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W. S. MOORE CO.
QUAD CONSTRUCTION, INC.
POLARIS RESOURCES, INC.

SUMMITVILLE MINE
RIO GRANDE CO., COLORADO

PROPOSED MINING & MILLING OPERATION FOR PRODUCTION OF COPPER CONCENTRATES

AUGUST 1970

AXELSON-SOMMERFELD & ASSOCIATES
CONSULTING ENGINEERS
DULUTH, MINNESOTA

COPY NO. 9

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INTRODUCTION

SUMMITVILLE MINE

RIO GRANDE CO., COLORADO

PROPOSED MINING & MILLING OPERATION

FOR

PRODUCTION OF COPPER CONCENTRATES

— FORWARD —

Since its discovery in June of 1870, the Summitville District, in the eastern San Juan Mountains, Colorado, has produced over seven million dollars worth of metals from an area no greater than 4,000 feet long by 1,000 feet wide. The chief values have been from gold, with lesser values from silver, copper and lead. Although copper has been a minor by-product throughout most of its production history it occasionally accounted for up to five percent of the ore values produced and now appears to be the most promising source of values in the future.

The W. S. Moore Co. of Duluth, Minnesota and Reno, Nevada became interested in the Summitville District in the early "sixties." After extensive geological studies and a deep drilling program indicated the presence of substantial tonnages of high grade copper ores remaining unmined on the property, the Cleveland-Cliffs Iron Company and the Union Pacific Railroad joined with the W. S. Moore Co. as partners to reactivate the mine.

On the premise that the undeveloped "Missionary Vein" area held the most promise for a large scale copper operation, the partners sunk a shaft, constructed a hoist house and headframe, developed two haulage levels and began construction of a mill to process the anticipated large tonnages of intermediate to low grade copper ores at a rate of from 350 to 500 tons per day. However, the underground development and exploration work failed to prove up

the anticipated reserve and both Cliffs and Union Pacific lost interest in the property and terminated their agreement with the W. S. Moore Co.

Despite the loss of its partners, the W. S. Moore Co. maintained its interest in the property. The sequence of events that transpired after that loss are best described in Mr. I. F. Moore's suggested introduction to this report which reads as follows:

> When Cleveland Cliffs Iron Co. and the Union Pacific Railroad terminated their respective interests in the Summitville Mine (December 1969), the future of the project was anything but bright. The failure of the partnership to find the anticipated tonnages of ore grade mineralization in the Missionary structure cast a pall over the entire effort and created serious doubt over the wisdom of attempting to continue the development program. To re-establish faith in the property a thorough re-evaluation of our geological assumptions and conclusions was deemed essential. This was particularly true in the Missionary area where the gap between our expectations and results loomed the largest. Towards this end I asked our consulting geologist, Larry Smith, to undertake the task. The following geological reports regarding the Missionary and Annie vein systems summarize his conclusions. I am pleased to report that the program has been successful to the point that sufficient ore has been delineated to warrant the installation of a modest flotation mill.
>
> Supporting the geological review, additional exploration funds were provided by two new partners in the venture, Polaris Resources and Quad Construction Co., both based in Denver, Colorado. At present the Moore Co. holds a 50% interest in the project, Quad and Polaris, 25% each.
>
> In addition to the major geological reports given here the resampling of the Annie vein has proven the validity of earlier reserve estimates. Various maps and sections are provided which outline potential ore blocks intercepted by diamond drilling; these give some indication of the potential involved at Summitville. Supplementing these, most of which are above the

Reynolds level, deeper drilling has produced no evidence of the ore "bottoming out" with depth and additional ore is anticipated as mine development deepens. For the second half of this report, I have requested that Axelson-Sommerfeld, consulting mining engineers, detail their thinking regarding the engineering and operating potential of this mine.

July 17, 1970

Irving F. Moore, President
W. S. Moore Co.

The study and this report confirm Mr. Moore's contention that reactivation of the Summitville Mine should yield a substantial return to its developers. In compiling this report, we attempted to include all pertinent data deemed necessary to support that contention. We gratefully acknowledge the invaluable assistance we gained from Mr. "Larry" Smith, who authored the section on Geology; Messrs. "Bob" Schlosser and "Al" Wild, who counseled us in the development of operating schedules, miner productivity, and operating costs; Mr. Jay Clitheroe of the Booth Company in Salt Lake City who developed the plant flowsheet and provided us with factors for predicting plant metallurgy; and the John Fergusons, father and son, who lent their knowledge and experience to the development of the General Arrangement Drawings.

A. H. Axelson, President
Axelson-Sommerfeld & Associates

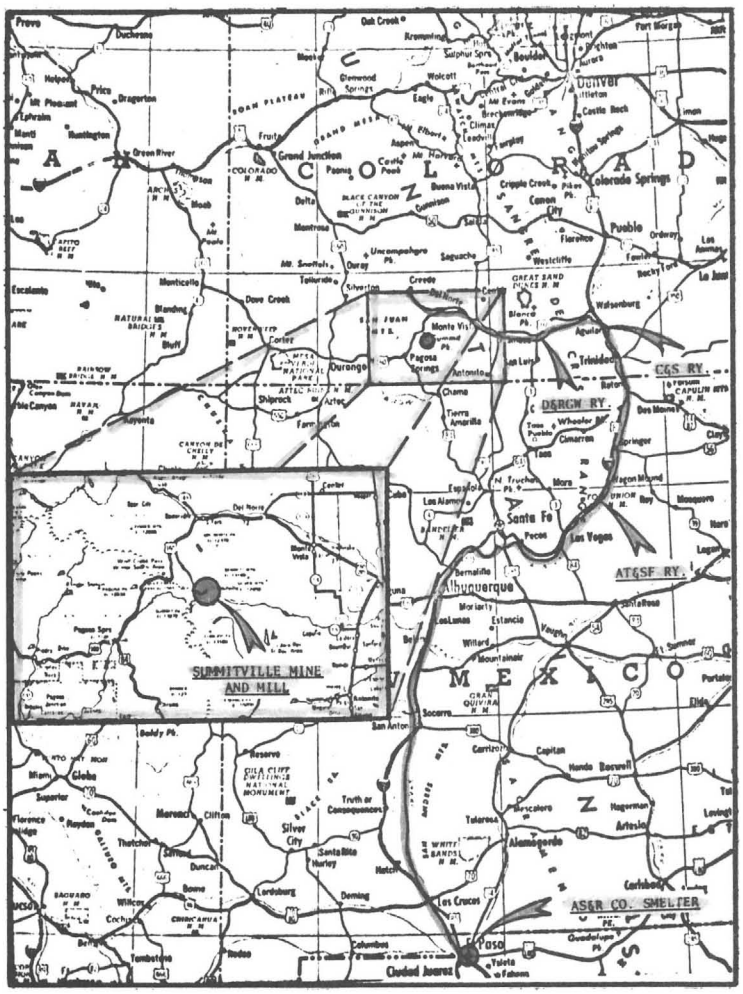
SECTION 1

SECTION 1

GENERAL DESCRIPTION

LOCATION

The Summitville District is situated high in the eastern San Juan Mountains of Colorado at the head of Wightman Fork, a tributary of Alamosa Creek which in turn flows into the Rio Grande River. It lies in the southwest corner of Rio Grande County, mostly within Section 30, Township 37 North, Range 4 East of the New Mexico Principal Meridian. Lode claims (patent and possessory) cover an area roughly 8,000 feet in length by 3,400 feet in width. Placer claims cover both sides of Wightman Fork for six and one-half miles.



The property is remote from any center of population. The small town of Summitville that once centered about the mine has long been deserted and is now relegated to the "ghost town" category as a tourist attraction. The closest town is South Fork, Colorado which is almost due north of Summitville and is reached by 18 miles of what is locally termed the Park Creek Road and 7½ miles travel eastward on U.S. Highway 160. The Park Creek

Road is a gravel surfaced Forest Service route and its use is largely confined to loggers, tourists and local sportsmen. Although narrow, the grades do not exceed 7% but its usage is limited by the two 15-ton bridges that cross and recross Park Creek. A second route for access is a fair, mountain road leading northeast to Del Norte, the Rio Grande County Seat, about 26 miles distant. A third route, about 43 miles in length follows Alamosa Creek and State Highway 15 to Monte Vista. Alamosa and Monte Vista, with populations of about 6,000 and 3,500 respectively, are the nearest towns of any size.

Rail transportation to the nearest smelter at El Paso, Texas would be via the Denver and Rio Grande Western Railroad from South Fork to Walsenburg; the Colorado and Southern Railway from Walsenburg to Trinidad; and the Atchinson, Topeka and Santa Fe Railroad from Trinidad, Colorado across New Mexico to El Paso, Texas.

TOPOGRAPHY & CLIMATE

The topography of the San Juan Mountains has a distinct three level aspect with a mature upland surface surmounted by Mountain Peaks and cut by deeply incised canyons. The upland surface is a rolling plateau ranging from 11,200 to 12,000 feet in altitude. Near Summitville most of the surrounding peaks are between 12,300 and 12,700 feet above sea level but along the Continental Divide some 6 to 8 miles to the southwest the highest peaks range up to 13,272' in altitude. The incised canyons range from a few tens of feet deep near the headwaters to about two thousand feet deep along the main streams.

Because of its high altitude, the Summitville District has long, cold winters and short, cool summers. Winter snowfall is extremely heavy in normal years and commonly some of the more protected snowbanks persist from year to year. Thunderstorms are common during the summer, particularly in July and August when they are likely to occur daily.

Many of the lower slopes and some of the higher, northward-facing slopes around Summitville are covered by a heavy spruce forest while much of the upland surface is mountain meadowland interspersed with patches of spruce. The higher peaks all project well above timberline, which, generally, is between 11,700 and 12,000 feet in altitude, dependent upon local conditions.

HISTORY & PRODUCTION

Gold was first discovered in June of 1870 in Wightman's Gulch by a five man prospecting team headed up by a James L. Wightman. Sluicing operations were initiated and continued intermittently until 1888, but, during that period, produced only a nominal amount of gold. Production from the Summitville District became significant only after inception of lode mining operations in 1875.

The lodes were discovered on the northeast face of South Mountain between 11,300 and 12,300 feet in altitude beginning in 1873 with the staking of the "Esmond" and "Summit" lodes and the "Little Annie," "Del Norte" and "Margaretta" mines and ending in 1926 with a strike of high-grade ore in the "Picken's Cut" of the Little Annie Group. In 1875, three mills were purchased, freighted in, and erected and mining of the lodes began in earnest. At first the deposits were worked as opencuts but these were soon followed by shafts and underground workings. The oxidized ores near the surface were rich and easy to beneficiate and most of the gold mined during the early boom period came from shallow depths.

By the end of 1887, most of the known and easily accessible oxide ores had been depleted. Inasmuch as the underlying sulfides were of much lower grade and more difficult to concentrate, production dropped off rapidly and by 1893 the district was practically deserted.

Interest revived, however, in 1894 and the district produced nominal mineral values each year through 1906; operated intermittently through 1917; was idle from 1917 through 1922; reinitiated in 1923 with production each year through 1947. Productivity reached its peak in 1941 following installation of a 100 ton flotation-cyandization mill in 1934 and expansion of that mill to 300 ton per day capacity in 1935.

In 1948, the flotation section of the mill was reactivated and an attempt made to treat gold-copper ore from waste dumps and surface diggings but with little success. The project was abandoned after four months of operation in 1949 with the production of less than $4,000 worth of concentrates.

There has been no production of metals from the Summitville District since that date. From 1873 through 1949, the various mines of the district produced over $7,000,000 in gold and about $430,000 in silver, copper and lead.

The W. S. Moore Co. completed its arrangements to lease the properties in September of 1963 after brief periods of control and geological investigation by Newmont Mining Company in 1953 and the General Minerals Corporation in 1955 and 1956.

PRESENT POTENTIAL

The main proven mineralized areas have been associated with thick quartz latite porphyry flows overlying a thick series of Andesite flows or breccias belonging to the San Juan series of rocks. The quartz latite and Andesite flows are cut by a series of later, more finely grained quartz latitedikes.

Practically all of the productive veins occurred entirely within the older latite formation. In a large number of cases the quartz latite dikes appear to be postmineral and to cut through the ore bearing veins, although in two or three instances veins were noted cutting through the later latite dikes but with widths decreased at the point of crossing. These later dikes appear to be responsible for a certain amount of secondary enrichment of the gold along the veins in the vicinity of the dike crossing. While the vein material may narrow or pinch for short distances the veins are usually very strong and the pay ore continuous as has been demonstrated by stoping operations five hundred to eight hundred feet in length and over a hundred feet high in a number of veins.

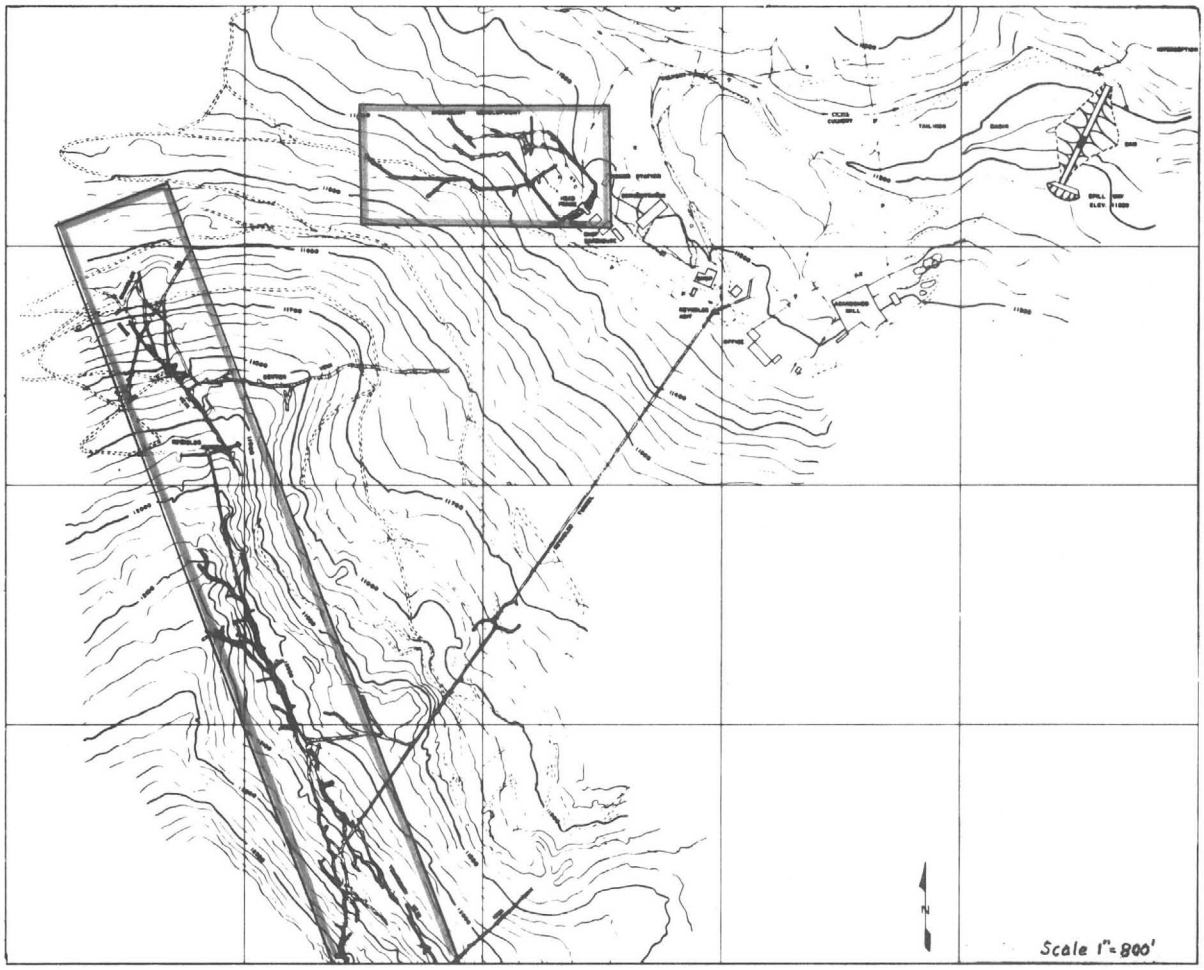
The ore minerals are generally concentrated in the vugs of leached porous rocks. Except for pyrite, there is little dissemination.

In the oxidized zone, native gold is the chief and often sole metal of value although minor values in silver are sometimes encountered.

In the sulphide zone which starts to appear at varying depths of three hundred to four hundred feet below the surface (dependent upon the extent of oxidation), the free gold ores gradually change to sulphide ores with a quartz gangue

impregnated with varying amounts of copper bearing sulphide minerals carrying some gold values with a slightly greater silver content. The copper minerals primarily occur as cupriferous pyrite, covellite and enargite although chalco pyrite and chalcocite are also sometimes present. Small quantities of lead and zinc in the form of galena and sphalerite also occur in the sulphide zone but not in sufficient amount to be of economic value.

Exploration and development work to date indicates that the areas of greatest potential lie below the old workings in the Annie, Dexter and Tewksbury veins (outlined in red on the map) where stoping operations above the Reynolds level



should yield substantial quantities of both high and intermediate grade sulphide ores as a mixture of covellite and enargite; and in the partially developed but unmined Missionary Vein area (outlined in green on the map) where pods of enargite with some high grade covellite have been exposed. Ores mined from the old workings will be trammed to the mill via the Reynolds

tunnel while ores from the Missionary will be hoisted through the newly completed shaft.

PROPOSED OPERATIONS

Having proven to their satisfaction that enough ore exists in the Summitville District to warrant its reactivation, the new partners to the venture have initiated a program of mine rehabilitation and development and are currently planning for construction of a mill and its related facilities to beneficiate the gold and silver bearing copper ore at a rate of 100 to 150 tons per day.

It is anticipated that mill construction will begin in the near future and that the mine and all facilities will be in full production no later than January 1, 1971.

SECTION 2

SECTION 2

GEOLOGIC DESCRIPTION

REGIONAL SETTING

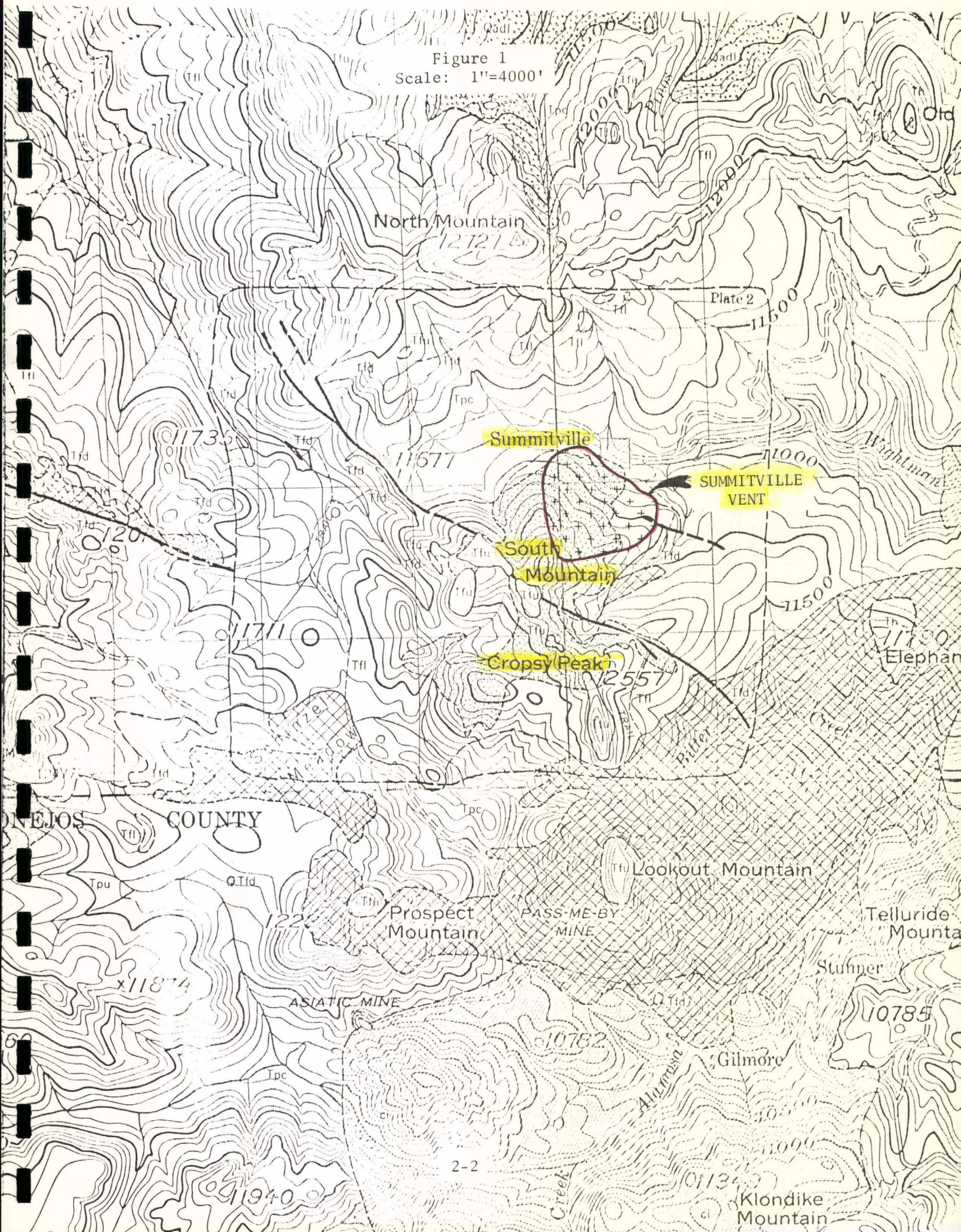
As mapped by Thomas A. Steven, (USGS Prof. Paper 343) the Summitville District lies within a large complex of Tertiary volcanic rocks. Most of the immediate area is surfaced by Conejos andesite, but quartz latite overlies the andesite in a sprawling area of about 20 square miles. This caldera represents an outpouring in Pliocene time from a number of vents, one of which underlies Summitville. (Figures 1 & 2)

The Summitville vent is a roughly circular neck or small stock about 1/2 mile in diameter at the surface, diminishing downward like a funnel. The old mines of the camp lie on the northern face of South Mountain in the central part of the neck within the quartz latite; the exception is the Missionary structure, never before productive, which lies at the north margin of the funnel in andesite, dipping southward parallel to the quartz latite contact.

All of the quartz latite neck except an eastward bulge is altered by argillization with the feldspars being replaced by various clays including kaolin, illite and montmorillonite. Similarly, biotite and other ferromagnesian minerals are replaced by chlorite. From the vent the area of argillization extends irregularly southward for more than a mile reaching as far as Cropsy Peak. It is somewhat less extensive to the west, while to the north the latite flows and the andesite are altered for only a few hundred feet from the vent. The Missionary structure lies within this latter thin altered margin of andesite.

Parts of the area of argillizaiton have undergone more intense alteration to quartz-alunite rock, a change attributed to very high temperature mineralizing solutions including sulfur. The scattered quartz alunite bodies host all of the known gold-copper-silver-mineralized zones. (EXHIBIT A)

Figure 1
Scale: 1"=4000'



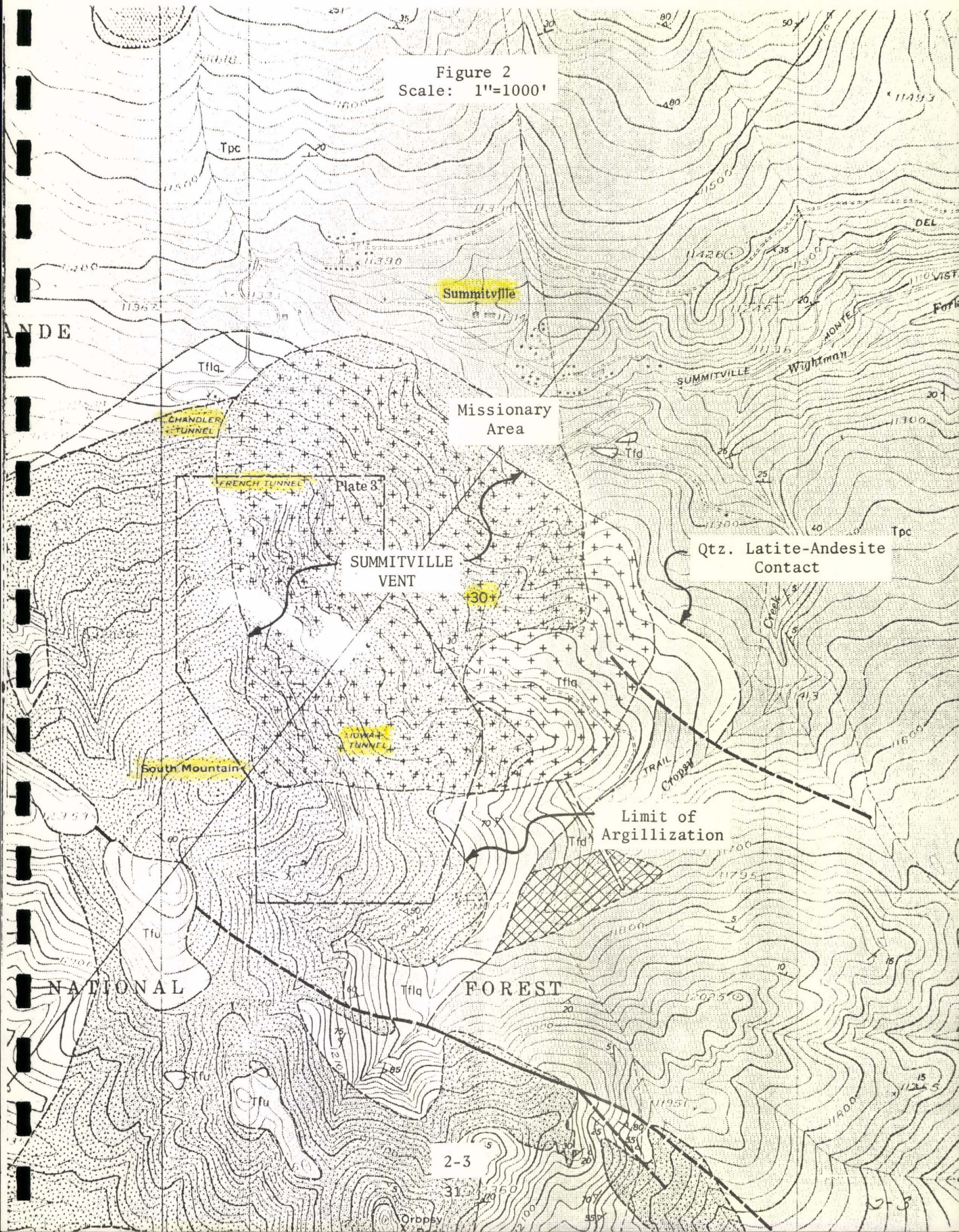


Figure 2
Scale: 1"=1000'
Summitville
Missionary Area
SUMMITVILLE VENT
Qtz. Latite-Andesite Contact
Limit of Argillization
Plate 3
CHANDLER TUNNEL
FRENCH TUNNEL
IOWA TUNNEL
South Mountain
Tpc
Tflq
Tfd
Tfu
NATIONAL
FOREST
SUMMITVILLE
Wightman
TRAIL
Creek
2-3
31

MISSIONARY STRUCTURE

(EXHIBITS C & D)

Investigation

The area chosen for a test of the effectiveness and utility of detailed mapping and bulk sampling is the portion of the south drift (203DW) on the second level from which a crosscut (206 XC) branches southerly to the hanging wall (Figure 3). Factors in the choice included Union Pacific sampling indicating near ore grade and a local abundance of diamond drill holes which in conjunction with the crosscut, provide a three dimensional view of the structure and mineralization.

