, Copper, Tungsten
10	Rex	Gold, Copper
11	Kaffin	Gold
12	Unknown	Gold
13	Unknown	Gold
14	Unknown	Gold
15	Iron	Gold, Copper
16	Atlantis	Gold
17	Paymaster-Alliance	Gold
18	Unknown	Gold
19	Unknown	Gold
20	Unknown	Gold, Copper
21	Unknown	Gold
22	You Owe Me	Gold
23	I Owe You Mine	Gold, Lead, Molybdenum
24	Black Hawk #2	Gold, Copper
25	Columbia-Sunshine	Gold
26	Neptune	Gold, Copper
27	Bird	Lead, Silver, Zinc Copper, Arsenic, Gold
28	Southern Confederate Mine	Lead, Silver, Zinc, Copper, Arsenic, Gold
29	Red Jacket	Lead, Silver
30	Shay	Lead, Molybdenum, Gold
31	Lion	Gold, Copper, Lead
32	North Herat	Gold
33	Herat Mine	Silver, Gold, Copper Lead

INDEX NUMBER	DEPOSIT NAME	COMMODITY
34	Clifton Mine	Unidentified
35	Unknown	Gold
36	Julian	Gold
37	Calendar	Gold
38	Unknown	Gold
39	Silver King	Silver, Copper, Gold, Lead
40	Monocco Mine	Copper, Lead, Silver, Gold, Iron, Arsenic
41	Mary Anderson North	Gold, Copper, Arsenic
42	Rising Sun	Gold, Copper, Arsenic
43	Wild Goose Spring	Gold
44	Immense	Gold
45	Electric	Gold, Copper
46	Albert	Gold, Silver, Copper, Arsenic
47	Unknown	Gold
48	Unknown	Unidentified
49	Ozark	Gold, Silver, Copper, Arsenic
50	June Bug	Unidentified
51	Golden Eagle	Gold, Copper,
52	Midas	Gold, Silver, Copper Arsenic
53	Utah Claim	Gold, Copper
54	Proberts Property Eost	Gold, Copper, Arsenic
55	Proberts Property West	Gold, Copper, Arsenic
56	Monte Del Ray	Arsenic, Lead, Copper
57	Fortuna	Gold, Lead, Arsenic Copper, Manganese, Silver
58	Laura Claim	Gold, Copper
59	Cyclone Mine	Lead, Silver, Arsenic, Zinc, Copper, Gold
60	Bonanza	Gold, Arsenic, Lead, Zinc
61	Mascot	Arsenic, Lead, Gold, Tungsten
62	Unknown	Gold
63	Unknown	Gold, Copper
64	Midland	Gold, Silver, Copper, Lead, Arsenic, Molybdenum
65	Unknown	Gold, Copper
66	Gold Star #2	Gold
67	Overland	Silver, Lead, Copper, Gold, Zinc
68	Gold Star	Copper, Lead, Silver, Gold

INDEX NUMBER	DEPOSIT NAME	COMMODITY
69	Unknown	Unidentified
70	Unknown	Gold
71	North Pass Canyon	Unidentified
72	Sunday	Lead,Silver
73	Roy Mine	Gold, Silver, Lead Zinc, Iron
74	Silver	Copper, Lead
75	Vanguard Research Co.	Beryllium

Key to Map Symbols

● Metals Deposit

Associated Workings

ore from 1892- 1896 (Heylmun, 1990). El-Shatoury and Whelan (1970) report that in 1892, the Cane Spring Consolidated Gold Mining Company built an amalgamating mill for the treatment of ores from the Alvarado and Cane Spring mines. It is likely that this mill and the one constructed by Col. Woodman are one and the same. The mill was in operation for 23 months during the years 1892-1895. The average grade of the ore treated in the mill is reported to have averaged $20 to $30 per ton in gold ($20.67/oz, pre-1935 price) (Gold Hill Standard, 1917). Total reported net receipts from bullion and concentrate from the Cane Spring mine were $117,907.23.

The area remained relatively inactive until 1905 when the area saw renewed activity centered on the development of copper ore (Heylmun, 1990). The linking of Gold Hill and Wendover by the Deep Creek Railroad in 1917 resulted in a third mining revival during which time the Gold Hill Mine was in full production (Heylmun, 1990). No production records are available for this operation.

Kemp and Billingsley (1918) published a geologic report and generalized map of the area that extended from Dutch Mountain in the north to the Overland Canyon in the south. Butler (1920) reported on a 1912 reconnaissance survey of the area and recommended detailed geological investigation. Butler (1920) reported that the district's gross ore production from 1892 to 1917 was $951,803 in gold, silver, copper and lead.

Production of tungsten from the Lucy L mine began in 1912 and it is estimated approximately 500 tons of ore containing 1% WO_3 was produced (El-Shatoury and Whëlan, 1970). Significant quantities of gold and bismuth were also extracted from the Lucy L but no production statistics are available (Moeller, pers. comm.). The Reaper mine was discovered in 1914. Net receipts from ore production from the Reaper are estimated to have been $75,000 of which $70,000 was obtained during World War I. Beginning in 1917, the Yellow Hammer mine was operated for tungsten; total value of production during World War II is estimated to have been $25,000 to $45,000. An additional 400 tons of tungsten ore was extracted from the Yellow Hammer during 1954-1955 from which approximately 97 units of WO_3 were produced (Everett, 1961). Everett also reports that 1,500 tons of sorted ore comprising copper oxides and sulphides with scheelite were mined during 1958. The grade of this production is not reported. Silver Queen Mines extracted an estimated 15,000 tons of ore from the Yellow Hammer pit in 1970 (Smith, 1975). **ACMC** extracted 50,000 tons of gold-silver-copper-tungsten ore and treated it at the Victoria Mill. The grade of this production is not known to the **MINING HOUSE.**

The Rube Mine produced high grade direct-smelting gold ore (7-10 oz Au/ton) from 1923-1933 (El-Shatoury and Whelan, 1970). Total production from this mine could not be found in the literature on the area.

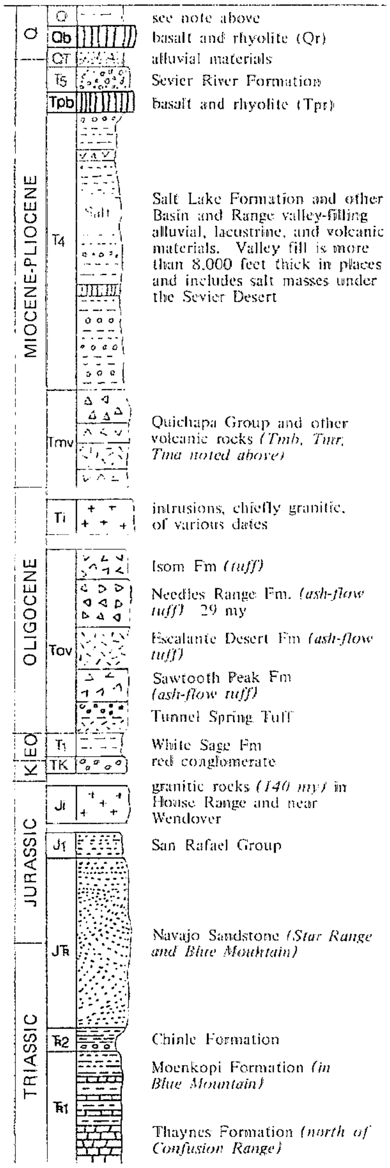
From 1923 to 1925 arsenic was produced at two former copper producers, the Gold Hill mine of Western Utah Copper Company and the United States mine of U.S. Smelting, Refining and Mining Company. Nolan (1935) estimated the value of arsenic production during this period to be $2,500,000. The mines were abandoned in 1925 due to a drop in the price of arsenic.

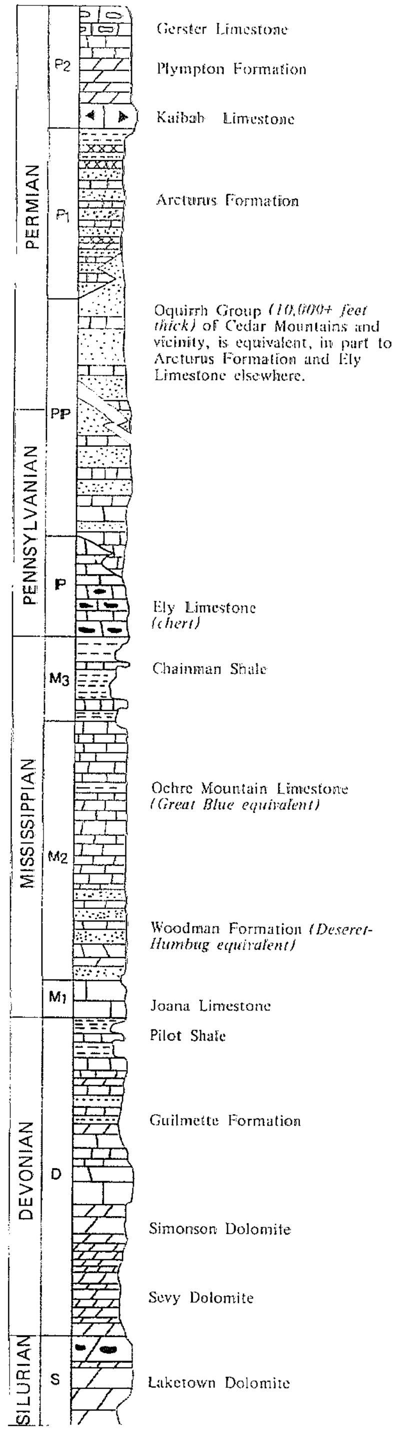
The United States mine re-opened during World War II with production estimated at 98,724 tons grading 15.2% arsenic.

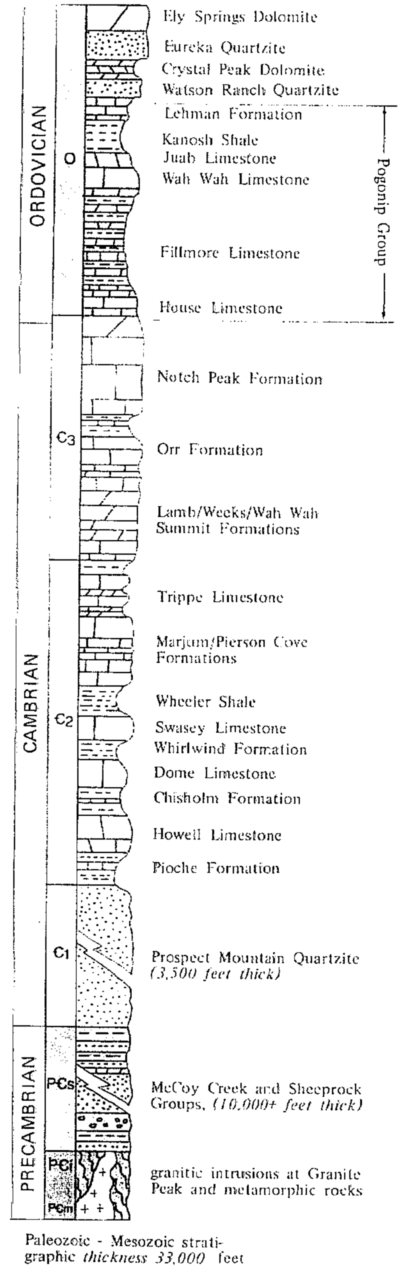
Nolan (1935) began a geological study of the Gold Hill area in 1925 after topographic mapping of the area had been completed. The stratigraphy and structure of the area was abstracted in 1928 and in 1935 he published his work on the area in U.S. Geological Survey Professional Paper 177. This is one of the definitive works on the area.

Griffitts (1965) reported the occurrence of beryllium in the quartz-carbonate veins in Rodenhouse Wash. El-Shatoury and Whelan (1970) conducted field investigations of the mineralization of the Gold Hill mining district in the summers of 1965 and 1966.

The Clifton/Gold Hill Mining District has produced gold, copper, arsenic and tungsten and minor amounts of lead, zinc, silver and bismuth. The total production from 1901 to 1964 included 25,000 oz Au, 832,000 oz Ag, 1,700 short tons copper and lesser quantities of lead and zinc. Total reported value of this production was $2,878,084. Complete bismuth and tungsten production statistics are not available.







Paleozoic - Mesozoic stratigraphic *thickness 33,000* feet

SYMBOLS

- ✱ Volcanic cone
- Igneous dike
- Gilsonite vein
- Fault exposed
- Fault inferred
- Fault concealed
- Thrust fault, barbs on upper plate

IGNEOUS ROCKS

Qb	Basalts	Ti	Tertiary intrusive rocks
Tpb	Basalts	Ji	Jurassic intrusive rocks
Tmb	Basalts	PCi	Precambrian intrusive rocks
Qr	Rhyolites	Tmv	Miocene volcanic rocks, undivided
Tpr	Rhyolites	Tov	Oligocene volcanic rocks, undivided
Tmr	Rhyolites		
Tma	Andesites	Tvu	Tertiary volcanic rocks, undivided

SURFICAL DEPOSITS

Qa	Alluvium and colluvium	Ql	Lake Bonneville deposits
Qao	Older alluvial deposits	Cm	Marshes
Qe	Eolian deposits	Cs	Mud and salt flats
Qg	Glacial deposits	Qls	Landslides

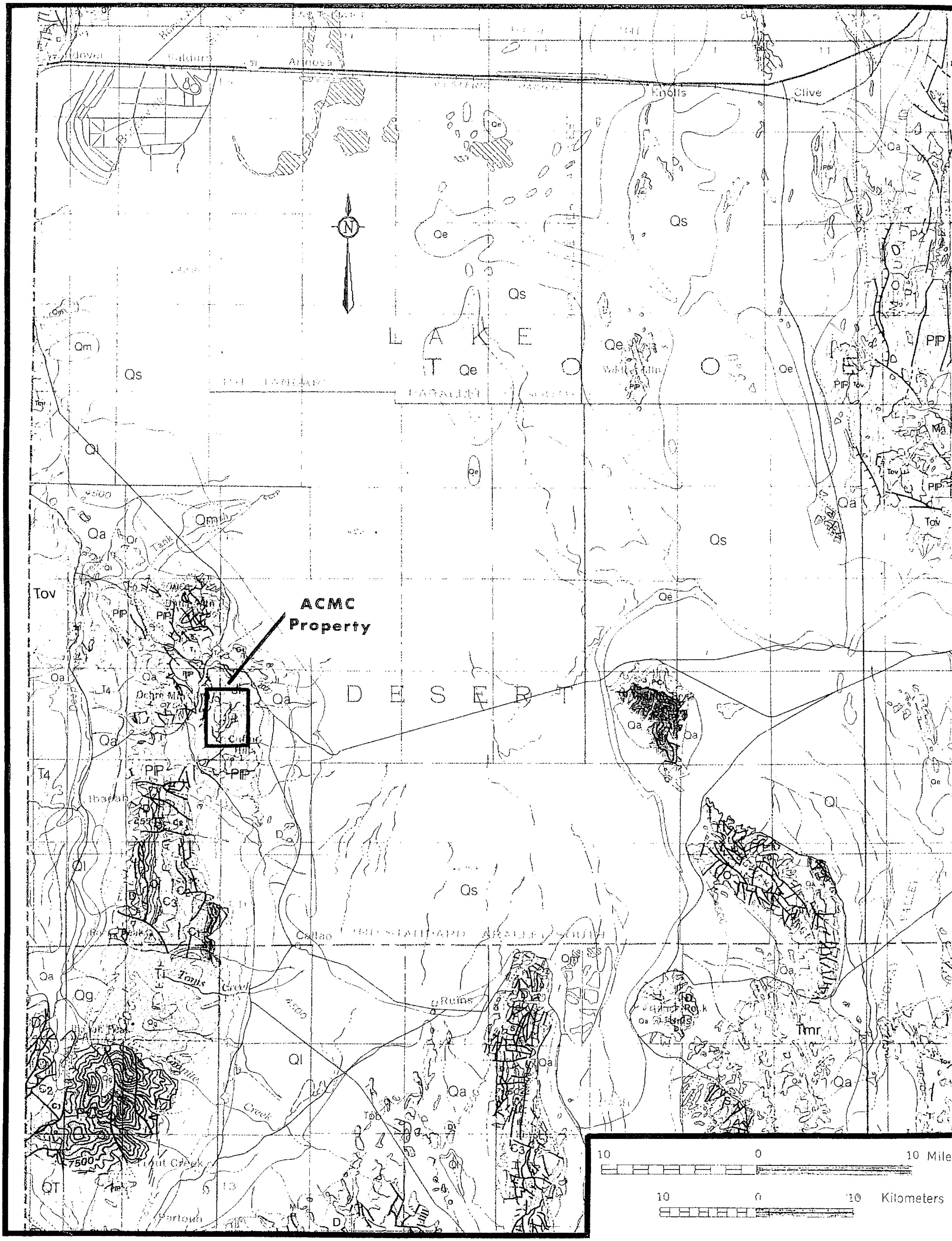


FIGURE 4.1 REGIONAL GEOLOGY

locally on the ACMC property have been interpreted as pegmatites (Nolan, 1935) and as replacement phenomena (El-Shatoury and Whelan, 1970).

The structural history of the Gold Hill area is complex and characteristic of polyphase deformational sequences in a tectonically active environment. Several stages of folding and faulting related to both compressional and extensional events are present. Eardley (1962) recognized at least four and possibly five phases of deformation, with each phase consisting of an initial compressive stage and a final extensional phase. Although Robinson (1988) describes eighteen different structural fabrics in the area, it is probable that these are multiple expressions of a limited number of deformational events.

Alteration fabrics and styles of mineralization are predictable within the constraints of the host lithologies and regional structure. Alteration processes within the carbonate sequences include recrystallization, silicification, bleaching, dolomitization, and the formation of calc-silicate skarns. Resultant fabrics include the development of micaceous andalusite hornfels, diopside-actinolite-garnet and wollastonite-spadaite skarns, and jasperoids with associated barite and opal.

Alteration in the intrusives consists of diopside-orthoclase alteration associated with actinolite and garnet, chloritization, sericitization, propylitization, and silicification associated with quartz-carbonate flooding.

Mineralization found in the area to date has been subdivided into a tripartite classification system by El-Shatoury and Whelan (1970). These deposit types include: contact metasomatic deposits, vein deposits and replacement deposits.

Contact metasomatic deposits exhibit an intimate spatial relationship to the limestone-granodiorite contact and are characterized by the presence of a distinctive calc-silicate gangue mineralogy consisting of wollastonite-amphibole (tremolite?)-garnet-tourmaline-diopside-quartz. The characteristic economic mineral association is native gold-pyrite-chalcopyrite-bornite-covellite-molybdenite-scheelite. The Frankie mine, located immediately adjacent the northeast corner of ACMC's property is an example of a local contact metasomatic deposit.

Vein deposits are lenticular or pencil shaped zones that are unconformable with the surrounding country rock. Economic veins in the area are of two types: either quartz-carbonate-adularia or simple quartz veins. The quartz-carbonate-adularia veins are reportedly restricted to the body of the intrusive (El-Shatoury and Whelan, 1970), and are mineralized with both sphalerite and galena as well as beryllium. Veins of this type are well exposed in the northern part of the property and are known simply as the beryllium veins. Quartz veins do not exhibit a host preference: mineralization consists of scheelite-pyrite-chalcopyrite-bismuth-gold as well as secondary quartz-hematite-magnetite. Veins of this type are represented by the Lucy L mine. In the opinion of the

MINING HOUSE, it is probable that these zones could more accurately be described as structurally controlled veins or shear zone-related mineralization.

Replacement deposits include both limestone- and intrusive-hosted variants. The limestone-hosted type of deposits may be found in either fractured but unaltered, or silicified, hematized and brecciated units. Ore mineralogy may include any of the series arsenopyrite-galena-sphalerite-chalcopyrite-pyrite-pyrrhotite-tetrahedrite. Where oxidized, a variety of arsenate minerals are locally present. The Smelter Tunnels workings on the Herat claim in the Clifton area is typical of replacement deposits developed along the limestone-monzonite contact.

Intrusive-hosted replacement deposits are described by El-Shatoury and Whelan (1970) as consisting of scheelite-molybdenite-powellite mineralization intergrown with coarse bladed actinolite and perthitic orthoclase. Associated minerals include chalcopyrite-pyrite-copper oxides and abundant magnetite. Gangue mineralogy consists of actinolite-perthite-garnet-apatite-tourmaline-quartz. Both the Yellow Hammer and Reaper Mines have been classified as intrusive-hosted replacement deposits. The **MINING HOUSE** notes that the Reaper deposit was originally classified as pegmatitic (Butler, 1920) and did not encounter significant field evidence to the contrary.

5.0 PROPERTY GEOLOGY

The stratigraphy of the **ACMC** property is relatively simple and consists of Carboniferous chemical sediments with only a minor clastic component. This sequence has been intruded by Jurassic granodiorite and Miocene volcanic dykes, flows and pyroclastics (Figure 5.1). The Oligocene quartz monzonite was not encountered; however, it does outcrop immediately north of the property in the Gold Hill area, and the Miocene volcanics observed on the property are likely a volcanic expression of this same Tertiary event.

The dominant sedimentary lithology across the property is the Ochre Mountain limestone. This unit consists primarily of fine grained, massive, micritic limestone with local stringers of thin (less than 3") light grey to black chert. Outcrops are frequently fractured and cut by numerous fine calcite veinlets. Robinson (1988) has noted that intraformational breccias occur throughout the Ochre Mountain limestone. The **MINING HOUSE** agrees with his interpretation of these breccias as a later tectonic fabric, and propose that widespread silicification in the formation is similarly structurally controlled. The Ochre Mountain Limestone is overlain by the Manning Canyon and Oquirrh formations as mapped by Nolan (1935). The **MINING HOUSE** interprets these units to be contemporaneous facies equivalents of Robinson's (1988) Ely Shale and Chainman Formation. On the property these lithologies are represented respectively by a black, carbonaceous, fissile shale interbedded with fine to very fine grained quartzites, and a fossiliferous limestone encountered by **MINING HOUSE** personnel along the east side of Rodenhouse Wash locally contains in excess of 35% crinoid stem fragments. **ACMC** personnel report similar fossiliferous beds on the west side of the wash.

Igneous rocks in the area of the **ACMC** property include two intrusive bodies: a Jurassic granodiorite and an Oligocene quartz monzonite. Significant overlap exists in both primary and secondary chemistry, mineralogy and textures; however, recent age dating quoted by Holladay (1987) and Robinson (1988) indicates the major intrusive on the property is Jurassic, ranging from 152 Ma (Stacey and Zartman, 1978) to 135 Ma (Moore and McKee, 1983).