Work in this area revealed two sources of error in previous exploration. First, detailed mapping showed extensive enargite mineralization controlled by fracturing. The latter and hence the mineralization are profoundly nonconformable to the orientation of the overall Missionary structure with few and minor exceptions within the 800 foot strike length of the structure available for detailed underground geologic mapping. Prior subsurface exploration had been based on an assumption inherited from the period of surface diamond drill exploration, that the ore bodies would conform to the East-West strike and south dip of the silicified breccia zones of the entire 200 foot width of the Missionary structure. In fact, mineralization occurs in "reverse" structures striking East-West but dipping steeply northward, or, less commonly, in "cross" structures striking North-South, dipping vertically, and connecting "reverse" ore bodies. The erroneous concept led to driving of drifts on faulty projections from diamond drill hole intercepts, to disappointments and an assumption of extreme discontinuity of ore bodies.

In spite of misalignment of exploration drifts, considerable high grade ore was encountered, usually in one corner or half of the drift cross section and invariably in obvious disarray with respect to the assumed south dip. Therefore the mineralization was considered "poddy" and amenable only to indiscriminate bulk mining.

This disillusionment led to the second error, that of indiscriminate "ring" sampling in uniformly spaced vertical planes across the drifts. Ore

and waste were mixed in single 150 pound samples representing the back together with both walls.

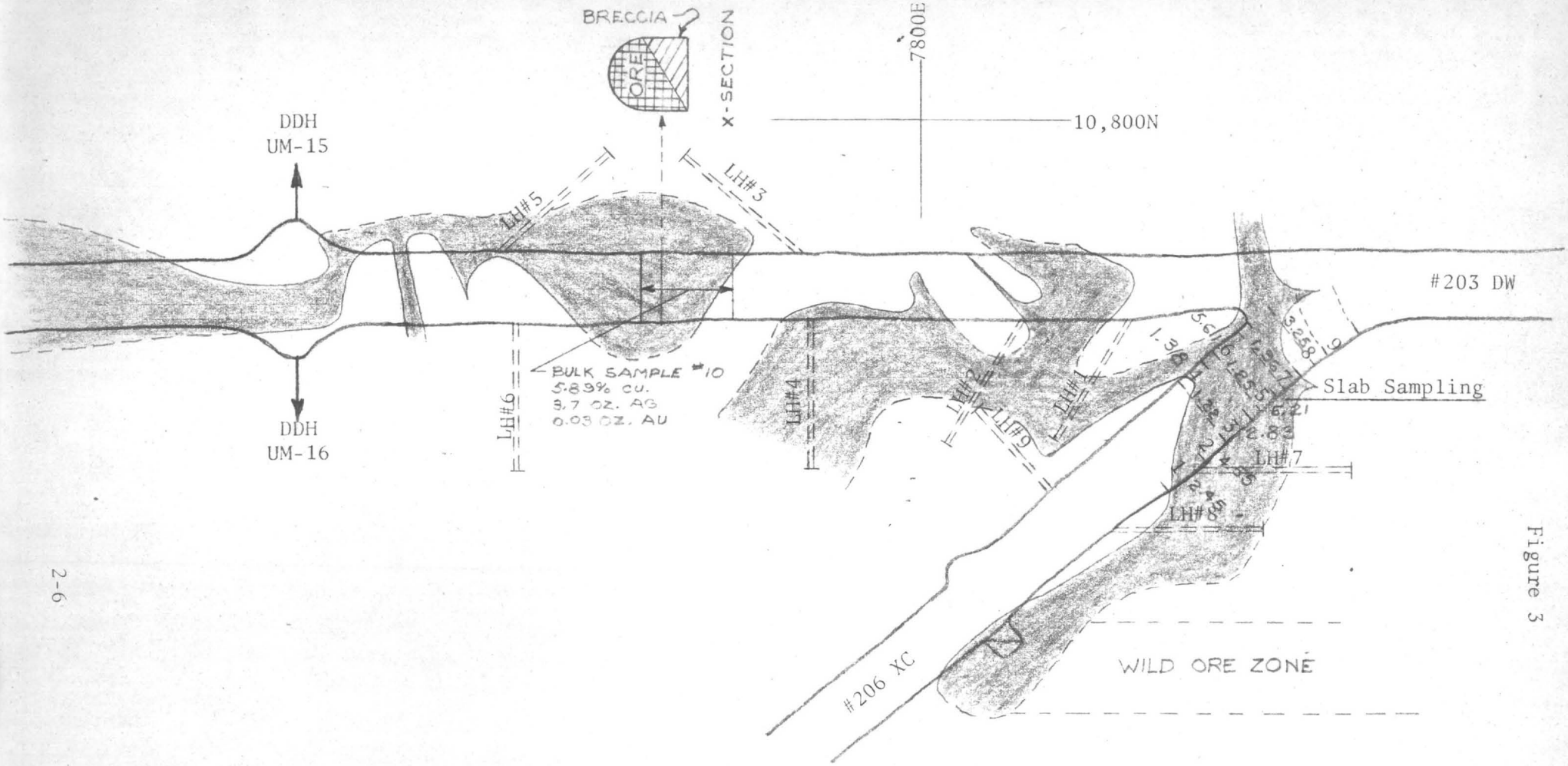
Given the misalignment of headings with respect to ore trends and the technique of sampling used, no significant sequence of "ring" samples could possibly have produced an average assay in ore matching that in nearby drill hole intercepts.

Four intervals along the upper breccia zone illustrate this point, one near station Number 5, another at the beginning of 206 crosscut, a third at station Number 7 and the last near station Number 8.

	"Ring" Samples			Adjacent Cored Intercept		
Location	Length	No. of Samples	Avg. Cu%	Avg. Cu%	Feet	D.D.H
No. 5	27'	5	1.86	4.73	5.4	UM #8
No. 206	25'	4	1.92	4.09	13.0	UM #27
No. 7	35'	5	2.61	6.37	17.9	UM #6
No. 8	27'	5	2.55	4.23	2.0	SM #27

Since sampling of on-surface stockpiles of copper-bearing material agreed closely with the averages of ring samples from the source areas, the ring samples were considered vindicated and the much higher assays in drift-width ore intercepts in core from nearby drill holes were discounted.

In order to check the validity of these assumptions the 25 foot length of 206 crosscut indicated as lean ore (1.92% copper) by a series of 4 ring samples was resampled across the structures responsible for the mineralization as shown in Figure 3. Bulk samples 1, 2, 3 and 5 were taken from slabs drilled and blasted from the full height of the 206 crosscut wall across a prominent zone of east dipping north-south fractures. Samples 4 and 6 were taken similarly across sheated fractures dipping north and running westward into the pillar between 203 drift and 206 crosscut. Table #1 shows average assays from these walls approximately double the average of the four most nearby equivalent ring samples.



Note: >2% Cu.

N

SUMMITVILLE MINE-MISSIONARY SHAFT
PORTION OF SECOND LEVEL

Map Showing

DETAILED MAPPING
LONGHOLE TESTING
SLAB SAMPLING
OF
JANUARY 1970

Scale: 1"=20' July 16, 1970

Figure 3

Missionary Shaft - Summitville, Colorado

206 crosscut - slab sampling

Map		Assay				Average Product			Value/Ton
Sample No.	Width	Number	Copper	Silver	Gold	Cu x ft.	Ag x ft.	Au x ft.	@ $ .60, $1.73, $35.00
Southeast Wall:									
1	5'	10614	2.33	1.2	0.01	12.25	6.5	0.05	$32.00
		10615	2.58	1.4	0.01				
2	4'	10618	4.55	2.0	0.04	18.20	8.0	0.16	59.46
3	4'	10620	2.73	2.0	0.04	11.32	7.6	0.16	38.65
		10622	2.93	1.8	0.04				
5	5'	10626	5.21	2.2	0.03	26.05	11.0	0.15	67.38
Total	18'					67.82	33.1	0.52	
Average			3.77	1.8	0.03				$49.40
Northwest Wall:									
4	4'	10624	1.38	1.0	0.02	5.52	4.0	0.08	$18.99
6	8'	10628	5.61	2.8	0.03	44.88	22.4	0.24	73.21
Total	12'					50.40	26.4	0.32	
Average			4.20	2.2	0.03				$55.26

TABLE 1

As part of this initial study, long hole percussion drilling 20 feet into the walls using jointed rods confirmed that both the drift (203DW) and the crosscut (206 XC) had by-passed the best mineralization. Black enargite was panned from the cuttings of holes #1 and #2 in the south wall, and from holes #4 and #9 in the same structure. Similarly the continuity of the ore showing east of the crosscut was confirmed by holes #7 and #8. (Figure 3)

Percussive long holes have a generally well justified reputation as being sources of unreliable samples due to a tendency for attrition along the hole to "salt" the cuttings, particularly with a soft, vug filling mineral such as enargite. In our drilling the holes are short and collared in waste rock, thus it is known exactly where we penetrate ore since crossing over from waste to enargite mineralization is readily identifiable when the drill cuttings change from a light color to black.

Missionary Ore Zone

Completion of geologic mapping has shown the Missionary zone to be a function of the south dipping contact between two volcanic formations. The Missionary structure per se is defined as a zone of variably silicified and alunitized andesite nearly 200 feet thick striking east-west along the north rim of the quartz latite neck, dipping southward at about 45° towards the roots of the neck and the related mineralized structures of the old Summitville mines in the South Mountain vein complex. The zone's andesite wall rocks are finely porphyritic and include flow breccias; they are argillized, in places soft and incompetent which necessitates close timber support. The andesite is generally very light grey in color including, however, smaller bodies of darker grey rock in which iron has been retained in the form of chlorite. Alteration is most intense at the margins of the Missionary structure.

The structure was shown by drill cores to be roughly stratified including upper and lower silicified breccia zones enclosed in partly silicified andesite breccia. Although varying in thickness and, in the case of the silicified breccias, pinching out along strike, the subzones conform at least roughly to the attitude of the entire Missionary structure, as shown in the set of cross sections (EXHIBITS D-1 through D-8).

The silicified andesite is light grey, porphyritic and in every respect similar to the andesite outside of the structure except harder and more competent. Parts of the andesite, particularly adjoining the breccia zones, are totlaly and densely silicified. Other areas of the andesite further removed from the breccia are softer and partly argillic, particularly the phenocrysts and flow breccia inclusions.

Pyritization has occurred to varied extent throughout the andesite in the Missionary structure. A pale species of pyrite occurs in clusters and/or small sheets, most notable at the margins of altered phenocrysts and fragments. Steven regards the pyrite as an alteration product derived from the interaction of iron rich mafic minerals such as biotite, pyroxenes or magnetite with sulfur in ascending hot mineralizing solutions.

The silicified breccia is andesite which has been fractured, and completely silicified. All of the volcanic structures have been destroyed. Apparently silica ascended with the sulfur but permeated the structure to a lesser degree.

The quartz-alunite rock occurs almost exclusively in the breccia zones; it is marked by enargite, brassy pyrite, alunite, occasionally by covellite and always by unhealed fractures and voids ranging from small vugs to sizeable chimneys.

Enargite is the principal copper mineral. It is visible as streaks, veins and solid masses, also as disseminated crystals and sooty coloring. Frequently, it is localized along fractures. A more coarsely crystalline variety lines or fills voids or forms rims partly surrounding alunite bodies. Larger alunite bodies commonly include fragments of enargite. Enargite is a sulfide of copper and arsenic containing 48% copper by weight. The crystal is black, prismatic, moderately soft and lighter in weight than pyrite. The copper mineral covellite also occurs with sufficient frequency to be worthy of mention. It is a sulphide mineral averaging 65% copper and readily identifiable by its indigo blue coloration.

Brassy pyrite, having a much richer color than the ubiquitous pale pyrite mentioned above, is closely associated with the enargite but much more abundant and somewhat more widespread than the copper mineral. It does not

occur within alunite bodies and therefore preceded both the enargite and the alunite mineralization.

The alunite is an amorphous cream to pale salmon colored material with a consistency ranging from that of toothpaste through hard chalk. It commonly fills the voids formed along the principal fractures.

The fractures are observed as uncurved planes, often closely spaced or sheeted and restricted largely to the silicified breccia zones. They occur in a bewildering variety of attitudes, fading out or terminating against crosscutting fractures, and are devoid of gouge or quartz vein filling. Alunite and enargite streaks or pods mark the trace of many fractures, particularly where sheeted.

Generally below and northward from the Missionary zone lies a very finely porphyritic, dense rock identified by the USGS as lava. The freshest lava contains fine but visible lath-shaped feldspars, widely scattered large "eyes" of dark quartz, and fracture filling by native sulphur. In some places where the lava is relatively unaltered, it is easily recognized by its blocky fracture pattern and a hardness not related to silicification. In such cases the contact of the lava with the porphyritic andesite is readily defined. However, elsewhere along the contact, the lava is intricately mixed with the andesite porphyry, somewhat altered by argillization and/or silicification and contains vein-like enargite and pyrite mineralization. In such cases the contact may be gradational over 20 or more feet.

The mixture of andesite and lava appears to be a "flow breccia" formed by violent attrition of the lava lined neck by the subsequent eruption of molten porphyritic andesite passing upward through the flaring vent of the volcano. The resulting contact is very irregular in detail, but on the scale of the development it is smoothly sigmoidal, forming a south-plunging trough in the older lava.

All of the conceivably exploitable ore deposits thus far encountered in the Missionary drilling and underground development occur in the andesite porphyry or at the lava contact, and the great bulk of these occur in the andesite-filled trough (EXHIBITS C-1 and C-2).

The two silicified breccia zones, shown on EXHIBITS C and D, are roughly parallel to the lava contact. The lower zone lies just above the lava in the east-west portion of #205 drift, occupying the bottom of the trough. The upper zone is generally followed by #203 drift and appears to bridge the prominances of lava straddling the trough. Lesser zones of silicified breccia follow the lava contact where it obliquely crosscuts the main zones.

Study of diamond drill core shows that brecciation of the andesite porphyry within the Missionary zone is almost complete, excepting only the upper transitional material underlying the quartz latite porphyry. Brecciation also occurs in the lava but here it is less pervasive, occurring in narrow zones generally on the extension of the silicified breccias.

Total silicification is more selective and generally is confined between zones of principal shearing in which brecciation has advanced to a true gouge through complete obliteration of volcanic structures.

The presently favored hypothesis of ore genesis assumes movement along an irregular boundary between underlying lava and overlying prophyritic andesite resulting in (1) brecciation of a zone about 200 feet thick, (2) silicification occurring late in the brecciation process and controlled locally by impervious gouge zones, (3) cross fracturing of the rigid silicified breccia plates, (4) copper-silver mineralization following the cross fracturing, with substitution by gold at higher levels with lower temperatures and pressures, and (5) alunite mineralization filling voids and replacing unsilicified andesite breccia in the vicinity of strong copper mineralizaiton. Copper mineralization followed the final explosive disgorgement of the central part of the porphyritic andesite plug, the emplacement of the quartz latite porthyry central core, and the development of the huge porphyroblasts of sanidine in the cooling quartz latite plug; but copper mineralization probably preceeded the widespread argillization of the quartz latite, andesite porphyry and marginal lava.

New Exploration - 1970

Underground development headings within and along structures observed to be related to Missionary mineralization were chosen as the means to (1) confirm the relationship of the ore with the structure, (2) to determine the continuity of the mineralization, and (3) to begin a compilation of ore reserves. Large muck pile samples from each advance in a raise or sub level headings were dried, crushed, split, pulverized, tested by colorimetry and assayed. Portions of the

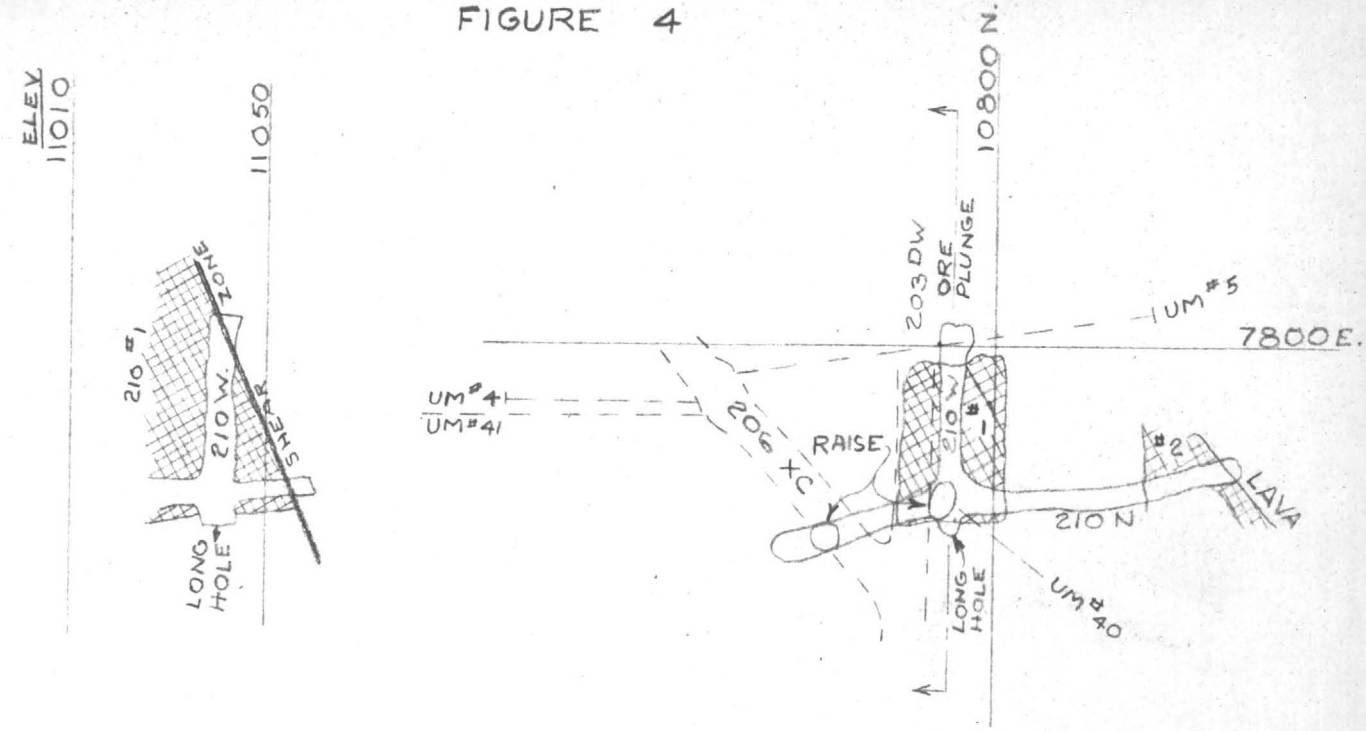
ore samples were accumulated for a composite metallurgical sample. This new work has tentatively identified three distinctive types of ore control and their related ore bodies within the Missionary structure.

The confirmation began in the 206-210 area of the upper silicified breccia zone on the west end of the Missionary second level where structural control of the mineralization by reverse and cross fracturing is most explicit in illustrating the most prevalent type of local ore control. Here the silicification of the upper silicified breccia zone is widest and the exposures in the drift plus diamond drill intercepts indicated a considerable succession of steeply north dipping "reverse" ore bodies.

Two raises were put up in separate ore bodies from 206 XC and 203 drift. From the top of these about 23' above the 2nd level a sub level crosscut (210 XC) was driven northward for about 110' following a prominent alunite-enargite filled fissure in the cross fracturing (Figure 4). Two ore bodies were encountered, neither of which had not been recognized in the main level development. These, designated 210 #1 and 210 #2, are 22 and 12 feet wide respectively where intersected by the crosscut. Subsequent drifting to test ore continuity followed the 210 #1 ore zone to the westward for over 60'. The back of this ore was encountered 12' above the sub level crosscut against a shear zone, descending westerly until it reaches the sub level drift about 50' to the west of the x-cut. On the east the ore is cut off by a near-vertical cross structure in the right hand wall of the x-cut. However, a long hole drilled eastward through the cross structure found copper mineralization over a distance of 40' after an initial 4' of barren ground, indicating that the cross structure represents only a temporary interruption in the strike continuity of the ore zone.

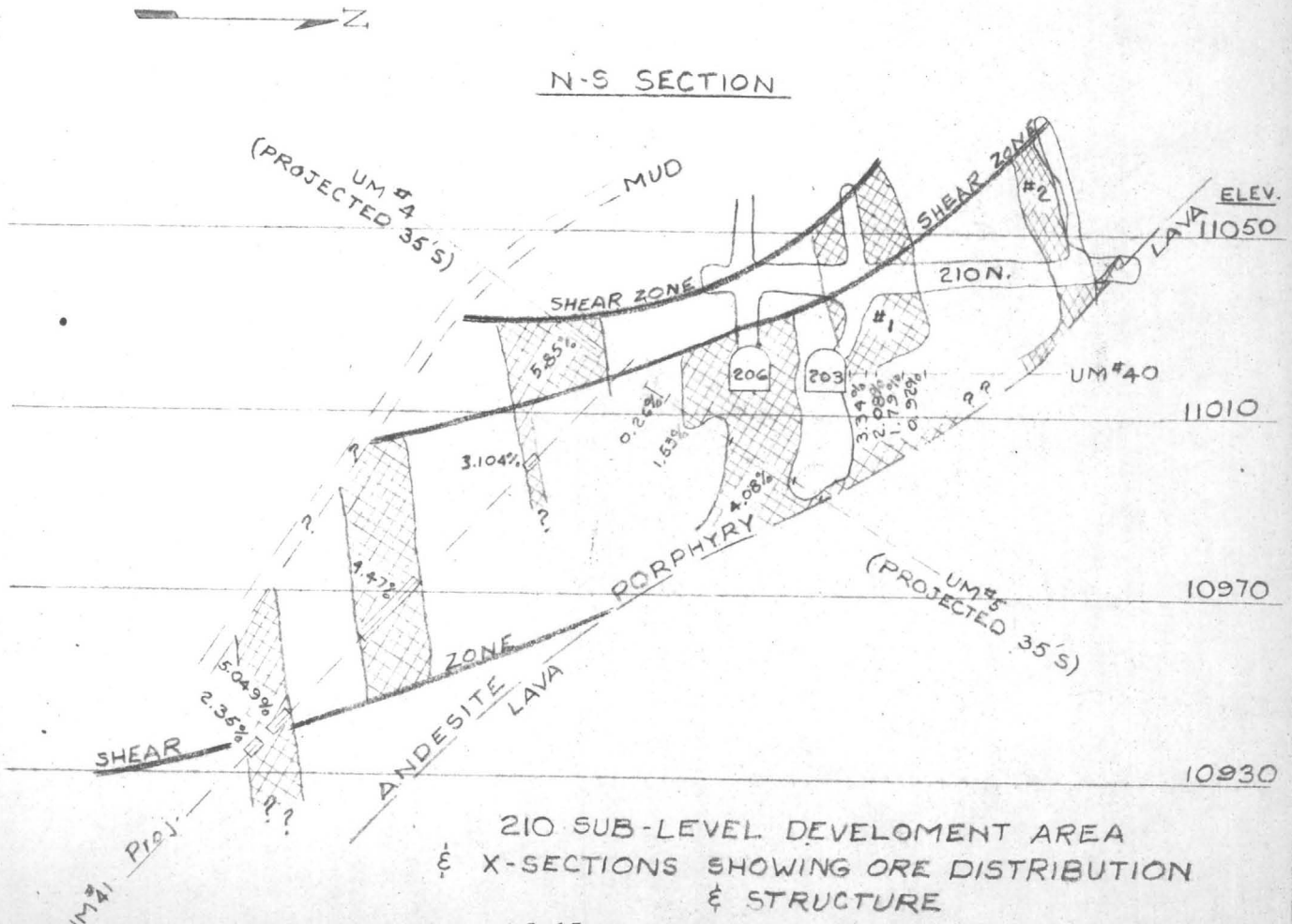
The second distinct type of ore control occurs at the west end of the 205 footwall drift where the lava contact at the Missionary footwall veers sharply from the East-West trend of the Missionary structure to a southwest trend (EXHIBIT C-2). The lower silicified breccia has been mapped here as a relatively narrow zone conforming to the overall Missionary structure and following the contact between the brecciated, sheared Conejos andesite porphyry and the underlying siliceous, fine grained lava. The westernmost 45 feet of the 205 drift had encountered wide and continous copper mineralization, much of which is

FIGURE 4



E-W SECTION

PLAN VIEW



210 SUB-LEVEL DEVELOMENT AREA
& X-SECTIONS SHOWING ORE DISTRIBUTION
& STRUCTURE

clearly highgrade, related to strong reverse fracturing, but more particularly there is clear indication on the level that silicification and mineralization have been enhanced along the lava contact where it is diagonally crosscutting the general strike of the porphyritic andesite breccia.

Therefore the next development project was aimed at exploration and sampling of this area. #212 raise was angled toward the point where the lava contact changes direction from W to SW. About 25 feet above the level the footwall lava was encountered on a southwest trend. A sub level drift extending nearly 40' to the southwest from this intersection, and still continuing, has remained in wide-spread enargite mineralization averaging about 2% copper in a fully silicified diagonally oriented breccia. It is hoped that this SW drift will follow this silicified breccia zone through the north end of 210 XC into the upper silicified breccia in the area of 203 drift where #10 bulk sample (assaying 5.8% Cu.) was cut from ore, conformable and adjacent to the lava footwall (Figure 3).

Reverse and conformable types of ore bodies are likely to be closely associated along the lava footwall in both the normal and diagonal strike segments. Maximum ore development is expected where reverse and cross fractures both enter the footwall with extensions of ore rising up the reverse sheeting and also up and down the footwall contact (See Figure 4).

A third area of mineralization with distinctive characteristics occurs at the east end of the Missionary development. In this area, silicification of the Missionary breccia zone appears to be terminating eastward and is confined almost exclusively to ore bodies. Widespread alunitization has occurred without silicification. Fracture systems within ore bodies, still recognizable as reverse or crossing, are clearly planes of exceptional enargite-alunite mineralization. But, the fractures tend to disappear abruptly outside the ore body and the author believes that the geometry of the ore is due more to other conditions governing the channeling of solutions than to the local fracture pattern.