The Jurassic intrusive on the property is medium to coarsely crystalline and is variable in composition but appears largely granodiorite to monzonite. Texture is typically equigranular with feldspar phenocrysts only locally present. Constituent minerals are alkali feldspars, plagioclase, hornblende and biotite with accessory clinopyroxene, magnetite, sphene, zircon and apatite and trace tourmaline, stilpnomelane and allanite.

Chloritization is pervasive in the intrusive and is interpreted as a later hydrothermal alteration product. Sericitization and propylitization were encountered in both surface samples and in drill core from the eastern property area. Although silicification is widespread across the entire property, the presence of free quartz as a primary igneous groundmass constituent was noted only locally in the eastern half of the property.

Most studies limit the Oligocene quartz monzonite of Nolan (1935) to an area north of the property. The presence of a second intrusive on the property has not previously been suggested, however the presence of alteration assemblages indicative of hydrothermal alteration, free quartz as an igneous mineral constituent in the eastern property area, and the presence of probable post-Jurassic(?) dioritic xenoliths in some monzonitic exposures all attest to the possibility of a second intrusive on the property or at least a phased intrusive. Pegmatitic fabrics in the vicinity of the Reaper and Yellow Hammer showings may similarly reflect a later intrusive emplacement and its related alteration.

Tertiary intermediate to felsic volcanics preserved along the flanks of Rodenhouse Wash are the final expression of post-Jurassic igneous activity. Rock outcrops are distinctly purple in colour and consist of volcanic breccias and tuffs. Robinson (1988) proposed a fluvial depositional environment based on the presence of cross-bedding and cut-and-fill structures; however, the **MINING HOUSE** notes that such depositional structures are common in all sediment-gravity flow processes including pyroclastic volcanism.

The structural geology of the **ACMC** property has not been thoroughly documented and is poorly constrained due to the lack of distinctive marker horizons in the Carboniferous section and the gross similarities between the Jurassic and Oligocene intrusives. Generalizations can be made, but detailed mapping would add immeasurably to the understanding of the structural controls on later mineralizing events and the predictability of their spatial distribution.

A variety of north-northwesterly to north-northeasterly trending structures on the property (Figure 5.1), including shear zones, veins, cleavages and fracture patterns are likely related to foreland folding and thrusting modified by later basin and range type extension. This relationship may be either genetic (i.e. cleavage development) or an inherited spatial relationship (i.e. late veins).

Easterly trending structural fabrics likely represent an orientation generated by syn-thrust tear faulting along the leading edge of the over-riding sheet. Both sets of structures have been reactivated during batholithic emplacement during Oligocene time. Robinson (1988) believes that thrusting also predates the Jurassic intrusives.

Structural expression directly attributable to plutonic emplacement alone appears, at present, to be limited to the variation in bedding orientations across the property area. Silicification is likely co-eval to the Oligocene quartz monzonite, but has been concentrated along older structures.

6.0 EXPLORATION POTENTIAL

6.1 GENERAL STATEMENT

To date, exploration and mineral extraction on the Gold Hill and Clifton property area has been conducted in a piecemeal fashion probably as a result of the title to the land being previously held by as many as 75 individuals (Moeller, pers. comm.). Almost all of the work to date has been directed towards historic prospects and mine workings which originated as surface showings.

Having acquired a substantial and strategic land position which includes many old workings, prospects and mines, **ACMC** is now in a position to conduct a property-wide exploration program. The program would be oriented towards:

1) determination of the exploration potential of known showings and deposits by a program of detailed reconnaissance mapping of the entire property and;

2) grassroots exploration for deposit models for which the property has potential, but as of yet remains untested.

The **MINING HOUSE** recommends that **ACMC** initially take a more regional geological and geophysical approach to exploration of the property. To date, only minor geological work has been completed utilizing modern techniques and exploration models and only about 7% of the total property has been explored by geophysical methods. Geophysical coverage of the property to date has been restricted to detailed (100 ft. line spacing) magnetic and electromagnetic surveys over the Yellow Hammer and Reaper mineral areas, covering about 110 acres. Extended, more regional coverage to the south and north of these areas covers an additional area of approximately 500 acres. The results of the geophysical surveys conducted to date are difficult to interpret because of the methods and instrument configurations used and the incompleteness of data.

In addition to the deposit types already recognized on the property, extensive low grade high tonnage mineralization amenable to open pit mining methods may also be present. Such mineralization may be controlled by regional structures that are not recognizable from detailed surveys covering small areas, but have quite evident signatures over large areas. An airborne magnetic and VLF electromagnetic survey followed by ground investigation of favourable geophysical structures is tentatively recommended. A detailed property-wide geological survey in conjunction with a more full evaluation of the geophysical work completed to date, would be a necessary prerequisite to recommending and implementing the airborne exploration program.

Following the above reconnaissance program the **MINING HOUSE** proposes that the property be subdivided into geographic and mineralogic sectors which warrant advanced exploration. Each sector would have a stand-alone, multi-phase exploration program. Each exploration phase would be contingent on the success of its predecessor.

In keeping with this proposed exploration format the **MINING HOUSE** discusses in the following sections, the detailed history, exploration potential and recommended exploration programs for known target areas and areas which it believes will warrant advanced exploration following the proposed reconnaissance survey (Figure 6.1). It should be noted however that exploration priorities will be dependant on the results of the reconnaissance survey.

6.2 YELLOW HAMMER MINE

6.2.1 Exploration History

The Salt Lake Mining Review reported on August 15, 1917 that the Western Utah Copper Company opened an important sheet of high grade tungsten ore below the tunnel level at the Yellow Hammer. Nolan (1935) notes that the only recorded production was in 1917 when 1,646 pounds of scheelite grading 69.5% WO_3 was shipped.

In 1918 Western Utah Copper Company planned the construction of a concentrating mill at Little Salt Springs, 18 miles south of Wendover, to treat Yellow Hammer ore. It was reported that copper ore from the Yellow Hammer mine carried molybdenite and scheelite with good results in a small experimental plant (The Salt Lake Mining Review, Oct 30, 1918).

In 1918 a new shaft was sunk to a depth of 115 feet in sulphide ore that was mostly of concentrating grade. Average ore grade was reported to be about 2.5% Cu and $4 in gold. (The Salt Lake Mining Review, Nov 15, 1918).

Total value of production during World War II is estimated to have been $25,000 to $45,000. An additional 400 tons of tungsten ore was extracted from the Yellow Hammer during 1954-1955 from which approximately 97 units of WO_3 were produced (Everett, 1961). Everett also reports that 1,500 tons of sorted ore comprising copper oxides and sulphides with scheelite were mined during 1958. The grade of this production is not reported.

Nolan (1935) described the Yellow Hammer orebodies as:

> "more tabular than pipelike and thus resemble the lower part of the Reaper deposit. The walls, like those of other deposits of this type, are not sharp. The vein-like or tabular habit seems to be controlled by a major fracture, along which the ore-depositing fluids entered and from which they extended for varying distances into the walls. In many of the deposits mineralization has extended along other fractures at angles to the main one. All the deposits that were examined are of small size, having a length of less than 25 feet and a width of less than 5 feet."

Nolan (1935) describes the mineralogy of the ore as consisting of sulphides and their oxides (predominantly chalcopyrite, copper pitch and malachite), scheelite, green hornblende (in many places altered to quartz and calcite), pink orthoclase, black tourmaline, albite, apatite, chlorite, muscovite and quartz. The quartz monzonite wall rocks are in many places altered to a pink orthoclase-rich rock with "splotches" of green hornblende. Wall rock alteration around one tungsten orebody consisted of calcite, sericite and chlorite with minor epidote (allanite?) and titanite.

Everett (1961) noted that the Yellow Hammer ore deposits occur in quartz monzonite and that mineralization appears to have been controlled by northerly trending fractures. The copper-tungsten bodies are described as extremely irregular. Everett noted that the lower 60 feet of the inclined shaft had been backfilled.

Silver Star Queen Mines commissioned Exploration Sciences to conduct a magnetometer survey over the Yellow Hammer in 1968. Silver Star Queen Mines subsequently completed approximately 48 drill holes at the Yellow Hammer prospect during 1968 and 1969. The **MINING HOUSE** was unable to ascertain the actual number of holes completed because of the incomplete nature of the data on file at **ACMC's** office. The majority of these holes appear to have been rotary holes with several diamond drill holes noted (Figure 6.2a; Table 6.1). Individual drill hole data is incomplete and available for only selected holes. Many mineralized drill intersections appear to have been assayed only for tungsten only.

Silver Star Queen Mines extracted 15,000 tons ore from the Yellow Hammer via open pit methods in 1970 (Smith,1975). The operations extended the pit from a depth of 23 ft to 66 ft below the periphery of the pit. A 15° decline was commenced on the lower pit level having a westerly heading to intersect drill hole 18. The decline was aborted at a depth of 30 feet because of a cave-in at the portal and slabbing of the pit wall.

In August 1974, Yellowstone Mines Ltd. began surface exploration on the property, completing a diamond drill program and geophysical surveys by Sept. 17, 1974. Diamond drilling consisted of 4 BQ holes totalling 868 ft (Figure 6.2b). The only available data pertaining to these holes is in the form of a progress report from E.R. Smith (1974). Available drill hole data is tabulated in Table 6.2.

TABLE 6.1 SILVER STAR QUEEN MINES LTD. YELLOW HAMMER DRILL HOLE AND ASSAY DATA - 1968/69

Hole #	Coordinates E	Coordinates N	Bearing	Dip	Hole Length (ft)	Sample Interval From (ft)	Sample Interval To (ft)	Sample Length (ft)	Au (oz/ton)	Ag (oz/ton)	WO3 (%)	Oxide Cu (%)	Sulphide Cu (%)	Total Cu (%)
DDH 1	888.0	915.5		90	85	5	10	5	0.390	4.40				9.250
						10	15	5	0.325	2.30				18.650
						15	20	5	0.250	1.60				23.900
						20	25	5	0.050	1.70				1.800
						25	30	5	0.030	0.90				7.150
						30	35	5	0.010	0.20				6.800
						35	40	5	Tr	0.10				0.700
						40	50	10	Tr	Tr				0.650
						50	60	10	0.010	Tr				0.750
						60	65	5	0.010	0.20				0.150
						65	70	5	0.040	0.30				2.250
						70	75	5	Tr	0.10				0.100
						75	80	5	Tr	Tr				Tr
						80	85	5	Tr	0.20				Tr
RDH 1	882.5	985.5		90	103	0	10	10	0.010	1.20	0.40			3.740
						10	20	10	0.350	1.25	0.90			1.340
						20	30	10	0.020	0.55	0.50			2.090
						30	40	10	0.020	1.20	0.80			4.470
						40	50	10	0.020	1.00	0.30			5.910
						50	60	10	0.020	0.80	0.30			3.280
						60	70	10	0.020	1.00	0.60			2.090
						70	80	10	0.020	0.80	0.60			0.520
						80	90	10	0.030	8.00	0.40			2.260
						90	93	3	0.040	0.10	0.40			0.670
						93	103	10	Tr	Tr	0.00			0.210
RDH 15	868.5	177.5	N06W	45	70	20	30	10	0.020	0.04	0.04	1.619	0.126	1.745
						30	40	10	0.100	1.70	1.78	5.591	0.734	6.325
						40	50	10	0.020	0.60	0.12	5.819	0.202	6.021
						50	60	10	0.220	0.50	0.10	3.061	0.305	3.366
						60	70	10	0.005	0.00	0.04	0.648	0.076	0.724
RDH 21	771.0	948.1	N22E	66	96	55	60	5	0.005	0.20	0.00	0.296	0.066	0.362
						60	65	5	0.020	0.50	0.00	2.327	0.203	2.530
						65	70	5	0.010	0.30	0.00	2.454	0.278	2.732
						70	75	5	0.005	0.20	0.00	0.466	0.141	0.607
						75	80	5	0.005	0.20	0.00	0.447	0.337	0.784
						80	85	5	0.145	4.70	0.30	0.768	15.253	16.021
						85	90	5	0.500	1.40	0.20	1.159	3.622	4.781
						90	96	6	0.010	0.70	0.00	0.266	1.074	1.340
RDH 122	810.9	925.4		90	60	30			0.010	0.25	0.02			0.100
						33			0.240	4.30	1.60			0.560
						30	40	10	Tr	0.20	0.04			0.200
						40	50	10	Tr	0.70	0.20			1.000
						50	60	10	Tr	Tr	0.08			0.200
RDH 123	849.7	939.1	N68W	52	105	40	50	10	Tr	0.20	0.15	0.150	0.050	0.200
						50	60	10	0.010	Tr	0.05	0.150		0.150
						60	70	10	Tr	Tr	0.23			0.770
						70	80	10	Tr	1.50	1.60	0.130	0.350	0.480
						80	90	10	0.090	3.50	1.70	2.190	13.960	16.150
						90	100	10	0.165	5.70	1.50	1.010	14.080	15.090
						100	104	4	0.070	2.50	1.20	1.240	7.260	8.500
RDH 125	831.6	925.2	N00E	62	110	50	60	10	Tr	Tr	0.03	Tr		Tr
						60	70	10	Tr	Tr	0.00	0.230		0.230
						70	80	10	Tr	0.20	0.68	2.940	0.550	3.490
						80	90	10	Tr	Tr	0.43	1.060	0.220	1.280
						90	100	10	0.010	0.90	0.70	0.800	1.560	2.360
						100	110	10	Tr	0.40	0.14	0.280	0.370	0.650
RDH 129	807.1	984.0		90	80	30	40	10	Tr-0.250	8.50	1.87	0.012	0.025	0.037
						40	50	10	Tr	Tr	0.06	0.280	0.071	0.351
						50	60	10	0.500	0.30	0.27	1.680	0.330	2.010
						60	70	10	0.460	9.60	1.50	0.604	0.391	0.995
RDH 130	814.6	968.7		90	80	50	60	10	Tr	0.00	0.00	0.018	0.057	0.075
						60	70	10	0.090	0.70	3.60	2.820	0.710	3.530
						70	80	10	0.010	0.00	6.20	2.770		2.770

TABLE 6.1 SILVER STAR QUEEN MINES LTD. YELLOW HAMMER DRILL HOLE AND ASSAY DATA - 1968/69

Hole #	Coordinates E	Coordinates N	Bearing	Dip	Hole Length (ft)	Sample Interval From (ft)	Sample Interval To (ft)	Sample Length (ft)	Au (oz/ton)	Ag (oz/ton)	WO3 (%)	Oxide Cu (%)	Sulphide Cu (%)	Total Cu (%)
RDH 124						60	90	30			0.11			
RDH 124								10			0.24			
RDH 116						80	90	10			0.20			
RDH127A						80	90	10			0.70			
RDH 22						72	82	10			0.14			
RDH 119						70	80	10			0.61			
RDH 2				90				28			6.30			
RDH 1x				45				40			2.38			
RDH 4				45				16			0.99			
RDH 5				45				5			0.70			
RDH 9				45				10			0.85			
RDH 16				45				40			4.12			
RDH 17				60				60			2.12			
RDH 18				45				10			0.40			
RDH 19				45				50			0.56			
RDH 20x				45				30			0.95			
RDH 26				60				30			1.20			
RDH 27				60				10			0.24			
RDH 34A				40				10			2.24			
RDH 35				?				40			0.96			
RDH 35A				40				10			1.28			
RDH 114				60				40			0.50			
RDH 131				90				50			0.29			

TABLE 6.2 YELLOWSTONE MINES LTD. YELLOW HAMMER DRILL HOLE AND ASSAY DATA - 1974

Hole #		Coordinates E	N	Bearing	Dip	Hole Length (ft)	Sample Interval From (ft)	To (ft)	Sample Length (ft)	WO3 (%)	Cu (%)	Mo (%)
DDH	1	5+00W	3+15S	036	65	210	NOT SAMPLED					
DDH	2	2+20W	2+60S	329	45	235	8.0	13.5	5.5	0.02	0.36	
							13.5	17.0	3.5	0.08	6.10	
							17.0	23.0	6.0	0.01	2.10	
							23.0	30.0	7.0	Tr	0.78	
							30.0	37.0	7.0	0.02	0.92	
DDH	3	2+20W	2+65S		90	200	126.0	133.0	7.0	15.50	1.47	0.08
							133.0	140.0	7.0	0.10	0.48	0.14
							140.0	147.0	7.0	0.03	0.16	0.20
							147.0	153.0	6.0	0.02	0.01	0.01
							153.0	160.0	7.0	0.27	0.28	0.14
DDH	4	1+50W	3+15S	342	70	223	164.0	172.0	8.0	1.08	0.10	0.03
							172.0	177.0	5.0	2.35	0.93	0.06
							204.5	209.0	4.5	0.07	1.52	0.09

An undated progress report (1974) under Gold Hill Exploration Company letterhead describes work progress on the main adit. At the time of the memo the adit had been driven 450 feet. At 400 feet it cut a "hi-grade fissure five feet thick of chalcopyrite and tungsten". The main heading was within 20 or 30 feet of the main "east-west fissure" which is described as being 10 to 20 feet wide. The memo went on to describe the assay results obtained in the first four holes drilled by Eric Smith of Yellowstone Mines.

On completion of the 4 hole drill program, Geotronics Surveys Ltd. conducted VLF-EM, magnetic, and I.P. surveys over the Yellow Hammer in September 1974. The VLF-EM and magnetic surveys totalled 6.8 line miles each and were conducted on 100 feet line spacings with station intervals of 100 feet and 50 feet respectively. The I.P. survey totalled one line mile using a Wenner array with a 100 ft electrode spacing and station intervals of 100 ft. A 200 ft electrode spacing and 200 ft station interval was also used. The purpose of the VLF-EM survey was to outline potential sulphide zones and/or faults which might host mineralization. The magnetic survey was conducted to delineate potential zones containing sulphide mineralization and associated magnetite as is present in the Yellow Hammer main zone.

The VLF-EM survey delineated two main zones which strike in a northeast direction. One northeast trending zone coincides with the main zone of mineralization in the Yellow Hammer and has a strike length of 1500 ft. A second parallel northeasterly trending anomaly is located approximately 1200 feet north of the previous anomaly. A shaft which is coincident with the anomaly reportedly intersected mineralization similar to that in the Yellow Hammer main zone (Mark, 1974). The magnetic survey outlined a magnetic high coincident with the Yellow Hammer main zone and the associated VLF-EM conductor. Elsewhere the survey outlined "spotty" anomalies which may or may not reflect local concentrations of magnetite mineralization. The I.P. survey was unable to delineate the known mineralization in the Yellow Hammer main zone (Mark, 1974).

Smith (1974) indicates that the tungsten-copper mineralization was traced for a strike length of 250 feet and to a depth of 200 feet in old workings and diamond drill holes 2 to 4 (Figure 6.2b). Smith estimated the average grade at 2.5% WO_3 and 1.5% Cu across an average width of 10 feet and suggested the zone was open in 3 directions with a geophysically indicated possible strike length of at least 1500 feet. In an October 15, 1974 progress report to Yellowstone Mines, Smith recommended continuation of the program recommended in his report of August 15, 1974 (unavailable for review by the **MINING HOUSE**). This included a second diamond drill phase to begin in late October 1974. The **MINING HOUSE** was unable to find any reference to this second drill program other than in a report by Manny Consultants which suggests that at least two more holes were completed (holes 5 and 6).

In a January 20, 1975 report to Yellowstone Mines Ltd. Smith described the Yellow Hammer ore zone as a tungsten-copper-molybdenum replacement zone within an intrusive host rock. The replacement zone varies from 20 to 30 feet thick with an exposed strike length of at least 250 feet. The zone strikes east west and dips approximately 75° south. The deepest drill hole intersected the zone at a vertical depth of 210 feet below surface. Smith described the greatest concentration of ore minerals occurring across an average width of 10 feet immediately adjacent to the hangingwall and used this average width in calculating an ore reserve estimate of 80,000 tons grading 2.5% WO_3 and 1.5% Cu. The **MINING HOUSE** is unable to comment on this reserve estimate because the longitudinal section used by Smith was unavailable for review. Smith also did not indicate the length and width of the reserve block and the tonnage factor used in the reserve calculation.

In April 1975, Manny Consultants Ltd. completed a property evaluation of the Yellow Hammer Mine on behalf of Yellowstone Mines Ltd. The evaluation included a field examination from March 10 to 14, 1975 which identified three E-W structures of which copper-tungsten mineralization is associated with only two. The mineralization appears to blossom at the convergence of these two structures. Samples collected from the east wall of the pit yielded 6 ft grading 0.082 oz Au/t, 2.96% Cu, 0.31% WO_3 and 20 ft grading 0.088 oz Au/t, 3.43% Cu and 0.35% WO_3. Samples collected from the west wall at the foot of the inclined shaft returned 0.044 oz Au/t, 2.85% Cu and 4.12% WO_3. The vertical distance between the pit and shaft samples was several tens of feet. Manny Consultants suggested that the depth extension of this mineralization was a diamond drill target.

Manny Consultants concluded that the property had validity and might support a small scale operation. They recommended that the property be systematically tested in several phases with the first phase consisting of 1000 ft of diamond drilling and the second phase comprising 300 feet of lateral underground exploration. Manny further suggested that systematic exploration and geological study of the area could be instrumental in leading to the discovery of large tonnage porphyry-type mineralization.

Kenneth C. Thomson completed a geological report on the Yellow Hammer property based on field work conducted in 1971 and 1977. Thomson described the property geology and conducted an aerial photo study of lineaments and structures. Thomson also analyzed a magnetic survey conducted by Exploration Services Inc in 1968 on behalf of Mr. Joe Foster.

On July 22, 1977, Anthony Lane and Associates completed a supplemental "ore reserve" to a May 20, 1977 report. The **MINING HOUSE** did not have access to the May 1977 report. The supplemental report was based on diamond drill logs, cross- sections and maps completed by Silver Star Queen Mines Inc. in 1968 and 1969. Lane also completed a civil survey of the pit limits and elevation as part of the report.

Lane calculated that up to 1977, a total of 33,648 tons had been extracted from the Yellow Hammer pit. Of this total, 13,230 tons was waste and 20,418 tons was ore with a back- calculated grade of 2.25% WO_3. Lane calculated that ore reserves outlined by the 1968 drilling which had not been mined out totalled 30,953 tons grading 0.593% WO_3. This reserve was located on the west side of the 1977 pit between 780E and 840E (Figure 6.2b). The **MINING HOUSE** has noted several outstanding errors in Lane's calculation of remaining reserves, namely:

1) Lane calculated the tonnage and grade of an 80 ft by 100 ft block by taking the average grade and thickness of all "ore-bearing" drill holes falling within the block ie. drill holes 125, 123, 124, 116, 127A, 21, 22, 122 and 119. Lane appears to have ignored other "ore" and "non-ore- bearing" drill holes such as 114, 132, 129, 115, 130, 126, 131, 23, 130, 117 and 30 which fall within the same block. Such an approach is unacceptable and the industry standard polygonal method of reserve estimation would have been the more appropriate method of ore reserve calculation.

2) An average of the drill intersection grades was used instead of the industry standard practice of using weighted averages.

3) The average depth to ore (50.3') was used in the tonnage calculation instead of the average ore intersection (18.77'). This resulted in an overestimation of tonnage by 19,403 tons.

In 1981, regional induced polarization pole-dipole surveys using "a" spacings of 200, 500, 100, 1500, and 2000 ft. for n-1 only, were completed over the Yellow Hammer area and environs. The surveys detected anomalous areas of about 1.5 to 2 times background with some apparent spatial relationship to the Yellow Hammer mineralization area. The great variation in the volume of rock measured by each set of data makes quantitative interpretation of the results, as a whole, very difficult. A more conventional survey using an "a" spacing of say 500 ft. and n spacings of 1, 2, 3, and 4 would have achieved the same depth of exploration with more interpretable results.

A pulse electromagnetic survey using a 100 ft. coil separation on 100 ft. lines was completed over the Yellow Hammer prospect area in 1985. This involved a grid area of 1000 ft. by 1500 ft. Responses tended to be very erratic with poor correlation of anomaly shape and amplitude across the three time gates of 0.2, 0.4, and 0.8 milliseconds. There were a few significant responses, however, that correlated with some of the known surface mineralization zones. The source of these responses may be conductive stringer sulphides and/or conductive fault zones associated with the mineralization. It is suggested that controlled VLF electromagnetic surveys using two transmitter station directions would be a more cost effective method of mapping conductive structures on this property. Based on the resistivity values of 100 to 300 ohm metres measured by the "I.P.depth probes", the effective depth of exploration of a VLF electromagnetic survey would be in the order of 200 to 400 ft. which is adequate for initial geophysical evaluation of the property.

In 1985 ACMC expanded the Yellow Hammer pit area to stabilize the pit walls and remove the waste rock overlying the reserves outlined by Smith and Lane in the shaft area at the east end of the pit. ACMC analyzed the blast hole cuttings for gold, silver, copper and tungsten. Assuming that each hole was of equal length, the average grade of 131 holes was 0.045 oz Au/ton (Appendix A).

In a letter dated January 6, 1986, R. Klatt of Lone Peak Exploration, Alpine, Utah recommended a Phase I drilling program to test the six pulse EM targets interpreted by

Geo-Western in 1985. Klatt cautioned against the use of Geo- Western's "tonnage estimates" based on the geophysical signatures. Klatt suggested that 150 holes be completed to an average depth of 150 feet. The holes would be drilled in a series of 25 fences of 6 holes each on 20 foot centres. The fences would be oriented perpendicular to the length of the targets at 50 foot intervals. Total footage would be 22,500 feet. Klatt recommended the use of a reverse circulation drill rig rather than a rotary drill. Semi-quantitative analysis of the samples would be conducted with an ASOMA field XRF unit and anomalous samples would then be analysed at an independent laboratory. Klatt estimated the cost of the drilling program at $181,000. Klatt also recommended that development drilling be conducted at the Yellow Hammer mine using a rotary blast-hole rig with a 100 foot depth capacity. Klatt also constructed a preliminary plan map of the Yellow Hammer pit dated January 12, 1986 (Figure 6.2).

In 1986 ACMC mined approximately 50,000 tons from the Yellow Hammer pit which was milled at the Victoria Mill (Moeller, pers. comm.).

In a letter dated January 21, 1990 Batric Pesic of Applied Research Co. described the results of the leaching performance of Yellow Hammer ore using 3 reagents: cyanide, Geobrom 3400 and thiourea. Cyanide leaching produced excellent results. Thiourea performed poorly. Geobrom 3400 required further evaluation and a table con sample was forwarded to Great Lakes for an independent evaluation. A general feature of the ore is the requirement for an acid preleach. A simple sulfuric acid preleach at room temperature was satisfactory. The preleaching was performed on oxidized ores. Pesic suggested a simple acid preleach of deeper sulphide ores would not be as satisfactory as with the oxidized ores.

ACMC drilled 5 rotary holes totalling 564 feet in the pit in March of 1990. The holes, designated as DHW1, 2, 3, 4 and 6 have been plotted on a copy of Klatt's plan (Figure 6.2b). **ACMC** indicates the holes were drilled at angles of approximately -90°. Analytical results from the 5 holes are presented in Appendix A.

ACMC drilled a total of 31 angled (-60°) reverse circulation holes in and around the immediate area of the Yellow Hammer pit in April and May of 1990. The holes were apparently drilled to define and confirm reserves within the pit area; to test the strike extensions of the pit zone and; to test geophysical conductors in the pit area. A complete plan of all drill holes was not available therefore the **MINING HOUSE** was able to locate only 18 holes which were designated as series ADH on a copy of Klatt's plan (Figure 6.2b). Field supervision for this drill program was provided by Mr. George Puvvada. Mr. Eric Smith of Kilborn Engineering Pacific Ltd, Vancouver, B.C. provided project management and supervision. Assay results are presented in Appendix A.

ACMC drilled 5 diamond drill holes totalling 507 feet within the Yellow Hammer pit in late 1990. The holes were reportedly drilled at dips of 45° however their orientations are uncertain (Figure 6.2b).

On March 9, 1991, **MINING HOUSE** geologist Ian Trinder briefly logged the core from diamond drill holes 90-1 to 90-5. The core is in storage at Casmyn Engineering in Oakville, Ontario. Only a half split of the core was available for logging; the other half had been subjected to analytical tests by Casmyn. The core had been split using a mechanical hand splitter which made determination of the original core condition difficult. Assay results and summary logs are presented in Appendix A and B.

The holes intersected monzonite which varied from relatively fresh to orthoclase and hornblende altered to late clay, carbonate and limonite altered (oxide weathering ?) along fractures and faults. Zones of fracture-controlled coarse grained amphibole were also intersected. Only diamond drill hole 90-1 intersected significant mineralization copper-magnetite mineralization associated with a coarse-grained amphibole-rich zone. Interpretation of the logs is hampered by the uncertainty of the hole orientations.

In a letter dated January 1991, Eric R. Smith of Kilborn Engineering Pacific Limited outlined the following reserve estimate for the Yellow Hammer:

Proven:	Zone 1:	32,000 tons @ 3.20% Cu 0.06 oz Au/ton
Probable:	Zone 2:	7,000 tons @ 3.30% Cu 0.06 oz Au/ton
	Zone 3:	4,000 tons @ 1.00% Cu 1.50% WO_3

The reserve estimate is based on the reverse circulation and diamond drill holes completed in 1990 as well as surface sampling and underground inspections of the adit. Smith apparently used a tonnage factor of approximately 10 ft^3 per ton of ore in his reserve calculation. Backup notes for the Kilborn estimate were unavailable for review. The **MINING HOUSE** has not audited the Kilborn reserve and, accordingly, expresses no opinion as to the validity of the reserve. An outline of industry standard reserve terminology is presented in Appendix C to assist the reader in assessing reserve calculations.

ACMC has had numerous Yellow Hammer samples analyzed since acquiring the property. Much of the work has been completed in the last several years. Some samples have been preconcentrated (tabled) prior to analysis and some are samples generated by various pilot plant tests. Discussion of these samples is beyond the scope of this report. Some of the most recent samples which reflect the in situ mineral inventory at the Yellow Hammer pit are presented in Table 6.3. Location maps were not available for these samples; available location information is presented in the table.

At the time of the **MINING HOUSE's** site visit, **ACMC** was extracting sulphide ore from the pit for metallurgical test work in a small pilot plant located at Gold Hill. **ACMC** reports that the test work is now completed and a total of 200 tons of ore was processed in the pilot plant.

TABLE 6.3 AMERICAN CONSOLIDATED MINING CO. YELLOW HAMMER GRAB SAMPLE ASSAY DATA - 1989/91

Assay #	Sample Description	Au oz/t FA	Ag oz/t FA	Cu (%) AA	WO3 (%) Grav	Mo (%)	Submitted By	Assayed By	Date
29998 K	Pit - Steep Face	0.154	0.994				W. Moeller	Kimball	10/16/89
29998 L	Above Tunnel	0.006	0.040				W. Moeller	Kimball	10/16/89
30201	Hi Wall	0.232	1.534				W. Moeller	Kimball	11/17/89
30354	No. 90-1 25 feet inside adit	0.106	1.564	3.99	<0.002	0.1040	E. Smith	Kimball	01/11/90
30355	No. 90-2 inside adit	0.036	0.528	1.83	<0.002	0.0480	E. Smith	Kimball	01/11/90
30356	No. 90-3 inside adit	0.177	2.718	9.32	<0.002	0.0027	E. Smith	Kimball	01/11/90
30357	No. 90-4 inside adit	0.006	0.314	3.16	<0.002	0.0013	E. Smith	Kimball	01/11/90
30358	No. 90-5 inside adit	0.018	0.390	2.68	<0.002	0.0032	E. Smith	Kimball	01/11/90
30359	No. 90-6 inside adit	0.098	1.062	5.22	<0.002	0.1270	E. Smith	Kimball	01/11/90
30360	Pit Adit	0.010	0.386	0.338			W. Moeller	Kimball	01/13/90
30387	Tunnel Wall - Chip Sample	0.016	0.356	0.181			E. Smith	Kimball	01/18/90
30388	Tunnel Floor 25' from Portal - Chip Sample	0.014	0.438	0.212			E. Smith	Kimball	01/18/90
30389	Tunnel Floor 50' from Portal - Chip Sample	0.018	0.466	0.150			E. Smith	Kimball	01/18/90
30415	Open Pit Adit - West End	0.025	0.546	0.704			E. Smith	Kimball	01/25/90
		0.020	0.440	0.708			E. Smith	Kimball	01/25/90
	Inside Tunnel - Floor	0.060	2.540					Assay Lab	02/14/90
	Inside Tunnel - Floor	0.104	2.400					Assay Lab	02/14/90
	Inside Tunnel - Wall Left Centre	0.017	0.240					Assay Lab	02/14/90
	Inside Tunnel - Wall Left Centre	0.028	0.290					Assay Lab	02/14/90
	Inside Tunnel - Wall Left Centre	0.168						Assay Lab	02/14/90
	Inside Tunnel - Wall Right Side	0.009	0.060					Assay Lab	02/14/90
	Inside Tunnel - Wall Right Side	0.011	0.270					Assay Lab	02/14/90
	3rd Level Sulphide o/c	0.258	2.200					Assay Lab	02/14/90
30566	Oxide Pit (3/12/90) - 20 ton mill shipment	0.298	3.372	8.91	<0.0020		W. Moeller	Kimball	03/13/90
30567	Sulphide Pit (3/12/90)	0.312	2.973	11.10	0.0059		W. Moeller	Kimball	03/13/90
	Sample From Two Blast Holes In Ore (02/05/91)	0.137					W. Moeller	Casmyn	03/18/91

6.2.2 Discussion

The three phases of diamond drilling at the Yellow Hammer (1968/69, 1974/75 and 1990) were all completed using different grid co-ordinate systems and were not cross-referenced. Generally only sketches of plans and sections were available with incomplete information on hole co- ordinates, azimuths, and dips. Despite these difficulties the **MINING HOUSE** has constructed compilation maps (Figures 6.2a and 6.2b) of the diamond drill holes completed in the pit area which it believes reasonably reflects the spatial relationships of the various drill programs. Such a compilation could assist in the understanding of the structural controls of the mineralization. Unfortunately drill logs were not available for the holes except for incomplete assay records. The compilation can still be used however to illustrate the distribution of mineralization and as a guide to the drill density required to adequately outline the remaining mineral inventory.

The compilation was completed using plans and sections from Silver Star Queen Mines (1969); modified Silver Star Queen Mines plans and sections from A. Lane and Associates (1977); a survey plan from Anthony Lane and Associates (1977); a geological pit plan from R. Klatt (1986) on which 1990 drill holes had been sketched and; a reserve cross section produced by E.R. Smith of Kilborn Engineering Pacific Limited (1991).

In order to complete the compilation the following assumptions were required:

1) The NE and NW section lines in both Lane's modified Silver Star Queen Mines drill plan and 1977 pit survey plan are coincident. This allowed the overlay of the 1969 and 1977 pit outlines.

2) The grid co-ordinates in the Silver Star Queen Mines drill plan and Klatt's 1986 pit plan are oriented relative to true north. The north arrow in Lane's pit survey plan and drill bearings quoted by Smith (1974) are relative to magnetic north.

3) The location of the inclined shaft collar in Lane's pit survey (elev 1625) and Klatt's pit plan (elev 1630) are assumed to be correct.

4) Assumptions 2 and 3 allow the overlay of Klatt's 1986 plan on the previous two plans.

While the **MINING HOUSE** recognizes the possibility of significant positional error in the compilation using the above assumptions, it appears the resulting plan is the best fit given the available data. The compilation appears to confirm that the mineralization encountered to date consists of discontinuous fracture controlled bodies hosted by the larger east-trending structure.

6.2.3 Exploration Potential

The Yellow Hammer deposit is best described as a replacement deposit within quartz monzonite. Mineralization recognized by various workers has included chalcopyrite, bornite and copper oxides, magnetite, scheelite, molybdenite, and powellite. Native gold has been reported. The mineralization appears to change from oxide dominated to sulphide dominated with depth. The oxide ore likely represents supergene alteration of original sulphide ore.

Based on the site visit to the Yellow Hammer pit, it is the opinion of the **MINING HOUSE** that, as presently defined, the deposit consists of several discrete podiform to tabular bodies of mineralization. The mineralized bodies may have limited strike lengths and depth extensions as evidenced from visual examination of remnant mineralization on the pit walls and mineralization occurring in that portion of the pit bottom which is not overburden covered. These mineralized bodies are localized within a major east-trending, steeply south dipping structure (approx 085°/80°-90°SE) by oblique trending fractures which cross-cut the main structure. These fractures have orientations which include: (approx 105°/80°- 85°SW, 055°/60°SE, 135°/58°SW and 150°/35°NE). The **MINING HOUSE** notes that Nolan (1935) and Everett (1961) describe the mineralization that was being exploited during those times as occurring in fracture controlled bodies having lengths of less than 25 feet and widths of less than 5 feet.

Historical data and personal observations by the **MINING HOUSE** suggests that the exploration potential of the Yellow Hammer zone may be limited to as yet undiscovered discrete, high grade mineralized bodies at depth and along strike within the main structure. Geophysically this structure appears to have a minimum strike length of 1500 feet. Of this strike length only approximately 500 feet in the immediate pit area has been drill tested to a depth of about 200 feet. Therefore in addition to the depth potential of mineralization at the pit, there is considerable potential along strike. Given the current uncertainty as to the extent of the mineral inventory in the Yellow Hammer pit, the **MINING HOUSE** cannot address the mineability of the mineralization at this time.

Additional exploration work is also warranted in the Yellow Hammer area, particularly 1200 feet north of the pit where geophysical surveys have partly delineated an anomaly which parallels the main Yellow Hammer structure. Copper mineralization has been noted in historic workings which appear to be coincident with this anomaly.

6.2.4 Recommended Exploration Program

In order to adequately outline the mineral inventory beneath the Yellow Hammer pit and its immediate lateral extents, the **MINING HOUSE** tentatively recommends drilling of a series of diamond drill holes on 20 foot centres in fences spaced 40 feet apart. A total footage of approximately 4000 feet should be sufficient to outline the mineral inventory in the immediate pit area to a depth of 100 feet below the present pit floor. Additional infill drilling totalling approximately 3000 feet may be required to dependant on the distribution of the mineralization. An additional 4000 feet of drilling on 40 foot centres in fences 40 feet apart may be sufficient to investigate the mineralization potential 100 feet laterally east and west of the pit and to a depth of approximately 100 feet below the pit bottom.

Diamond drilling has been recommended for the drill program because it is the only drill method which will provide detailed structural information required to interpret the mineralized zone.

Should the detailed diamond drill program be completed and a geological reserve outlined, the **MINING HOUSE** recommends a feasibility study be completed to determine the economics of placing the deposit into production.

Prior to any advanced work on the Yellow Hammer pit however, the **MINING HOUSE** strongly urges the completion of a property-wide reconnaissance geological survey and a re-evaluation of geophysical surveys completed to date. The **MINING HOUSE's** current review of the geophysical results on the Yellow Hammer was limited in scope and detail because of time and cost restraints. Further detailed evaluation of the induced polarization and pulse electromagnetic results is warranted in order to assess more fully the potential of the methods. The geological survey and geophysical re-evaluation may indicate exploration targets that have not yet been tested by drilling. It is suggested that testing of every geophysical "anomaly" is not warranted at the present time.

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Additional detailed ground magnetometer and VLF-EM surveys may be warranted prior to any diamond drilling. The magnetometer survey could assist in outlining the magnetite bodies which are part of the Yellow Hammer mineralization. The VLF-EM survey could assist in outlining geological structures and sulphide conductors.

6.3 REAPER

6.3.1 Exploration History

The Reaper mine was discovered in 1914 and reported net receipts from ore production are estimated to be $75,000 of which $70,000 was obtained during World War I. In World War II ore was recovered from the dumps. No underground work has been completed since 1918 (Everett, 1961). Nolan (1935) suggests that the production was less than 100 tons of 60% ore.

Workings include a 105 foot vertical shaft in quartz monzonite with crosscuts developed at the 56 and 105 foot levels. A 10 foot deep winze was sunk below the lower level. The orebody was stoped to surface from the upper level. Several other prospect holes were dug in the immediate vicinity of the main workings. ACMC reports that the shaft and underground workings can be accessed using a rope harness and winch (Moeller, pers. com.).

An I.P. geophysical survey was conducted over the Reaper Mine in April 1981. The grid was set up using a Wenner array with a 200 foot spread which provided an estimated search depth of 150 to 200 feet. Six 1600 foot long north-south lines were laid out at 200 foot intervals with 00+00 on the Reaper dump. The resulting data was plotted in profile form then contoured. Two "expanding depth probes" were then undertaken to test interpreted sulphide zones. Depth probe No. 1 was located at Station 2 North on Line 0 and depth probe No. 3 was located at Station 7.5 North on Line 2 West. An east-west line was also completed using a dipole-dipole array with a 1000 foot spread. The line extended from 1300 feet east to 1700 feet west of the Reaper Mine. Station 0 corresponded to 00+00 on the north-south grid.

In 1982, a 400 foot rotary drill hole was completed on a monzonite hilltop approximately 750 feet north of the Reaper shaft. No drill log was available for the review by the **MINING HOUSE** however it is reported that the hole intersected relatively fresh monzonite along its entire length. During an inspection of the site, **MINING HOUSE** personnel located an additional hole drilled by **ACMC** immediately adjacent the latter. Information on this hole was not available. The cuttings remaining around the holes confirm that the holes intersected relatively unaltered monzonite. J.A. Ruckman of AARC Chemical Consulting conducted analysis on 70, five foot samples from the rotary hole using Direct Current Plasma (DCP) Emission spectrophotometry, a semi-quantitative method. The analysis returned between 1.11 oz Au/ton and 2.55 oz Au/ton in all samples. However, traditional fire assay and cyanide leach tests do not indicate the presence of any significant gold.

The **MINING HOUSE** has determined that the upper limit of gold detection using DCP analysis is generally accepted to be 5000 ppb Au (approximately 0.15 oz Au/ton). Ruckman's analytical results are therefore more than an order-of-magnitude greater than the accepted upper detection limit. The **MINING HOUSE** has chosen to disregard these analyses at this time and accept the results of the more conventional fire assay and cyanide leach techniques. Further investigation of Ruckman's results are beyond the scope of this report. **ACMC** reports that additional test work is currently being conducted on the monzonite material by Batric Pesic of Applied Research Co.

6.3.2 Exploration Potential

The Reaper deposit has been described as an irregular pipe- like mass of pegmatite, noted both as a pegmatitic replacement by Nolan (1935) and simply a replacement by El-Shatoury and Whelan (1975). The pegmatite had a north- northeast trend and dipped almost vertical (N40°E/80°SE). It was elliptical at surface with a long axis of 60 feet and a short axis of 30 feet. On the 56 foot level it was smaller and had a circular outline approximately 20 feet in diameter. Two apophyses extended to the northwest and to the north-northeast. On the bottom level the pegmatite had a tabular or lenticular outline striking northeast. At the north end of the lenses an apophysis extended to the northwest. The walls of the pegmatite are not sharp, reflecting replacement of the quartz monzonite host (Nolan, 1935).

The pegmatite was characterized by green amphibole and pink orthoclase. The amphibole was present in sheafs up to 4 feet in length and was locally replaced by chlorite, biotite, muscovite, calcite or quartz. Orthoclase with single cleavage faces up to 1 foot across were noted. The orthoclase was later than the amphibole which it replaced. Apatite was abundant. Molybdenite and its oxidation product, powellite were also common. Tourmaline, often with quartz, was common around the edge of the pegmatite and locally in the monzonite host rock (Nolan, 1935).

Small sulphide aggregates were locally present in the pegmatite and were especially abundant in the north end of the lower level where with quartz, they formed much of the pegmatite lens. Chalcopyrite was the most abundant sulphide mineral which was replaced by copper pitch and malachite. Magnetite was observed and epidote, titanite, diopside and zircon were also recognized microscopically (Nolan, 1935).

Tungsten is reported to have been abundant in the stope from the 56 foot level to the surface. The stope was in the central part of the pipe (Nolan, 1935). Scheelite crystals as large as 24 inches in diameter and several feet in length are reported to have been extracted (Everett, 1961). Butler (1920) described the occurrence during the early stages of development as follows:

> "Adjacent to the shaft (subsequently removed by stoping) a body composed largely of scheelite 18 to 24 inches in thickness had been exposed for 4 or 5 feet along strike and 3 or 4 feet below the outcrop. Deeper in the shaft other apparently smaller bodies of scheelite were exposed. The scheelite occurs in large crystals, some of which are 4 inches long. One block of nearly pure scheelite ore on the dump was estimated to weigh full 200 pounds. The bodies of high grade ore appear to occur as lenticular masses in the vein material and suggest segregations of the scheelite through the pegmatite of which the scheelite

is an essential part. The scheelite was one of the earliest minerals to form. Much of it is in well formed crystals and little of it includes other minerals."