The shear zone control of silicification and copper mineralization has been noted in observations of the upper ore limits in the 210 development. In parts of the Missionary zone where preliminary silicification was slight,

this type of alteration was limited to pipe-like bodies between shear zones. Although fracturing of these would be largely nonconformable, copper mineralization would permeate the entire silicified pipe and thus be controlled by the shearing and, overall, conformable. In detail the mineralization might pinch and swell, in places it would be only tenuously connected, but the richness of mineralization is evidence of a throughway to mineralizing solutions.

Overriding local controls of silicification and copper mineralization is a pattern of ore distribution shown on the level maps (EXHIBITS C-1 and C-2) as "target areas". These are understood as areas of more intense and closely spaced cross and reverse sheeting within which the ore bodies are observably larger, richer, more interconnected and separated by less waste. These conditions seem to obtain along projections of major strike-segments of the Missionary structure, the cross sheeting of one segment conforming to the reverse sheeting of another.

Ore Reserves

Reserves being developed may be considered in three catagories: (1) the typically reverse oriented ore bodies in the wide, upper silicified breccia of the west end; (2) the mixed reverse and conformable of the narrower lower and diagonal silicified breccias; and (3) the conformable ore bodies of the areas of the eastern pipe-like mineralization. Only the first of these catagories has been tested to the point of confirmation of theory; however, despite some control uncertainties, all environments contain ore grade mineralization.

The 210 sub level and 206 crosscut development have exposed four reverse ore bodies which appear to have an east-west continuity of more than 120 feet. Additional ore bodies of this type occur down the dip of the upper silicified breccia where cored by diamond drill hole #41. These bodies occupy a portion of the silicified breccia zone in which cross fracturing (north-south) is frequent and are apparently sandwiched between waste blocks controlled by reverse fracturing; they comprise probably one third of the upper breccia zone. The silicified breccia appears to be thinning upward toward the first level but has a horizontal width averaging at least 100 feet. Undeveloped portions of the zone to the west and east contain ore showing in main drifts or found by diamond drill or longholing. Omitting the updip half of the silicified breccia zone, and omitting in addition all ore outside of the 160 feet or more of most productive

cross structure, the reverse oriented ore would amount to more than 20,000 tons. The copper content of this ore in our samples varies from 3½% to more than 5%, averaging certainly more than 4%.

$$\frac{100'(\text{width}) \times 60'(\text{height}), \times 160'(\text{length})}{12(\text{cu. ft/ton}) \times 3(\text{waste/ore ratio})} = > 20{,}000 \text{ tons}$$

The mixed reverse and conformable ore on the footwall of the lower silicified breccia has not been tested in recent development. In the vicinity of the 212 raise the 205 drift followed continuous ore for a distance of about 40 feet, categorized as reverse fracture controlled, but the southwest raise revealed continuous conformable ore rising 20 feet or more from the floor along the footwall lava. The combined ore zone may extend along the unexposed footwall many tens of feet both eastward and to the southwest, but restricting ourselves to exposed ore, it may be assumed to extend updip to surface past the first level (which tested the lower breccia zone in only two widely spaced crosscuts). Ignoring two other ore exposures on the footwall on the second level, the potential reserves would be 40 feet long, average about 10 feet in width and extend through a vertical range of 300 feet or more, from which reserves in the vicinity of 5,000 to 10,000 tons may be readily inferred.

$$\frac{40'(\text{length}) \times 300'(\text{height}) \times 10'(\text{width})}{12(\text{cu. ft/ton})}$$

In addition to the postulated 10,000 tons the related reserves of the southwest trending lava footwall zone are exposed on the footwall intersection of 205 drift and, unsatisfactorily, by the southwest sub drift of 212 development. The sub level assays average about 2%, but these represent reverse-structure ore at some distance from the footwall and outside of main reverse structures. Mined, with conformable footwall ore, the mixed structure reserves may prove to be as important as any other, however, at this point in development they are omitted in the interests of conservatism.

The pipe-like ore bodies of the east end of the Missionary development (so called Octopus ore zone) are known from test holes and raises to be highly irregular in shape and probable only semi-continuous. The extreme richness of this ore (213 drift is averaging in excess of 6% Cu.) and the size of the bodies exposed in both second and first levels and diamond drilling assure that a feasible mining plan will be developed.

Three irregular pipes of ore are assumed, a western pipe rising northward from 207 crosscut through the Octopus development on the first level, a central pipe from the 204-205 intersection through the ore at the east end of the 1st level, and at the east end from the footwall ore in 204 drift to an unknown updip extension through unexplored ground on first level. The areas of these pipes are:

West:	1600 sq. ft.	average
Central:	400 sq. ft.	average
East:	600 sq. ft.	(one level only since the updip extension is speculative)
Total	2600 sq. ft.	Avg. copper percent about 6% from actual sampling.

Reduced 50% to a central core for protection against soft waste contamination and extended toward surface for 200 feet, this reserve totals 20,000 tons.

Total Missionary Reserves - Summary

West-Reverse	20,000 tons @ 4%
Footwall-Mixed	10,000 tons @ 3½%
East-Conformable	20,000 tons @ 6%
Total	50,000 tons @ 4½%

As an idea of the potential involved here:

4½% Cu = 90 lbs Cu/tons x 60¢/lb x 50,000 tons - $2,700,000 gross value at today's market prices.

Assays of core and development samples have shown a consistent ratio of at least one half ounce of silver per unit of copper. Thus the average ore contains more than 2 ounces of silver per ton worth (at $1.73 per ounce) more than $3.50 per ton with an additional gross value of about $200,000. Gold content in areas sampled is only about 0.02 ounces per ton, of which only half may be recoverable, and is ignored in this appraisal as an offset to metallurgical losses in copper (5 to 10%) and silver (10 to 25%).

The figure of 50,000 tons could easily be doubled or tripled by the additional possibilities for ore within the present headings or at greater depths. Surface and underground diamond drilling have indicated good ore extending at least 200' below the present 2nd level with no indication of "bottoming out". DDH UM 46 has encountered good ore intercepts in the "Octopus" between Levels 1 and 2 (type III ore) while UM 47 has encountered ore within the same ore zone but above the 1st Level.

A bare beginning of surface geologic study has distinguished the lava formation which underlies the productive Conejos-type andesite porphyry. The lava crops out in a belt a few hundred feet wide running easterly on the north side of the Missionary outcrop and at the foot of the slope from South Mountain. The belt swings south under the tailings pond and forms a pronounced ridge close behind the old Iowa mill. Contrary to mapping shown in Steven's Professional Paper, the andesite porphyry exposed south and east of the lava is invariably altered. Quartz boulder float along the contact looks identical to that in the Missionary outcrop.

If mineralization prevails along the contact of the lava and the overlying Conejos andesite porphyry, and if this contact continues to the west, the mineralization should, in spite of the Newmont report of investigation, intersect the structural trend that runs through the heart of the volcanic cone-complex producing the Tewksbury, Annie, Hidden, Dexter, and other veins. The intersection very possible occurs in low ground at the edge of the meadow and under considerable cover, but should be reflected, if present, by a geochemical anomaly.

By transfer of Steven's geology to a claim map, it appears that all of the areas underlain by altered quartz latite and the peripheral altered andesite porphyry of thenorth half of the caldera are covered by patented or unpatented claims controlled by Summitville Mines. (EXHIBIT A)

SOUTH MOUNTAIN VEIN COMPLEX

Background

Following work on the Missionary structure a similar re-appraisal of the veins occurring in the South Mountain vein complex was begun. Closely detailed mapping of 60 feet of the Annie structure indicates that typical structures, alteration and ore relationships in this vein conform with the generalized relationships illustrated by Thomas A. Steven and James C. Ratte in USGS Prof. Paper 343. This mapping program reinforces the sampling appraisal made for the Union Pacific-W. S. Moore Co. partnership in 1964 by Keith Jones of the U.P.

This study has been somewhat limited by incomplete accessibility and bad air, however, a surprising number of similarities between this area and the Missionary were noted.

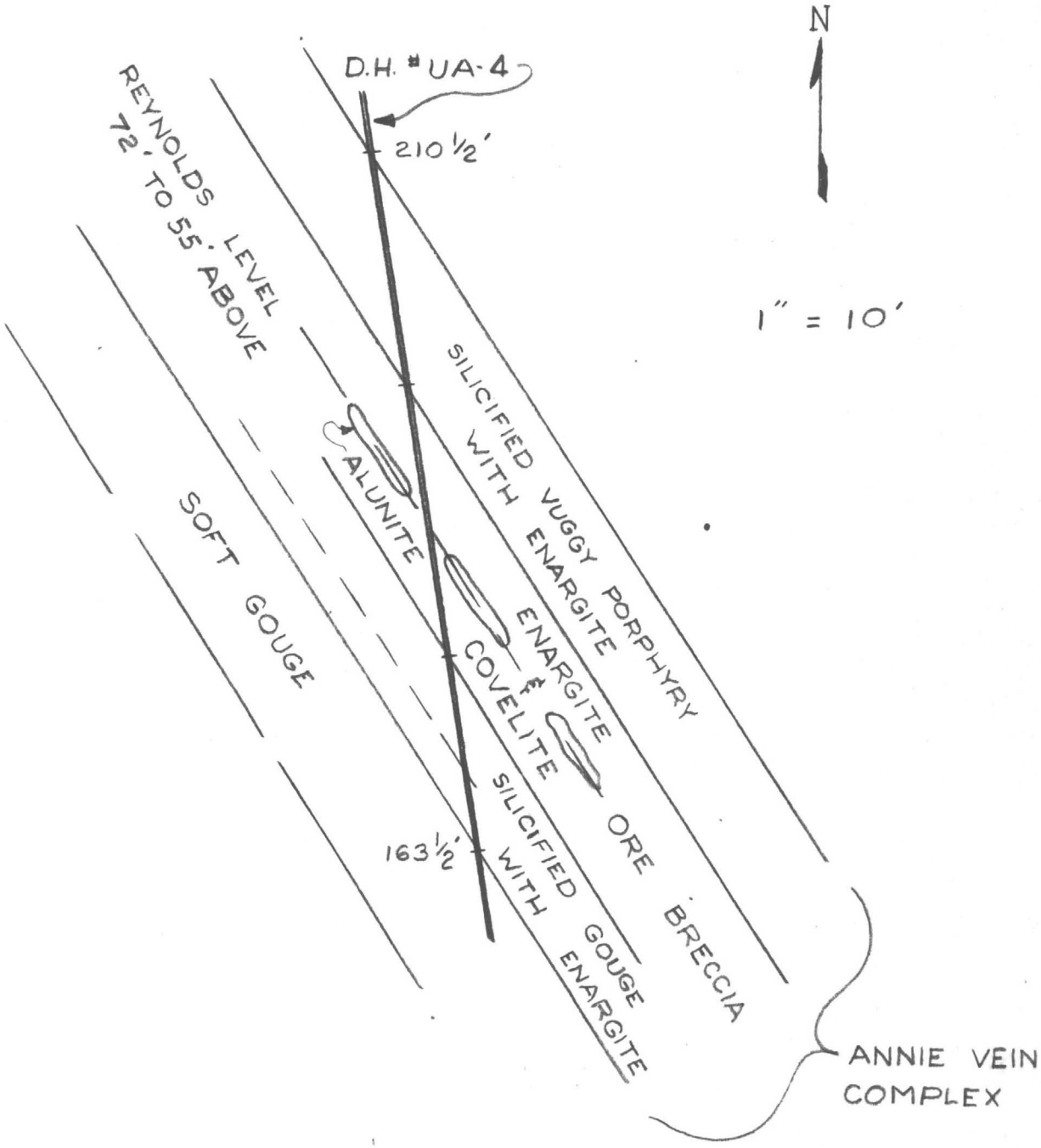
Geologic Setting

The Summitville vein deposits, including the Tewksbury, Annie, Hidden, and North and South Dexter structures occur in steeply inclined pipes and tubular ore shoots within the vent area of the Fisher quartz latite porphyry on the north slope of South Mountain. Within the massive, intensely argillized porphyry northwesterly trending fracture systems have been mineralized by copper and silver sulfides and gold in sheeted quartz veins with silicified zones up to 100 feet wide.

Detailed Geology - Annie Vein

The Annie structure is a composite vein, including (1) a southwest transition of silicified gouge, (2) a central quartz breccia with sheeted quartz veins, and (3) a northeast transition of silicified porphyry (Figure 5). The best mineralization occurs in the sheeted vein section; where observed it is partly oxidized, has a distinctly greenish black cast, and is predominantly enargite. This portion is enclosed in a vuggy quartz breccia containing alunite and enargite in somewhat reduced amounts. The transitional silicified gouge and porphyry zones contain only lean copper mineralization. The total thickness of mineralization, including silicification, is quite variable. Ore exposures sampled in the Annie vein by Keith Jones, limited by the width of the drift, range from less than two to more than seven feet. A true ore width of about 9 feet was found in Diamond Drill Hole UA-4.

FIGURE 5



HORIZONTAL PROJECTION OF UA-4
DETAIL DIAGRAM OF ANNIE VEIN

Mapping a 60 foot length of the Annie structure where it spans one of the ore shoots shows at least 15 prominent pre-mineralization cross fractures. Fracture attitudes vary widely from northerly to westerly in strike. Dips are generally south to east at inclinations of 55 to 75 degrees, but a few northwest dipping fractures were noted, apparently divorced from mineralization. Coper silver ore appears to be continous but variable in the Annie vein within the swarm of cross fractures, many of which create miniature ore pipes at their intersections with the Annie.

The nature of the structure intersections is further revealed by the intersection between the Annie and North Dexter veins (Figure 6). The Annie vein is ill defined and practically unmineralized immediately southeast of the intersection; the North Dexter cannot be located even approximately to the southwest. At the intersection there is a pod of alunite more than 6 feet long by 2 feet wide rimmed with specimen grade bladed covellite and surrounded by mineralized breccia. The Annie vein to the northwest and the North Dexter to the east are well defined and are ore bearing.

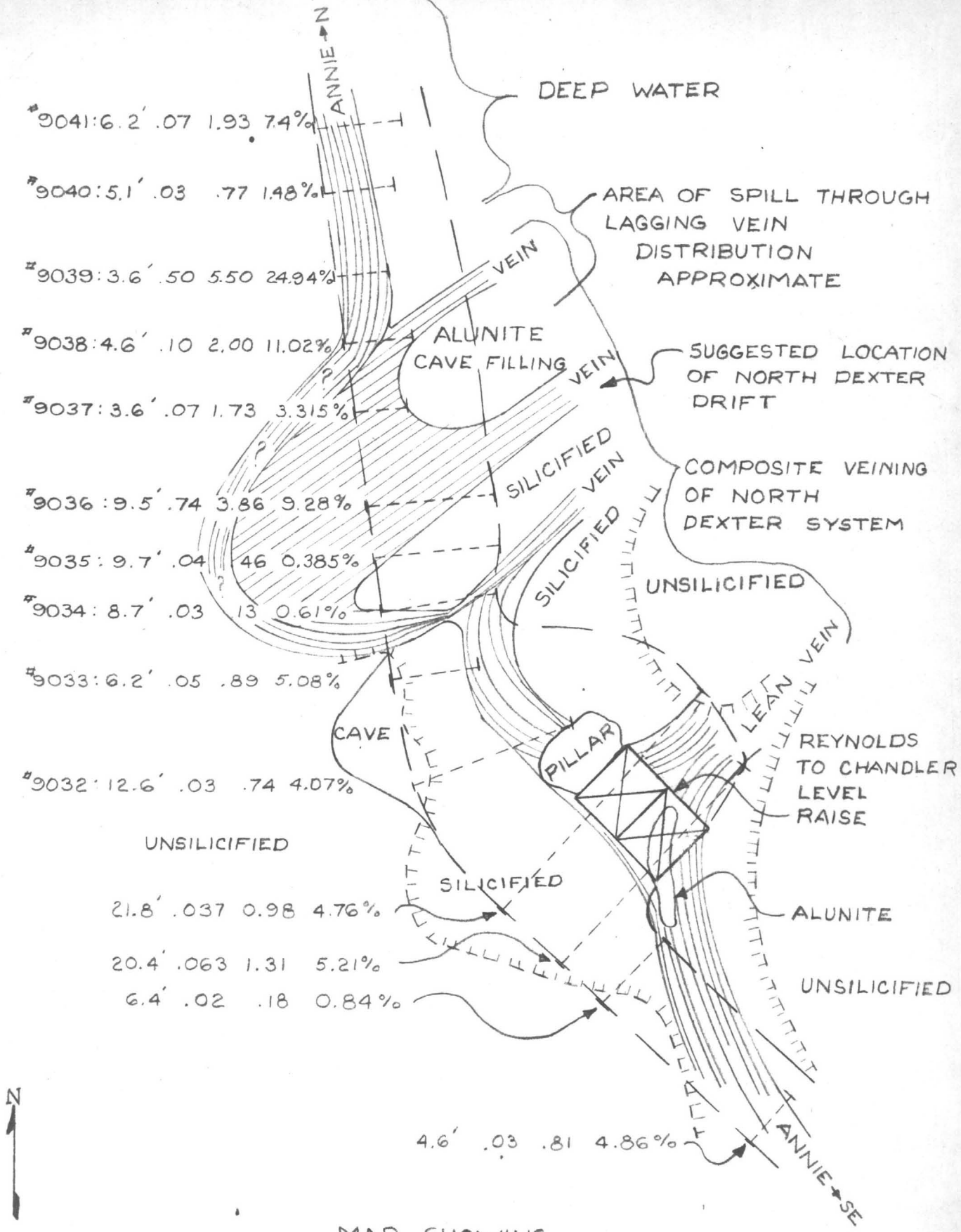
The structures thus appear to consist of fractures bounding blocks of quartz latite porphyry rather than faults of any appreciable displacement, some, by happenstance, are more open to mineralized solutions than others and subject to drastic change along strike and at the appropriate intersecting fractures. This would explain why the South Dexter vein may not be recognizable at the projected point of the intersection with the Annie vein, even though it was extensively developed on the Chandler and Dexter levels above (Figure 7).

The Annie vein is mildly sinuous, requiring some curving of the Reynolds level drift as it follows the richer sheeted quartz zone. The changes in direction occur abruptly at cross fractures. Irregularities in dip are probably similarly segmental. Measureable displacements are rare and discontinuities in the strong vein structure or mineralization are not likely to be the result of faulting.

Sampling

The Annie vein was sampled at measured 5-foot intervals by Mr. Keith Jones in 1964. (EXHIBIT E) Single samples were chipped from shallow channels across the entire visible mineralized structure. Four areas along the vein contained two or more consecutive ore grade samples. These are tabulated

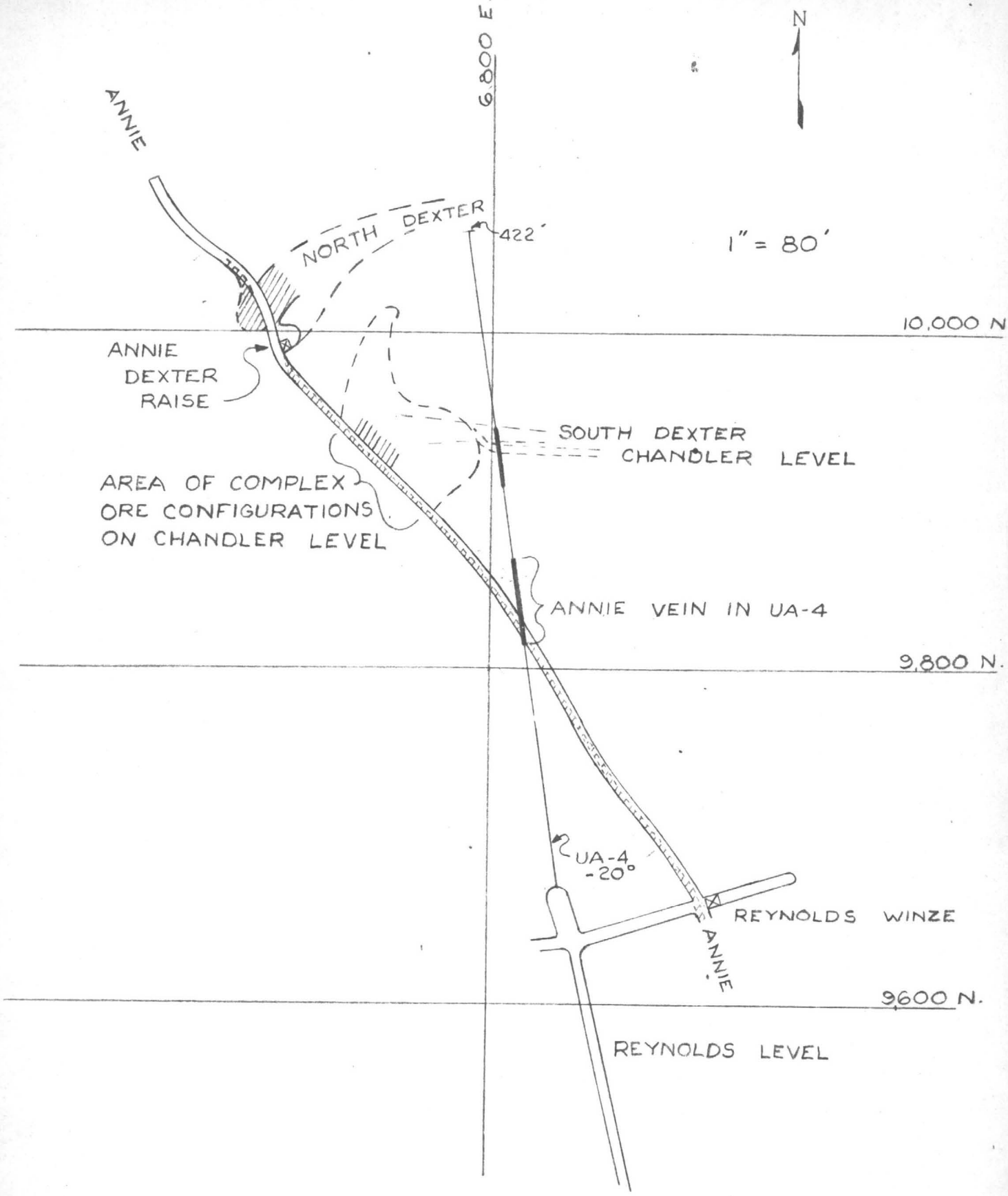
FIGURE 6



MAP SHOWING
ANNIE - NORTH DEXTER VEINS
INTERSECTION ON THE REYNOLDS
LEVEL.

1" = 10'

FIGURE 7



LOCATION MAP

ANNIE - DEXTER ORE AREA

ON REYNOLDS LEVEL

below with weighted average assays:

SAMPLE GROUP	FT. FROM REYNOLDS WINZE	WIDTH Avg.	Avg. AU	Oz/ton AG	Avg. % Cu
A-7253-54	38-48' (Annie Belle)	3.1'	0.07	2.24	4.52
A-7279-95	175-260	3.9	0.12	1.85	5.09
A-8906-10	313-338 (So. Dexter?)	5.6	0.07	3.17	9.63
No Number	417-490 (No. Dexter)	9.0	0.12	1.49	5.35
Total 37 Samples	193 feet Average:	6.0	0.11	2.10	5.77

Check Sampling

Two sections originally sampled by Keith Jones were resampled, each in three segments determined by lithology and ore grade. This resampling appears here below in comparison with Keith Jones' thicknesses and assays.

SAMPLE	DESCRIPTION	FEET	ASSAY OZ. PER TON Au	Ag	% Cu
A-7282	Keith Jones' Interval	5.5'	.30	2.10	3.66
	Resampled Intervals:				
	Silicified Porphyry (NE)	3.5'	1.07	0.30	1.224
	Sheeted Vein (Center)	1.5'	.61	4.30	5.497
	Silicified Gouge (SW)	1.2'	.05	0.50	0.806
	Averages: Best	5.0'	.23	1.50	2.520
	Best	5.5'	.22	1.40	2.364
A-7291	Keith Jones' Interval	5.1'	.06	0.54	6.25
	Resampled Intervals:				
	Silicified Porphyry (NE)	1.9'	.005	0.050	0.315
	Sheeted Vein (Center)	2.6'	.22	12.40	17.035
	Silicified Gouge (SW)	0.8'	- -	- - -	0.226
	Averages: Best	4.5'	.13	7.40	9.975
	Best	5.3'	.11+	6.3+	8.504

Apparently there is a decimal error in Jones' assay for silver in A-7291. Otherwise, there are discrepancies of the degree expectable when high and low grade material are chip sampled as a single unit. The discrepancy in sample A-7282 yields a decrease to about two-thirds of the Jones' assays, while in A-7291 there is an increase of between one quarter and one third. From this comparison one may assume that while some of the Jones' samples may have omitted mineable material and others have added waste material, the averages of thickness and grade probably have built-in compensation for dilution and unrecovered ore.

Sampling on Chandler Level

Less complete chip-channel sampling by Keith Jones on the Chandler level revealed four areas of ore grade mineralization as tabulated below:

SAMPLE GROUP	(FT. from Reynolds Winze)	Width Avg.	Avg. Oz/ton Au	Avg. Oz/ton Ag	Avg. % Cu
	55-97 South shoot	3.3'	0.17	1.04	2.89
	270-326 South Dexter	4.6'	0.20	2.26	3.23
	395-415 North Dexter split	4.5'	0.08	4.54	3.33
	437-497? North Dexter	4.0'	0.28	3.52	8.84
Total (32 samples):	178 feet Average:	4.1'	0.21	2.65	5.05
Comparison:	Reynolds Level-198 ft. Avg.:	5.9'	0.11	2.23	5.72

Ore Reserves

As shown on the accompanying Longitudinal section of the Annie vein, (EXHIBIT E), core assays from diamond drill holes A-I-4, A-I-3 and A-I-2 above the Reynolds level and from holes UA-4 and UD-1 below the level supplement the evidence of thickness and metal content and support the evidence in the drifts that the predominately southeast dipping cross fractures control the attitude of the ore shoots, imparting to all except the vertical south and north Dexter splits a southeast-downward rake.

Drill Hole	Width	Avg. Oz/ton Au	Avg. Oz/ton Ag	Avg. % Cu
A-I-4	3.5'	.03	1.02	3.07
A-I-3	4.7'	.08	5.65	4.80
A-I-2	14.0'	.07	1.57	3.80
UA-4	9.7'	.08	2.23	3.58
UD-1	4.1'	.18	5.90	8.65
Average (36 feet)	7.2'	0.08	2.72	4.35

Continuity appears to be reasonable assured by structure and sampling from 70 feet below the Reynolds level through the Chandler level. Between the Chandler and the overlying Ida levels there is no information except the outlines of the gold ore stopes which in the main are absent along the extrapolation of the upward rake of the copper ore shoots. The general avoidance of the copper shoots in gold mining signifies the reluctance of past operators to cope with copper in their cyanide circuits, but perhaps also reflects a disassociation between copper-silver and gold mineralization.