The deposit is mineralogically similar to the Yellow Hammer deposit however the morphology of the deposits differ somewhat. Both deposits have been described as replacement deposits by El-Shatoury and Whelan (1970). Nolan (1935) refers to the Reaper as a pegmatitic replacement and infers that the Yellow Hammer is similar except that it is more tabular or vein-like. The **MINING HOUSE** concurs with the replacement model and suggests that the morphological differences between the two bodies is due to variations in the structures which controlled the distribution of the mineralizing fluids. These fluids may have been pneumatolytic based on the mineralogy of the deposits and the associated alteration.

At this time there are no known tungsten reserves at the Reaper (Everett, 1961). Although the deposit appears to have been a small discrete body, the proposed property-wide geologic investigations may be able to determine if the Reaper deposit is related to a larger structure which would guide further exploration efforts. In particular, the copper-tungsten potential of this area would increase if it could be proved that the Reaper is structurally related on a regional or local scale to the Yellow Hammer deposit.

6.3.3 Recommended Exploration Program

The **MINING HOUSE** recommends no advanced exploration for the Reaper deposit at this time. If the proposed reconnaissance geological and geophysical surveys indicate additional potential for a structural extension of the Reaper deposit, follow-up work would be scheduled at that time. The **MINING HOUSE** recommends that the geophysics completed to date over the Reaper be re-evaluated as a part of the proposed property-wide geological reconnaissance survey.

6.4 CLIFTON/HERAT

6.4.1 Exploration History

The principle workings in the Clifton area consist of a number of short adits cut on either side of a narrow wash on the Herat patented mining claim. The location is approximately 1,000 feet east-northeast of the old Clifton townsite, Section 25, Twp 8S, Range 18W. The property has been variously referred to as the Clifton, Herat, and Smelter Tunnel area.

The major workings of the Herat Mine are located on the south facing flank of the wash, and are the site of some of the earliest exploration and development in the Gold Hill District. Production statistics are not available, but a shipment of 156 tons of residue collected from the smelter dump in 1920 had an average content of 11.1 oz Ag/ton and 7.4% Pb. A second shipment of 47 tons of smelter residue collected in 1923 averaged 16.0 oz Ag/ton and 11.4% Pb.

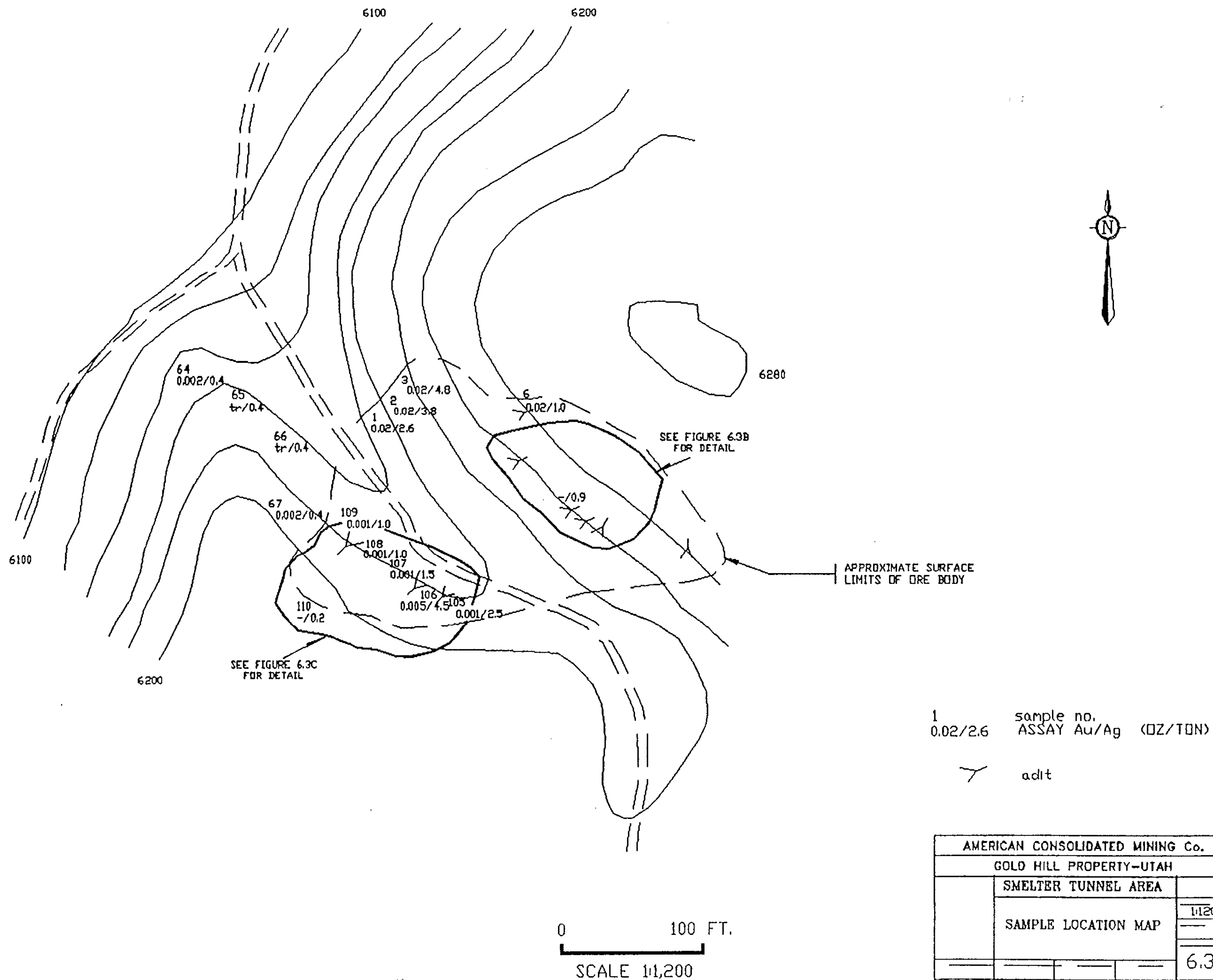
Subsequent to their acquisition of the property, ACMC has conducted a number of geophysical surveys, collected numerous samples, and reportedly completed at least 44 drill holes in the general Clifton area. The **MINING HOUSE** has been able to document locations for only 39 of the latter.

In 1984, **ACMC** built and operated a 10,000 square foot test heap-leaching pad. The **MINING HOUSE** was not able to determine the thickness of the ore on the leach pad. The pad was loaded with raw dump material from the old workings and a trial leach run without any pre-treatment crushing or concentrating. ACMC reports in excess of 1000 ounces of silver were recovered (Moeller, pers. com.).

Geophysical surveys in the immediate vicinity consist of two pulse EM surveys completed in November 1984 and April 1985. An I.P. survey completed in late 1981 also covered a small portion of the Clifton area. Despite some problems with survey specifics, as discussed in previous sections, both surveys revealed pronounced north-easterly (039°) trending structural fabrics across the southeastern property area.

Assay results have been reported for 124 grab samples collected in the Clifton area; approximate locations have been documented for 89 of these samples. An additional 10 samples collected by Placer Dome (1988) and 405 samples presumably collected by ACMC (1989) were not located but may in part represent additional sampling in the Clifton area. A portion of the soil sampling survey conducted in 1980 by the Bear Creek Mining Co. on behalf of Kennecott Copper Co. also covers the Clifton area. Twenty of 25 samples collected by Anaconda (1982) were from the Clifton area (Appendix D).

Locations for 83 of 90 samples collected by **ACMC** from the old Herat mine workings are presented in Figure 6.3a-c. Distribution of anomalous results is randomly spread



AMERICAN CONSOLIDATED MINING Co.
GOLD HILL PROPERTY-UTAH
SMELTER TUNNEL AREA
SAMPLE LOCATION MAP
1:1200
6.3A

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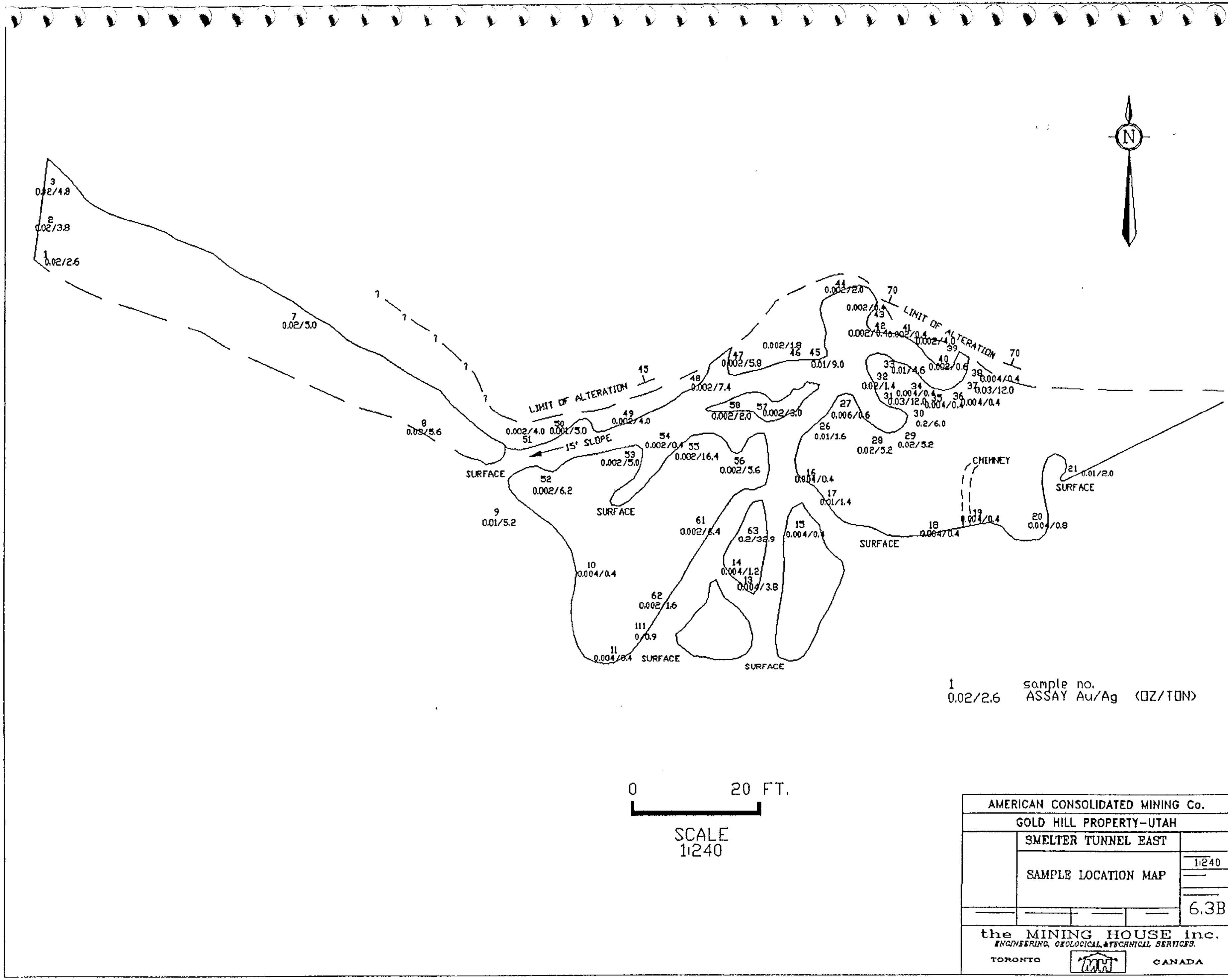
N
LIMIT OF ALTERATION
LIMIT OF ALTERATION
15' SLOPE
CHIMNEY
SURFACE
1
0.02/2.6
sample no.
ASSAY Au/Ag (OZ/TON)
0 20 FT.
SCALE
1:240
AMERICAN CONSOLIDATED MINING Co.
GOLD HILL PROPERTY-UTAH
SMELTER TUNNEL EAST
SAMPLE LOCATION MAP
1:240
6.3B
the MINING HOUSE inc.
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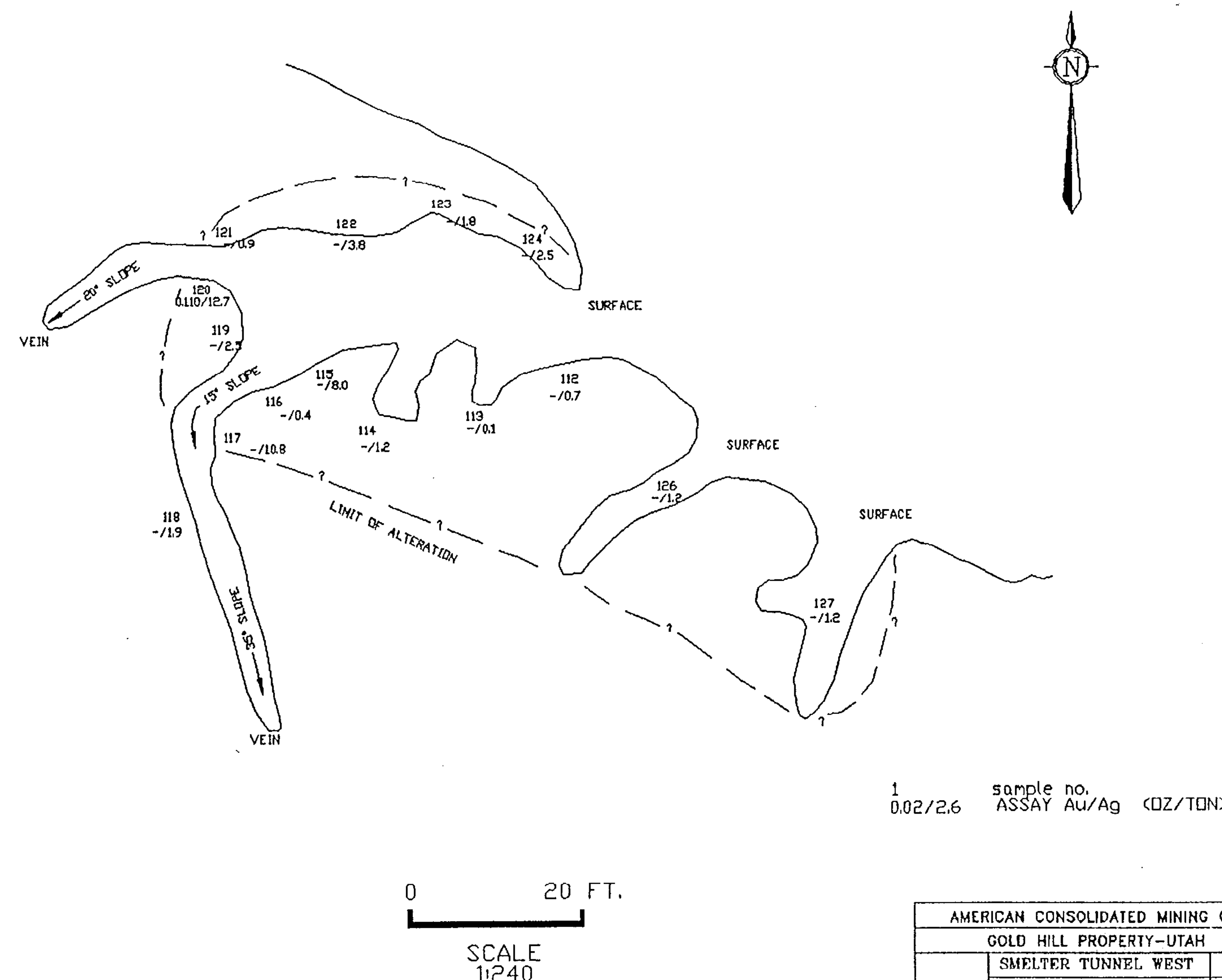
TORONTO
CANADA



AMERICAN CONSOLIDATED MINING Co.
GOLD HILL PROPERTY-UTAH
SMELTER TUNNEL WEST
SAMPLE LOCATION MAP
1:240
6.3C

the MINING HOUSE inc.
ENGINEERING, GEOLOGICAL & TECHNICAL SERVICES.
TORONTO CANADA

between both the south and main workings, and between floor and face samples. No sample widths were available, and the **MINING HOUSE** presumes that these samples are all selected grabs. The lack of a systematic pattern to the assay results, and the poor grades encountered at the backs of the deepest workings suggest that this body has been largely mined out.

Drilling in the Clifton area consists of a grid pattern of 29 reverse circulation holes drilled by ACMC in 1989 at approximately 200 foot spacings (CF-1 through CF-29) to depths of 250 feet. Only summary drill logs and partial assay results were available for review by the **MINING HOUSE.** Descriptions of lithologies encountered are limited to fresh and altered limestone and quartz-monzonite (granodiorite?). The only significant results are from pre-tabled splits taken from of holes CF-12 and CF-19 through CF-21; no sample lengths were specified in the certificates however **ACMC** reports that the samples were composites of the entire hole length (Moeller, pers. com.). ACMC reports that a complete samples series from all holes have been submitted for analysis and results are pending. Drill hole locations are presented on Figure 6.4. No location for hole CF-29 was found.

Seven holes were drilled by BEO in 1980; three of these holes (Numbers 2 through 4) were in the Clifton area, and are known respectively as the Saddle, Junction and Wash holes (Figure 6.4). Some assay data was located for the remaining 4 BEO holes, but locations are not available. Thin zones of anomalous silver mineralization were

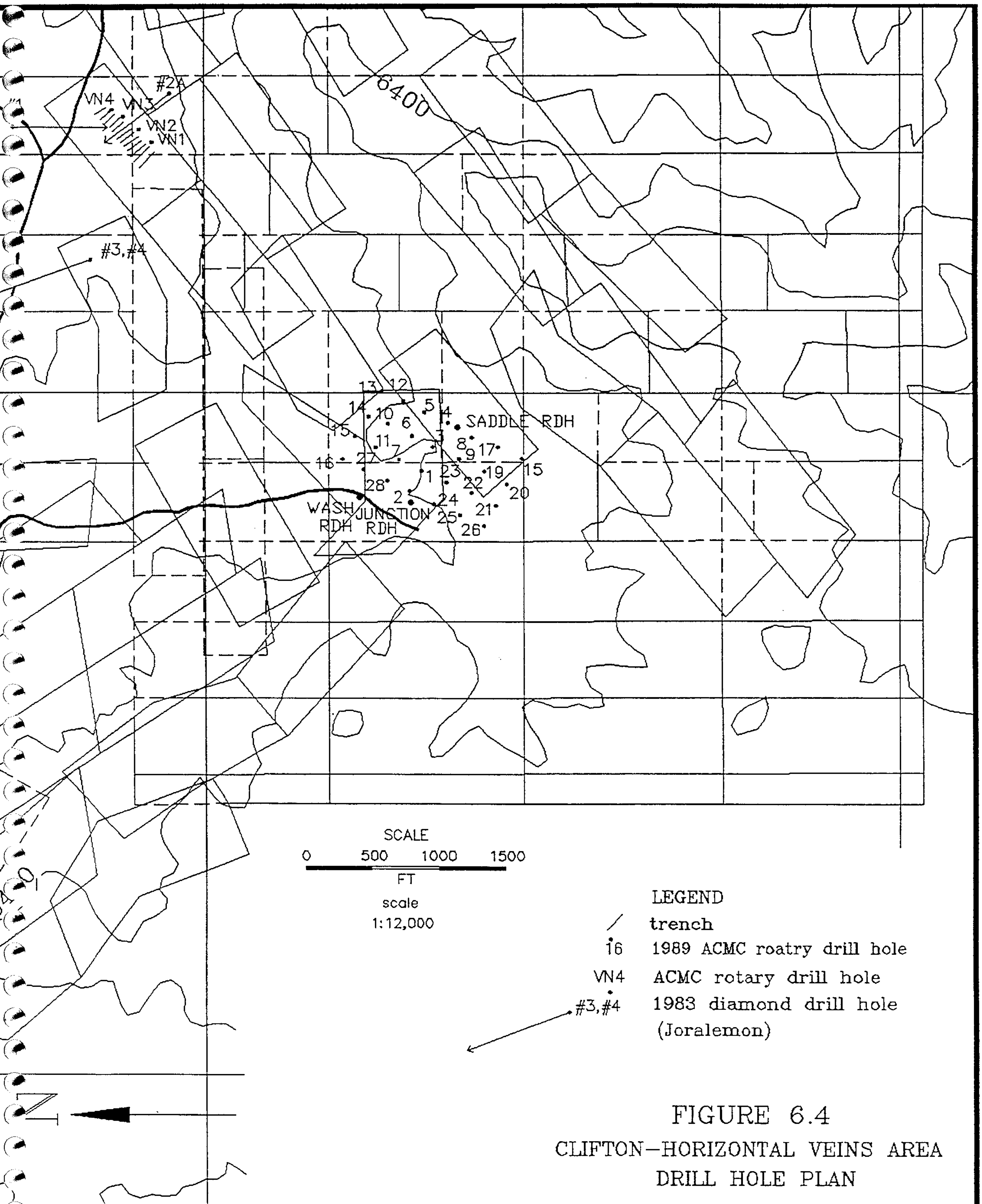


FIGURE 6.4
CLIFTON–HORIZONTAL VEINS AREA
DRILL HOLE PLAN

encountered in all three Clifton area holes, as presented in Table 6.4. The reported assay technique was referred to as a "Speedy Melt Assay". ACMC indicates that this analytical method involves the fire assay of a complete 8 to 10 pound sample.

TABLE 6.4: CLIFTON AREA DRILL RESULTS - SUMMARY

Hole #	Name	Interval (feet)	oz Ag/ton
2	Saddle	110 - 115	7.83
		270 - 275	9.70
3	Wash	20 - 25	23.30
		150 - 155	8.20
		170 - 175	91.90
4	Junction	55 - 60	5.90
		170 - 175	4.10

All samples assayed trace gold (Au)

Mineralization at the Herat Mine appears to be limited to a replacement zone along the contact of the Ochre Mountain limestone and the Jurassic granodiorite. Limestone near the old workings has been thoroughly silicated and locally constitutes a calc-silicate skarn. The underlying granodiorite is relatively fresh with alteration apparently restricted to kaolinitization of feldspars along the Ochre Mountain contact.

Mineralization in the old workings was seen to be thoroughly oxidized in hand samples. Scanning electron microscopy (SEM) completed on behalf of ACMC by Cannon Microprobe documented the presence of relict sulphide minerals and minor electrum and native silver. Cannon concluded that the fine grain size of ore minerals and their inclusion within both low specific gravity silicates and oxides as well as within lead carbonates, sulphates and sulphides will make concentration by straight gravimetric or flotation processes difficult.

The University of Minnesota Mineral Resources Research Centre encountered no electrum and only limited native silver in samples supplied to them by **ACMC** (Brandom, 1988; 1989). In samples of tabled concentrate, both magnetic and non-magnetic fractions contained approximately 50% anglesite and 20% to 40% Mn and Fe oxides (Brandom, 1989). This latter is mineralogically significant because manganese oxides, which can occur as late fracture coatings, commonly act as chemical sinks, thus producing spurious anomalous results.

6.4.2 Exploration Potential and Recommended Exploration Program

Based on the data currently available the **MINING HOUSE** does not consider the Clifton/Herat area to be a high priority target, nor is the Clifton-type Pb-Ag mineralization considered to be a significant exploration model for a stand alone operation. Ore in the Smelter Tunnel mine historically appears to have been limited to contact-related lead-silver mineralization. The low angle orientation of the contact severely limits the potential for deeper mineralization in the Herat mine. Furthermore, preliminary results also suggest processing difficulties in the recovery of this type of ore.

A reassessment of the exploration potential of the Clifton area may be warranted pending the receipt of assay results from the 1989 reverse circulation holes. In particular, the results will assist in determining the area's potential for gold mineralization.

Although further exploration on the main Clifton area property is not recommended at this time, the spatial location of the Herat mines is of regional interest. The Clifton area Pb-Ag mineralization has traditionally been attributed to skarn mineralization; however its position on the strike extension of the Pb-Ag bearing Horizontal Veins suggests that the Herat contact mineralization may be a replacement zone localized by the intersection of the near horizontal granodiorite-limestone contact and a near vertical, mineralized structure which post-dates the intrusion of the granodiorite. Attention should therefore be paid to areas where structures such as the Horizontal Veins area and the parallel Ivanhole-Spanish Mine-Southern Confederate trend, are predicted to intersect the limestone - granodiorite contacts. Reconnaissance mapping and sampling should be undertaken to determine the potential for veins, stockwork or replacement mineralization developed within areas of potential shear zones.

6.5 LUCY L MINE AND AREA

6.5.1 Exploration History

The Lucy L deposit is located approximately 2 miles south- southeast of Gold Hill.

Nolan (1935) reported that work on the Lucy L deposit included 1300 feet of underground workings accessed from two adits. No information was available on mine exploration development at the Lucy L after approximately 1925.

Based on Nolan's report (1935) and observations by **MINING HOUSE** personnel, the workings appear to have been largely within variably carbonate and clay altered monzonite which is overlain by limestone of the Ochre Mountain Formation. The limestone has been extensively fractured and carbonate veined with locally intensely silicified zones. A black carbonaceous? shale of the Manning Canyon Formation outcrops at the portal of the south adit between the monzonite and overlying limestone. The shale has been intensely deformed and is interpreted by the **MINING HOUSE** to host a thrust fault.

During July 1981, ACMC commissioned Geo-Western to conduct an I.P. and resistivity survey over the Lucy L Mine area. A Wenner array was used with a 200 foot electrode spacing. The grid included seven 2,500 foot long traverse lines oriented north-south.

Geo-Western interpreted at least 6 northeast- trending anomalies some of which are reported to have been explored by early mine workings. In Lucy L Gulch, immediately west of the main Lucy L portal, the I.P. traverses and expanding I.P. depth profiling reportedly outlined an anomaly which measured 700 feet north-south by 500 feet in width and open to the west. "Mineralization" was interpreted from a depth of less than 25 feet to approximately 300 feet by depth profiling. A flat monzonite contact was interpreted at 280 feet. Two rotary test holes were completed within the I.P. anomaly and the samples were submitted for assay. The drill cuttings consisted of a black clay-like material which reportedly showed a high sulphide content when panned. The black clay-like material was originally thought to contain graphite however close-spaced I.P. tests on an outcrop of the material failed to return a significant response. Geo-Western therefore concluded that the anomaly was due to disseminated sulphides.

In 1981, ACMC commissioned Metals Research Corporation of Kimberly, Idaho to conduct flotation tests on ore from the Lucy L mine. The results were reported in a letter dated November 10, 1981. ACMC had partially roasted the sample prior to delivery and the resulting oxidation of the sulphide minerals created difficulties in concentration, particularly in the flotation of oxidized silver minerals. Flotation recoveries of 77% for gold and 11% for silver were reported. The head grade was calculated to be 0.441 oz Au/ton and 61.4 oz Ag/ton. The flotation resulted in an upgrading of 17:1 for gold. Cyanidation of the flotation concentrate resulted in a 99% leach of gold and 78% leach of silver.

Metals Research Corporation conducted additional flotation concentration and cyanide leach test work on Lucy L ore. Results were reported in a letter dated February 10, 1982. A total of three and one-half tons of pre-crushed and partially ground ore was tested. The head assay returned 0.38 oz Au/ton and 1.06 oz Ag/ton. A duplicate head which was roasted returned 0.411 oz Au/ton and 0.51 oz Ag/ton. Two float tests were described. The first flotation test was for free gold, untarnished gold pyrite and silver sulphides. Recovery was 70% for gold and 64% for silver. The second flotation test was for free gold, gold pyrite, gold bearing sulphides and silver sulphides. The recovery was 85% for gold and 17% for silver. Roasting of the concentrate did not benefit the leach or the recovered metal content.

Bruce C. Wojcik, of Metals Research Corporation reported on a bulk flotation test and cyanide leach recovery test on ten barrels (7220 lbs) of Lucy L ore on May 26, 1982. Test parameters were similar to those outlined in the February 10, 1982 report. Flotation recoveries were 85% of the gold and 34% of the silver contained in the head ore (0.396 oz Au/ton and 4.3 oz Ag/ton). The concentrate contained 19.3 oz Au/ton and 83.6 oz Ag/ton. The cyanide leach resulted in a 94% leach of the gold and a 62% leach of the silver. Overall recovery in the entire circuit was 80% of the gold and 21% of the silver contained in the head ore. A 1.14 oz gold bar and 3.25 oz silver bar were returned to ACMC.

A screen analysis was also conducted on the ore as received by Metals Research Corporation. The screen analysis was as follows:

Size	Weight % of Total	Assay (oz/ton) Gold	Silver
+20 Mesh	28.2	0.568	3.478
-20 +48 Mesh	28.1	0.228	3.865
-48 Mesh	43.6	0.426	5.122
Weighted Average		0.396	4.30

ACMC reports that the bulk ore samples submitted to Metals Research Corporation were collected from the end of the second level in the southern adit of the Lucy L mine.

ACMC has submitted various grab and rotary drill samples from the Lucy L area for analysis since acquiring the property. Some samples appear to have been analyzed by semi- quantitative methods and others have possibly been preconcentrated (tabled) prior to analysis; the **MINING HOUSE** will not address these results. Some recent grab samples analyzed quantitatively which may reflect the mineralization at the Lucy L are presented in Table 6.5. Location maps were not available for these samples; available location information is presented in the table.

TABLE 6.5 AMERICAN CONSOLIDATED MINING CO. LUCY L MINE AREA GRAB SAMPLE ASSAY DATA - 1986/91

Assay #	Sample Description	Au oz/t FA	Ag oz/t FA	Submitted By	Assayed By	Date
22175	Lucy L Tunnel Entrance (Yellow)	0.010	0.070		Kimball	05/16/86
22176	Lucy L Tunnel Entrance (Black)	0.008	0.068		Kimball	05/16/86
25351	Lucy L Blacks (07/14/87)	0.289	0.150		Kimball	07/17/87
25352	Lucy L Upper Level (07/14/87)	0.137	0.400			07/17/87
30355	Lucy L Head Ore	0.569	4.120			10/22/87
	Lucy L Backs 115 Feet Top Level Entrance	0.001		W. Moeller	Casmyn	03/18/91
	Lucy L 3rd Level Shipping Sample	0.007		W. Moeller	Casmyn	03/18/91
	Lucy L 3rd Vein Material West End	0.018		W. Moeller	Casmyn	03/18/91
	Lucy L 3 Level 20 Feet Ore Pile	0.003		W. Moeller	Casmyn	03/18/91
	Lucy L Ore Bin Sample 2/3 Level	0.252		W. Moeller	Casmyn	03/18/91
	Lucy L 2 Level 8 Feet From Entrance	0.056		W. Moeller	Casmyn	03/18/91
	Lucy L 3 Level (Clay) West End	0.001		W. Moeller	Casmyn	03/18/91
	Lucy L Outside Pile Two Outside Shafts	0.005		W. Moeller	Casmyn	03/18/91

The **MINING HOUSE** examined the main levels of two adits and found them to be safely accessible. The western-most is located on the southwest side of a hill in Lucy L Gulch at an elevation of approximately 5950 feet asl; it is referred to as the southern adit by Nolan (1935). Based on discussions with **ACMC** personnel and personal observations, a third level has been added to the south adit since the publication of Nolan's report. The third level appears to have followed the gold bearing quartz vein worked on the main and second levels as described by Nolan (1935). The second adit entered by **MINING HOUSE** personnel was located on the southeast side of the hill. This adit does not appear to be the north adit described by Nolan because the north adit was located approximately 425 feet east and 500 feet north of the south adit portal at an elevation of approximately 5946 feet. The north adit is reported to have been largely within limestone of the Oquirrh Formation with minor monzonite. The portal of the adit entered by the **MINING HOUSE** personnel however is estimated to be at an elevation of approximately 6000 feet asl, approximately 400 feet east and 100 to 200 feet north of the southern adit. The adit was largely in monzonite and had an initial heading varying from approximately S65°W to S90°W whereas Nolan's north adit had initial headings of S30°W to S75°W. Nolan's north adit was therefore apparently not located during the **MINING HOUSE** visit however its entrance may now be caved. The east adit which was entered was connected to surface by an approximately 70° inclined shaft which continued to greater depth. The extent of the deeper workings is unknown. At the end of the adit, a stope which was extracting a quartz vein, is open to a lower level. The **MINING HOUSE** was not able to access the lower workings of this stope. Based on an inflow of air into the east adit and outflow of air from the west or southern adit and the apparent relative positions of the two adits, the **MINING HOUSE** speculates that the stope may connect the east adit with the west or south adit. In any case it appears significant development work has taken place at the Lucy L subsequent to the publication of Nolan's report. A detailed survey of the various levels in the adits and the surrounding surficial workings is required to tie-in the workings completed to date.

Most of **ACMC's** work to date appears to have been concentrated on the south or main adit and the Lucy L Gulch area northwest of the south adit.

6.5.2 Exploration Potential

According to Nolan (1935) the Lucy L mine developed two types of lode deposits: gold-bismuth and tungsten-copper. The largest gold-bismuth orebody was hosted by quartz monzonite approximately 225 feet in from the portal of the south adit. It was a lenticular mass of quartz 50 to 75 feet long and 10 feet in maximum thickness, with a dip of 40-50 NW. The orebody had a crescent shape in horizontal section with concavity to the northwest. The dimensions of the orebody appeared considerably smaller on the second level.

The ore consisted almost entirely of fractured quartz. Dark brown iron oxide and local yellow-brown jarosite filled the fractures. Two ages of quartz were present. The earlier was coarse crystalline, euhedral and volumetrically most abundant. The later quartz was very fine grained and generally found at the interstices of the older quartz grains. It was separated from the older quartz by a fibrous chalcedony layer. Locally the younger quartz was observed to replace the older quartz. Sericite was commonly associated with the younger quartz.

Metallic minerals observed included bismuthinite and native bismuth (both largely oxidized to bismutite), pyrite, and native gold. Nolan suggested that the metallic minerals were found within or near areas of the younger quartz. All gold observed was within the bismutite. Nolan (1935) noted that the gold and bismuth minerals appeared to be restricted to small shoots in the quartz body which were roughly outlined by the stopes. No data is available on the grade of the mineralization within the shoots. Grades of other lode veins in the Gold Hill area however appear to have varied from 0.5 to 3.0 oz Au/ton.

Nolan also reported auriferous rock in two zones at the west end of the bottom level of the northern workings. The rock is described as greyish-green, calcite-rich and containing a few limonite pseudomorphs after pyrite and some copper stains. Microscopically the rock is characterized by calcite, green hornblende, garnet, apatite and abundant fine grained quartz veinlets.

Nolan (1935) reported that tungsten-copper ore was found in a silicate-carbonate vein exposed in a series of small pits approximately 400 feet south of the north adit portal. The vein, as mined, was approximately 4 feet wide and 100 feet long with a north strike and a near vertical dip. The vein is hosted by quartz monzonite approximately 50 feet east of the contact with limestone. Nolan stated that ore extended downward only about 15 feet. The eastern workings of the south adit extend at a depth of approximately 100 feet below the northern extension of the vein and failed to intersect similar mineralization. The mineralization was described as having a small extent and erratic distribution.

The ore consisted of primarily of dark silicates which were largely replaced a matrix of calcite. Pyrite and chalcopyrite were most abundant in areas of abundant calcite. The ore was distinguished by the presence of yellowish-grey scheelite which was up to one inch in length. The silicate minerals included andradite garnet, diopside, epidote, titanite, green hornblende (partly altered to actinolite) and orthoclase. Scheelite appears to have been formed in the early stage of vein formation. Quartz and calcite veinlets with associated sericite and chlorite cut all other minerals. A silicate- rich sample collected by the **MINING HOUSE** from a pit immediately north of the east adit returned 0.100 oz Au/ton, 0.858 oz Ag/ton and 0.517% Cu (ref. Kimball assay 31739d, March 6,1991). This pit is interpreted to be part of the surface workings described by Nolan. The sample was not analyzed for tungsten.

No gold production data is available for the Lucy L. El- Shatoury and Whelan (1970) report that approximately 500 tons of ore grading 1% WO_3 was extracted from the Lucy L mine starting in 1912.

At this time there is no defined mineral inventory at the Lucy L mine. Although the lode gold zones appear to have been small discontinuous bodies or shoots within a larger structure, they were of high grade and warrant additional exploration work. Detailed geologic investigations may be able to determine their local and regional structural controls and guide further exploration efforts.

Of particular interest is a major structure south of the Lucy L which trends approximately north to north-northwest and roughly strikes into the Lucy L mine area. The structure has been delineated by several exploration pits and adits along the east side of a ridge between The Lucy L hill and the Lucky Day Knob. The structure appears to contain several quartz-amphibole veins with locally visible chalcopyrite and malachite staining. Opaline quartz was also observed. It is not known at this time whether the structure is related to the mineralization at the Lucy L Mine but a composite grab sample of quartz and amphibole vein collected by **ACMC** personnel on February 20, 1991 returned 0.162 oz Au/ton, 2.038 oz Ag/ton and 4.74% Cu (ref. Kimball Lab sample 31701a). A quartz-mica-rich grab sample from the dump of the adjacent Keno shaft immediately west of the vein outcrops returned 0.018 oz Au/ton and 0.158 oz Ag/ton (ref. Kimball Lab sample 31701b). The Keno shaft (Au, Ag, Cu) and the Polestar Mine

(Au, Ag, Cu) on the southeast side of the Lucky Day Knob may have exploited the quartz veins in this structure.

6.5.3 Recommended Exploration Program

The presence of the Lucy L mine, Polestar mine and Keno shaft along what appears to be a major north to north-northwest trending structure suggests the exploration potential of this area is very good. The oreshoots have traditionally been small but high grade and would appear to be structurally controlled. The **MINING HOUSE** therefore recommends that subsequent to the reconnaissance geological survey an initial two phase exploration program be undertaken at the Lucy L mine area.

Phase I will consist of a detailed geological survey, sampling and ground geophysical surveys if warranted. Initially, a topographic survey will be completed of all accessible Lucy L mine adits including the lower levels and the surrounding surficial workings. The northern adit described by Nolan will be located and surveyed if accessible. Following this survey, the underground and surficial workings should be geologically mapped and sampled in detail with particular attention paid to structural fabrics. The geological survey would also include the surficial workings which trend south to Lucky Day Knob and the Polestar mine if accessible. The detailed work will assist in determining the structural controls on mineralization and it's relationship to the large north- northwest structure. It is anticipated that some trenching of the quartz veins within the structure trending north-northwest from Lucky Day Knob would also be completed at this time. The detailed geology and sampling will assist in outlining advanced exploration targets in the mine or immediate vicinity.

If the re-evaluation of historical geophysics (and the airborne survey, should **ACMC** elect to complete it) suggest additional geophysical ground surveys are warranted, the work could be conducted concurrent with or subsequent to the detailed geological surveys. Structural information from the geological survey would be used to determine the optimum grid orientation for the geophysical surveys. VLF-EM and I.P. surveys may assist in further delineating structures which may potentially host mineralization.

Contingent on favourable results from the Phase I program the **MINING HOUSE** recommends that a Phase II exploration program consisting of a series of shallow diamond drill holes be completed. The number of holes and total footage will be dependant on the Phase I results and the initial Phase II drill results. An estimated 10 holes totalling approximately 2000 feet may be required to initially test targets in the Lucy L area. This phase of exploration will be results- driven; additional drilling will be required if the program is successful in locating a mineralized structure.

6.6 SOUTHERN SHEAR ZONE SYSTEM

The Southern shear zone system is a major structural trend exposed in the south half of the **ACMC** property. The system is marked by several parallel zones of pronounced silicification and carbonatization along northeasterly trending shear zones. Strikes generally vary between 056° and 081°; visually, the average strike orientation appears to be approximately 065° with moderate to subvertical northwesterly dips.

Although the presence of veins within these zones and the distribution of showings along strike has long been recognized, the structural nature of these fabrics does not appear to have been previously addressed. The scale of the individual shear zones is regional with documented strike lengths in excess of 1500 feet, and apparent strike lengths greater than 6000 feet. Individual zones up to 65 feet wide were noted with conjugate thicknesses likely on the order of a few hundred feet.

To date the **MINING HOUSE** has recognized two major shear zones within the Southern shear zone system. For the purpose of discussion, and in keeping with established nomenclature, these are referred to as the Ivanhole-Southern Confederate shear zone and the Horizontal Veins shear.

6.6.1 Ivanhole - Southern Confederate Shear Zone

Documentation of previous exploration completed on the Ivanhole is limited. In addition to general sampling and a limited amount of reconnaissance mapping in the vicinity of the Southern Confederate claim, at least two periods of drilling (1974 and 1980) and one I.P. survey (1983) have been undertaken.

The Southern Confederate claim, at the presumed southwestern extension of this structure, reportedly supplied much of the ore processed by the Clifton smelter prior to 1926. Grades of shipped ore reportedly averaged approximately 30% Pb with 30 oz Ag/ton.

The ore host at the Southern Confederate, as summarized from Nolan (1935), is a 20 foot wide shear zone striking N50°E and dipping steeply to the southeast. The quartz monzonite wall rock has been sericitized, silicified and chloritized; no mention of carbonatization of the host rock is noted. Ore consists primarily of anglesite, cerusite and plumbojarosite with minor galena. The Southern Confederate claim is presently held by third party interests, and the claim was not visited during the **MINING HOUSE** property visit.

The earliest reported drill results on the Ivanhole date from August 1974 when a 197 foot diamond drill hole was completed under the supervision of Dr. E. H. Turner of

Kennecott Copper Co. The basis for selection of this area or collar location is not known to the **MINING HOUSE.**

Visible gold was reportedly identified in the core from the 120 to 134 foot interval. Initial assay results for this interval were considered disappointing, and the section was eventually analyzed four different times using three different techniques and laboratories. Values ranged from 0.01 to 4.725 oz Au/ton. This is summarized, as follows, from Turner's undated memorandum:

(i) North American Laboratories - Fire Assay
0.01 oz Au/ton with 1.1 oz Ag/ton

(ii) Terralab - Xray Diffraction Analysis (XRD)
4.5 oz Au/ton with 11.8 oz Ag/ton

(iii) U.S. Bureau of Mines - Cyanidation Test
4.725 oz Au/ton

(iv) North American Laboratories - Fire Assay
0.01 oz Au/ton with 1.1 oz Ag/ton

The **MINING HOUSE** has not been able to confirm either the sequence of these assays, nor the validity of every value reported. Analyses i, ii and iv are reportedly from a single pulp, whereas the cyanidation test is a total digestion leach of the remaining half core. The earliest available analyses are from Terralab (assay report dated August 9th, 1974), and have gold and silver results the reverse of those quoted by Turner; ie. 11.8 oz Au/ton and 4.5 oz Ag/ton, not 4.5 oz Au/ton and 11.8 oz Ag/ton. This discrepancy has not been resolved. Subsequent notations to the unsigned analytical certificates imply the presence of two additional holes drilled concurrently in the Ivanhole area. No other references to these additional holes was found in the data set.

The earliest assay reports from North American Laboratories are dated September 30th, 1974. These reports are missing results for the entire interval 109 to 156 feet; no corresponding break was encountered in the numerical sequencing of the assay results. A second series of assay results including the section from 109 to 156 feet was reported on November 26th, 1974. Average grade for the interval from 120 to 143 feet was 0.0096 oz Au/ton.

The U.S. Bureau of Mines cyanidation test results consist of a single undated memo. Footnotes to this memo suggest that this work post-dates the second North American Laboratories assays.

A second period of drilling was undertaken on the Ivanhole during 1979 and 1980. Two rotary? holes, with depths of 200 and 125 feet, were completed by BEO in late 1979. In 1980, Noranda completed a 200 foot HQ diameter hole beside the BEO collar locations (Dow, 1980).

One composite sample was collected by BEO from each of the holes that they completed. These samples were sent for only a semi-quantitative analysis (Spectraspan). The analytical certificate has no statement of assay units therefore the **MINING HOUSE** must disregard these analyses at this time. Noranda also sampled these two holes and collected 65 samples at 5 foot intervals. The **MINING HOUSE** does not know if these samples were ever analyzed; Noranda did not supply BEO with any assay results. Twelve surface samples collected from the Ivanhole area at the same time are similarly undocumented.

The HQ diameter Noranda hole recorded by Dow was reportedly lost at the Park City mill site (W. Moeller, pers comm). Prior shipment of the Noranda sample, a non-representative grab sample was taken by BEO. Two fire assays were run with no significant results; however, addition of iron to the assay sample resulted in an assay of 0.1 oz Au/ton. Assay certificates also document a second Noranda hole 120 feet long. No other note of this second hole has been found.

Two samples were collected from the Ivanhole trend by Anaconda Minerals in 1982. Although both samples returned anomalous assay results for gold (0.082 and 0.015 oz Au/ton), they have only been located at a scale of 1:24000 (Appendix D).

A geophysical (I.P.) survey was completed over the Ivanhole area during July 1983. The survey consisted of three lines, each 2000 feet long, and spaced at 400 and 500 foot intervals. Although this ground coverage amounts to little more than a test survey, six subparallel structures were recognized (Hewitt, 1983). These zones all strike approximately N68°E; five of the structures dip steeply to the northwest, and one dips subvertically to steeply southeast.