Reserves calculated below assure that primary and possibly secondarily enriched copper-silver sulfides extend up through unmined blocks to at least the Ida level, and that stoping below the Ida will be compensated by ore still mineable above that level. Ore reserves thereby would have an average vertical range of about 250 feet above a Reynolds mill sub level with an additional 90 feet which probably would be available below with deeper access. The width would average about 5.0 feet and cumulative length should average at least 188 feet. Assuming 12 cubic feet of ore per ton, the tonnage in reserve would calculate:

Above Reynolds level: $\frac{250 \times 5 \times 188}{12} = 19{,}580$ tons Say 20,000 tons.

Below Reynolds level: $\frac{9}{25} \times 20{,}000 = 7{,}200$ tons.

Those reserves have indicated metal content and value as follows:

% copper	5.39	$64.68	@$ .60/lb.	95%
oz./ton silver	2.44	4.22	@$1.73/oz.	75-80%
oz./ton gold	o.16	5.60	@$35.00/oz.	50-75%
	Total Gross Value	$74.50		

Approximate Recoverable Value $68.00/ton

SECTION 3

SECTION 3

OPERATING PLANS & SCHEDULES

GENERAL

Detailed records, acquired and maintained by the Mine Superintendent and the Underground Foreman over the past year of development work at Summitville, provide a basis for predicting miner performance for each of the variety of tasks required for a continuation of development during production and for the production mining operations as well. Using this data, it was possible to first develop a monthly manning schedule for the mine for both the pre-production and the production phases of the operation; then, from the manning schedule and the records of man-shift production rates to develop an underground production schedule; and, finally, by educated guess and laboratory test results, approximate the tonnage and analysis of the crude ore and concentrate produced.

MANNING SCHEDULE

By concentrating on each of the areas in turn (the Annie-Dexter and Missionary) it was possible to define the specific tasks involved in bringing that area into production; providing for a continuation of its development; and producing the desired tonnage of crude ore on a one shift per day, five day per week mine schedule for a three shift per day, seven days per week mill schedule. The individual tasks or functions considered in developing a month by month schedule of manpower assignments were as follows (see Exhibit F-1):

Underground:

Standard Drifting; Drift Timbering; Two Compartment Timber Raise; Dog Hole Raise; Slusher Drifts; Stoping; Tramming; Repair and U.G. Maintenance; and Diamond Drilling.

Surface:

Hoisting; Mine Maintenance; General Labor; Mine Sampling; Mill Operation; Mill Maintenance; Laboratory; Steno-Clerk & Warehouse Clerk; and Watchman.

Salaried Personnel:

Manager, Geologist, Mine Foreman, and Shift Boss.

Man and man-shift requirements for each of the above named tasks or functions may be recapitulated from Exhibit F-1 as follows:

Class	Preproduction Aug. 1970	Sept. 1970	Oct. 1970	Nov. 1970	Dec. 1970	Production Av.Month
Underground - Wage						
Development	7	7	8	8	8	4
Production	-	-	-	-	-	4
Service & Repair	5	5	4	4	5	6
Exploration	1	1	1	1	1	1
Total Men	13	13	13	13	14	15
Total Man-Shifts	273	273	286	247	308	330
Surface - Wage						
Mill Operation	-	-	-	-	4	4
Service & Repair	8	8	8	9	10	10
Total Men	8*	8*	8*	9*	14*	14
Total Man-Shifts	178	177	187	182	316	308
Total Wage - Men	21*	21*	21*	22*	28*	29
- Man-Shifts	451	450	473	429	624	630
Total Salaried - Men	3	4	4	4	4	4
- Man-Shifts	63	84	88	76	88	88
Grand Total - Men	24*	25*	25*	26*	32*	33
- Man-Shifts	514	534	561	505	712	718

* Plus Part Time Watchman for 10 shifts in August, 9 shifts in September, 11 shifts in October and November, and 8 shifts in December.

UNDERGROUND PRODUCTION

By applying man-shift production rates based on actual experience at Summitville to the manpower schedule it was a simple matter to arrive at the anticipated production of total materials to be produced, by months, from each of the mine areas. Factors based on experience and judgement were then applied to split total material tonnages into ore and waste quantities which may be

summarized as follows (For Detail - see Exhibit F-2):

Material & Location	Preproduction Aug. 1970	Sept. 1970	Oct. 1970	Nov. 1970	Dec. 1970	Production Av.Month
Total Material - Tons						
Annie-Dexter	404.4	431.1	460.6	370.0	736.7	1805.6
Missionary	919.0	562.9	1004.3	592.5	686.1	1663.1
Total	1323.4	994.0	1464.9	962.5	1422.8	3468.7
Crude Ore - Tons						
Annie-Dexter	224.0	207.9	221.3	171.9	485.3	1606.6
Missionary	654.3	333.4	751.0	403.8	467.5	1553.7
Total	878.3	541.3	972.3	575.7	952.8	3160.3
Waste Rock - Tons						
Annie-Dexter	180.4	223.2	239.3	198.1	251.4	199.0
Missionary	264.7	229.5	253.3	188.7	218.6	109.4
Total	445.1	452.7	492.6	386.8	470.0	308.4

With the mine in full production after January 1, 1971, we anticipate realizing the following productivity rates per man-shift of underground, total wage earner and total labor requirements:

	Tons		
	Crude Ore	Waste Rock	Total Material
Average Monthly Production	3160.3	308.4	3468.7
Tons per Miner Shift	9.58	0.93	10.51
Tons per Wage Earner Shift	5.02	0.49	5.51
Tons per Total Labor Shift	4.40	0.43	4.83

PRODUCT DATA

To arrive at factors for plant metallurgy for study purposes, the Booth Laboratory in Salt Lake City ran bulk tests of two grades of ore deemed to be representative of the average crude ores that would be produced from the Summitville Mine. The first sample tested was a composite of ores from the Missionary Vein (primarily enargite) with a head assay for copper content of 3.25%. Bulk testing indicated an overall weight recovery of 9.33%; copper recovery of 90.51%, silver 78.7% and gold 49% to yield a concentrate analyzing 31.34% copper, 18.3 ounces of silver, .21 ounces of gold and 10.39% arsenic.

The second sample was a composite from the Annie-Dexter (mixed enargite and covellite) with a head assay for copper of 7.17%. Testing of this composite indicated an overall weight recovery of 13.75%, copper recovery of 97.44%, silver 95.43% and gold 95.10% to yield a concentrate having 50.92% copper, 19.0 ounces of silver, 1.1 ounce of gold and 8.93% arsenic.

For study purposes, we assumed that the high-grade crude would average 7.00% copper, 0.15 ounces of gold, and 2.75 ounces of silver and that the intermediate grade crude would run 3.25% copper, 0.05 ounces of gold and 2.50 ounces of silver. Arbitrarily assuming a ratio of 20% high-grade to 80% intermediate-grade the average crude to the mill would assay 4.00% copper, 0.07 ounces of gold and 2.55 ounces of silver. Assuming a 10.25% weight recovery, a 92.00% copper recovery, a 60.00% gold recovery and an 82.00% silver recovery as a conservative weighted average of the two tests, the concentrate would assay 35.90% copper, .41 ounces of gold and 20.40 ounces of silver.

Since the El Paso Smelter imposes a penalty for both arsenic and antimony, the Booth Laboratory was requested to furnish these analyses for the study purposes. Their best approximation, based on a limited amount of test work, is approximate assays of 10.10% and 0.75% respectively in the concentrate.

SECTION 4

THE PLANT & RELATED FACILITIES

GENERAL

The former partners in the reactivation of the Summitville Mine had either expended or allocated some $2,545,000 of a planned $4,072,000 budget for the necessary mobile and fixed facilities before terminating their involvement in the venture. Part of these monies went for exploration; mine development; underground mining equipment; a shaft, head frame and hoist house; rehabilitation of office and shop buildings; construction of a tailings basin; acquisition and erection of the shell for the mill building; and purchase of miscellaneous equipment, building materials and supplies--all of which either lend themselves, as is, or can be adapted to, operations by the new partners at a lower level of annual production.

Logically then, the design of the plant and related facilities for beneficiation of the ore was influenced by the material, buildings and equipment on hand rather than by strict adherence to the requirements of a flowsheet developed for minimal expenditure for a 100 or 150 ton mill. The compromise flowsheet developed by Mr. Jay Clitheroe of the Booth Laboratory involves the following equipment and flow of materials (see Exhibit G-1):

(1) Run-of-mine crude produced from the old workings will be trammed from the Reynolds Tunnel to a crude ore pocket where it will be blended with ores hoisted in the Missionary Shaft and hauled by front-end loader to the pocket. A fixed grizzly across the top of the bin will serve to screen out oversize that would plug the feeder.

(2) Crude ore will be drawn from the bin by a hydrostroke feeder and conveyed by the No. 1 conveyor to a vibrating grizzly in the crushing plant.

(3) Plus 3" oversize from the grizzly will be fed through a jaw crusher to the No. 2 belt where the primary crushed product will join the bypassed grizzly fines.

(4) The No. 2 belt will discharge onto a double deck vibrating screen where the ore will be split into two size fractions, i.e., a plus 1/2" coarse fraction that will be conveyed by the No. 3 belt to a cone crusher for secondary crushing; and a minus 1/2" fraction that will be conveyed by the No. 4 and No. 5 belts to the fine ore pocket in the mill.

(5) The oversize from the screen, after secondary crushing, will join the ore from the grizzly and primary crusher for resizing on the vibratory screen--thus effecting a closed circuit for oversize with the gyratory crusher.

(6) Fine ores from the Fine Ore Pocket will be fed by belt feeder (No. 6 conveyor) to the feed end of the ball mill where water, cyanide and lime will be added for wet grinding and primary conditioning.

(7) Slurried ore from the mill will be laundered, in part, directly to a spiral classifier. Part (one-quarter) will be jigged for recovery of free gold prior to discharge into the classifier.

(8) The overflow from the classifier, containing the minus 150 to minus 200 mesh fines will be laundered to the flotation conditioners after sampling while the sands will be raked up by the spiral and flow by gravity to the boot of the ball mill for closed circuit regrind. The free gold that initially bypassed the jig remains in closed circuit and will eventually be recovered by the jig.

(9) The slurried fines, after addition of flotation reagents will flow by gravity to a bank of rougher flotation cells for the first stage of concentration.

(10) The tails from the roughers will flow by gravity to a bank of scavenger cells while the concentrates will be pumped to a bank of cleaner cells.

(11) The concentrates from the scavengers will be returned to the conditioner for recirculation while the tails will flow by gravity (after sampling) to the tailings basin.

(12) Concentrates from the cleaner cells (after sampling) will be pumped to the concentrate thickener for partial dewatering prior to filtration.

(13) The underflow (concentrates) from the thickener will then be pumped to a 3 disc vacuum filter for dewatering to a filter cake having about 18% moisture.

(14) The filtrate will then drop by gravity to an indirect heat dryer for a further reduction in moisture content.

(15) The concentrates at about 5% moisture content will then drop by gravity into a 13½ ton steel box for containerized movement to the smelter.

(16) A flatbed truck will transport the container to the rail head where it will be loaded on either a flat car or gondola for shipment to the smelter. The truck will transport an empty container back to the mill on its return trip.

ARRANGEMENT OF FACILITIES

Exhibit G-2 shows the relationship of the crude ore pocket and crushing plant to the completed concentrator and related facilities. The plot plan also indicates two alternate alignments for the extension of the narrow gauge underground rail system from the Reynolds Adit to the crude ore pocket.

Exhibit G-3 shows by plan and elevation a suggested design for the coarse ore pocket. (This drawing also shows the details for the filtering, drying and container-loading section of the concentrator.)

Exhibit G-4 shows by plan and elevation a suggested design for the crushing plant.

Exhibit G-5 and a portion of Exhibit G-3 show by plan and elevation a suggested design for the concentrator.

It should be noted that the above listed general arrangement drawings are for a 150 ton per day mill that is readily expandable to treat 300 tons of crude per day. That expansion would require only the addition of a rod mill and the doubling of the rougher and scavenger flotation capacity by the addition of conditioners and float cells.

The design shown on the drawings was developed to incorporate the worthwhile suggestions of Messrs. Haley and Bingel of Quad Construction and Messrs. John Ferguson, Senior and John Ferguson, Junior of Ferguson Equipment Company.

SECTION 5

SECTION 5

CAPITAL REQUIREMENTS

GENERAL

In the preceding attempt to reactivate the Summitville Mine, the participants were led to believe that the total capital expenditure required for reactivation would be approximately 1.5 million dollars. Detailed engineering and a more realistic evaluation of costs soon revised this figure upwards to approximately 4.2 million dollars of which a substantial amount was expended prior to termination of the venture.

The new partners were fortunate in acquiring the mobile equipment and all of the installed or constructed fixed facilities, on site, for a total expenditure of only one hundred and fifty thousand dollars but these facilities are inadequate, in themselves, to meet the total requirement for reactivation.

To arrive at the additional capital expenditure required, the consultant deemed it prudent to include sufficient detail on the General Arrangement Drawings for the various facilities to permit development of a realistic approximation of the equipment, supplies and elements of work involved for construction or erection of those facilities. By applying realistic lump sum or unit prices to these quantities, taking into consideration the remoteness of the site and the difficulties attendant to work in high altitudes, the consultant then developed a detailed cost estimate (see Exhibit H) that may be recapitulated as follows:

CAPITAL COST OF FACILITIES

Item	Equip. & Supplies	Labor	Total
1.0 Crude Ore Pocket			
1.1 Site Preparation	$ 500	$ 540	$ 1,040
1.2 Construction of Draw Point & Bin	8,460	16,460	24,920
1.3 Erection of Bin Housing	3,350	2,700	6,050
1.4 Erection of Conveyor Housing	2,645	1,185	3,830
1.5 Installation of Equipment	10,510	5,000	15,510
Total Item 1.0	$ 25,465	$ 25,885	$ 51,350
2.0 Crushing Plant			
2.1 Erection of Structure	$ 12,385	$ 14,180	$ 26,565
2.2 Erection of Conveyor Housing	5,650	2,545	8,195
2.3 Installation of Equipment	83,975	17,530	101,505
Total Item 2.0	$102,010	$ 34,255	$136,265
3.0 Mill			
3.1 Alterations to Existing Building	$ 27,880	$ 25,070	$ 52,950
3.2 Installation of Equipment	87,205	20,090	107,295
Total Item 3.0	$115,085	$ 45,160	$160,245
4.0 External Facilities			
4.1 Power Distribution System	$ 11,880	$ 7,920	$ 19,800
4.2 Water Supply System	10,110	2,210	12,320
4.3 Tailings Disposal System	12,020	4,380	16,400
4.4 Crude Ore Track from Reynolds Adit	7,600	9,095	16,695
4.5 Rail Head Facilities	5,150	450	5,600
4.6 Additional Mobile Equipment	30,425	-	30,425
Total Item 4.0	$ 77,185	$ 24,055	$101,240
Total Items 1.0 thru 4.0	$319,745	$129,355	$449,100
Engineering & Contingencies	31,975	12,925	44,900
Total Capital - New Facilities	$351,720	$142,280	$494,000
Acquisition of Exist. Equip.	150,000	-	150,000
Grand Total Capital Expend.	$501,720	$142,280	$644,000

The above costs comprehend acquisition and installation of those items of used equipment designated as being available by Quad Construction and the Ferguson Equipment Company with the single exception of the dryer. Acquisition costs of the used equipment are those quoted and agreed upon during the various discussions.

SECTION 6

SECTION 6

REVENUES, COSTS, EARNINGS & CASH FLOW

GENERAL

For discussion purposes, the "Revenue, Costs and Earnings" Statement for the proposed mining and milling operation is here reproduced in reduced form. A full scale copy of this statement, marked Exhibit J, is also bound in the Exhibit Section of this report.

ITEM		PREPRODUCTION					PRODUCTION AFTER DECEMBER 31, 1970					
		AUG 1970	SEPT 1970	OCT 1970	NOV 1970	DEC 1970	AV. MONTH	1971	1972	1973	1974	1975
PRODUCTION DATA:												
Average Crude to Plt. or S.P.:	Nat. Tons	878	541	972	576	953	3,160	41,920	40,270	37,920	37,920	37,920
	Dry Tons	773	476	855	507	839	2,781	36,890	35,438	33,370	33,370	33,370
	% Copper	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	Oz. Gold	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
	Oz. Silver	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
Stockpile as of End of Period:	Nat. Tons	3,308	3,849	4,821	5,397	6,350	-	2,350	-	-	-	-
	Mine Value (34.39)	$113,762	$132,367	$165,794	$185,603	$218,377						
Plant Concentrates:	Nat. Tons						300	3,980	3,823	3,600	3,600	3,600
	Dry Tons						285	3,781	3,632	3,420	3,420	3,420
	% Copper						35.90	35.90	35.90	35.90	35.90	35.90
	Oz. Gold						0.41	0.41	0.41	0.41	0.41	0.41
	Oz. Silver						20.40	20.40	20.40	20.40	20.40	20.40
REVENUE:												
Gross Revenue at Smelter							136,900	1,816,203	1,744,631	1,642,797	1,642,797	1,642,797
Charges & Penalties							24,761	328,493	315,548	297,130	297,130	297,130
Net Revenue at Smelter							112,139	1,487,710	1,429,083	1,345,667	1,345,667	1,345,667
Transportation - Mine to Smelter							3,477	46,128	44,309	41,724	41,724	41,724
Net Smelter Return, F.O.B. Railhead							108,662	1,441,582	1,384,774	1,303,943	1,303,943	1,303,943
COSTS:												
Labor	- Wage Payroll	14,000	15,494	16,313	13,047	20,386	20,958	251,496	251,496	251,496	251,496	251,496
	- Salaried Payroll	3,600	4,350	4,730	5,000	5,500	5,500	66,000	66,000	66,000	66,000	66,000
	- Fringe Benefits & Overtime	5,280	5,955	6,244	5,426	7,766	7,937	95,244	95,244	95,244	95,244	95,244
General Expense	- Supplies	12,451	12,798	15,062	13,661	17,952	21,880	264,160	263,500	262,560	262,560	262,560
	- Royalties	-	-	-	-	-	5,607	74,586	71,454	67,283	67,283	67,283
	- Purchase Payments	-	-	2,500	-	-	833	10,000	10,000	10,000	10,000	10,000
	- Depreciation	-	-	-	-	-	10,024	123,867	121,906	118,551	118,551	118,551
	- Interest	-	-	-	-	-	4,160	103,350	67,600	46,800	26,000	5,850
Local Taxes	- Personal Property & Mining Tax	-	-	-	-	-	617	7,404	7,404	7,404	7,404	7,404
Total Cost Before Colorado Corporate Tax		35,331	38,597	44,619	37,134	51,604	77,516	995,907	954,604	925,338	904,538	884,388
EARNINGS:												
Total Earnings Before Colorado Corporate Tax			-	-	-	-	31,146	445,675	430,170	378,605	399,405	419,555
Depletion Allowance					-	-	-	211,999	203,644	189,302	191,758	191,758
Taxable Income		-	-	-	-	-	-	233,676	226,526	189,303	207,647	227,797
Colorado Corporate Tax		-	-	-	-	-	-	11,684	11,326	9,465	10,382	11,390
Total Earnings After Colorado Corporate Tax			-	-	-	-	-	433,991	418,844	369,140	389,023	408,165
CASH FLOW:												
Total Earnings After Colorado Corporate Tax		-	-	-	-	-	-	433,991	418,844	369,140	389,023	408,165
Depreciation		-	-	-	-	-	-	123,867	121,906	118,551	118,551	118,551
Gross Cash Flow		-	-	-	-	-	-	557,858	540,750	487,691	507,574	526,716
Debt Repayment		-	-	-	-	-	-	65,000	260,000	260,000	260,000	195,000
Net Cash Flow		-	-	-	-	-	-	492,858	280,750	227,691	247,574	331,716
Accumulative Net Cash Flow		-	-	-	-	-	-	492,858	773,608	1,001,299	1,248,873	1,580,589

The figures shown thereon are deemed to be neither ultraconservative nor overly optimistic and were developed as follows:

Ore Production Data

Crude and concentrate tonnages and analyses were developed by the projections and techniques described in Section 3 of this report.

Revenue

Smelter discounts of market value, charges for reduction, and penalties for contaminants were calculated from rates submitted by Mr. Reed F. Welch of the American Smelting and Refining Company on June 8, 1970 for the AS&R smelter in El Paso, Texas.

Transportation

The charges shown are based on rail transportation of concentrate, in canisters, from the rail head to the smelter by flatcar or gondola. The rate used comprehended the shipment of the concentrate plus round-trip movement of the canisters. (The cost of transporting full canisters from the mine to the rail head and returning the empty canisters is included with "Labor & Supplies" in the "Cost" columns of the statement.)

Costs

All costs shown are the result of a detailed analysis and development of each incremental item of cost as follows:

Labor - Manpower schedules developed for production purposes by tasks as described in Section 3 of this report were related to incentive, hourly wage and monthly salary schedules to arrive at the cost of labor. Fringe benefits and an allowance for overtime pay were recognized by an overall 30% increase in the indicated labor costs (see Exhibit I).

Supplies and General Expense - The figures shown recognize the costs of bits and drill steel, explosives and primers, timber, rail, duct work, piping, balls, liners, screen cloth, reagents, electricity, natural gas, fuels, lubricants, small tools, spare parts, office and laboratory expense, vehicle and trailer rental, and miscellaneous expense. These figures were either based on or projected from detailed records kept by the mine manager and his underground foreman at Summitville (see Exhibit I).

Royalties and Purchase Payments - As per the stipulations of the mineral lease of the property.

Depreciation - Based on a ten year straight line depreciation of the anticipated total capital requirement as described in Section 5 of this report plus amortization of preproduction expense on a tonnage basis for the first five years of production. For example, the allowable depreciation for the year 1972 would be:

Depreciation of Capital		
Total Capital Requirement/Ten Years		
= $644,000/10 =		$ 64,400/Year
Amortization of Preproduction Expense		
Total Expense to Aug. 1, 1970	= $ 75,000	
Antic.Exp. from Aug. 1 thru Dec. 31	= 204,831	
Total Preproduction Expense	= $279,831	
Total Prepro.Exp./Antic.Total 5 Year Prod.		
= $279,831/18,603 = $15.042/ton		
Allowable Amortization for 1972		
= Annual Tons Conc. x Allow. Rate		
= 3,823 tons x $15.042 =		$ 57,506
Allowable Depreciation for 1972 =		$121,906

Interest - Based on a short term loan for construction expense plus working capital at an 8% interest rate. Assumes repayment in forty-eight equal monthly installments commencing one year after vesting of the loan.

Working Capital		
(Aug. 1 '70 through June '71)	=	$ 542,481
Construction plus Mobile Equip.	=	494,000
Total	=	$1,036,481
Use	=	$1,040,000

Taxes - The State of Colorado requires payment of a General Property Tax and a Mine Tax based on the assessed value of personal property and the mineral claims plus a Corporate Income Tax of five percent of Colorado Earnings before Federal Income Tax.

The above statement was developed on the premise that the operation of the Summitville Mine would be by a Cost Corporation with the earnings and cash flow accruing therefrom being divided among the participating partners prior to payment of Federal Income Taxes.

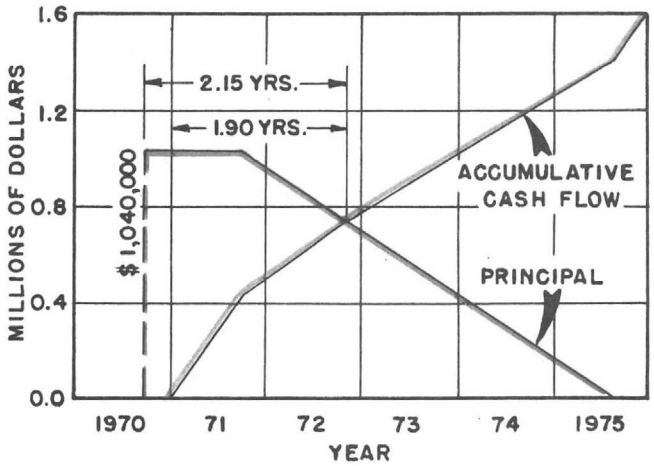
SECTION 7

SECTION 7

SUMMARY & CONCLUSIONS

A critical but unbiased "look" at the results of this study indicates that reactivation of the Summitville Mine at a nominal 100 ton per day underground production level should result in a substantial return to the participants in spite of the indicated low productivity rate per man-shift and the disappointingly high capital cost of the required facilities. Conceivably this cost might be reduced somewhat by modifying the mill design to the bare minimum required for a 100 ton per day non-expansible facility. This means sizing the grizzlys, crushers, screens and belts to the 100 ton per day capacity; and rearranging the smaller units to take full advantage of the existing structures. A small saving could also result by reducing the capacity of the coarse ore bin and eliminating the track connection to the Reynolds Adit (feed the mill by front-end loader from stockpile).

However, we strongly recommend against these measures. There is no reason to believe that the mine, with further exploration and development, <u>will not</u> be able to reach and sustain a 300 ton per day operation. Obviously operations at this level, requiring only a nominal capital expenditure to double the capacity of the facility, would yield substantially increased profits to the participants.



Further, in spite of magnitude of the bank loan necessary to provide capital money for improvements plus working capital for operations ($1,040,000) the loan will be amortized within five years and, as is evidenced by this chart, could well be paid up in its entirety 2.15 years after the money is vested

to the participants' account or 1.90 years after the start of production (assumed to be on or about January 1, 1971). In addition, the loan might be secured in part by the value of ore in stockpile (anticipated to be over $200,000 by the end of the year), the value of the mill and related facilities (almost $700,000 by the end of the year), and the preproduction expense of mine exploration and development (over $280,000 that will be recoverable as depreciation on future production). This is all in addition to the inherent value of the minerals in the ground--a value impossible to assess at this time.

We've been extremely conservative in our estimates of productivity and operating costs; thorough in our determination of capital expenditure; and---trusting in our belief that crude ores in the volume and of the quality that we predict can be mined continuously for five years or more. We've made no estimate of reserve tonnages, but others with more knowledge than ours of the formation and the mine claim that there is 70,000 tons of quality ore in sight as of this moment--slightly less than two years production at the anticipated rates. For an underground operation this should be adequate for, in ground of this potential, it can be assumed that continued development and exploration work will maintain this two year tonnage in reserve for some years to come.

All things considered, we believe this to be a profitable venture.