The **MINING HOUSE** has traced the Ivanhole structures for a strike length of approximately 1300 feet from the "Spanish Mine", through the Ivanhole drill area and across the drainage wash immediately to the north of the Ivanhole. The Spanish Mine was developed in a portion of the structure which hosted carbonate and quartz-galena veins. This section of the shear strikes N55°E and dips 40 to 50°NW. A high grade grab sample collected by the **MINING HOUSE** from a galena veinlet at the Spanish Mine portal assayed 13.31% Pb with 5.08 oz Ag/ton and 0.148 oz Au/ton.

Immediately north of the portal a carbonate vein swings sharply to the northwest for a strike length of approximately 30 feet. Similar cross structures near the Ivanhole were noted striking approximately N25°W and dipping moderately to the south. The development of vein fabrics oblique to the regional trend of the shear system is a predictive response to shear system generation, and these cross structures can frequently exert a strong localizing effect on mineralization in such systems.

A grab sample from a vertical quartz vein striking 081° was collected by **MINING HOUSE** personnel immediately east of the Ivanhole drill area along the projected trace of the Spanish Mine vein structure. This vein represents a second east-west trending cross structure. The sample returned anomalous gold and silver values of 0.074 oz Au/ton and 1.888 oz Ag/ton.

6.6.2 Horizontal Veins System

The Horizontal Veins shear system is a major structural zone along the southeast flank of Rodenhouse Wash and parallels the Ivanhole - Southern Confederate trend.

The central portion of the system consists of a number of subparallel structures in the general vicinity of the Horizontal Veins. Troyer (1972) has noted the presence of at least three structures in this central area, all to the southeast of the main zone; the **MINING HOUSE** also found additional structures immediately northwest of the main zone.

The zones are typically buff to tan in color and are cored by quartz and/or quartz-carbonate veins or silica- flooded shears. Individual veins range from a few inches to as much as 7 feet in thickness; mineralization appears to be concentrated in, or restricted to, these veins (Troyer, 1972), and primarily consists of lead sulphides and sulphates. This is similar to the gross mineralogy of the Southern Confederate. Average strike is approximately N60°E and dips are steep to the southeast.

The main zone has been traced at surface for a minimum strike length in excess of 2500 feet (Troyer, 1972). The zone was seen to be continuous over this entire distance and, where contacts were observed, varied in thickness from 15 to 70 feet.

The Horizontal Veins, in **ACMC** nomenclature, refers to a series of three shallow vertical exploration shafts developed in the main zone. These three shafts are known from southwest to northeast as the 30 Foot Shaft, the 100 Foot Shaft and the 130 Foot Shaft respectively. **MINING HOUSE** personnel visited the 30 Foot and 100 Foot shaft areas, but made no attempt to enter either due to a lack of equipment and poor ground conditions. From surface, each can shaft was be seen to have followed a discrete, vertical shear to depth.

In 1975, Cameron Mining collected a grab sample reported to have been from the 130 Foot Shaft area. This sample returned an analytical value of 0.99 oz Au/ton; however, neither analytical technique nor sample location have been documented. During late 1977, Occidental Minerals collected 20 grab samples from the main zone in the vicinity of the three shafts. Thirteen samples were taken from the 30 Foot Shaft area, two from the 100 Foot Shaft area, and five from the 130 Foot Shaft area. Assay results ranged from <0.001oz Au/ton to 0.024 oz Au/ton, and from below detection limit to 18.38 oz Ag/ton. The **MINING HOUSE** has not been able to document the location of these samples. Assay results are summarized in Table 6.6.

Three grab samples collected from the Horizontal Veins trend by Anaconda Minerals (1982) returned anomalous gold assays of 0.023, 0.014 and 0.015 oz Au/ton; all three samples were also greater than the upper detection level for lead (7500 ppm). Assay sheets and approximate sample locations are presented in Appendix D.

The southwestern extent of the Horizontal Veins shear zone, as outlined to date, is in the Clifton area near the Herat mine site. The northern limits are currently delineated by the Church claims. Much of the general exploration in the Clifton - Rodenhouse Wash area is thus related to the Horizontal Veins shear. Portions of the area have been covered by the following geophysical surveys:

(i)	ground magnetics & VLF	(Whipple, 1974)
(ii)	Junction Hole I.P.	(Hewitt, 1981b)
(iii)	Iron Claims I.P.	(Hewitt, 1983a)
(iv)	Church I.P. & magnetics	(Hewitt, 1983c)
(v)	Clifton Pulse EM	(Hewitt, 1984)
(vi)	Clifton Pulse EM	(Hewitt, 1985)
(vii)	Clifton IP, & Magnetics	Mackelprang, 1988
(viii)	~~Great~~ Clifton IP/Resistivity Yellowhammer	(Great Basin Geophysical Inc) 1992
(viiii)	~~Dighem~~ Airborne Geophysics Electromagnetic Resistivity Magnetics VLF Radiometrics	(Dighem 1992)

TABLE 6.6: HORIZONTAL VEINS ASSAY SUMMARY
(Occidental Minerals, 1977)

		oz Au/ton	oz Ag/ton
30 Foot Shaft			
North Pit -	Grab 1	0.024	18.38
-	Grab 2	<0.001	0.058
-	Grab 3	0.014	15.29
South Pit -	Grab 1	0.006	1.47
-	Grab 2	0.002	0.088
-	Grab 3	0.019	8.53
Dump 1		0.005	4.55
Dump 2		0.006	1.323
Dump 3		0.007	7.64
Dump 3 -	Repeat	0.006	7.64
100 ft north of shaft		0.003	0.147
200 ft north of shaft		0.002	0.118
500 ft north of shaft		0.002	0.382
100 Foot Shaft			
Dump		0.014	4.59
150 ft west of shaft		0.003	0.058
130 Foot Shaft			
Bottom of shaft		0.016	14.71
Dump		0.004	1.41
Dump -	Repeat	0.004	1.35
Pit intersection (?)		0.003	0.029
Pit intersection (?)		0.004	0.058

In addition to the seven BEO drill holes collared in 1980, which have been discussed previously in section 6.4, the **MINING HOUSE** has reviewed documentation for nine drill holes completed in the Horizontal Veins area.

Four of the nine holes tested the North Vein in the Atlantis claim. At the same time, eleven sample trenches were cut across the zone; locations for both drilling and trenching are shown on Figure 6.4. Only limited data are available for holes NV-3 and NV-4. Hole NV-3 was sampled at 5 foot intervals over its entire 260 foot length. Anomalous mineralization was encountered in several intervals of this hole, including 0.03 oz Au/ton over 20 feet at the top of the hole and 0.03 oz Au/ton over a 10 foot interval from 25 to 35 feet. No lithologic information is available for these holes.

Five diamond holes totalling 4597 feet were completed in 1983 under the supervision of Peter Joralemon. All holes were targeted on the basis of geophysical anomalies defined by GeoWestern (Hewitt, 1981b; 1983a; 1983c). The first three diamond drill holes (No.'s 1, 2 and 2A) targeted obvious geophysical breaks as defined by I.P. surveys. The rationale behind the selection of holes 3 and 4 is no longer readily apparent. Drill hole data are tabulated in Table 6.7; collar locations are presented on Figure 6.4. All holes cored variably altered (propylitized/sericitized) monzonite with the exception of holes 3 and 4 which collared in limestone before entering the monzonite.

TABLE 6.7: HORIZONTAL VEINS AREA DIAMOND DRILL HOLE SUMMARY
(after Joralemon, 1983

Hole	Orientation	Length	Comments[1]
#1	-60° @ 180°	2001 ft	2-5% py; numerous qtz veins with cpy, gal, sph; up to 2% combined Cu-Pb-Zn over 10 feet; geochemically anomalous Mo, Ba
#2	-60° NW	378 ft	hole lost @ 378'
#2A	-60° NW	910 ft	disseminated py; qtz-py veins with cpy, gal, sph; up to 5.5 oz Ag/ton; incomplete assays
#3	-60° NNW	1237 ft	northwest of main shear; disseminated py; few qtz-py veins; 3.5% combined Pb-Zn in 1 ft sample near base of hole
#4	vertical	71 ft	collared at #3; no assays reported

(1) cpy - chalcopyrite, gal - galena, py - pyrite, sph - sphalerite

The 1983 diamond drill program documents the presence of a broad zone of propylitic alteration (chlorite+pyrite) extending to a vertical depth of at least 1730 feet. During cursory examination of five boxes of core, the **MINING HOUSE** noted definite zones of sericitic alteration within the propyllitic envelope. This does not appear to have been systematically documented in the available drill logs.

The drill holes encountered numerous thin quartz- carbonate-sulphide veins and small fault and breccia zones within the monzonite. These are interpreted to reflect the continuity of the surface shear structures to depth. The association of these structures with mineralization is promising as it confirms the shear zone acted as a fluid conduit for mineral-bearing solutions.

The mineralization encountered near the base of hole #3 is associated with a thin quartz-sulphide vein hosted by a chloritized monzonite. This interval returned analytical values of 1.81% Pb and 1.75% Zn across the vein; however, no sample data are available for the host monzonite. It does not appear that sampling of these holes reflected the areas potential for porphyry-type mineralization. The **MINING HOUSE** notes that semi-quantitative spectrographic analyses of 100 foot composites were reported to have values of up to 8.8 times background for molybdenum and up to 25 times background for beryllium.

6.6.3 Exploration Potential and Recommended Exploration Program

In the opinion of the **MINING HOUSE,** significant exploration is warranted on the Southern shear system over both the Ivanhole-Southern Confederate and the Horizontal Veins zones. A two phase exploration program is recommended to follow completion of the regional geologic mapping and sampling program. It is anticipated that results of the latter will lead to the recognition of additional zones in the Ivanhole system that will require further examination during this program.

Both the Ivanhole - Southern Confederate and Horizontal Veins structures can be considered as "stand alone" exploration targets, but the **MINING HOUSE**, based on budgetary considerations, believes that it is preferable to treat them as a single entity at this time to avoid duplication of preparatory and mobilization costs.

Phase I will consist of detailed geological mapping and a number of systematic sample traverses across the entire widths of the various zones within this structure. At present it is not known how many zones are present, what their aggregate thickness might be, or how mineralization is distributed through the zones.

Phase I may be facilitated by a limited geophysical survey. Modest ground VLF-EM and magnetic surveys are therefore recommended to delineate the structures in areas of overburden cover and to identify additional zones not recognized at surface. The choice of survey methods is based on their utility for geologic and structural mapping, the speed with which they can be completed and interpreted, and their cost effectiveness.

A second phase of exploration will be necessary to test the subsurface continuity of surface results. The scale of Phase II will be contingent on the results of Phase I. A minimum of three to five 200 foot diamond drill holes is recommended for each of the two zones based on currently available information; the necessity for additional footage requirements is anticipated.

The potential of the area to host porphyry-type mineralization is readily apparent. Propylitic and sericitic alteration is locally well developed in the quartz monzonite and combined base metal sulphides exceeding 3% have been reported. Due to the limited geological information available, it is difficult to assess the probability of finding such mineralization without relying on an intensive, deep drilling program. The **MINING HOUSE**, therefore, believes it premature to propose a program specific to porphyry type mineralization at this time. Results from regional geological and geochemical surveys will be invaluable in outlining potential porphyry targets.

6.7 NORTHEAST TARGET AREAS

Two intermediate stage exploration targets have been recognized in the northeastern portion of the ACMC property area along Rodenhouse Wash. ACMC refers to these two areas as the Beryllium veins, and the Kiewit disseminated gold zone (W. Moeller, pers comm). In addition to these targets, the area contains one past producer (the Climax Mine), and numerous exploration pits and short adits.

The northeastern property area is primarily underlain by intrusive rock of granodioritic to quartz monzonitic composition similar to that encountered in the Horizontal veins area immediately to the south. Field examinations in this area by the **MINING HOUSE** were limited by both schedule and scope of work. No distinct cross-cutting relationships were documented to constrain the age of this pluton.

Only a minor Paleozoic carbonate and shale is preserved in this area; exposure is restricted to an area along the central portion of the Rodenhouse Wash, and a few isolated outliers northeast of the property corner. Several small volcanic plugs or stocks were also encountered along Rodenhouse Wash proximal to the intrusive-carbonate contact. The volcanics appear dacitic to rhyolitic in composition and are easily recognized by their distinct purple coloration. Texturally, they vary from medium-fine ash and crystal tuff to coarse heterolithic tuff and/or volcanic breccia.

6.7.1 Beryllium Veins

The beryllium veins were first discovered by the Vanguard Research Co. in 1962. Vanguard reports that some 700 samples were analyzed with a nuclear beryllium analyzer Simpson, 1964); sample sites were labelled in the field but were not mapped at that time. Existing sample markers show that sampling was as close spaced as every two to three feet.

Subsequent mapping by personnel of the USGS (Griffitts, 1965) outlined a discontinuous belt of beryllium-rich veins with a strike length of 2 miles. The entire zone appears to be restricted to the intrusive body. Individual veins in the belt range in scale from small stringers to single veins with widths in excess of 40 feet and strike lengths up to 1000 feet. Orientation of the larger veins is approximately north-south with moderate westerly dips. The zone terminates abruptly to the north along the north rim of Rodenhouse Wash. The southern terminus is ill defined, but appears to be more gradual.

The composition of the beryllium veins is mineralogically simple, consisting primarily of quartz, adularia and calcite. In thin section, bertrandite has been identified as the beryllium host mineral occurring as inclusions within adularia. El-Shatoury and Whelan (1970) did not recognize the presence of bertrandite, and believe that the beryllium is contained as a replacement within the adularia crystal structure. The most pronounced textural feature of the veins is the development of well defined layering sub-parallel to the vein margins.

Shawe (1966; 1968) has noted that silicic igneous rocks near beryllium belts in the eastern United States have unusually high beryllium and fluorine contents (6 ppm to 20 ppm Be, and 0.12% to 0.79% F). Griffitts, however, has commented on the relative lack of fluorine in the beryllium veins of the Gold Hill District when compared to other berylliferous areas in Utah (Griffitts, 1965).

Shawe's (1966) reference to "millions" of tons at 0.5% BeO in the beryllium veins area has not been substantiated by the **MINING HOUSE**; this likely reflects his personal estimate. While this order of magnitude is plausible, it cannot be used for an economic evaluation or assessment without significant additional documentation.

Subsequent to **ACMC'** acquisition of this property through the BEO limited partnership, 62 grab samples were collected and sent for assay. The **MINING HOUSE** has not seen sample descriptions or analytical certificates, nor is the date of this survey known. Available data is limited to an assay summary and accompanying sample location map (Figure 6.5). It appears that all samples collected were directly from the beryllium veins or the vein margins.

Results of the sampling are encouraging. The distribution of these results ranges from 0.02 oz Au/ton to 16.0 oz Au/ton. Three samples assayed greater than 1.0 oz Au/ton, and an additional 13 samples returned assays from 0.10 to 0.88 oz Au/ton (Table 6.8). The average grade of 59 samples containing less than 1.0 oz Au/ton, as reported by ACMC, is 0.08 oz Au/ton. The **MINING HOUSE** is not aware of the reasons for omitting the three high-grade samples. Average grade for all 62 samples cut to 1.0 oz Au/ton is 0.12 oz Au/ton.

TABLE 6.8: GOLD ASSAYS IN THE BERYLLIUM VEINS AREA

(see Figure 6.5 for sample locations)

Sample	oz Au/ton	Sample	oz Au/ton	Sample	oz Au/ton
1	0.04	22	0.14	43	0.10
2	0.04	23	0.07	44	0.05
3	0.04	24	0.07	45	0.25
4	0.04	25	0.10	46	0.04
5	0.02	26	0.02	47	0.04
6	0.88	27	0.05	48	0.10
7	0.06	28	0.05	49	0.07
8	0.04	29	0.06	50	0.06
9	0.03	30	16.0	51	0.08
10	0.04	31	0.03	52	0.07
11	0.42	32	0.08	53	0.03
12	0.25	33	0.10	54	0.05
13	0.05	34	0.02	55	0.03
14	0.03	35	0.04	56	0.03
15	0.02	36	0.06	57	0.04
16	0.03	37	0.07	58	0.06
17	0.03	38	0.03	59	0.03
18	0.02	39	0.06	60	0.12
19	0.03	40	2.1	61	3.0
20	0.03	41	0.18	62	0.02
21	0.10	42	0.19		

The **ACMC** property has never been systematically explored for it's potential to host large-tonnage, low-grade disseminated gold mineralization amenable to bulk mining methods. The **MINING HOUSE** believes that this deposit type represents a viable target in this area. In addition to the recommended property-wide geologic mapping and sampling, the **MINING HOUSE** believes that a two-stage future exploration program is warranted in the Beryllium Veins area.

The first stage of exploration (Phase I) should consist of detailed structural mapping and channel sampling of the beryllium veins to determine the limits and continuity of the mineralization at surface. Sampling and mapping of the auriferous areas encountered to date should also document the genetic relationship between beryllium and gold mineralization, and the structural constraints on their distribution.

The second stage (Phase II) of exploration in this area would consist of a series of low diamond drill holes to test the subsurface continuity of the mineralization. It is estimated that a minimum of 6 to 10 short diamond drill holes (approx 200 feet each) will be necessary to test these targets. The maximum number of holes in this stage will depend on results obtained. Phase II is considered contingent on the successful completion of Phase I and is a results- driven program.

6.7.2 Kiewit Disseminated Gold Zone

A series of 38 surface (grab?) samples collected by the Kiewit Mining Group during the summer of 1990 returned an average assay value of less than 0.005 oz Au/ton; the highest value was only 0.027 oz Au/ton (Figure 6.6; Appendix E). A single rotary drill hole found in this area during the **MINING HOUSE** property visit is undocumented and apparently unknown to **ACMC** personnel. Based on the information which has been provided to **ACMC** by Kiewit, the **MINING HOUSE** does not consider the Kiewit disseminated gold zone to represent a valid exploration target at this time. No exploration program beyond general reconnaissance mapping and sampling is warranted at present unless the complete data package generated by Kiewit can be acquired.

6.8 MISCELLANEOUS AREAS

In addition to the target areas discussed previously, there are several grassroots exploration targets on the property that have not previously been tested by **ACMC.** While some of these areas have seen historic exploration and/or limited production and development, others are considered to be new. Due to the abundance of old workings in the area the **MINING HOUSE** has limited discussion to the immediate property area and refer the reader to Nolan (1935) for a general discussion of other past producers in the Gold Hill District.

6.8.1 Bridge Vein System

During the Yellow Hammer site visit, a short traverse was completed from the Yellow Hammer open pit eastward across the Reaper mine dump to the monzonite-limestone contact. A pronounced silicified shear zone was encountered in the draw between the Yellow Hammer and the Reaper and is here-in-after referred to by **ACMC** as the Bridge vein system. The **MINING HOUSE** is unaware of any previous exploration of this structure beyond a brief comment by Griffitts (1965).

Macroscopically, the mineralogical and textural similarities between this structure and the quartz-carbonate-adularia veins of the beryllium zone are striking. Estimated width of the zone is well in excess of 60 ft and exhibits a minimum strike length of 1000 feet. The structure has a general northerly trend with a strike of approximately N35°W at the northern trace of the zone swinging to approximately N05°W at the south end where the structure is lost under the road.

The structure is cored by a coarse quartz-calcite-barite vein flanked by a quartz and/or quartz-carbonate breccia. The zone margins are marked by an intensely silicified and locally aphanitic monzonite. Between 3 and 5% sulphide was noted locally within the brecciated quartz-carbonate.

Four representative grab samples were collected by **MINING HOUSE** personnel across the width of the vein structure. Assay results averaged 0.116 oz Au/ton and range from 0.236 in the core of the vein to 0.064 oz Au/ton along the margins of the structure (Table 6.9). No economically significant silver was returned.

TABLE 6.9: REPRESENTATIVE GRAB SAMPLE RESULTS BRIDGE VEIN SYSTEM

Location	Au (oz/ton)	Ag (oz/ton)	Comments
Reaper #1	0.236	0.148	0.021% Be
Reaper #2	0.064	0.416	
Reaper #3	0.082	1.030	
Reaper #4	0.082	0.468	0.672% Cu

Similar zones, consisting of quartz-carbonate-barite veins and minor quartz-carbonate breccia were noted to the east of the Reaper mine. Orientation of these zones is subparallel to the main zone (approximately N10°E). No sampling of these structures was undertaken due to time constraints.

The limestone-quartz monzonite contact northeast of the Reaper mine locally exhibits intense brecciation and milling of fragments. The overlying limestone exhibits extreme silicification for a width of up to 20 feet or more immediately above the contact. Development of characteristic skarn mineralogy or calc-silicates was not observed.

It is the opinion of the **MINING HOUSE** that further exploration is warranted in the immediate vicinity of the Yellow Hammer-Reaper vein system. The main vein system should be mapped in detail and several continuous channel samples cut through the entire system. The nature of auriferous mineralization associated with quartz-carbona te flooded shears is such that gold distribution is non-uniform. Consequently grab samples are notoriously unrepresentative. Detailed structural mapping is essential to predicting the orientation of possible ore shoots.

In conjunction with the above recommendations for the main structure, sampling of additional veins and breccia zones in the area is warranted. During this phase, the brecciated silicified zones along the limestone contacts should also be systematically sampled and investigated. The potential for replacement gold mineralization within the limestones remains an additional and previously untested target.

A modest budget for Phase II diamond drilling is warranted contingent on favourable results being generated from Phase I mapping and sampling. The **MINING HOUSE** estimates that six short (150 to 200 feet) diamond drill holes would adequately test the main vein for a first pass exploration program. Drilling should concentrate on establishing depth continuity and documenting the orientation of possible mineralized shoots.

6.8.2 Bear Creek Mining Company Survey (Kennecott)

In mid 1980, the Bear Creek Mining Company undertook a reconnaissance geochemical survey over part of the **ACMC** property. The survey covered portions of the southern property area between the Yellow Hammer and Ivanhole (Figure 6.7). Both soil samples and grab samples were collected.

Data and sample locations are available for 112 soil samples and 46 rock grab samples. Multi-element (ICP?) analysis was run for gold, silver, base metals, molybdenum, tungsten and a variety of indicator elements. Platinum group analysis is available for 12 of the above 46 rock samples and for an additional 12 samples which lack multi-element analyses (Appendix F).

Most of this data appears to have been under-utilized to date; the only data contour maps available are for Pb and Mo. These maps have erroneously included both soils and rock samples as a single data set and have contoured absolute values. The failure to differentiate between sample media or statistically treat the data has resulted in an anomaly distribution which reflects the distribution of rock sample locations. A reinterpretation of this data is warranted, but was beyond the scope of this report. Sample locations are presented in Figures 6.7.