AS&A
August 1970
Duluth, Minnesota

SECTION 8

INDEX TO EXHIBITS

A. Property Map - Summitville Claims

B. Surface Map - Summitville Mine

C. Missionary Vein Sub Level Maps

D. Geological Cross Sections of the Missionary Vein

E. Longitudinal Cross Section of Annie Vein

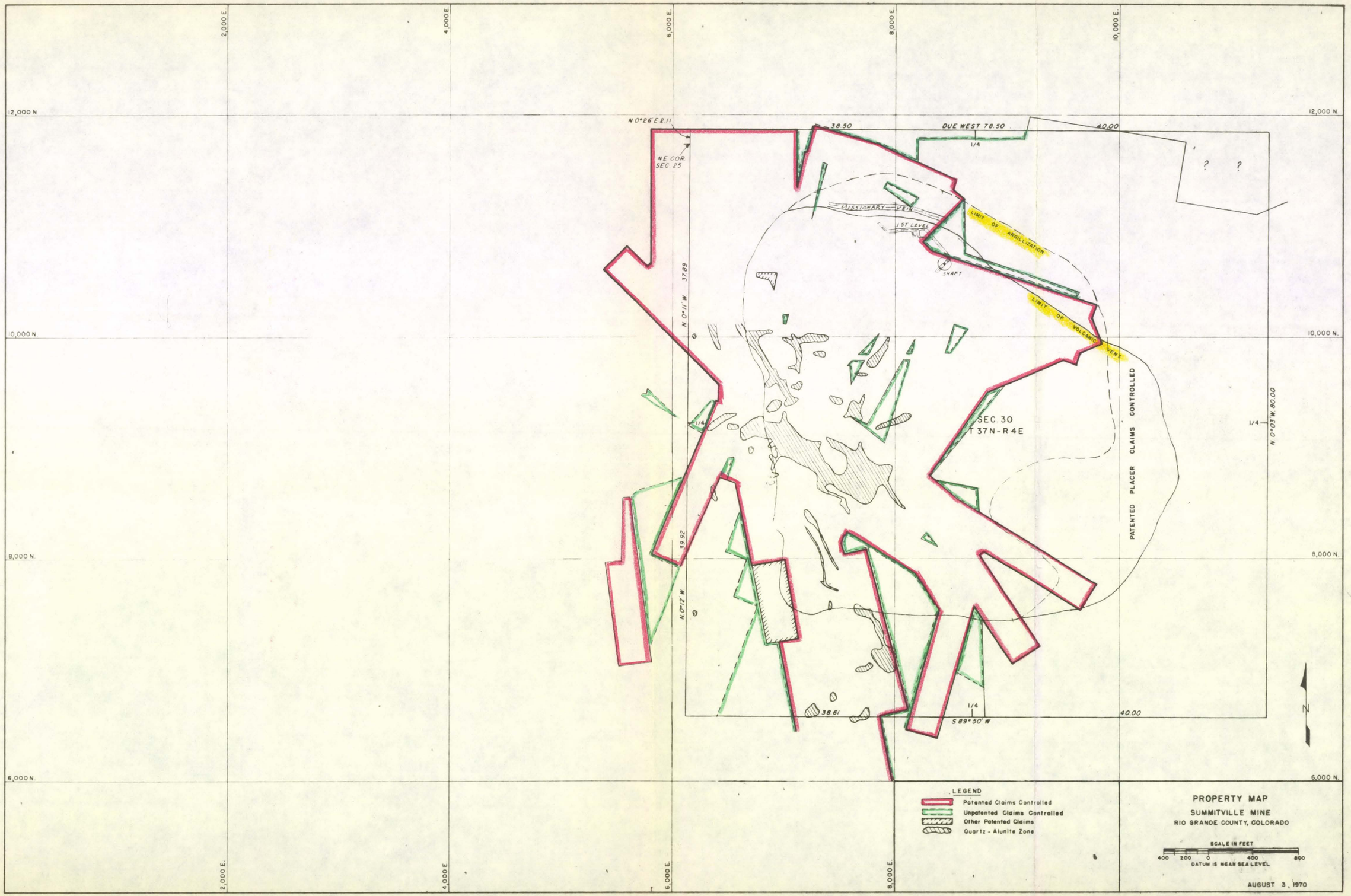
F. Manpower & Production Schedules

G. Flow Sheet & General Arrangement Drawings

H. Estimate of Capital Requirements

I. Operating Cost Estimate - Labor & Supplies

J. Revenues, Costs and Earnings Statement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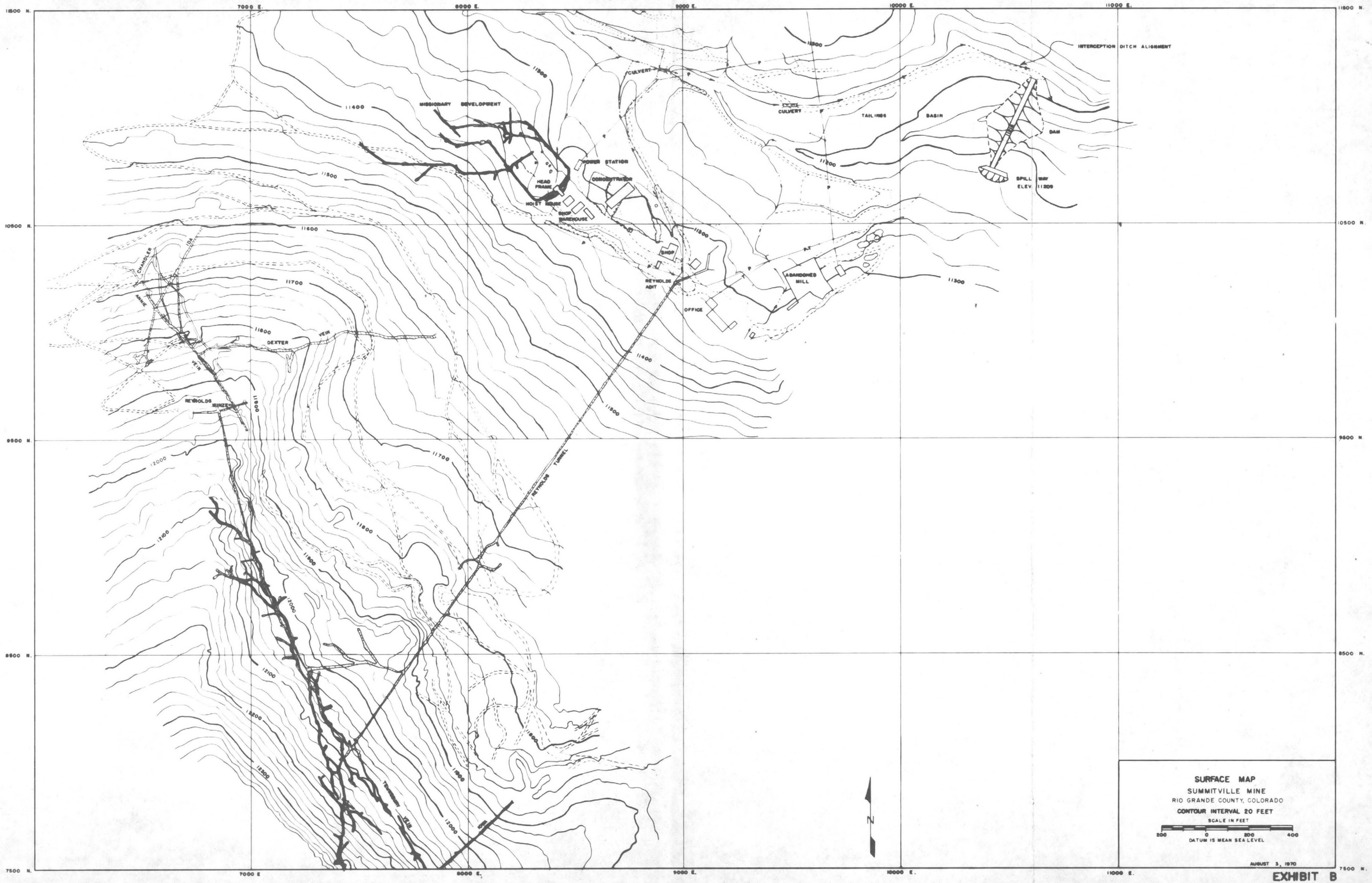
LEGEND
Patented Claims Controlled
Unpatented Claims Controlled
Other Patented Claims
Quartz - Alunite Zone
PROPERTY MAP
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
SCALE IN FEET
400 200 0 400 800
DATUM IS MEAN SEA LEVEL
AUGUST 3, 1970

EXHIBIT A


SURFACE MAP
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
CONTOUR INTERVAL 20 FEET
SCALE IN FEET
200 0 200 400
DATUM IS MEAN SEA LEVEL
AUGUST 3, 1970
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MISSIONARY DEVELOPMENT
CULVERT
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DAM
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POWER STATION
COMPRESSOR
HEAD FRAME
HOIST HOUSE
SHOP
WAREHOUSE
SHOP
REYNOLDS ADIT
OFFICE
ABANDONED MILL
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ADIT
MINE
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REYNOLDS MINE
REYNOLDS TUNNEL
TRIBUTARY VEIN
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EXHIBIT B

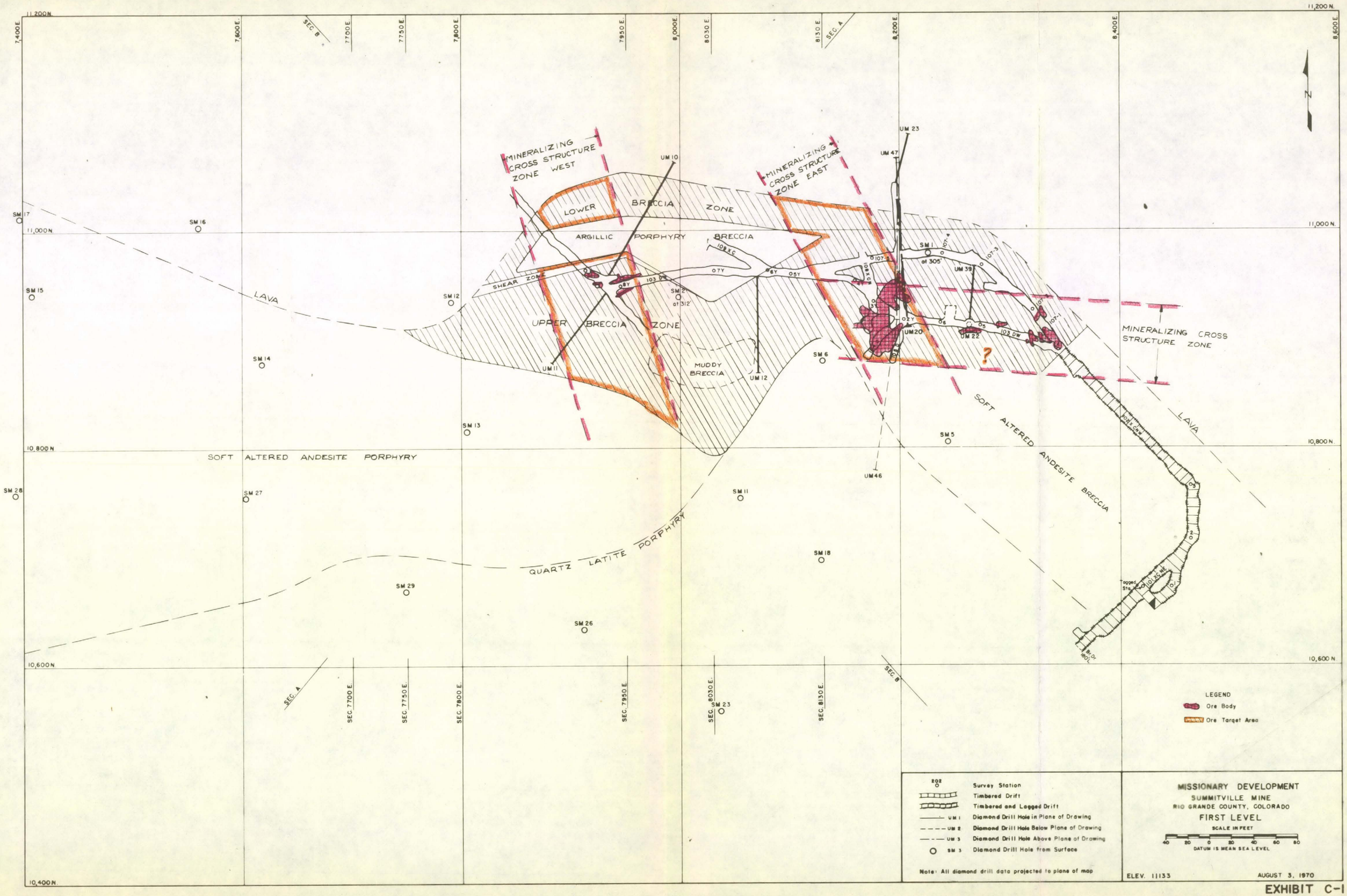

MINERALIZING CROSS STRUCTURE ZONE WEST
MINERALIZING CROSS STRUCTURE ZONE EAST
LOWER BRECCIA ZONE
ARGILLIC PORPHYRY BRECCIA
SHEAR ZONE
UPPER BRECCIA ZONE
MUDDY BRECCIA
LAVA
SOFT ALTERED ANDESITE PORPHYRY
QUARTZ LATITE PORPHYRY
SOFT ALTERED ANDESITE BRECCIA
MINERALIZING CROSS STRUCTURE ZONE
UM 10
UM 11
UM 12
UM 20
UM 22
UM 23
UM 39
UM 46
UM 47
SM 1
SM 2
SM 5
SM 6
SM 11
SM 12
SM 13
SM 14
SM 15
SM 16
SM 17
SM 18
SM 23
SM 26
SM 27
SM 28
SM 29
SEC. A
SEC. B
SEC. 7700 E.
SEC. 7750 E.
SEC. 7800 E.
SEC. 7950 E.
SEC. 8030 E.
SEC. 8130 E.
7,400 E.
7,600 E.
7,700 E.
7,750 E.
7,800 E.
7,950 E.
8,000 E.
8,030 E.
8,130 E.
8,200 E.
8,400 E.
8,600 E.
11,200 N.
11,000 N.
10,800 N.
10,600 N.
10,400 N.
N
LEGEND
Ore Body
Ore Target Area
Survey Station
Timbered Drift
Timbered and Lagged Drift
UM 1 Diamond Drill Hole in Plane of Drawing
UM 2 Diamond Drill Hole Below Plane of Drawing
UM 3 Diamond Drill Hole Above Plane of Drawing
SM 3 Diamond Drill Hole from Surface
Note: All diamond drill data projected to plane of map
MISSIONARY DEVELOPMENT
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
FIRST LEVEL
SCALE IN FEET
40 20 0 20 40 60 80
DATUM IS MEAN SEA LEVEL
ELEV. 11133
AUGUST 3, 1970

EXHIBIT C-1

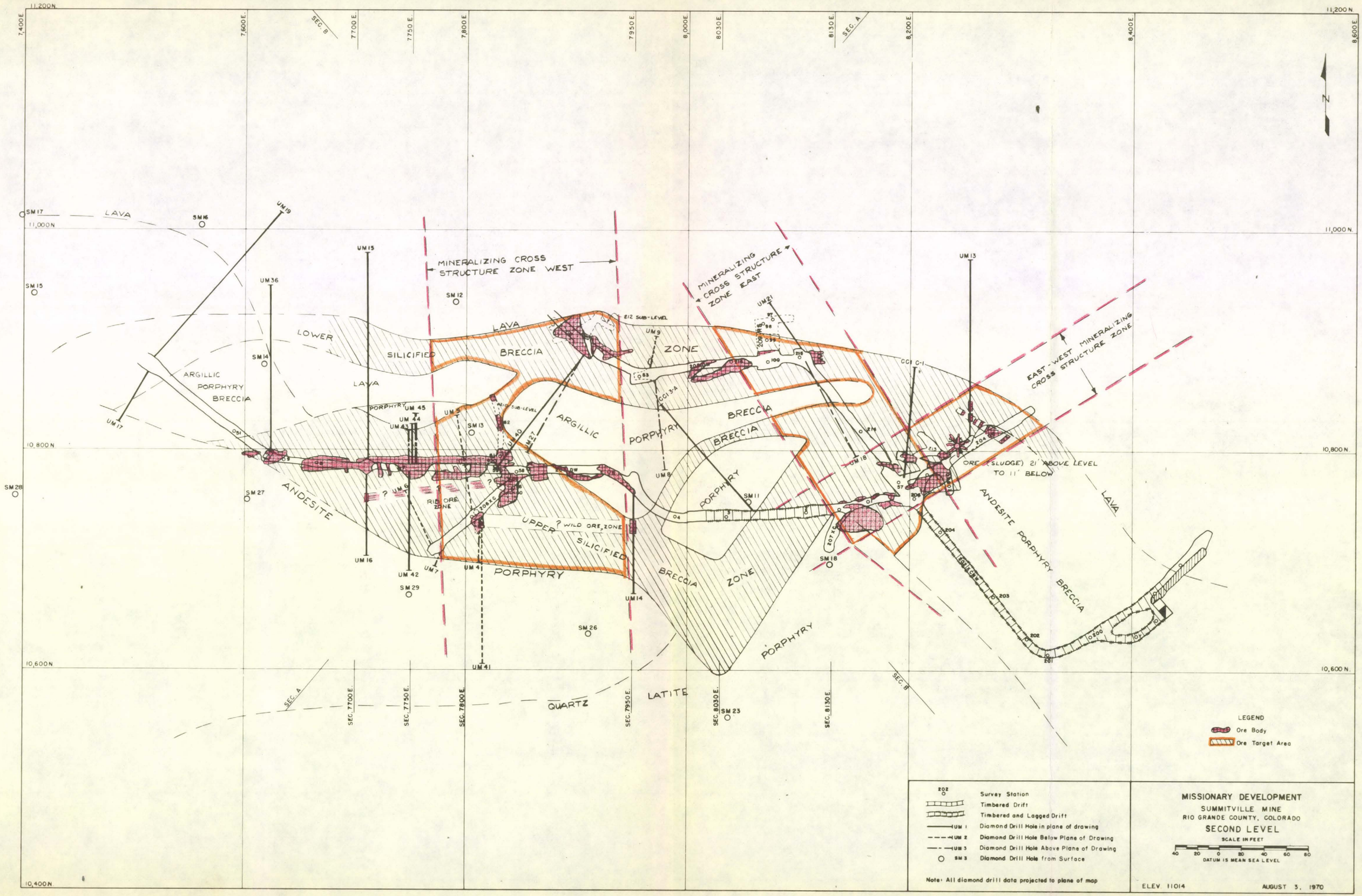

MINERALIZING CROSS STRUCTURE ZONE WEST
MINERALIZING CROSS STRUCTURE ZONE EAST
EAST - WEST MINERALIZING CROSS STRUCTURE ZONE
LAVA
LOWER LAVA
SILICIFIED BRECCIA ZONE
ARGILLIC PORPHYRY BRECCIA
ANDESITE
UPPER SILICIFIED PORPHYRY BRECCIA ZONE
QUARTZ LATITE PORPHYRY
ANDESITE PORPHYRY BRECCIA
ORE (SLUDGE) 21' ABOVE LEVEL TO 11' BELOW
212 SUB-LEVEL
RIB ORE ZONE
? WILD ORE ZONE
SEC. A
SEC. B
SEC. 7700 E.
SEC. 7750 E.
SEC. 7800 E.
SEC. 7950 E.
SEC. 8030 E.
SEC. 8130 E.
11,200 N
11,000 N.
10,800 N.
10,600 N.
10,400 N
7,400 E
7,600 E
7,700 E
7,750 E
7,800 E
7,950 E
8,000 E
8,030 E
8,130 E
8,200 E
8,400 E
8,600 E
LEGEND
Ore Body
Ore Target Area
Survey Station
Timbered Drift
Timbered and Lagged Drift
Diamond Drill Hole in plane of drawing
Diamond Drill Hole Below Plane of Drawing
Diamond Drill Hole Above Plane of Drawing
Diamond Drill Hole from Surface
Note: All diamond drill data projected to plane of map
MISSIONARY DEVELOPMENT
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
SECOND LEVEL
SCALE IN FEET
DATUM IS MEAN SEA LEVEL
ELEV. 11014
AUGUST 3, 1970

EXHIBIT C-2

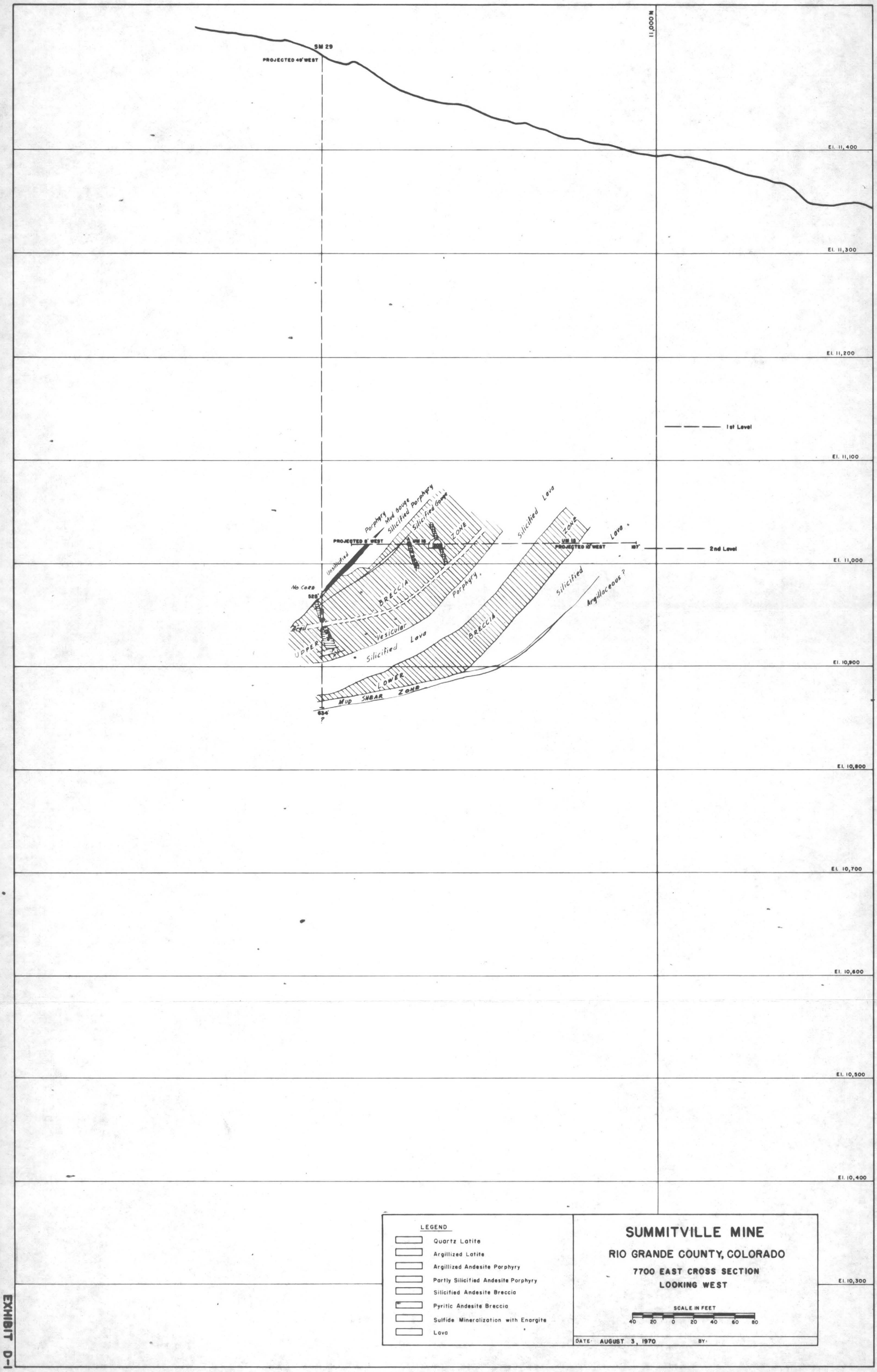

11,000' N
SM 29
PROJECTED 49' WEST
El. 11,400
El. 11,300
El. 11,200
1st Level
El. 11,100
Porphyry
Mud Gouge
Silicified Porphyry
Silicified Gouge
ZONE
Silicified Lava
ZONE
Lava
PROJECTED 8' WEST
UM 18
UM 18
PROJECTED 10' WEST
187'
2nd Level
El. 11,000
Unsilicified
No Core
528'
BRECCIA
Porphyry.
Argillaceous ?
Silicified
Argil
UPPER
Vesicular
Silicified Lava
BRECCIA
El. 10,900
LOWER
MUD SHEAR ZONE
634'
?
El. 10,800
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
7700 EAST CROSS SECTION
LOOKING WEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE: AUGUST 3, 1970
BY:

EXHIBIT D-1

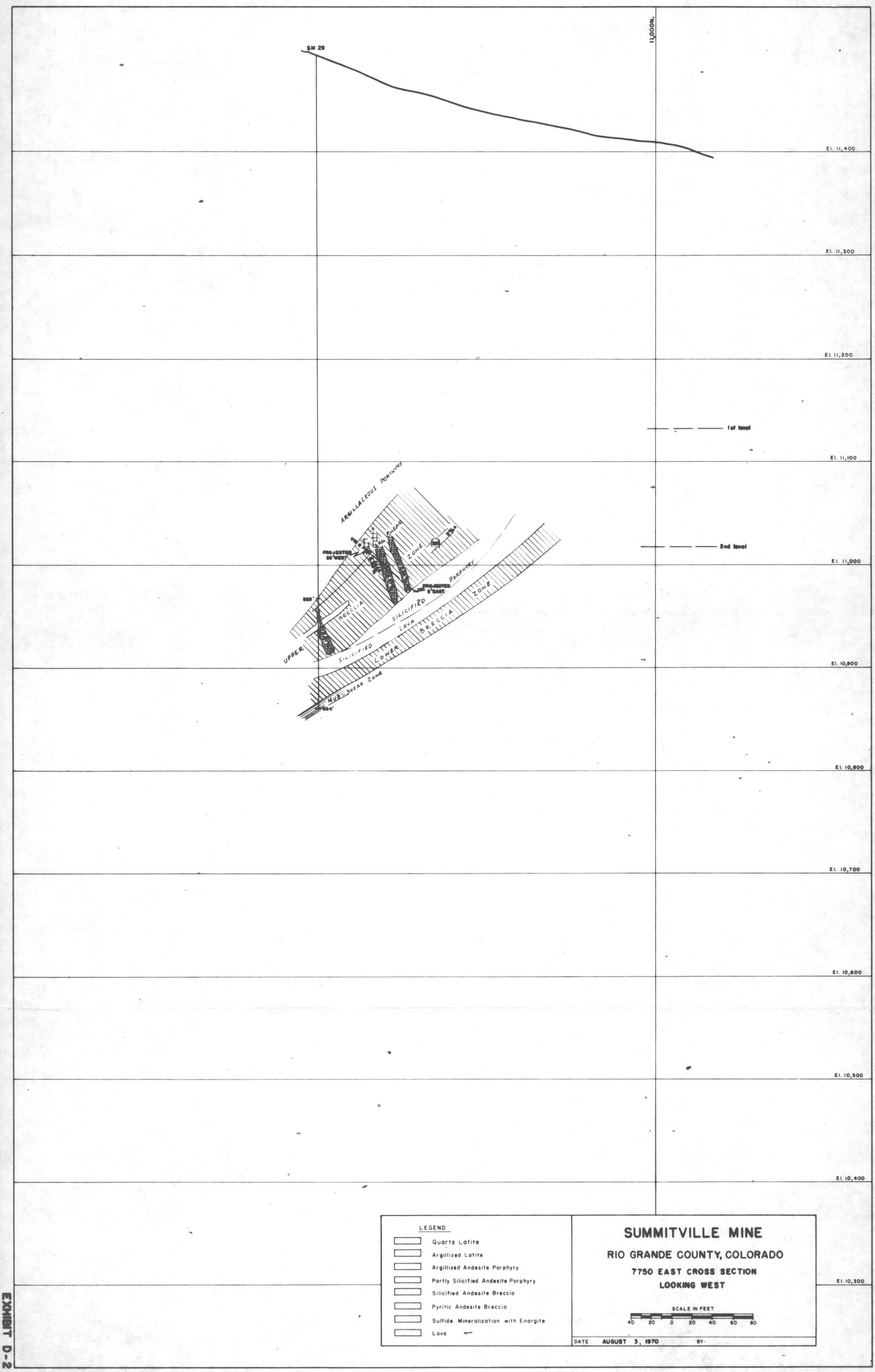

SM 29
11,000'N.
El. 11,400
El. 11,300
El. 11,200
1st level
El. 11,100
ARGILLACEOUS PORPHYRY
SHEAR
ZONE
PROJECTED 20' WEST
2nd level
El. 11,000
PROJECTED 0' EAST
PORPHYRY
ZONE
BRECCIA
SILICIFIED
LAVA
BRECCIA
UPPER
SILICIFIED
LOWER
El. 10,900
MUD SHEAR ZONE
El. 10,800
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
7750 EAST CROSS SECTION
LOOKING WEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE AUGUST 3, 1970
BY:

EXHIBIT D-2

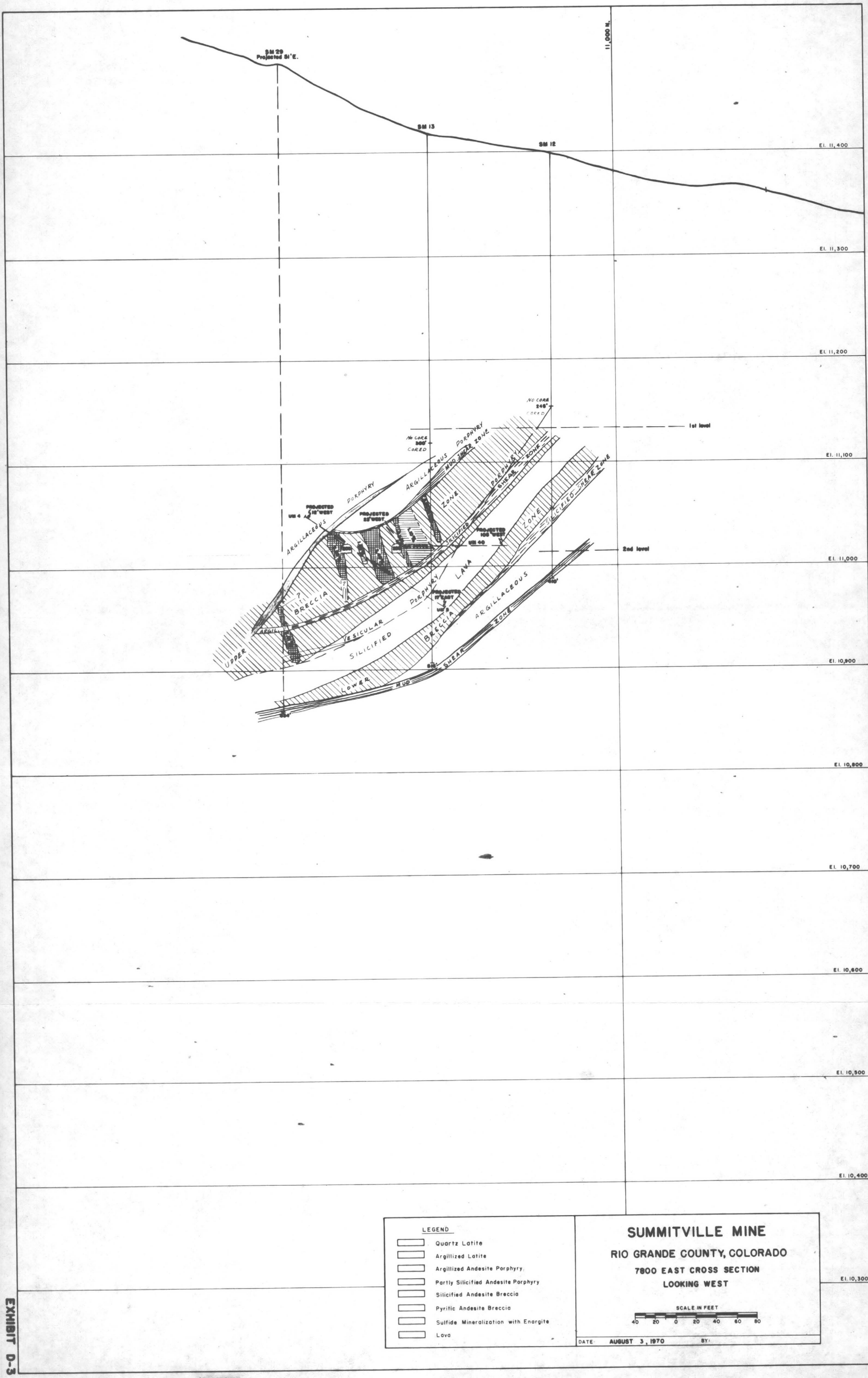

SM 29
Projected 51'E.
SM 13
SM 12
11,000 N.
El. 11,400
El. 11,300
El. 11,200
El. 11,100
El. 11,000
El. 10,900
El. 10,800
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
1st level
2nd level
NO CORE
248'
CORED
NO CORE
300'
CORED
PORPHYRY
ARGILLACEOUS
MUD SHEAR ZONE
PORPHYRY
SHEAR
ZONE
SILICIFIED SHEAR ZONE
ZONE
UM 4
PROJECTED
10' WEST
PROJECTED
25' WEST
PROJECTED
100' WEST
UM 40
ARGILLACEOUS
BRECCIA
UPPER
ARGIL.
VESICULAR
SILICIFIED
PORPHYRY
LAVA
PROJECTED
17' EAST
UM 8
BRECCIA
ARGILLACEOUS
ZONE
LOWER
MUD
SHEAR
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
7800 EAST CROSS SECTION
LOOKING WEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE: AUGUST 3, 1970
BY:

EXHIBIT D-3

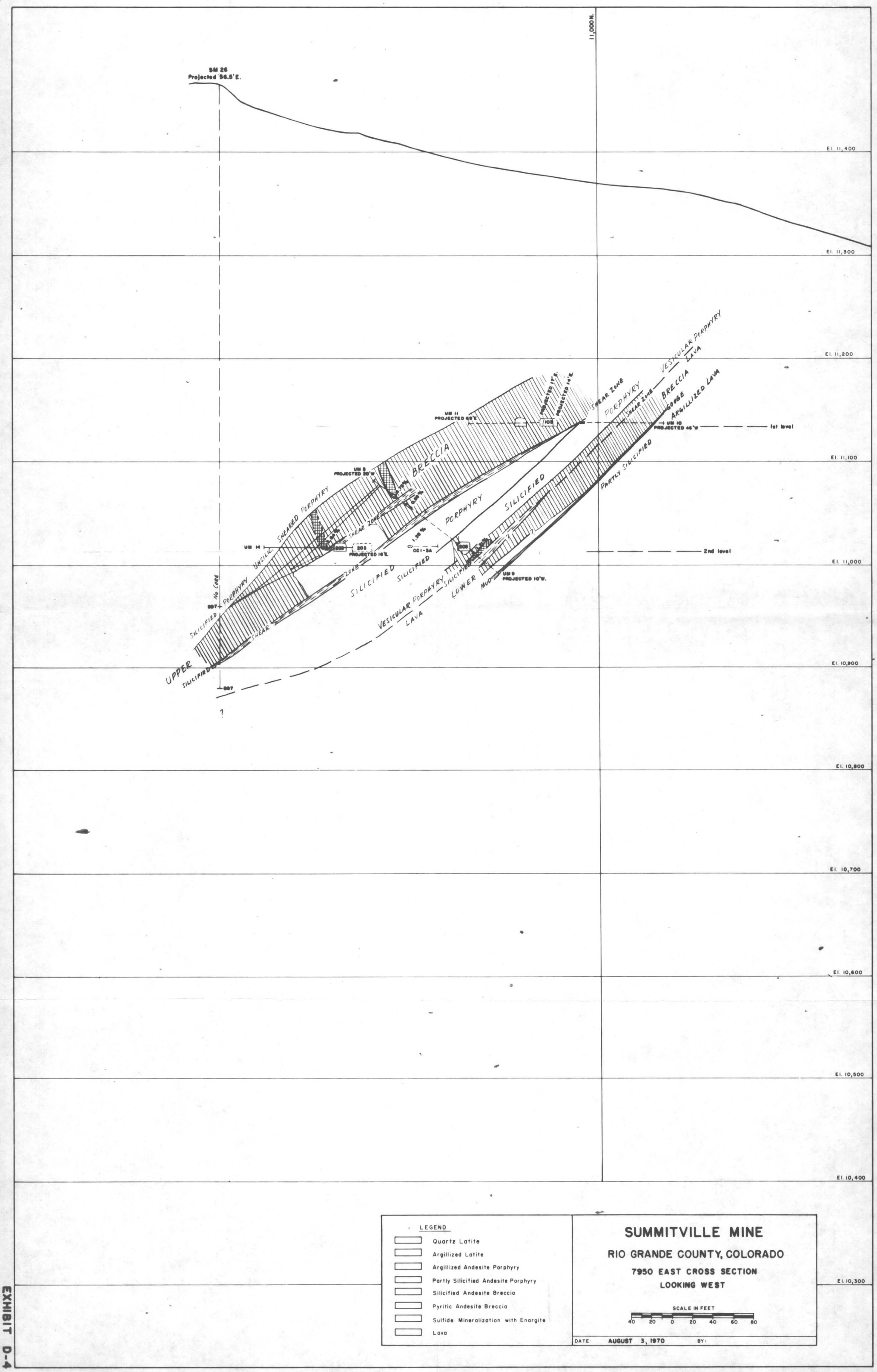

11,000 N.
SM 26
Projected 56.5' E.
El. 11,400
El. 11,300
El. 11,200
El. 11,100
El. 11,000
El. 10,900
El. 10,800
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
VESICULAR PORPHYRY
LAVA
SHEAR ZONE
PORPHYRY
SHEAR ZONE
BRECCIA
GOUGE
ARGILLIZED LAVA
PARTLY SILICIFIED
UM 11
PROJECTED 60'E
PROJECTED 17'E
PROJECTED 14'E
105
UM 10
PROJECTED 46'W
1st level
UM 8
PROJECTED 20'W
BRECCIA
SHEARED PORPHYRY
UNSILC
SHEAR ZONE
UM 14
202
203
PROJECTED 16'E
CC1-3A
1.28%
PORPHYRY
SILICIFIED
SILICIFIED
SILICIFIED
SILICIFIED
ZONE
2nd level
UM 9
PROJECTED 10'W.
MUD
VESICULAR PORPHYRY
LAVA
LOWER
UPPER
SILICIFIED
SILICIFIED
PORPHYRY
No Core
SHEAR
207
207
?
?
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
7950 EAST CROSS SECTION
LOOKING WEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE AUGUST 3, 1970 BY:

EXHIBIT D-4

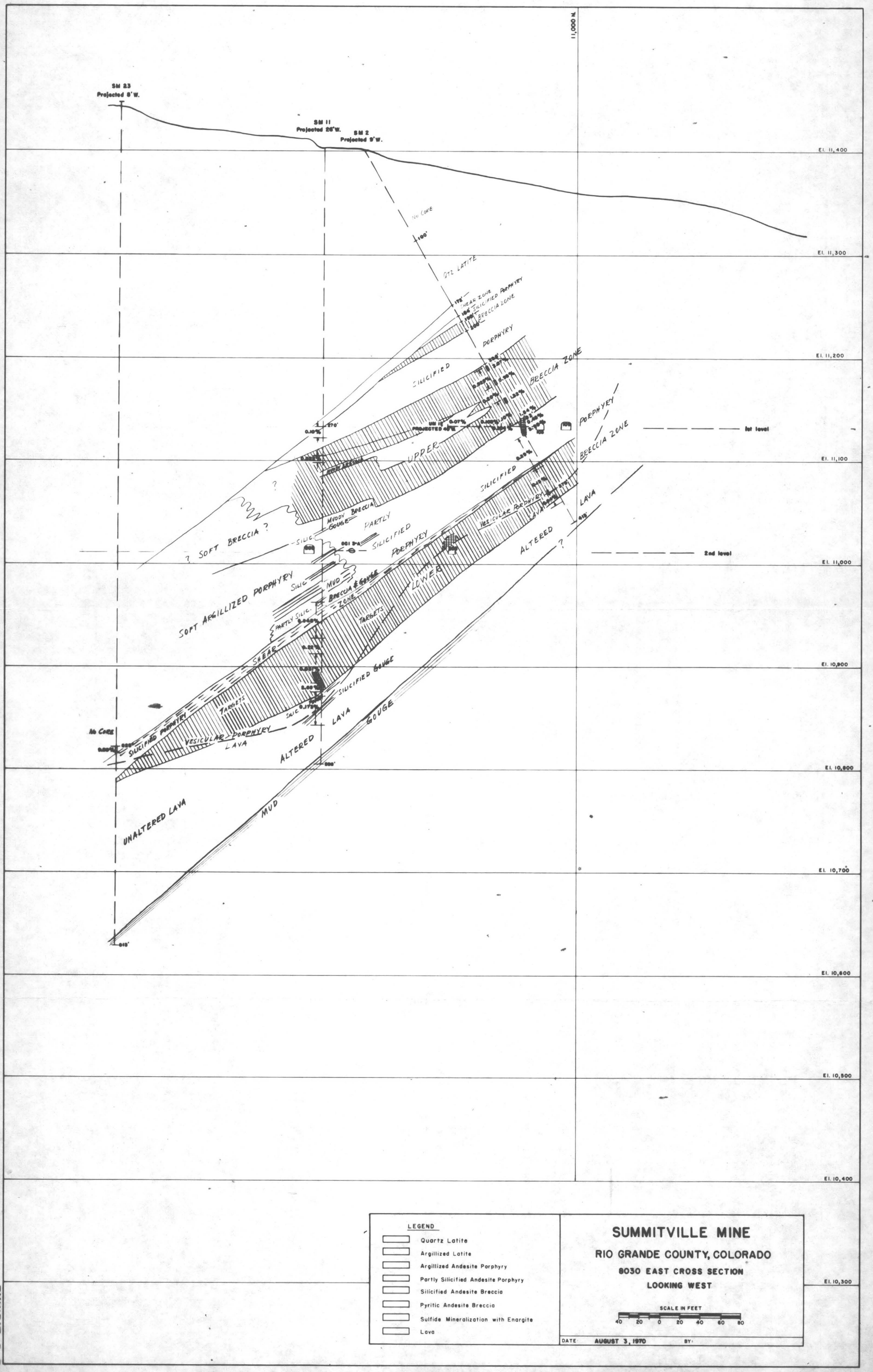

SM 23
Projected 8' W.
SM 11
Projected 26' W.
SM 2
Projected 9' W.
11,000 N
El. 11,400
El. 11,300
El. 11,200
El. 11,100
El. 11,000
El. 10,900
El. 10,800
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
1st level
2nd level
NO CORE
QTZ LATITE
SHEAR ZONE
SILICIFIED PORPHYRY
BRECCIA ZONE
PORPHYRY
SILICIFIED
BRECCIA ZONE
UPPER
PORPHYRY
BRECCIA ZONE
SILICIFIED
VESICULAR PORPHYRY
LAVA
ALTERED
LAVA
SOFT BRECCIA ?
MUDDY BRECCIA
GOUGE
PARTLY
SILICIFIED
PORPHYRY
SOFT ARGILLIZED PORPHYRY
SILIC
MUD
BRECCIA & GOUGE
ZONE
LOWER
TARGETS
PARTLY SILIC.
SHEAR
SILICIFIED GOUGE
TARGETS
SILICIFIED PORPHYRY
VESICULAR PORPHYRY
LAVA
ALTERED
LAVA
GOUGE
NO CORE
UNALTERED LAVA
MUD
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
8030 EAST CROSS SECTION
LOOKING WEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE: AUGUST 3, 1970
BY:

EXHIBIT D-5

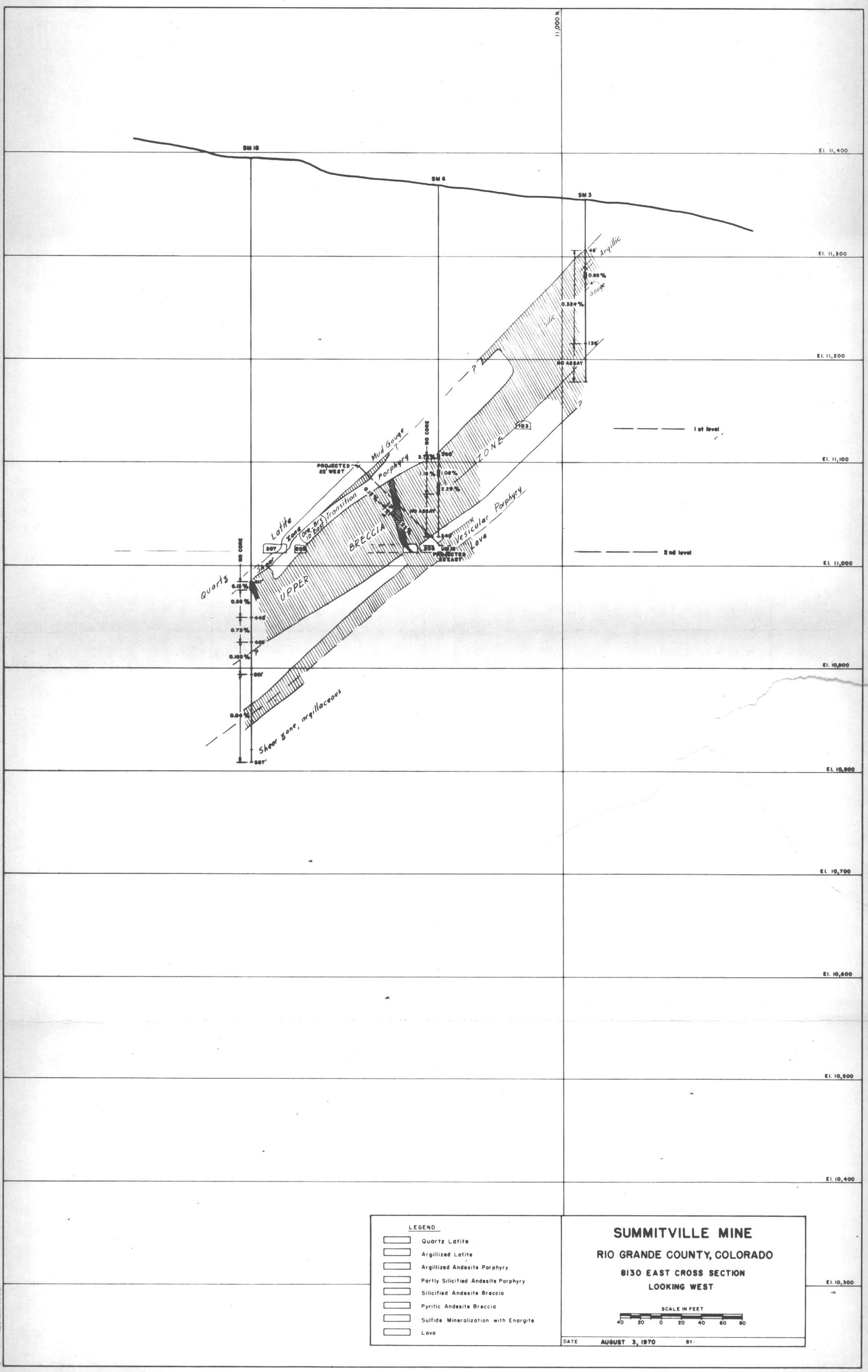

11,000 N.
SM 18
SM 6
SM 3
El. 11,400
El. 11,300
El. 11,200
El. 11,100
El. 11,000
El. 10,900
El. 10,800
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
Argillic
Silic
Gouge
0.85 %
0.324 %
NO ASSAY
1 st level
2 nd level
Mud Gouge
Porphyry
Transition
Latite
Zone
Ore-Br. to East
PROJECTED 22' WEST
BRECCIA
UPPER
ZONE
Vesicular Porphyry
Lava
PROJECTED 22' EAST
NO CORE
Quartz
Shear Zone, argillaceous
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
8130 EAST CROSS SECTION
LOOKING WEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE AUGUST 3, 1970
BY:

EXHIBIT D-6

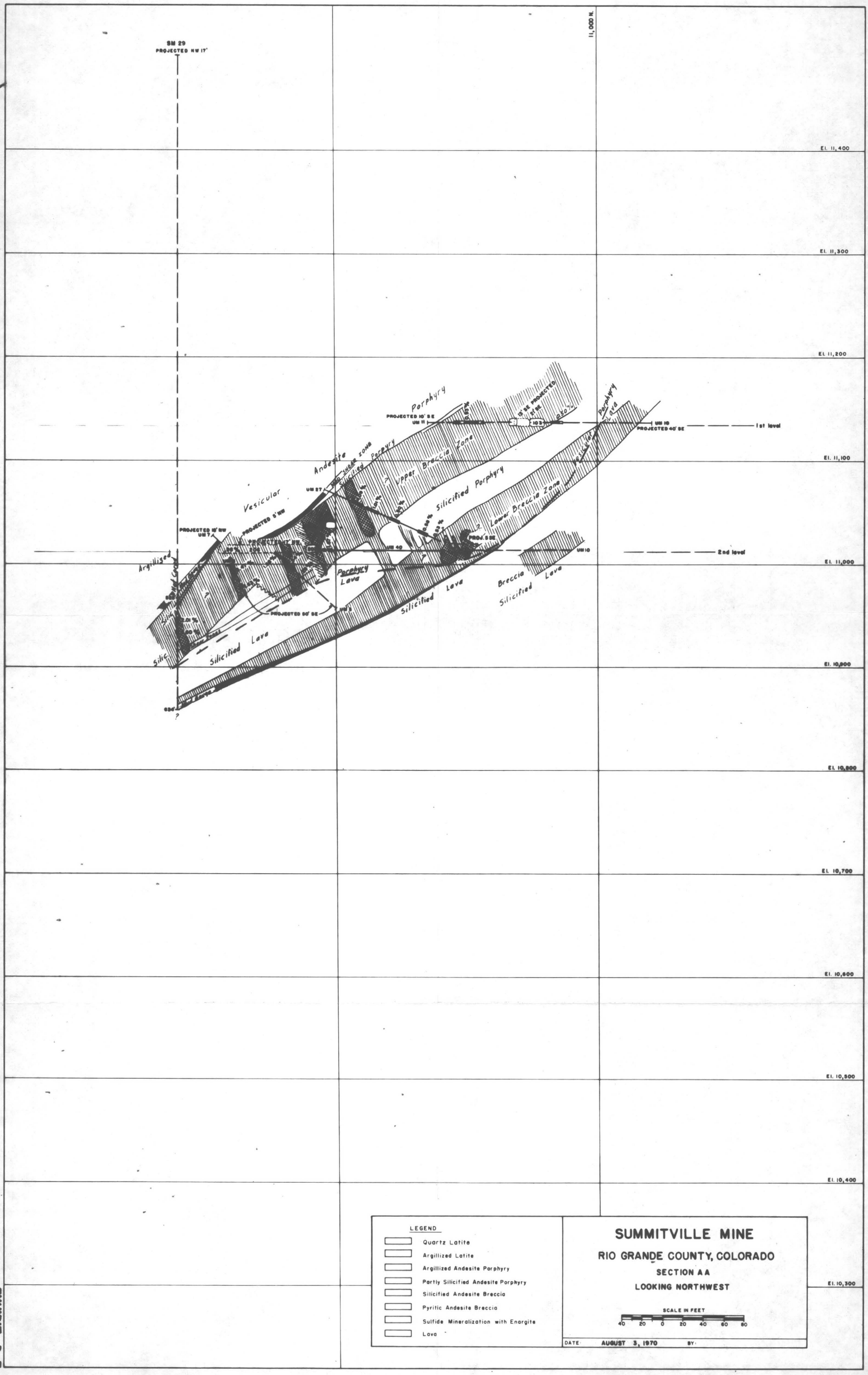

SM 29
PROJECTED NW 17'
11,000 N.
El. 11,400
El. 11,300
El. 11,200
El. 11,100
El. 11,000
El. 10,900
El. 10,800
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
1st level
2nd level
Porphyry
Andesite
Silicified Porphyry
Upper Breccia Zone
Vesicular
Silicified Porphyry
Lower Breccia Zone
Porphyry Lava
Argillized
Silicified Lava
Breccia
Silicified Lava
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
SECTION AA
LOOKING NORTHWEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE: AUGUST 3, 1970
BY:

EXHIBIT D-7

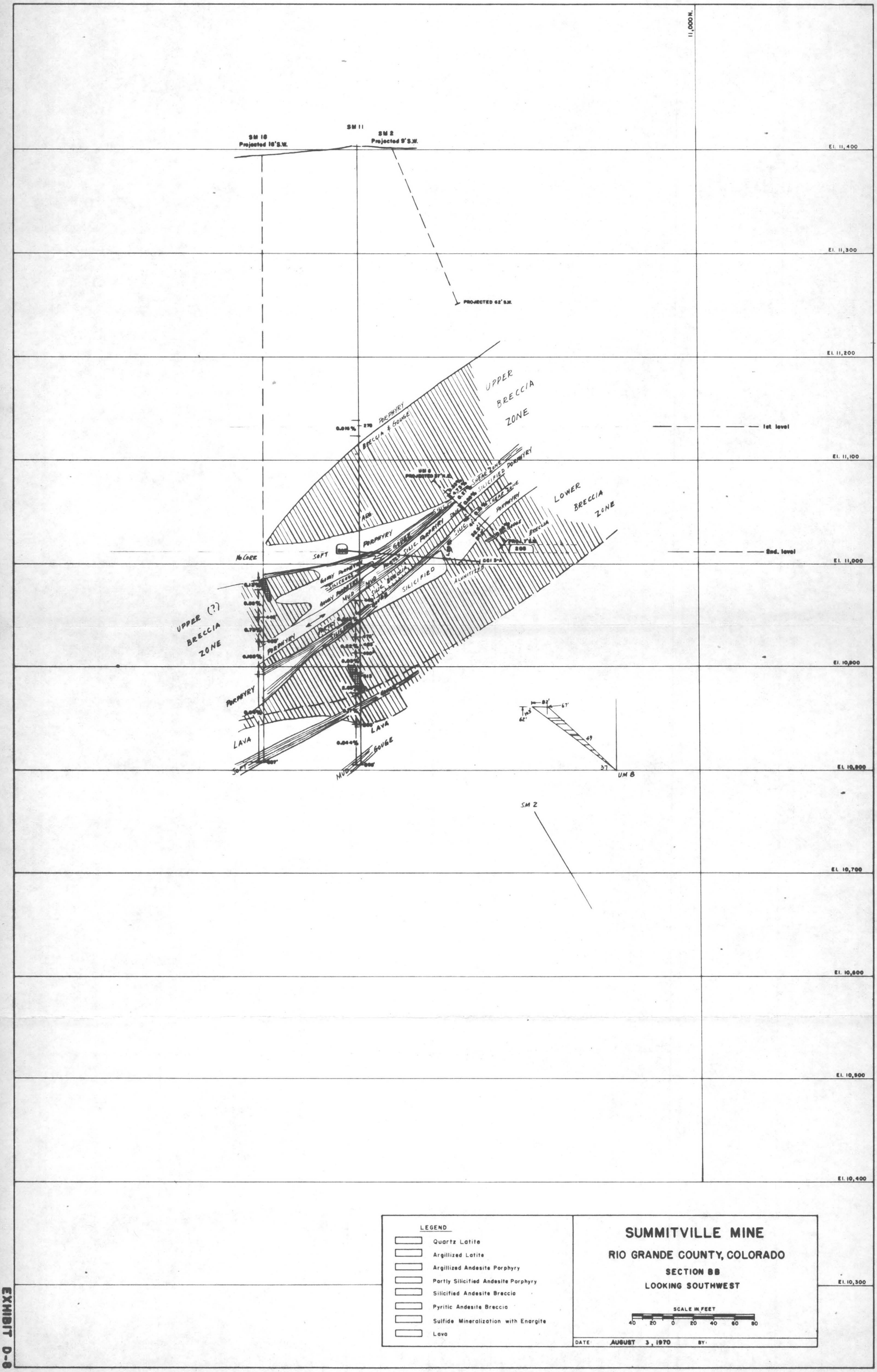

11,000 N.
SM 10
Projected 16' S.W.
SM 11
SM 2
Projected 9' S.W.
El. 11,400
El. 11,300
PROJECTED 62' S.W.
El. 11,200
UPPER
BRECCIA
ZONE
PORPHYRY
BRECCIA & GOUGE
1st level
El. 11,100
SHEAR ZONE
SILICIFIED PORPHYRY
LOWER
BRECCIA
ZONE
PORPHYRY
2nd. level
No CORE
SOFT
GOUGE
SILIC. PORPHYRY
SILICEOUS
MUD
SILICIFIED
ALUNITIZED
El. 11,000
UPPER (?)
BRECCIA
ZONE
El. 10,900
LAVA
GOUGE
MUD
El. 10,800
UM 8
SM 2
El. 10,700
El. 10,600
El. 10,500
El. 10,400
El. 10,300
LEGEND
Quartz Latite
Argillized Latite
Argillized Andesite Porphyry
Partly Silicified Andesite Porphyry
Silicified Andesite Breccia
Pyritic Andesite Breccia
Sulfide Mineralization with Enargite
Lava
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
SECTION BB
LOOKING SOUTHWEST
SCALE IN FEET
40 20 0 20 40 60 80
DATE AUGUST 3, 1970 BY:

EXHIBIT D-8

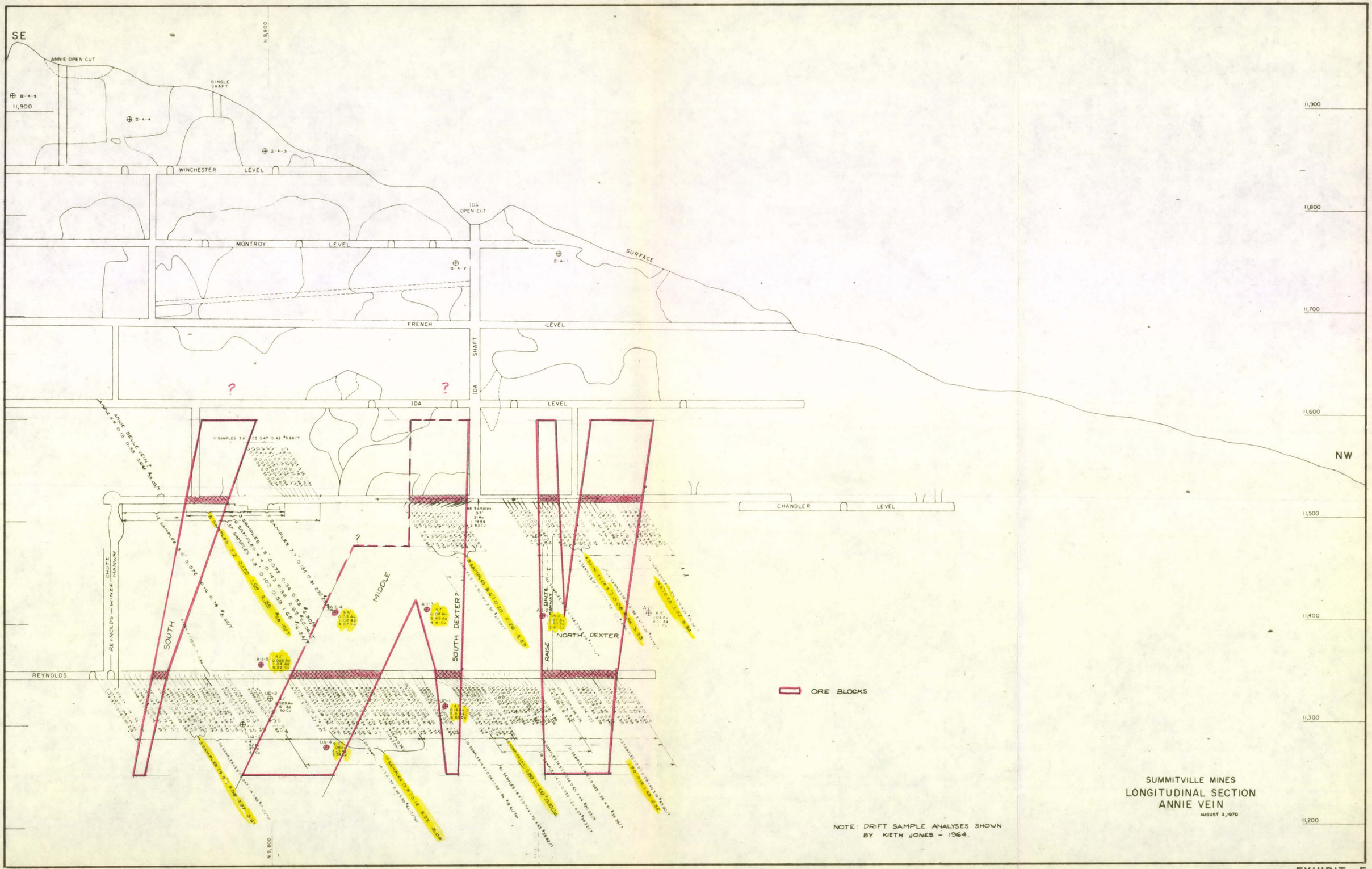

SE
NW
ANNIE OPEN CUT
BINGLE SHAFT
WINCHESTER LEVEL
IDA OPEN CUT
MONTROY LEVEL
SURFACE
FRENCH LEVEL
IDA SHAFT
IDA LEVEL
CHANDLER LEVEL
REYNOLDS
REYNOLDS - WINZE - CHUTE MANWAY
SOUTH
MIDDLE
SOUTH DEXTER
NORTH DEXTER
RAISE
CHUTE
11,900
11,800
11,700
11,600
11,500
11,400
11,300
11,200
N 9,800
ORE BLOCKS
NOTE: DRIFT SAMPLE ANALYSES SHOWN BY KIETH JONES - 1964.
SUMMITVILLE MINES
LONGITUDINAL SECTION
ANNIE VEIN
AUGUST 3, 1970
CHARLES E. MELBYE
Geological Engineer

EXHIBIT E

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION
MANNING SCHEDULE

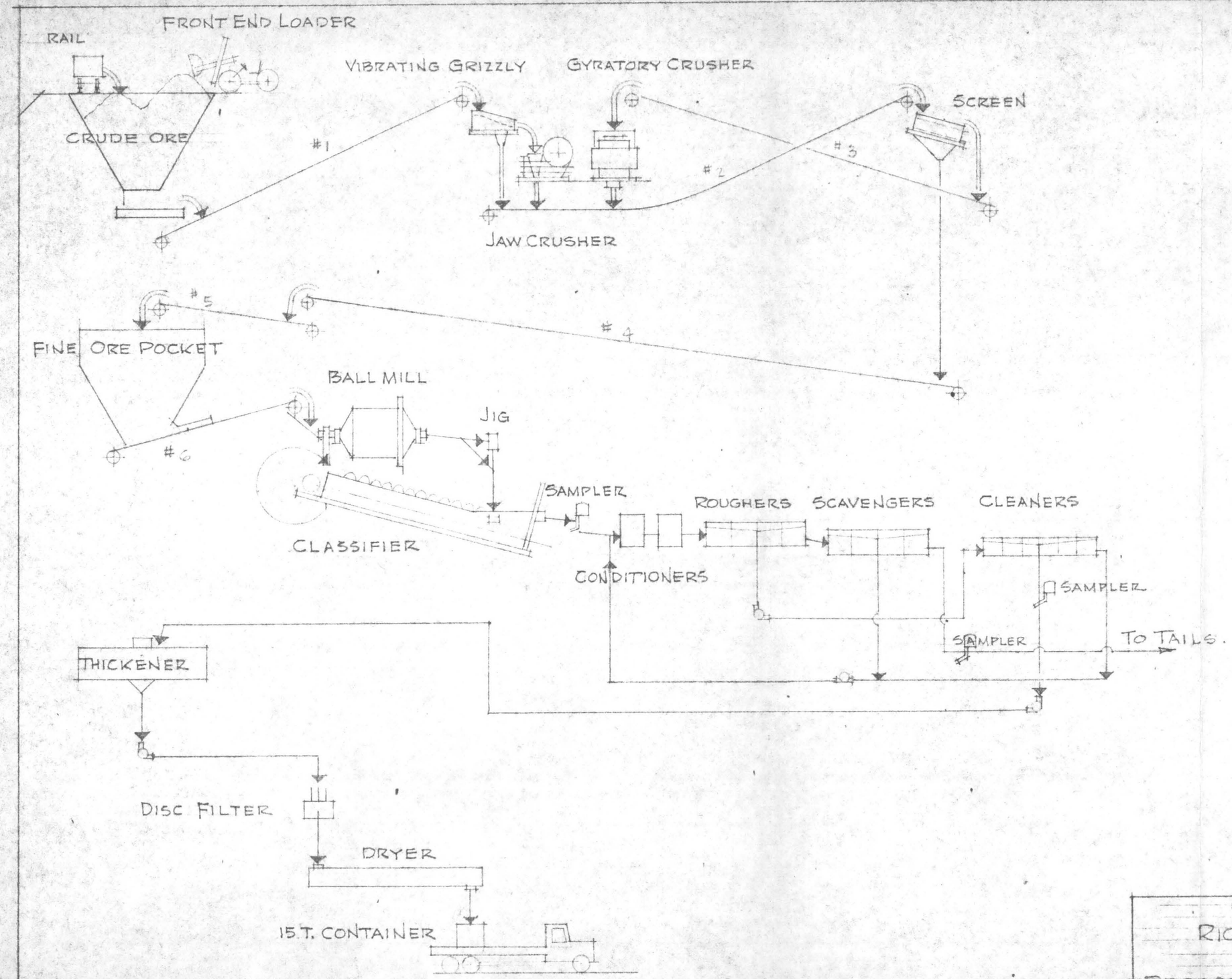
CLASSIFICATION & FUNCTION	PREPRODUCTION															PRODUCTION		
	AUGUST 1970			SEPTEMBER 1970			OCTOBER 1970			NOVEMBER 1970			DECEMBER 1970			AV. MONTH AFTER DEC. 70		
	Men	Shifts	Man-Shifts	Men	Shifts	Man-Shifts	Men	Shifts	Man-Shifts	Men	Shifts	Man-Shifts	Men	Shifts	Man-Shifts	Men	Shifts	Man-Shifts
WAGE EARNERS																		
Underground - Annie Dexter																		
Standard Drifting	2	13	26	2	15	30	2	16	32	2	12	24	2	10	20	2	10	20
Drift Timbering	2	5	10	2	6	12	2	6	12	2	7	14	2	5	10	2	5	10
Two Comp. Timber Raise	2	21	42	2	10	20	2	10	20	2	19	38	2	7	14	2	7	14
Dog Hole Raise	-	-	-	1 1	10 11	21	2	12	24	-	-	-	1	22	22	1	11	11
Slusher Drift	-	-	-	-	-	-	-	-	-	-	-	-	1	22	22	1	11	11
Stoping	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	22	44
Tramming	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	33	33
Repair & U.G. Maint.	2	8	16	2	11	22	2	11	22	2	10	20	2	22	44	3	11	33
Diamond Drilling	-	-	-	1	21	21	1	11	11	1	8	8	1	11	11	1	11	11
Total	5-10/21	21	115	7	21	147	6½	22	143	6½	19	123	7½	22	165	8½	22	187
Underground - Missionary																		
Standard Drifting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drift Timbering	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Two Comp. Timber Raise	2	10	20	-	-	-	-	-	-	2	19	38	2	22	44	2	11	22
Dog Hole Raise	1	11	11	2	21	42	2	22	44	1	19	19	1	22	22	1	11	11
Slusher Drift	2	21	42	1	21	21	2	22	44	1	19	19	1	22	22	1	11	11
Stoping	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	22	44
Tramming	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Repair & U.G. Maint.	2 1	16 11	43	2	21	42	2	11	22	2	9	18	2	11	22	2	11	22
Diamond Drilling	1	21	21	-	-	-	1	11	11	1	11	11	1	11	11	1	11	11
Total	7-11/21	21	158	6	21	126	6½	22	143	6½	19	124	6½	22	143	6½	22	143
Grand Total U.G.	13	21	273	13	21	273	13	22	286	13	19	247	14	22	308	15	22	330
Surface																		
Hoisting	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Mine Maintenance	2	21	42	2	21	42	2	22	44	2	19	38	1	22	22	1	22	22
General Labor	2	21	42	2	21	42	2	22	44	3	19	57	4	22	88	4	22	88
Mine Sampling	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Mill Operation	-	-	-	-	-	-	-	-	-	-	-	-	4	22	88	4	22	88
Mill Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	1	22	22	1	22	22
Laboratory (& Cook)	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Steno-Clerk - Warehouse Clk.	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Watchman	1	10	10	1	9	9	1	11	11	1	11	11	1	8	8	-	-	-
Total	8+1	21+10	178	8+1	21+9	177	8+1	22+11	187	9+1	19+11	182	14+1	22+8	316	14	22	308
Grand Total Wage	21+1	21+10	451	21+1	21+9	450	21+1	22+11	473	22+1	19+11	429	28+1	22+8	624	33	22	630
SALARIED PERSONNEL																		
Manager	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Geologist	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Mine Foreman	1	21	21	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Shift Boss	-	-	-	1	21	21	1	22	22	1	19	19	1	22	22	1	22	22
Total	3	21	63	4	21	84	4	22	88	4	19	76	4	22	88	4	22	88

EXHIBIT F-1

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION
APPROXIMATION OF ORE PRODUCTION

ITEM OF U.G. WORK	PREPRODUCTION															PRODUCTION		
	AUGUST 1970			SEPTEMBER 1970			OCTOBER 1970			NOVEMBER 1970			DECEMBER 1970			AV. MONTH AFTER DEC.70		
	Ann-Dex	Miss.	Total	Ann-Dex	Miss.	Total	Ann-Dex	Miss.	Total	Ann-Dex	Miss.	Total	Ann-Dex	Miss.	Total	Ann-Dex	Miss.	Total
DEVELOPMENT																		
Standard Drift																		
Man Shifts	26	-	26	30	-	30	32	-	32	24	-	24	20	-	20	20	-	20
Feet/Shift	2.2	-	2.2	2.2	-	2.2	2.2	-	2.2	2.2	-	2.2	2.2	-	2.2	2.2	-	2.2
Total Footage	57.2	-	57.2	66.0	-	66.0	70.4	-	70.4	52.8	-	52.8	44.0	-	44.0	44.0	-	44.0
Tons/Foot	4.0	-	4.0	4.0	-	4.0	4.0	-	4.0	4.0	-	4.0	4.0	-	4.0	4.0	-	4.0
Total Tons	228.8	-	228.8	264.0	-	264.0	281.6	-	281.6	211.2	-	211.2	176.0	-	176.0	176.0	-	176.0
Per Cent Ore	25%	-	25%	25%	-	25%	25%	-	25%	25%	-	25%	25%	-	25%	25%	-	25%
Tons Ore	57.2	-	57.2	66.0	-	66.0	70.4	-	70.4	52.8	-	52.8	44.0	-	44.0	44.0	-	44.0
Two Compartment Raise																		
Man Shifts	42	20	62	20	-	20	20	-	20	38	38	76	14	44	58	14	22	36
Feet/Shift	2.2	2.2	2.2	2.2	-	2.2	2.2	-	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Total Footage	92.4	44.0	136.4	44.0	-	44.0	44.0	-	44.0	83.6	83.6	167.2	30.8	96.8	127.6	30.8	48.4	79.2
Tons/Foot	1.9	1.9	1.9	1.9	-	1.9	1.9	-	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Total Tons	175.6	83.6	259.2	83.6	-	83.6	83.6	-	83.6	158.8	158.8	317.6	58.5	183.9	242.4	58.5	92.0	150.5
Per Cent Ore	95%	25%	72.5%	95%	-	95%	95%	-	95%	75%	50%	62.5%	75%	50%	56.1%	75%	50%	59.7%
Tons Ore	166.8	20.9	187.7	79.3	-	79.3	79.3	-	79.3	119.1	79.4	198.5	43.9	92.0	135.9	43.9	46.0	89.9
Dog Hole Raise																		
Man Shifts	-	11	11	21	42	63	24	44	68	-	19	19	22	22	44	11	11	22
Feet/Shift	-	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	-	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Total Footage	-	58.3	58.3	111.3	222.6	333.9	127.2	233.2	360.4	-	100.7	100.7	116.6	116.6	233.2	58.3	58.3	116.6
Tons/Foot	-	.75	.75	.75	.75	.75	.75	.75	.75	-	.75	.75	.75	.75	.75	.75	.75	.75
Total Tons	-	43.7	43.7	83.5	167.0	250.5	95.4	174.9	270.3	-	75.5	75.5	87.5	87.5	175.0	43.7	43.7	87.4
Per Cent Ore	-	0%	0%	75%	10%	31.6%	75%	50%	58.9%	-	50%	50%	75%	50%	64.4%	75%	50%	62.5%
Tons Ore	-	0.0	0.0	62.6	16.7	79.3	71.6	87.5	159.1	-	37.8	37.8	65.6	43.8	109.4	32.8	21.8	54.6
Slusher Drift																		
Man Shifts	-	42	42	-	21	21	-	44	44	-	19	19	22	22	44	11	11	22
Feet/Shift	-	6.5	6.5	-	6.5	6.5	-	6.5	6.5	-	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Total Footage	-	273.0	273.0	-	136.5	136.5	-	286.0	286.0	-	123.5	123.5	143.0	143.0	286.0	71.5	71.5	143.0
Tons/Foot	-	2.9	2.9	-	2.9	2.9	-	2.9	2.9	-	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Total Tons	-	791.7	791.7	-	395.9	395.9	-	829.4	829.4	-	358.2	358.2	414.7	414.7	829.4	207.4	207.4	414.7
Per Cent Ore	-	80%	80%	-	80%	80%	-	80%	80%	-	80%	80%	80%	80%	80%	80%	80%	80%
Tons Ore	-	633.4	633.4	-	316.7	316.7	-	663.5	663.5	-	286.6	286.6	331.8	331.7	663.5	165.9	165.9	331.8
PRODUCTION																		
Stoping																		
Man Shifts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	44	88
Tons/Shift	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	30	30
Total Tons	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1320.0	1320.0	2640.0
Per Cent Ore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	100%	100%
Tons Ore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1320.0	1320.0	2640.0
GRAND TOTAL																		
Tons Ore	224.0	654.3	878.3	207.9	333.4	541.3	221.3	751.0	972.3	171.9	403.8	575.7	485.3	467.5	952.8	1606.6	1553.7	3160.3
Tons Waste	180.4	264.7	445.1	223.2	229.5	452.7	239.3	253.3	492.6	198.1	188.7	386.8	251.4	218.6	470.0	199.0	109.4	308.4
Tons Total Material	404.4	919.0	1323.4	431.1	562.9	994.0	460.6	1004.3	1464.9	370.0	592.5	962.5	736.7	686.1	1422.8	1805.6	1663.1	3468.7

EXHIBIT F-2

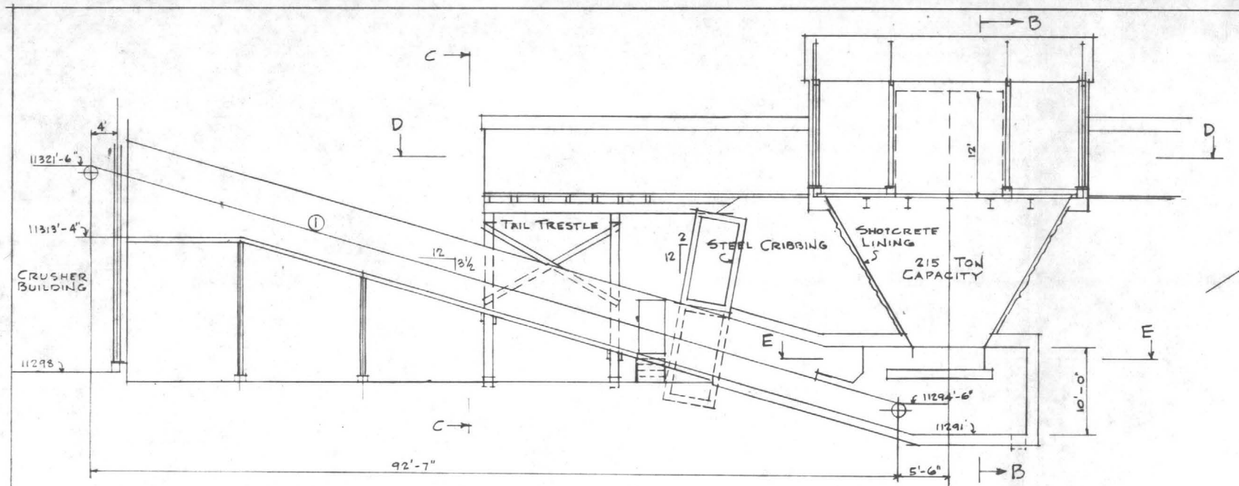


SUMMITVILLE MINE
RIO GRANDE, CO. COLORADO
FLOW SHEET
PROPOSED COPPER CONCENTRATOR
A.S. & A. AUG. 12, 1970
DULUTH, MINN.

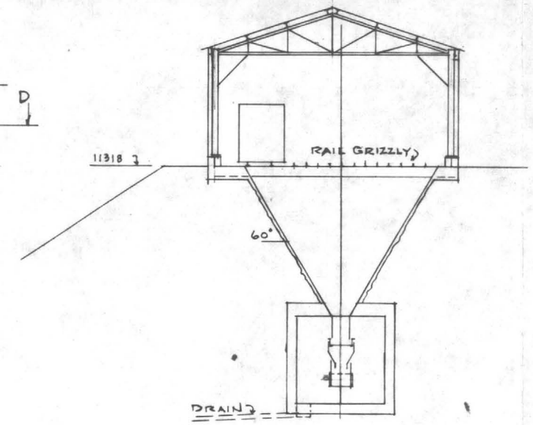
EXHIBIT G-I

SURFACE FACILITIES
SUMMITVILLE MINE
RIO GRANDE COUNTY, COLORADO
SCALE IN FEET
40 20 0 20 40 60 80
DATUM IS MEAN SEA LEVEL
N
10,800 N.
10,600 N.
10,400 N.
10,200 N.
10,000 N.
9,200 E.
9,400 E.
9,600 E.
9,800 E.
9,900 E.
9,200 E.
9,400 E.
FIRST LEVEL
SECOND LEVEL
BUS STATION
HISTORIC DEVELOPMENT
HEAD FRAME
HOIST HOUSE
CHANGE HOUSE & SHOP
BOILER HOUSE
THICKENER 11285
CONCENTRATOR BUILDING
CRUSHER BUILDING ELEV. 11259
11300
11296
TRESTLE
CRUSHE ORE POCKET
11318
SKID MOUNTED BUILDING
HAUL ROAD
TOE OF OLD TAILINGS PILE
GAS LINE
TRESTLE
TRACK
POWER LINE
CARPENTER SHOP
GAS VALVE
TREE LINE
REYNOLDS ADIT
WOOD CULVERT
REYNOLDS TUNNEL
OFFICE
BOARDING HOUSE
ABANDONED TRESTLE
240
11,250
260
270
280
290
11,300
310
320
330
340
11,350
360
370

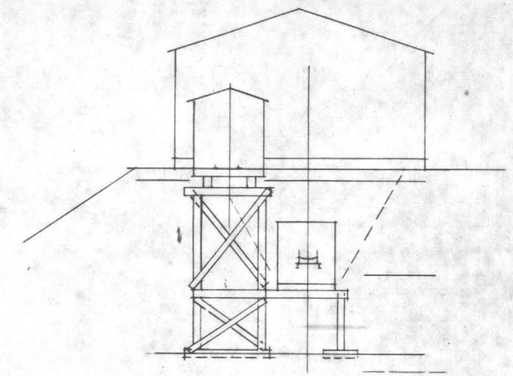
EXHIBIT G-2



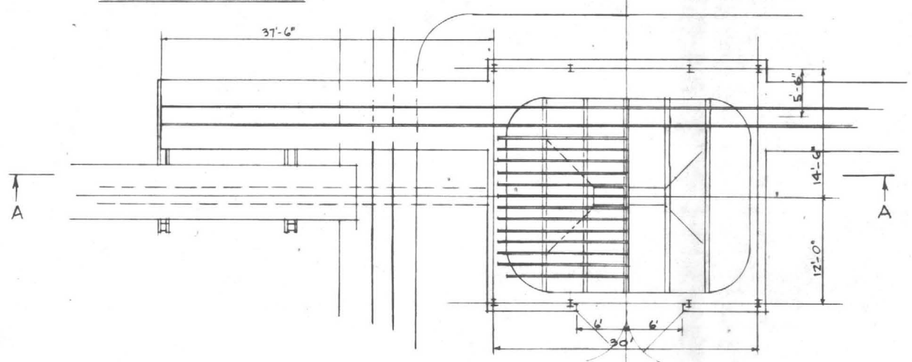
SECTION A-A



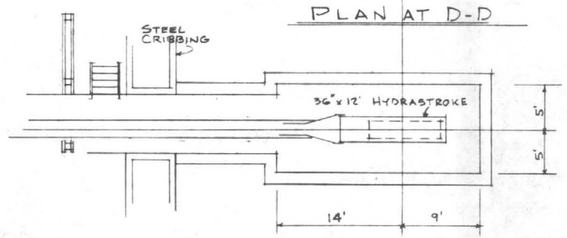
SECTION B-B



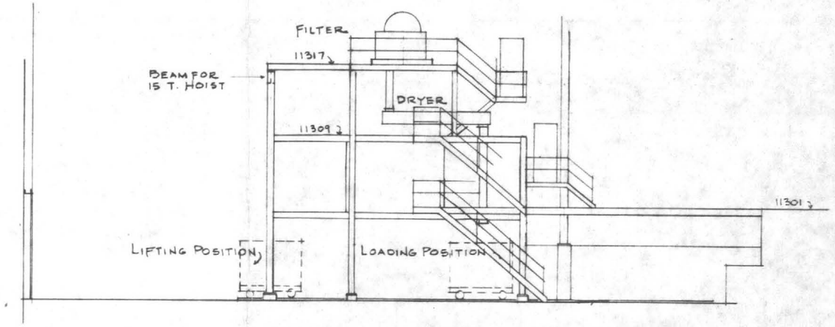
SECTION C-C



PLAN AT D-D

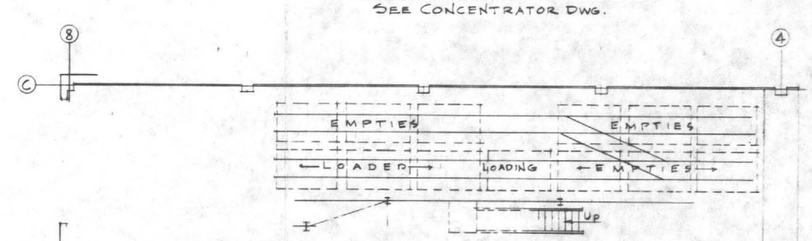


PLAN AT E-E



SECTION F-F

SEE CONCENTRATOR DWG.