6.8.3 Other Areas

In addition to those areas discussed previously, there are a number of small pits, showings and marginal past producers in the **ACMC** property area. The **MINING HOUSE** has concerned itself only with those prospects located within the **ACMC** claims as defined in Table 2.1.

The Climax mine is located in the northern half of Rodenhouse Wash adjacent the northwest end of the beryllium veins. Nolan (1935) reports that a 150 foot vertical shaft was sunk on a quartz-sulphide vein trending N82°W. Two cars of ore were shipped from 250 feet of cross cuts and drifts; these shipments contained 29 oz Ag and 27% Pb.

Ore mineralogy of vein material at the Climax mine dump consisted of quartz, pyrite, arsenopyrite, galena and sphalerite. The host lithology is a propylitized and sericitized quartz monzonite.

The Climax mine area will be mapped and sampled as part of the reconnaissance exploration program and the detailed geologic survey of the beryllium veins area, northeast property area. The **MINING HOUSE** does not believe that the Climax mine is an independent exploration target given currently available data.

The Doctor claim consists of an inaccessible shaft and several surface cuts immediately south of the Yellow Hammer pit. Nolan (1935) notes that a minor amount of tungsten ore is reported to have been shipped from the claim. Development appears to have been restricted to the quartz monzonite about 50 feet from the limestone contact. Ore minerals quoted by Nolan included: scheelite, quartz, calcite, magnetite, sulphides (chalcopyrite-bornite-pyrite and silicates. The sulphides occur chiefly within fine veins and stringers trending N60°E.

An unlocated grab sample collected in January of 1981 and analyzed using semi-quantitative techniques returned values of 0.7 oz Au/ton with 10.3 oz Ag/ton and 2.6%

Pb. Two grab samples collected in October 1989 and fire assayed returned 0.02 oz Au/ton and 0.018 oz Au/ton, each with less than 1.0 oz Ag/ton. The **MINING HOUSE** has not visited the Doctor claim.

The Church area is located at the northeast end of the Horizontal Veins area as currently defined. A number of shallow pits and exploration adits have been found in this area. Those adits visited by the **MINING HOUSE** appear to be developed in fresh to variably altered and sheared monzonite. Thin quartz-sulphide veins were noted in adits and surface pits, and are the probable target of the historic exploration.

Six grab samples collected from Church area adit dumps by Occidental Minerals Corp. in 1977, and three samples collected from the main adit by **ACMC** in 1983 all returned less than or equal to 0.002 oz Au/ton. One semi-quantitative analytical result reported in 1980 averaged 0.303 oz Au/ton from a bulldozer trench; however this result has not been subsequently verified.

The Iron claim is similarly located along the northern end of the Horizontal Veins system. No significant assay results have been reported, but the claim is marked by the development of a pronounced iron stained silicification and jasperoid zone. Both the Iron claim and the Church claim will be covered by the detailed geologic surveys proposed for the Horizontal Veins portion of the Southern shear system.

During the site visit, **MINING HOUSE** personnel notes several exposures of jasperoid and silicification in both limestone and monzonite. Nolan (1935) has noted that jasperoids in the Gold Hill District are primarily composed of fine crystalline quartz with associated barite, sericite, calcite, chlorite(?), chalcedony and opal. Barite is locally a significant framework constituent present as coarse bladed crystals. **MINING HOUSE** personnel observed that barite locally occurred in a later generation of veining.
It is the opinion of the **MINING HOUSE** that the jasperoid and silicification zones represent promising exploration targets for disseminated gold mineralization and possibly or epithermal vein-type gold mineralization. The degree of brecciation and silicification present in these gossans attest to the passage of a significant volume hydrothermal fluids concentrated along what appears to have been pre-existing structures.

As the jasperoid zones on the property do not appear to have previously been considered significant exploration targets, the **MINING HOUSE** believes that a concerted effort to locate these zones is warranted. Part of the regional exploration program should attempt not only to document the presence of such zones, but should also include a modest budget for collecting representative chip samples across their width.

The **MINING HOUSE** cannot over-emphasize the importance of following a systematic exploration approach in attempting to discover this type of disseminated gold deposit. Of particular interest is a summary of the exploration criteria for sediment-hosted disseminated precious-metal deposits presented by Bagby and Berger (1985):

"District- and deposit-scale criteria include structure, alteration and geochemical characteristics. These criteria are necessarily based on detailed geologic mapping. For example, alteration types and their spatial relationship to structures and different potential host lithologies must be mapped and reasonably understood prior to geochemical sampling. In addition, vein types and their crosscutting relationships help define a target area. Most of the deposits discussed above have late calcite veining crosscutting oxidized rocks. Jasperoidal breccia and jasperoidal veins generally occur near ore, even when they themselves may not carry high gold values. Geochemical surveys, including rock and soil, can be extremely valuable for closing in on a target (Bagby et al., 1984). The ubiquitous gold suite of associated trace elements, arsenic, mercury and antimony is an important indicator of gold mineralized rock. Extremely high values for these elements are not necessary to define a favourable area. Instead it may be more significant that the suite of indicator elements is present."

7.0 EXPLORATION MODELS

The **MINING HOUSE** proposes that at least five mineral deposit types are valid exploration models on **ACMC's** Gold Hill property. The results of reconnaissance exploration program will further delineate areas on the property where advanced exploration for the various models will be most appropriate.

7.1 SEDIMENT HOSTED, DISSEMINATED PRECIOUS METAL DEPOSIT

(Bagby and Berger, 1985; Bonham, 1988)

Deposits of this type are also commonly referred to as Carlin-type deposits however it is somewhat of a misnomer because many sediment-hosted, disseminated precious-metal deposits have characteristics which differ significantly from the Carlin deposit.

Sediment-hosted disseminated precious-metal deposits are typically formed in carbonaceous, thin bedded, silty dolomites and limestones or calcareous siltstones and claystones. Gold mineralization is extremely fine-grained (<1 micron in unoxidized ore) and disseminated through the host rocks. Silicification, decalcification argillization and carbonization are the primary alteration types. Silicification in the form of jasperoid is ubiquitous and is a major exploration guide. The jasperoids are typically anomalous in gold, antimony, arsenic, mercury and barium and can be located above, below or in the ore zone. Barite is a common gangue mineral and fluorite is commonly present. Oxidation of the deposits results in the formation of oxide and sulphate minerals and the release of gold from associated sulphides. Deposits of this type are commonly characterized by the trace elements: arsenic, barium, mercury, antimony, thallium, molybdenum and typically tungsten.

The deposits occur in regional structures along which Mesozoic and Tertiary faulting and intrusive activity was concentrated.

Bagby and Berger (1985) have divided the sediment-hosted disseminated precious-metal deposit type into the jasperoidal-and Carlin-type subsets. A complete gradation exists between the two subsets. In jasperoidal-type deposits the majority of the gold and/or silver is hosted by jasperoid or quartz veins and related silicified rocks. In Carlin-type deposits however, the gold and/or silver is evenly distributed in the host rocks which do not always appear silicified. Carlin-type ore zones are commonly pod-like, extending up to tens of metres away from faults whereas jasperoidal-type ore zones are generally limited to narrow fault zones. A comparison of the geological characteristics of the jasperoidal-type and Carlin-type deposits is presented in Table 7.1.

TABLE 7.1

Comparison of Geologic Characteristics of Jasperoidal and Pod-like (Carlin-type) Sediment-Hosted, Disseminated Precious-Metal Deposits
(from Bagby and Berger, 1985)

Jasperoidal, Quartz-Veinlet Type	Disseminated, Pod-like Type
Quartz veins common	Quartz veins uncommon
Main ore in silicified rock	Main ore not silicified
Ore primarily restricted to fault zones	Pod-like orebodies extend away from faults
Several silicification stages	Jasperoid may be present
Gold- and silver-rich varieties	Gold-rich variety most common
Siliceous rocks common	Calcareous rocks common

The jasperoid silicification has been interpreted by some workers to be an early- and preore-stage of alteration (Berger and Henley, 1989).

The geological setting of the **ACMC** property indicates potential for a sediment-hosted disseminated precious-metal deposit. In particular, the silicified jasperoid zones on the property are prime targets for the jasperoid-type deposit as defined by Bagby and Berger (1985).

The limestone and shale sequence of the Ochre Mountain, Manning Canyon and Oquirrh Formations may be potential hosts for a sediment-hosted disseminated precious-metal deposit of the Carlin-type subset. A reconnaissance geological survey may assist to outline prospective areas of carbonaceous sediments with associated jasperoid zones.

7.2 EPITHERMAL VEIN-TYPE GOLD MODEL

(Panteleyev, 1986)

The term epithermal deposit was defined by Lindgren (1922, 1933) to include a broad range of precious metal, base metal, mercury and stibnite deposits which he believedwere deposited from low temperature (<200°C), magmatic gas charged aqueous fluids at moderate pressure (Heald et al., 1987). Modification of Lindgren's description of epithermal characteristics has resulted in the generally accepted definition of an epithermal deposit as a near-surface deposit formed in a hydrothermal system at temperatures under 300°C and under low to moderate pressures (Silberman and Berger, 1985) (Table 7.2).

Table 7.2: Characteristics of Epithermal Systems

Depth of formation	Surface to 1000m
Temperature of formation	50 to 300°C
Form of deposits	Thin to large veins, stockworks, disseminations, replacements
Ore textures	Open-space filling, crustification, colloform banding, comb structure, brecciation
Ore elements	Au, Ag, (As, Sb), Hg, [Te, Tl, U], (Pb, Zn, Cu)*
Alteration	Silicification, argillization, sericite, adularia, propylitization
Common features	Fine-grained chalcedonic quartz, quartz pseudomorphs after calcite, brecciation

*() Elements often pesent in economic concentrations but less valuble than associated precious metals

[ ] Elements seldom present in more than sub-economic concentrations

from Silberman and Berger (1985)

Panteleyev (1986) presents the following general characteristics of epithermal deposits:

(1) Metal deposition occurs from surface to a maximum depth of 1000 metres. Ore zones can be developed over considerable strike lengths but are generally restricted in vertical extent to intervals varying from 100 to 1000 metres. The ore zones either bottom in barren rock or pass into non-economic zones containing base metal sulphides.

(2) Veins are the most common ore host. Breccia zones, stockworks and bedding replacement zones also occur.

(3) Epithermal deposits form in extensional tectonic environments with tensional fractures and normal faults. Volcanic collapse structures are common but not necessarily present.

(4) The deposits commonly occur in volcanic terranes with well differentiated volcanic rocks and subvolcanic intrusions. Rocks characteristic of hot springs and fumeroles are locally present where the hydrothermal discharge sites are not deeply eroded.

(5) Ore and associated minerals are generally deposited as open space fillings. Ore textures include colloform banding, crustification, vuggy, drusy, and cockscomb. Mineral deposition commonly occurs in repeated cycles.

(6) Gold and silver are the main economic metals with enhanced concentrations of mercury, arsenic, antimony, zinc, lead, copper and rarely tellurium, selenium and thallium. The main economic minerals are native gold and silver, electrum, acanthite and silver bearing arsenic- antimony sulphosalts. Tellurides are locally important. Sphalerite galena and chalcopyrite are common. Enargite is present in some deposits instead of chalcopyrite. Some deposits contain significant concentrations of cinnabar, stibnite, tetrahedrite and selenides. Gold to silver ratios are variable but silver is generally more abundant than gold. Base metal sulphides tend to increase in abundance with depth.

(7) Gangue minerals are mainly quartz and calcite with lesser fluorite, barite and pyrite. Chlorite, hematite, dolomite, rhodonite and rhodochrosite are less common.

(8) Hydrothermal alteration is associated with the epithermal deposits. Silicification commonly accompanies precious metal deposition and may be flanked by zones of illite-sericite and clay alteration, all of which occur within a propylitic alteration zone. Adularia may be present in vein structures at depth. Argillic alteration zones may be present near the paleotopographic surface. Some deposits contain zones of aluminous advanced argillic alteration with kaolinite or dickite, sericite, pyrophyllite, andalusite and accessory minerals such as diaspore, corundum and topaz.

Epithermal deposits are presently considered to form from dilute, near-neutral to weakly alkaline chloride waters that undergo boiling or effervescent degassing, fluid mixing and oxidation at temperatures between 200° and 300°C. The two most important causes of cooling in the ascending or laterally migrating fluids appears to be boiling or fluid mixing (Panteleyev, 1986).

The **MINING HOUSE** considers the Gold Hill property to have good exploration potential for epithermal vein type mineralization. The sediment-hosted, disseminated precious metal type epithermal deposit has been presented in section 7.1. The presence of quartz vein-hosted gold at the historic Lucy L mine, fine grained, auriferous, chalcedonic quartz veins between the Lucy L mine and Lucky Day Knob, and quartz-carbonate veins hosting Au-Ag-Pb mineralization in the Southern Shear Zone system all indicate that epithermal and possibly deeper seated mesothermal mineralizing systems were active in the property area. The above target areas and the property as a whole have excellent potential for epithermal vein-type mineralization.

7.3 PORPHYRY Cu-(Au) MODEL

(Titley and Beane, 1981)

Porphyry copper deposits are the result of hydrothermal systems which develop around cooling porphyry plutons emplaced at shallow depths. Hydrothermal waters from various sources circulate through secondary permeability fractures in both the pluton and host rocks. The deposits are variable in form and large with typical dimensions of 1000's x 1000's x 100's of meters. Mineralization is generally structurally controlled; mainly stockworks, veins, vein sets, breccias, disseminations and replacements. Sulphides and related alteration are generally zoned in crudely concentric patterns about the genetically related intrusion. Principal ore minerals include: chalcopyrite, bornite, chalcocite, enargite, other copper minerals and molybdenite. Associated minerals include pyrite and other sulphides and magnetite. The deposits generally range from 0.2 to 1% Cu, 0.01 to 0.05% Mo and are 50 to greater than 1000 million tons in size. Gold and silver can form significant by-products.

The mineralized rocks include the genetically related intrusions and the surrounding country rocks which include a variety of sedimentary, volcanic, intrusive and metamorphic rocks. The related porphyritic intrusions generally include calc-alkalic diorite to granite and alkalic diorite to nepheline syenite.

Hydrothermal alteration is extensive and consists of an inner potassic zone (biotite, K-spar) associated with economic sulphides and an outer propylitic alteration (epidote, chlorite, calcite) associated with pyrite. Phyllic alteration (sericite, quartz, pyrite) and argillic alteration (kaolin, montmorillonite, quartz) may occur as a zone between the potassic and propylitic zones or may be superimposed on older alteration and sulphide assemblages.

The geological setting of the **ACMC** property exhibits potential for a porphyry copper-gold deposit. Extensive areas of the property are underlain by a Jurassic intrusive which has been mapped as granodiorite to quartz monzonite. Based on the **MINING HOUSE's** brief field visit it appears that several intrusive phases may be present on the property; a favourable geologic environment for porphyry deposits. In addition, extensive areas of propylitic hydrothermal alteration have been recognized in the quartz monzonite on the property.

A porphyry copper deposit is not considered to be a priority target on **ACMC's** property at this time. However as exploration continues on the property, the geologic and geochemical database will be improved and at that time possible porphyry copper target areas may be defined.

7.4 PORPHYRY Mo MODEL

(White et al., 1981)

Porphyry molybdenum deposits are spatially, temporally and genetically associated with porphyritic intrusions which range in composition from quartz monzonite to high-silica, alkali-rich granite. Ages of known deposits range from 17 to 140 m.y. Most of the molybdenum occurs in quartz veinlets within a stockwork. The stockwork occurs within overlapping zones of hydrothermally altered rocks which are marginal to or within genetically related intrusions. Disseminated molybdenite is uncommon.

In most porphyry molybdenum deposits, molybdenite is associated with pyrite and with fluorine and tungsten bearing minerals. Minor copper and tin is present in some quartz-monzonite related and high-silica, alkali-rich granite related porphyry molybdenum deposits respectively. Tungsten, tin, copper, lead and zinc often occur in geochemical halos marginal and/or peripheral to the highest grade molybdenum ore zones.

White et al. (1981) proposed a two-fold classification of porphyry molybdenum deposits based on the composition of their cogenetic intrusions, namely: the Climax-type associated with high-silica, alkali-rich granite intrusions similar to those at the Climax Mine and the quartz monzonite-type associated with quartz monzonite intrusions. A comparison of the two deposit types is presented in Table 7.3 .

TABLE 7.3: COMPARISON OF PORPHYRY MOLYBDENUM DEPOSIT TYPES

CHARACTERISTICS	CLIMAX-TYPE	QUARTZ MONZONITE-TYPE
Cogenetic rock type	Granite porphyry	Quartz monzonite porphyry
Intrusive phases	Multiple intrusions of granite	Composite intrusions of diorite to quartz monzonite
Intrusive type	Stock	Stock or batholith
Orebody type	Stockwork	Stockwork
Orebody Shape	Inverted cup	Inverted cup, tabular
Average ore grade (%MoS2)	0.30 to 0.45	0.10 to 0.20
Orebody tonnage	50 to 1,000 million tons	50 to 1,000 million tons
Disseminated MoS2	Rare	Rare
Age	Middle to late Tertiary	Mesozoic to Tertiary
Fluorine minerals	Fluorite, topaz	Fluorite
Bismuth minerals	Sulphosalts	Sulphosalts
Tungsten minerals	Wolframite (huebnerite)	Scheelite
Tin minerals	Cassiterite, stannite	Rare
Copper minerals	Rare chalcopyrite	Minor chalcopyrite
Silicification	High silica core	No high silica
Greisenization	Greisen common	No greisen
Ore zone Cu:Mo ratio	1:100 to 1:50	1:30 to 1:1

from White et al., 1981

The geological setting of the **ACMC** property exhibits potential for a porphyry molybdenum deposit of the quartz- monzonite-type. Extensive areas of the property are underlain by a Jurassic intrusive which has been mapped as granodiorite to quartz monzonite. Based on the **MINING HOUSE's** brief field visit it appears that several intrusive phases may be present on the property; a favourable geologic environment for porphyry deposits. In addition, extensive areas of propylitic hydrothermal alteration have been recognized in the quartz monzonite on the property. The copper-tungsten (with associated molybdenite) mineralization presently known on the property may be a peripheral expression of a porphyry molybdenum deposit, possibly at depth.

A porphyry molybdenum deposit is not considered to be a priority target on **ACMC's** property at this time. However as exploration continues on the property, the geologic and geochemical database will be improved and at that time possible porphyry molybdenum target areas may be defined.

7.5 COPPER-GOLD SKARN MODEL

(Einaudi et al., 1981; Eckstrand, 1984)

Skarn consists of coarse grained Ca-Fe-Mg-Mn silicates formed by the replacement of carbonate-bearing rocks during regional or contact metamorphism and metasomatism.

The processes of skarn formation include metamorphic recrystallization of impure carbonate rocks, bimetosomatic reaction between unlike lithologies and infiltration metasomatism involving magmatic hydrothermal fluids. Metal deposits having skarn as gangue are termed skarn deposits and may be formed by any of the above processes. Most major skarn deposits, however are considered to be deposited by magmatic hydrothermal fluids. Skarn deposits are commonly statiform bodies within carbonate sediments and occur tens to hundred of feet away from an intrusive contact. The deposits may also occur as semi-concordant to discordant bodies immediately adjacent an intrusive contact. Intrusive calc-alkaline felsic intrusive stocks, plutons and batholiths associated with the skarns and skarn deposits are commonly granodiorite to quartz monzonite in composition. Einaudi et al. (1981) recognize six major subclasses of skarn deposits based on the dominant economic metal; Fe, W, Cu, Zn-Pb, Mo and Sn. Gold may be a significant metal in skarn copper deposits. Continuous transitions occur between some classes.

The geological setting of the **ACMC** property exhibits potential for a skarn deposit of either the W, Cu-(Au), Pb- Zn-(Ag) or possibly Mo subclass. Extensive areas of the property are underlain by a Jurassic intrusive, mapped as granodiorite to quartz monzonite, which is contact with a Paleozoic carbonate sequence. This contact is relatively flat lying which results in the contact being exposed only over a limited surface area. Two areas of skarn mineralization have been worked in the immediate property area. The Smelter Tunnels at Clifton in the southern part of the property extracted

Pb-Ag mineralization from a skarn in limestone immediately above the granodiorite/quartz monzonite contact. Immediately northeast of the property the Frankie Mine extracted Cu-Au and Pb-Zn ore from what has been described as two separate orebodies in limestone at the contact with the granodiorite/quartz monzonite.

In the opinion of the **MINING HOUSE** the property has a favourable geologic environment for the discovery of additional skarn-type deposits both along the exposed contact and where the limestone sequence is more extensive over the intrusive contact. A deeper seated skarn-type deposit is not considered to be an immediate priority target on ACMC's property at this time because of the difficulties in exploring beneath the limestone cover. However as exploration continues on the property, the geologic, geophysical and geochemical database will be improved and at that time possible deeper seated skarn target areas may be defined in addition to those already recognized in outcrop and subcrop.

8.0 PROPOSED EXPLORATION BUDGETS

8.1 GENERAL STATEMENT

The **MINING HOUSE** has recommended that **ACMC** initially take a more regional geological and geophysical approach to exploration of the property. A reconnaissance geological survey is proposed to gain an understanding of the property geology and regional and local structural controls on mineralization. The results will assist in the interpretation of the exploration potential of known historic workings and in the planning of advanced exploration work. The reconnaissance survey will also undoubtedly outline additional areas of presently unrecognized mineralization potential.

A helicopter-borne geophysical survey is tentatively recommended as a stand-alone complement to the reconnaissance geology survey. The completion of the reconnaissance geological survey in conjunction with a detailed re- evaluation of the geophysical work completed to date, would be a necessary prerequisite to recommending and implementing the airborne exploration program. A regional airborne magnetic and VLF electromagnetic survey may delineate regional, mineralization controlling structures that are not recognizable from detailed surveys with limited areal extent.
On completion of the reconnaissance surveys the **MINING HOUSE** proposes that the property be subdivided into geographic and mineralogic sectors based on its exploration potential as outlined in Chapter 6. Each sector in which additional exploration is

warranted will have a stand-alone multi-phase exploration program. Each exploration phase would be contingent on the success of its predecessor.

The **MINING HOUSE** notes that if the regional airborne geophysical survey is completed the geophysical surveys outlined in each of the follow-up programs would be limited to ground follow-up of the airborne anomalies and thus the cost of extensive ground surveys would be avoided.

The **MINING HOUSE** has scheduled and budgeted a modest exploration program suitable for a company of **ACMC's** size. To avoid excessive initial expenditures several exploration methods and techniques such as detailed geochemical surveys, airphoto and satellite imagery interpretation have either not been implemented or have been minimized at this time. Should the initial exploration results warrant it additional exploration methods could be implemented at a later date. The key to the program as outlined is its progressive sequence of stand-alone exploration phases which allows **ACMC** to prioritize its exploration according to available financing. It also allows a breathing period between each exploration phase in which **ACMC** can adequately assess the data obtained in the previous exploration stage.

The budgeting each phase as a stand-alone entity increases total logistical costs such as manpower, mobilization and demobilization. **ACMC** can reduce the logistical costs by implementing two or more exploration phases simultaneously or consecutively within a given work period as suggested in the attached schedule (Table 8.1).

8.2 PROPOSED BUDGETS

Summary and detailed budgets for the recommended reconnaissance and follow-up exploration programs follow.

ACMC - EXPLORATION PROGRAMS
PROPOSED BUDGET SUMMARIES

1.0 Reconnaissance Exploration Program		
1.1 Mapping, Sampling, Geochemistry	$64,000	
1.2 Airborne Geophysics	$42,000	$106,000
2.0 Yellow Hammer Mine Area Follow-up		
2.1 Phase I Reserve Definition Drilling	$150,000	
2.2 Phase Ia Reserve Definition Drilling	$114,000	
2.3 Phase II Reserve Definition Drilling	$145,000	$409,000
3.0 Lucy L Mine Area Follow-up		
3.1 Phase I Ground Surveys	$42,000	
3.2 Phase II Diamond Drilling	$94,000	$136,000
4.0 Southern Shear Zone Area Follow-up		
4.1 Phase I Ground Surveys	$42,000	
4.2 Phase II Diamond Drilling	$94,000	$136,000
5.0 Beryllium Veins Area Followup		
5.1 Phase I Ground Surveys	$27,000	
5.2 Phase II Diamond Drilling	$81,000	$108,000
6.0 Bridge Vein System Follow-up		
6.1 Phase I Ground Surveys	$26,500	
6.2 Phase II Diamond Drilling	$59,500	$86,000
		===========
	GRAND TOTAL	$981,000

ACMC - RECONNAISSANCE EXPLORATION PROGRAM
MAPPING, SAMPLING & GEOCHEMISTRY
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING				
1.1 Personnel				
Geologist	5 days @	$300 /day	$1,500	$1,500
1.2 Expenses				
Reproduction, Maps, etc.			$100	$100
				$1,600
2.0 FIELD PROGRAM				
2.1 Personnel				
Geologist	30 days @	$300 /day	$9,000	
Geologist	30 days @	$300 /day	$9,000	
Sampler/Technician	30 days @	$150 /day	$4,500	
Field Assistant	30 days @	$150 /day	$4,500	$27,000
2.2 Field Support				
Mob/Demob			$5,000	
Consumables (1)	120 mdays	$20 /day	$2,400	
Equipment Rental			$500	$7,900
2.3 Truck Rental				
1 month @ $1500/month (2)			$1,500	$1,500
2.4 Assaying				
(i) Rock Samples (3)	200 @	$15	$3,000	
(ii) Soil Samples (4)	500 @	$7	$3,500	$6,500
				$42,900

(1) accomodations at company cost on site
(2) all inclusive
(3) sample prep, 30g fire assay and ICP-9 or W
(4) sample prep and ICP-32

3.0 REPORT				
3.1 Personnel				
Geologist	15 days @	$300 /day	$4,500	
Geophysicist (5)	5 days @	$500 /day	$2,500	$7,000

(5) re-evaluation of historic data

3.2 Computer Processing/AUTOCAD	50 hrs @	$40 /hr	$2,000	$2,000
3.3 Word Processing	35 hrs @	$30 /hr	$1,050	$1,050
3.4 Expenses				
Printing and Reproduction			$1,000	$1,000
				$11,050
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$2,800
SUBTOTAL				$58,350
CONTINGENCY (~10%)				$5,650
TOTAL				$64,000

ACMC - RECONNAISSANCE EXPLORATION PROGRAM
AIRBORNE GEOPHYSICAL SURVEY
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geophysicist	15 hrs @	$70 /hr	$1,050	$1,050
1.2 Expenses					
Reproduction, Maps, etc.			$100	$100
				$1,150
2.0 AIRBORNE GEOPHYSICAL SURVEY				
2.1 Airborne Survey (all inclusive) (Multi-frequency EM and magnetics)				$30,000
3.0 INTERPRETATION AND REPORT				
3.1 Personnel				
Geophysicist	50 hrs @	$70 /hr	$3,500	$3,500
3.2 Computer Processing/AUTOCAD	10 hrs @	$40 /hr	$400	$400
3.3 Word Processing	10 hrs @	$30 /hr	$300	$300
3.4 Expenses				
Printing and Reproduction			$1,000	$1,000
				$5,200
4.0 PROJECT MANAGEMENT & SUPERVISION (~5%)				$1,800
SUBTOTAL				$38,150
CONTINGENCY (~10%)				$3,850
TOTAL				$42,000

YELLOW HAMMER MINE
PHASE I MINERAL INVENTORY DEFINITION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING				
1.1 Personnel				
Geologist	3 days @	$300 /day	$900	$900
1.2 Expenses				
Reproduction, Maps, etc.			$100	$100
				$1,000
2.0 FIELD PROGRAM				
2.1 Personnel				
Geologist	30 days @	$300 /day	$9,000	
Field Assistant	30 days @	$150 /day	$4,500	$13,500
2.2 Field Support				
Mob/Demob			$2,500	
Consumables (1)	50 mdays	$20 /day	$1,000	
Equipment Rental			$500	$4,000
2.3 Truck Rental				
1 month @ $1500/month (2)			$1,500	$1,500
2.5 Diamond Drilling (3)				
	4000 ft @	$25 /ft	$100,000	$100,000
2.6 Drill Core Assaying (4)				
	400 @	$15	$6,000	$6,000
				$125,000

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	10 days @	$300 /day	$3,000	$3,000
3.2 Computer Processing/AUTOCAD	50 hrs @	$40 /hr	$2,000	$2,000
3.3 Word Processing	10 hrs @	$30 /hr	$300	$300
3.4 Expenses				
Printing and Reproduction			$500	$500
				$5,800
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$6,000
SUBTOTAL				$137,800
CONTINGENCY (~10%)				$12,200
TOTAL				$150,000

YELLOW HAMMER MINE
PHASE Ia MINERAL INVENTORY DEFINITION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	0 days @	$300 /day	$0	$0
1.2 Expenses				
Reproduction, Maps, etc.			$0	$0
				$0
2.0 FIELD PROGRAM				
2.1 Personnel				
Geologist	30 days @	$300 /day	$9,000	
Field Assistant	30 days @	$150 /day	$4,500	$13,500
2.2 Field Support				
Mob/Demob			$0	
Consumables (1)	50 mdays	$20 /day	$1,000	
Equipment Rental			$500	$1,500
2.3 Truck Rental				
1 month @ $1500/month (2)			$1,500	$1,500
2.5 Diamond Drilling (3)				
	3000 ft @	$25 /ft	$75,000	$75,000
2.6 Drill Core Assaying (4)				
	300 @	$15	$4,500	$4,500
				$96,000

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	5 days @	$300 /day	$1,500	$1,500
3.2 Computer Processing/AUTOCAD	25 hrs @	$40 /hr	$1,000	$1,000
3.3 Word Processing	5 hrs @	$30 /hr	$150	$150
3.4 Expenses				
Printing and Reproduction			$500	$500
				$3,150
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$4,500
SUBTOTAL				$103,650
CONTINGENCY (~10%)				$10,350
TOTAL				$114,000

NOTE: Phase Ia is contingent on additional infill drilling being required to define the mineral inventory from Phase I drilling

It is assumed that if required, Phase Ia will be conducted immediately after Phase I to reduce logistical costs

YELLOW HAMMER MINE
PHASE II MINERAL INVENTORY DEFINITION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING				
1.1 Personnel				
Geologist	0 days @	$300 /day	$0	$0
1.2 Expenses				
Reproduction, Maps, etc.			$0	$0
				$0
2.0 FIELD PROGRAM				
2.1 Personnel				
Geologist	30 days @	$300 /day	$9,000	
Field Assistant	30 days @	$150 /day	$4,500	$13,500
2.2 Field Support				
Mob/Demob			$0	
Consumables (1)	50 mdays	$20 /day	$1,000	
Equipment Rental			$500	$1,500
2.3 Truck Rental				
1 month @ $1500/month (2)			$1,500	$1,500
2.5 Diamond Drilling (3)				
	4000 ft @	$25 /ft	$100,000	$100,000
2.6 Drill Core Assaying (4)				
	400 @	$15	$6,000	$6,000
				$122,500

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	5 days @	$300 /day	$1,500	$1,500
3.2 Computer Processing/AUTOCAD	25 hrs @	$40 /hr	$1,000	$1,000
3.3 Word Processing	5 hrs @	$30 /hr	$150	$150
3.4 Expenses				
Printing and Reproduction			$500	$500
				$3,150
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$6,000
SUBTOTAL				$131,650
CONTINGENCY (~10%)				$13,350
TOTAL				$145,000

NOTE: Phase II will consist of initial drill delineation of mineralization extensions 100 feet east and west of the main pit to a depth of approximately 100 feet below pit bottom

It is assumed that Phase II will be conducted immediately after Phase I to reduce logistical costs

LUCY L MINE AREA
PHASE I EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	5 days @	$300 /day	$1,500	$1,500
1.2 Expenses				
Reproduction, Maps, etc.			$100	$100
				$1,600
2.0 FIELD PROGRAM				
2.1 Personnel				
Geologist	25 days @	$300 /day	$7,500	
Geophysical Technician	25 days @	$225 /day	$5,625	
Field Assistant	25 days @	$150 /day	$3,750	$16,875
2.2 Field Support				
Mob/Demob			$3,750	
Consumables (1)	75 mdays	$20 /day	$1,500	
Equipment Rental			$1,500	$6,750
2.3 Truck Rental				
1 month @ $1500/month (2)			$1,500	$1,500
2.4 Assaying				
Rock Samples (3)	150 @	$15	$2,250	$2,250
				$27,375

(1) accomodations at company cost on site
(2) all inclusive
(3) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	15 days @	$300 /day	$4,500	$4,500
3.2 Computer Processing/AUTOCAD	40 hrs @	$40 /hr	$1,600	$1,600
3.3 Word Processing	28 hrs @	$30 /hr	$840	$840
3.4 Expenses				
Printing and Reproduction			$500	$500
				$7,440
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$1,835
SUBTOTAL				$38,250
CONTINGENCY (~10%)				$3,750
TOTAL				$42,000

LUCY L MINE AREA
PHASE II EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING				
1.1 Personnel				
Geologist	3 days @	$300 /day	$900	$900
1.2 Expenses				
Reproduction, Maps, etc.			$100	$100
				$1,000
2.0 FIELD PROGRAM				
2.1 Personnel				
Geologist	25 days @	$300 /day	$7,500	
Field Assistant	25 days @	$150 /day	$3,750	$11,250
2.2 Field Support				
Mob/Demob			$2,500	
Consumables (1)	50 mdays	$20 /day	$1,000	
Equipment Rental			$500	$4,000
2.3 Truck Rental				
1 month @ $1500/month (2)			$1,500	$1,500
2.5 Diamond Drilling (3)				
	2000 ft @	$25 /ft	$50,000	$50,000
2.6 Assaying				
Drill Core (4)	400 @	$15	$6,000	$6,000
				$72,750

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	15 days @	$300 /day	$4,500	$4,500
3.2 Computer Processing/AUTOCAD	50 hrs @	$40 /hr	$2,000	$2,000
3.3 Word Processing	25 hrs @	$30 /hr	$750	$750
3.4 Expenses				
Printing and Reproduction			$500	$500
				$7,750
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$4,000
SUBTOTAL				$85,500
CONTINGENCY (~10%)				$8,500
TOTAL				$94,000

SOUTHERN SHEAR AREA
PHASE II EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	3 days @	$300 /day		$900	$900
1.2 Expenses					
Reproduction, Maps, etc.				$100	$100
					$1,000
2.0 FIELD PROGRAM					
2.1 Personnel					
Geologist	25 days @	$300 /day		$7,500	
Field Assistant	25 days @	$150 /day		$3,750	$11,250
2.2 Field Support					
Mob/Demob				$2,500	
Consumables (1)	50 mdays	$20 /day		$1,000	
Equipment Rental				$500	$4,000
2.3 Truck Rental					
1 month @ $1500/month (2)				$1,500	$1,500
2.5 Diamond Drilling (3)					
	2000 ft @	$25 /ft		$50,000	$50,000
2.6 Assaying					
Drill Core (4)	400 @	$15		$6,000	$6,000
					$72,750

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9

3.0 REPORT					
3.1 Personnel					
Geologist	15 days @	$300 /day		$4,500	$4,500
3.2 Computer Processing/AUTOCAD	50 hrs @	$40 /hr		$2,000	$2,000
3.3 Word Processing	25 hrs @	$30 /hr		$750	$750
3.4 Expenses					
Printing and Reproduction				$500	$500
					$7,750
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)					$4,000
SUBTOTAL					$85,500
CONTINGENCY (~10%)					$8,500
TOTAL					$94,000

LUCY L MINE AREA
PHASE II EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	3 days @	$300 /day		$900	$900
1.2 Expenses					
Reproduction, Maps, etc.				$100	$100
					$1,000
2.0 FIELD PROGRAM					
2.1 Personnel					
Geologist	25 days @	$300 /day		$7,500	
Field Assistant	25 days @	$150 /day		$3,750	$11,250
2.2 Field Support					
Mob/Demob				$2,500	
Consumables (1)	50 mdays	$20 /day		$1,000	
Equipment Rental				$500	$4,000
2.3 Truck Rental					
1 month @ $1500/month (2)				$1,500	$1,500
2.5 Diamond Drilling (3)					
	2000 ft @	$25 /ft		$50,000	$50,000
2.6 Assaying					
Drill Core (4)	400 @	$15		$6,000	$6,000
					$72,750

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	15 days @	$300 /day	$4,500	$4,500
3.2 Computer Processing/AUTOCAD	50 hrs @	$40 /hr	$2,000	$2,000
3.3 Word Processing	25 hrs @	$30 /hr	$750	$750
3.4 Expenses				
Printing and Reproduction			$500	$500
				$7,750
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$4,000
SUBTOTAL				$85,500
CONTINGENCY (~10%)				$8,500
TOTAL				$94,000

BERYLLIUM VEINS AREA
PHASE I EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	3 days @	$300 /day		$900	$900
1.2 Expenses					
Reproduction, Maps, etc.				$100	$100
					$1,000
2.0 FIELD PROGRAM					
2.1 Personnel					
Geologist	20 days @	$300 /day		$6,000	
Field Assistant	20 days @	$150 /day		$3,000	$9,000
2.2 Field Support					
Mob/Demob				$2,500	
Consumables (1)	40 mdays	$20 /day		$800	
Equipment Rental				$500	$3,800
2.3 Truck Rental					
20 days @ $60/day (2)				$1,200	$1,200
2.4 Assaying					
Rock Samples (3)	150	@	$15	$2,250	$2,250
					$16,250

(1) accomodations at company cost on site
(2) all inclusive
(3) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	12 days @	$300 /day	$3,600	$3,600
3.2 Computer Processing/AUTOCAD	35 hrs @	$40 /hr	$1,400	$1,400
3.3 Word Processing	25 hrs @	$30 /hr	$750	$750
3.4 Expenses				
Printing and Reproduction			$250	$250
				$6,000
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$1,150
SUBTOTAL				$24,400
CONTINGENCY (~10%)				$2,600
TOTAL				$27,000

BERYLLIUM VEINS AREA
PHASE II EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	3 days @	$300 /day	$900	$900
1.2 Expenses					
Reproduction, Maps, etc.				$100	$100
					$1,000
2.0 FIELD PROGRAM					
2.1 Personnel					
Geologist	20 days @	$300 /day	$6,000	
Field Assistant	20 days @	$150 /day	$3,000	$9,000
2.2 Field Support					
Mob/Demob			$2,500	
Consumables (1)	40 mdays	$20 /day	$800	
Equipment Rental			$500	$3,800
2.3 Truck Rental					
20 days @ $60/day (2)			$1,200	$1,200
2.5 Diamond Drilling (3)					
	1750 ft @	$25 /ft	$43,750	$43,750
2.6 Assaying					
Drill Core (4)	350 @	$15	$5,250	$5,250
				$63,000

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9, W03 or Be

3.0 REPORT				
3.1 Personnel				
Geologist	10 days @	$300 /day	$3,000	$3,000
3.2 Computer Processing/AUTOCAD	40 hrs @	$40 /hr	$1,600	$1,600
3.3 Word Processing	25 hrs @	$30 /hr	$750	$750
3.4 Expenses				
Printing and Reproduction			$500	$500
				$5,850
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$3,500
SUBTOTAL				$73,350
CONTINGENCY (~10%)				$7,650
TOTAL				$81,000

BRIDGE VEIN SYSTEM
PHASE I EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	3 days @	$300 /day		$900	$900
1.2 Expenses					
Reproduction, Maps, etc.				$100	$100
					$1,000
2.0 FIELD PROGRAM					
2.1 Personnel					
Geologist	20 days @	$300 /day		$6,000	
Field Assistant	20 days @	$150 /day		$3,000	$9,000
2.2 Field Support					
Mob/Demob				$2,500	
Consumables (1)	40 mdays	$20 /day		$800	
Equipment Rental				$500	$3,800
2.3 Truck Rental					
20 days @ $60/day (2)				$1,200	$1,200
2.4 Assaying					
Rock Samples (3)	120 @	$15		$1,800	$1,800
					$15,800

(1) accomodations at company cost on site
(2) all inclusive
(3) sample prep, 30g fire assay and ICP-9

3.0 REPORT					
3.1 Personnel					
Geologist	12 days @	$300 /day		$3,600	$3,600
3.2 Computer Processing/AUTOCAD	35 hrs @	$40 /hr		$1,400	$1,400
3.3 Word Processing	28 hrs @	$30 /hr		$840	$840
3.4 Expenses					
Printing and Reproduction				$250	$250
					$6,090
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)					$1,110
SUBTOTAL					$24,000
CONTINGENCY (~10%)					$2,500
TOTAL					$26,500

BRIDGE VEIN SYSTEM
PHASE II EXPLORATION PROGRAM
PROPOSED BUDGET

1.0 PLANNING AND EXPEDITING					
1.1 Personnel					
Geologist	3 days @	$300 /day	$900	$900
1.2 Expenses					
Reproduction, Maps, etc.				$100	$100
					$1,000
2.0 FIELD PROGRAM					
2.1 Personnel					
Geologist	15 days @	$300 /day	$4,500	
Field Assistant	15 days @	$150 /day	$2,250	$6,750
2.2 Field Support					
Mob/Demob				$2,500	
Consumables (1)	30 mdays	$20 /day		$600	
Equipment Rental				$500	$3,600
2.3 Truck Rental					
15 days @ $60/day (2)				$900	$900
2.4 Diamond Drilling (3)					
	1200 ft @	$25 /ft		$30,000	$30,000
2.5 Assaying					
Drill Core (4)	240 @	$15		$3,600	$3,600
					$44,850

(1) accomodations at company cost on site
(2) all inclusive
(3) footage cost estimate supplied by ACMC
(4) sample prep, 30g fire assay and ICP-9

3.0 REPORT				
3.1 Personnel				
Geologist	10 days @	$300 /day	$3,000	$3,000
3.2 Computer Processing/AUTOCAD	30 hrs @	$40 /hr	$1,200	$1,200
3.3 Word Processing	25 hrs @	$30 /hr	$750	$750
3.4 Expenses				
Printing and Reproduction			$500	$500
				$5,450
4.0 ACMC PROJECT MANAGEMENT & SUPERVISION (~5%)				$2,550
SUBTOTAL				$53,850
CONTINGENCY (~10%)				$5,650
TOTAL				$59,500

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10.0 CERTIFICATES OF QUALIFICATION

CERTIFICATE OF QUALIFICATION

I, John V. Tully, of 553 Greenwood Dr., Grand Junction, Colorado, do hereby certify that:

1. I am an independant geological engineer retained by the Mining House inc.

2. I am a graduate of Mount Allison University, New Brunswick, Canada with a B.Sc. degree - Geology (1965).

3. I have been practicing my profession full time since graduation.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the properties or securities of American Consolidated Mining Co.

5. The statements contained, in this report and the conclusions and recommendations made, are based upon my review of all data available. I visited the Gold Hill property from February 13th to February 15 th, 1991.

6. I hereby consent to the use of this report in a Statement of Material Facts of the Company for the preparation of a prospectus for submission to the Ontario Securities Commission and other regulatory authorities.

[signature]

John V. Tully

Toronto, Ontario
April 18, 1991

CERTIFICATE OF QUALIFICATION

I, Ian D. Trinder, of 4185 Taffey Crescent, Mississauga, Ontario, do hereby certify that:

1. I am an independant geologist retained by the Mining House inc.

2. I am a graduate of the University of Manitoba with a B.Sc. degree - Honours Geology (1983), and of the University of Western Ontario with a M.Sc. degree - Geology (Mineral Deposits) (1989).

3. I have been practicing in my profession since 1980, and full time since graduating in 1983.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the propertiesor securities of American Consolidated Mining Co.

5. The statements contained, in this report and the conclusions and recommendations made, are based upon my review of all data available. I visited the Gold Hill property from February 13th to February 23rd, 1991.

6. I hereby consent to the use of this report in a Statement of Material Facts of the Company for the preparation of a prospectus for submission to the Ontario Securities Commission and other regulatory authorities.

Ian D. Trinder, M.Sc.

Toronto, Ontario
March 22, 1991

CERTIFICATE OF QUALIFICATION

I, Richard W. Evoy, of 405 Lake George Road East, Echo Bay, Ontario, do hereby certify that:

1. I am an economic geologist working as an independant consultant to the Mining House.

2. I am a graduate of Lake Superior State University in Honours Geology with the degree of B.Sc. (1984), and of the University of Missouri - Columbia with degree of M.Sc. (1989).

3. I have been practicing in my profession since 1981, and full time since graduating in 1984.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the properties or securities of American Consolidated Mining Co.

5. The statements contained, in this report and the conclusions and recommendations made, are based upon my review of all data available. I have visited the property from February 13th to February 23rd, 1991.

6. I hereby consent to the use of this report in a Statement of Material Facts of the Company for the preparation of a prospectus for submission to the Ontario Securties Commission and other regulatory authorities.

Richard W. Evoy, M.Sc.

Toronto, Ontario
March 22, 1991.