PLAN AT EL. 11290

CONTAINER LOADING.

SUMMITVILLE MINE
RIO GRANDE CO. COLORADO

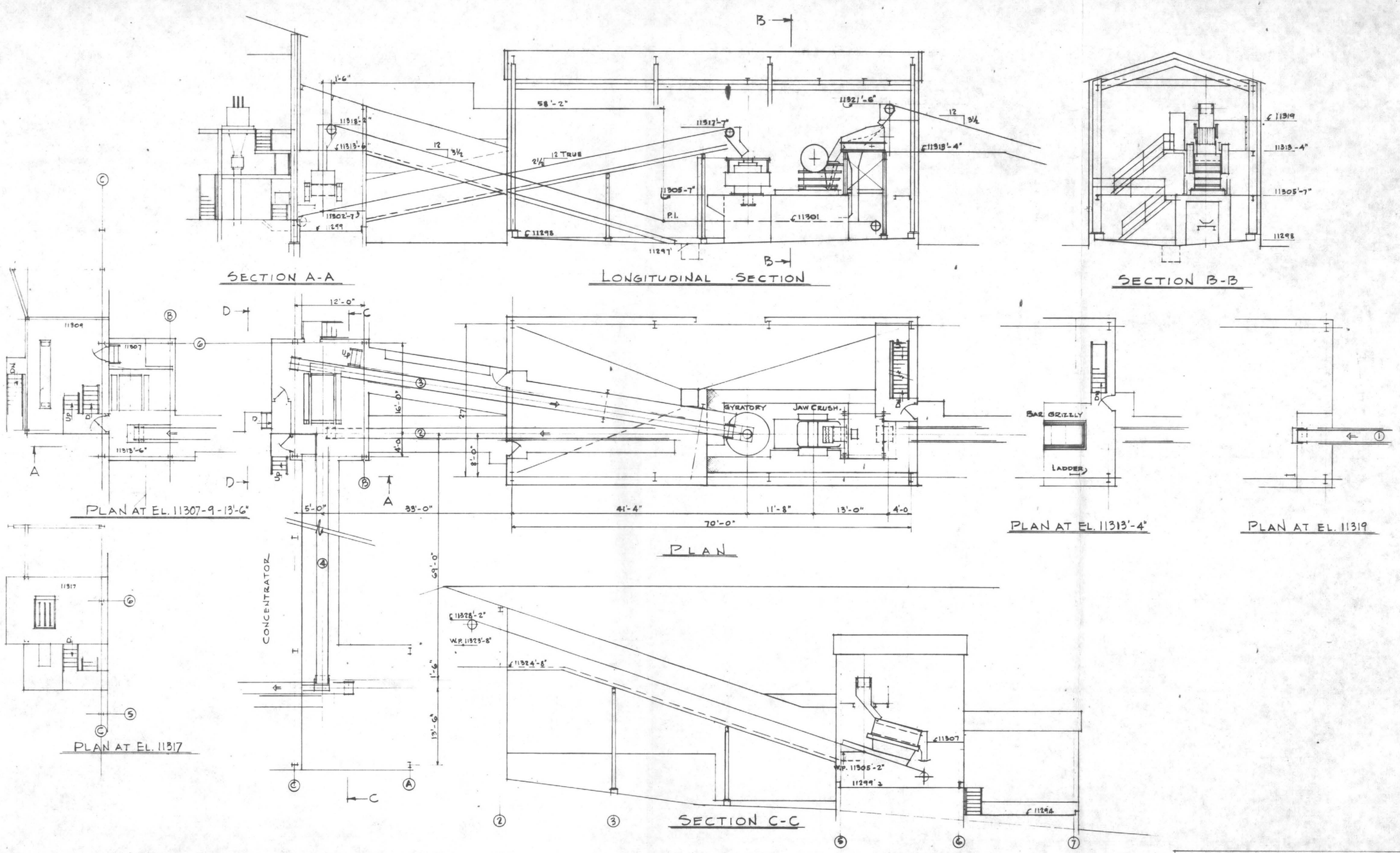
PROPOSED CRUDE ORE POCKET

SCALE - 1/8" = 1'-0"

A.S. & A.
DULUTH, MINN.

AUG. 12, 1970

EXHIBIT G-3



SUMMITVILLE MINE
RIO GRANDE CO. COLORADO
PROPOSED CRUSHING PLANT
SCALE - 1/8" = 1'-0"

A.S. & A.
DULUTH MINN.

AUG. 12, 1970

EXHIBIT G-4

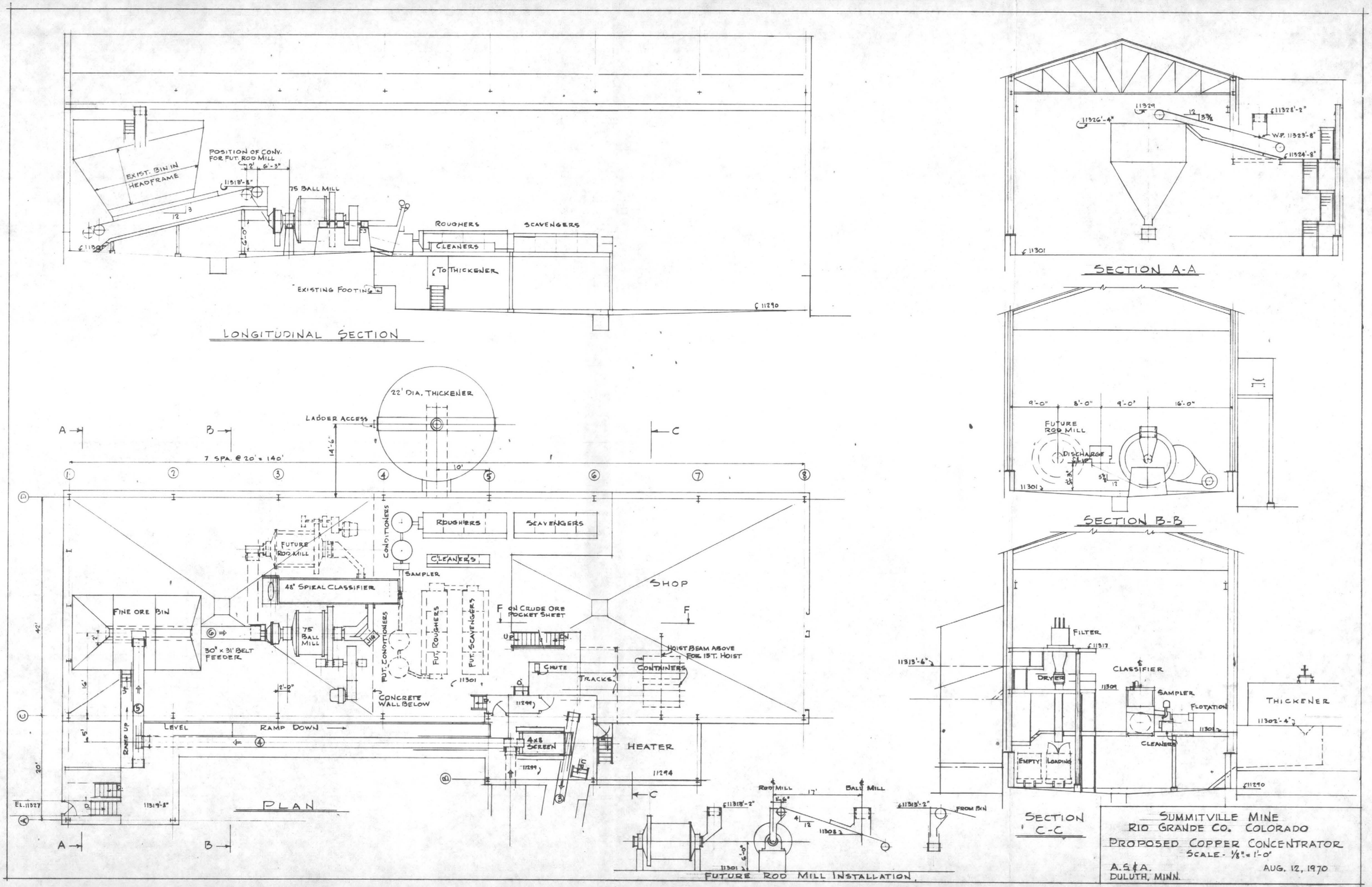

POSITION OF CONV. FOR FUT. ROD MILL
EXIST. BIN IN HEADFRAME
75 BALL MILL
ROUGHERS
SCAVENGERS
CLEANERS
TO THICKENER
EXISTING FOOTING
LONGITUDINAL SECTION
22' DIA. THICKENER
LADDER ACCESS
7 SPA. @ 20' = 140'
ROUGHERS
SCAVENGERS
CLEANERS
CONDITIONERS
SAMPLER
FUTURE ROD MILL
48" SPIRAL CLASSIFIER
FINE ORE BIN
30" x 31' BELT FEEDER
75 BALL MILL
FUT. CONDITIONERS
FUT. ROUGHERS
FUT. SCAVENGERS
SHOP
ON CRUDE ORE POCKET SHEET
HOIST BEAM ABOVE FOR 15T. HOIST
CHUTE
TRACKS
CONTAINERS
CONCRETE WALL BELOW
LEVEL
RAMP DOWN
RAMP UP
4x8 SCREEN
HEATER
PLAN
SECTION A-A
SECTION B-B
FILTER
DRYER
CLASSIFIER
SAMPLER
FLOTATION
CLEANERS
EMPTY
LOADING
THICKENER
SECTION C-C
ROD MILL
BALL MILL
FROM BIN
FUTURE ROD MILL INSTALLATION
SUMMITVILLE MINE
RIO GRANDE CO. COLORADO
PROPOSED COPPER CONCENTRATOR
SCALE - 1/8" = 1'-0"
A.S.&A.
DULUTH, MINN.
AUG. 12, 1970

EXHIBIT G-5

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION

APPROXIMATION OF CAPITAL COST

ITEM	COST EQUIP. & SUPP.	LABOR	TOTAL
1.0 Crude Ore Pocket			
1.1 Site Preparation			
1.1.1 Clearing	-	$ 150	$ 150
1.1.2 Ditching	-	150	150
1.1.3 F&I Culvert & Sump Lateral	$ 500	240	740
1.2 Construction of Drawpoint & Bin			
1.2.1 Excavation	-	970	970
1.2.2 Concrete	5,000	6,000	11,000
1.2.3 Steel Cribbing	On Site	2,500	2,500
1.2.4 Compacted Backfill	-	900	900
1.2.5 Embankment	-	1,500	1,500
1.2.6 F&I Used Rail for Bin Liner	960	1,290	2,250
1.2.7 Place Shotcrete	950	2,450	3,400
1.2.8 F&I Steel Stringers	200	200	400
1.2.9 F&I Used Rail for Grizzly	1,350	650	2,000
1.3 Erection of Bin Housing			
1.3.1 F&I Prefab Steel Building Complete with Door	3,350	2,700	6,050
1.3.2 F&I Insulation & Int. Sheathing	Included with Item 1.3.1		
1.4 Erection of Conveyor Housing			
1.4.1 F&C Conveyor Trestles	960	320	1,280
1.4.2 F&I Conveyor Tables	725	375	1,100
1.4.3 F&I Sheathing & Insulation	960	490	1,450
1.5 Installation of Equipment			
1.5.1 F&I Hydrostroke Feeder	2,100	750	2,850
1.5.2 F&I No. 1 Conveyor	7,750	2,110	9,860
1.5.3 F&I Starters, Conductors & Lighting	360	2,040	2,400
1.5.4 F&I Gas Fired Unit Heater	300	100	400
Total Item 1.0	$ 25,465	$ 25,885	$ 51,350
2.0 Crushing Plant			
2.1 Erection of Structure			
2.1.1 Excavation	-	$ 200	$ 200
2.1.2 Concrete	$ 7,500	9,100	16,600
2.1.3 Erect, Insulate & Modify Pre-Fab Building	1,200	2,600	3,800

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION

APPROXIMATION OF CAPITAL COST

ITEM		COST EQUIP. & SUPP.	LABOR	TOTAL
2.0 Crushing Plant (cont.)				
2.1 Erection of Structure (cont.)				
2.1.4	F&I Crane Rails	Included with Item 2.1.3		
2.1.5	F&I Structural Steel	$ 375	$ 125	$ 500
2.1.6	F&I Plate Decks	1,040	400	1,440
2.1.7	F&I Stairs & Railing	920	330	1,250
2.1.8	F&I Man Doors	125	25	150
2.1.9	F&C Vehicle Door	Included with Item 2.1.3		
2.1.10	Fab & I Chutes & Skirting	1,225	1,400	2,625
2.2 Erection of Conveyor Housing				
2.2.1	F&I Conveyor Trestles	2,130	710	2,840
2.2.2	F&I Conveyor Tables	2,050	1,100	3,150
2.2.3	F&I Sheathing & Insulation	1,470	735	2,205
2.3 Installation of Equipment				
2.3.1	F&I Vibrating Grizzly	4,500	250	4,750
2.3.2	Install Jaw Crusher	10,235	650	10,885
2.3.3	F&I No. 2 Conveyor	6,400	2,150	8,550
2.3.4	F&I Vibrating Screen	4,700	300	5,000
2.3.5	F&I No. 3 Conveyor	6,000	1,750	7,750
2.3.6	Install Gyratory Crusher	18,400	1,000	19,400
2.3.7	F&I No. 4 Conveyor	6,000	1,850	7,850
2.3.8	F&I No. 5 Conveyor	5,300	620	5,920
2.3.9	F&I Elect. Power & Lighting	6,840	4,560	11,400
2.3.10	F&I Dust Control Equipment	6,000	4,000	10,000
2.3.11	F&I Gas Fired Unit Heater	600	200	800
2.3.12	F&I Hoists	9,000	200	9,200
	Total Item 2.0	$102,010	$ 34,255	$136,265
3.0 Mill				
3.1 Alterations to Existing Building				
3.1.1	Excavation	-	$ 900	$ 900
3.1.2	F&I Perf. Pipe Underdrains	$ 200	200	400
3.1.3	Compacted Backfill & Gravel Base	1,225	575	1,800
3.1.4	Concrete	12,000	14,500	26,500
3.1.5	F&I Structural Steel	6,750	2,250	9,000
3.1.6	F&I Sheathing & Insulation	1,540	760	2,300
3.1.7	F&I Plate Decks	200	100	300
3.1.8	F&I Expanded Metal Decks	1,425	775	2,200
3.1.9	F&I Gantry	300	100	400
3.1.10	F&I Narrow Gauge Track	800	600	1,400

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION

APPROXIMATION OF CAPITAL COST

ITEM	COST EQUIP. & SUPP.	LABOR	TOTAL
3.0 Mill (cont.)			
3.1 Alterations to Existing Building (cont.)			
3.1.11 F&I Man Doors	$ 500	$ 400	$ 900
3.1.12 F&I Stairs & Railings	2,340	1,010	3,350
3.1.13 Fab & I Chutes, Skirting & Launders	350	400	750
3.1.14 Install & Modify Fine Ore Bin	250	2,500	2,750
3.2 Installation of Equipment			
3.2.1 F&I Belt Feeder	1,560	400	1,960
3.2.2 Renovate & Install Ball Mill	250	1,500	1,750
3.2.3 F&I Ball Mill Motor	1,000	250	1,250
3.2.4 F&I Jig	600	150	750
3.2.5 F&I Spiral Classifier	5,200	500	5,700
3.2.6 F&I Conditioners	1,200	50	1,250
3.2.7 F&I Rougher Float Cells	6,200	150	6,350
3.2.8 F&I Scavenger Float Cells	6,200	150	6,350
3.2.9 F&I Cleaner Float Cells	2,300	100	2,400
3.2.10 F&I Wet Feeders	1,300	500	1,800
3.2.11 F&I Dry Feeders	Included with Item 3.2.10		
3.2.12 F&I Samplers	1,200	150	1,350
3.2.13 F&I Circulating Pumps	4,000	500	4,500
3.2.14 F&I Thickener	4,000	960	4,960
3.2.15 F&I Filter	2,560	140	2,700
3.2.16 F&I Dryer	14,500	150	14,650
3.2.17 F&I Heating Plant for Dryer	4,500	250	4,750
3.2.18 F&I Gas Fired Unit Heaters	1,800	600	2,400
3.2.19 F&I Piping	500	500	1,000
3.2.20 F&I 15 Ton Hoist	4,500	100	4,600
3.2.21 Fabricate Conc. Containers (11)	4,950	1,650	6,600
3.2.22 Fabricate Container Dollys	385	440	825
3.2.23 F&I Elec. Power Service & Lighting	15,600	10,400	26,000
3.2.24 F&I Sump Pumps	2,200	200	2,400
3.2.25 F&I Process Water System	700	300	1,000
Total Item 3.0	$115,085	$ 45,160	$160,245
4.0 External Facilities			
4.1 Power Distribution System			
4.1.1 Construct Sub Station	$ 11,880	$ 7,920	$ 19,800
4.1.2 Extend Power Dist. to Mill	Included with Item 4.1.1		

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION

APPROXIMATION OF CAPITAL COST

ITEM	COST EQUIP. & SUPP.	LABOR	TOTAL
4.0 External Facilities (cont.)			
4.2 Water Supply System			
4.2.1 Construct Water Treatment Station			
4.2.1.1 Excavation	-	$ 100	$ 100
4.2.1.2 Concrete	$ 85	65	150
4.2.1.3 F & Erect Structure	1,200	300	1,500
4.2.2 Domestic Water Supply			
4.2.2.1 F&I Neutralizer Unit	350	50	400
4.2.2.2 F&I Taste & Odor Control Unit	300	50	350
4.2.2.3 Modify Dist. System	250	250	500
4.2.3 Process Water Supply			
4.2.3.1 F&I Storage Tank	5,500	500	6,000
4.2.3.2 F&I Neutralizer Unit	650	150	800
4.2.3.3 F&I Pumps	625	175	800
4.2.3.4 F&I Pipe Line	900	450	1,350
4.2.4 Electric Power & Lighting			
4.2.4.1 F&I Distribution Line	100	50	150
4.2.4.2 F&I Starters & Controls	100	50	150
4.2.4.3 F&I Lighting	50	20	70
4.3 Tailings Disposal System			
4.3.1 F&I Tailings Pipe Line	4,000	1,000	5,000
4.3.2 F&I Floating Pump Station	1,800	1,500	3,300
4.3.3 F&I Return Water Line	5,000	1,000	6,000
4.3.4 Electric Power			
4.3.4.1 Extend Dist. Line	1,220	880	2,100
4.3.4.2 F&I Transformer	Included with Item 4.3.4.1		
4.3.4.3 Starter & Controls	Included with Item 4.3.4.1		
4.4 Crude Ore Track from Reynolds Adit			
4.4.1 Excavation	-	200	200
4.4.2 Modify Carpenter Shop	300	700	1,000
4.4.3 Construct Tail Trestle	250	700	950
4.4.4 Construct Snow Shed	5,000	5,500	10,500
4.4.5 F&I Track	1,875	1,875	3,750
4.4.6 F&I Lighting	175	120	295

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION

APPROXIMATION OF CAPITAL COST

ITEM	COST EQUIP. & SUPP.	LABOR	TOTAL
4.0 External Facilities (cont.)			
4.5 Railhead Facilities			
4.5.1 F&I Gantry	$ 500	$ 250	$ 750
4.5.2 F&I Hoist	4,500	100	4,600
4.5.3 F&I Electrical	150	100	250
4.6 Additional Mobile Equipment			
4.6.1 U.G. Mobile Equipment	20,425	-	20,425
4.6.2 Concentrate Canister Truck	10,000	-	10,000
Total Item 4.0	$ 77,185	$ 24,055	$101,240
Total Items 1.0 thru 4.0	$319,745	$129,355	$449,100
Engineering & Contingencies	31,975	12,925	44,900
Total Capital - New Fac.	$351,720	$142,280	$494,000
Acquisition of Exist. Equip.	150,000	-	150,000
Grand Total Capital Expend.	$501,720	$142,280	$644,000

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
PROPOSED MINING & MILLING OPERATION
OPERATING COST ESTIMATE - LABOR & SUPPLIES

ITEM OF COST	PREPRODUCTION															PRODUCTION		
	AUGUST 1970			SEPTEMBER 1970			OCTOBER 1970			NOVEMBER 1970			DECEMBER 1970			AV. MONTH AFTER DEC. 70		
	Quant.	Rate	Amount	Quant.	Rate	Amount	Quant.	Rate	Amount	Quant.	Rate	Amount	Quant.	Rate	Amount	Quant.	Rate	Amount
LABOR - WAGE																		
Standard Drifting	228.8	$ 4.27	$ 977	264.0	$ 4.27	$ 1,127	281.6	$ 4.27	$ 1,202	211.2	$ 4.27	$ 902	176.0	$ 4.27	$ 752	176.0	$ 4.27	$ 752
Timbering Drifts	5 Sets	80.00	400	6 Sets	80.00	480	6 Sets	80.00	480	7 Sets	80.00	560	5 Sets	80.00	400	5 Sets	80.00	400
Two Comp. Timber Raise	259.2	5.00	1,296	83.6	5.00	418	83.6	5.00	418	317.6	5.00	1,588	242.4	5.00	1,212	150.5	5.00	752
Dog Hole Raise	43.7	13.25	579	250.5	13.25	3,319	270.3	13.25	3,581	75.5	13.25	1,000	175.0	13.25	2,319	87.4	13.25	1,158
Slusher Drift	791.7	1.89	1,496	395.9	1.89	748	829.4	1.89	1,568	358.2	1.89	677	829.4	1.89	1,567	414.7	1.89	784
Stoping - Annie Dexter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1320.0	1.20	1,584
Stoping - Missionary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1320.0	1.20	1,584
Tramming	42 Sh.	36.00	1,512	42 Sh.	36.00	1,512	44 Sh.	36.00	1,584	38 Sh.	36.00	1,368	44 Sh.	36.00	1,584	55 Sh.	36.00	1,980
Repair & U.G. Maint.	59 "	do	2,124	64 "	do	2,304	44 "	do	1,584	38 "	do	1,368	66 "	do	2,376	55 "	do	1,980
Diamond Drilling	21 "	40.00	840	21 "	40.00	840	22 "	40.00	880	19 "	40.00	760	22 "	40.00	880	22 "	40.00	880
Total U.G. Direct Labor			$ 9,224			$10,748			$11,297			$ 8,223			$11,090			$11,854
Hoisting	21 Sh.	$28.00	$ 588	21 Sh.	$28.00	$ 588	22 Sh.	$28.00	$ 616	19 Sh.	$28.00	$ 532	22 Sh.	$28.00	$ 616	22 Sh.	$28.00	$ 616
Mine Maint.	42 "	32.00	1,344	42 "	32.00	1,344	44 "	32.00	1,408	38 "	32.00	1,216	22 "	32.00	704	22 "	32.00	704
General Labor	42 "	24.00	1,008	42 "	24.00	1,008	44 "	24.00	1,056	57 "	24.00	1,368	88 "	24.00	2,112	88 "	24.00	2,112
Mine Sampling	21 "	28.00	588	21 "	28.00	588	22 "	28.00	616	19 "	28.00	532	22 "	28.00	616	22 "	28.00	616
Mill Operation	-	-	-	-	-	-	-	-	-	-	-	-	88 "	36.00	3,168	88 "	36.00	3,168
Mill Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	22 "	36.00	792	22 "	36.00	792
Laboratory	21 Sh.	20.00	420	21 Sh.	20.00	420	22 Sh.	20.00	440	19 Sh.	20.00	380	22 "	24.00	480	22 "	24.00	480
Steno-Clerk - Warehouse Clk.	21 "	28.00	588	21 "	28.00	588	22 "	28.00	616	19 "	28.00	532	22 "	28.00	616	22 "	28.00	616
Watchman	10 "	24.00	240	9 "	24.00	216	11 "	24.00	264	11 "	24.00	264	8 "	24.00	192	-	-	-
Total Surface Dir. Labor			$ 4,776			$ 4,752			$ 5,016			$ 4,824			$ 9,296			$ 9,104
Supervisory - Salaried	63 Ms.	-	$ 3,600	84 Ms.	-	$ 4,350	88 Ms.	-	$ 4,500	76 Ms.	-	$ 5,000	88 Ms.	-	$ 5,500	88 Ms.	-	$ 5,500
Grand Total Payroll			$17,600			$19,850			$20,813			$18,087			$25,886			$26,458
Fringe Benefits @ 30%			5,280			5,955			6,244			5,426			7,766			7,937
Grand Total Labor Cost			$22,880			$25,805			$27,057			$23,513			$33,652			$34,395
SUPPLIES & GENERAL EXPENSE																		
U.G. Supplies - Std. Drifting	228.8	$ 5.15	$ 1,178	264.0	$ 5.15	$ 1,360	281.6	$ 5.15	$ 1,450	211.2	$ 5.15	$ 1,088	176.0	$ 5.15	$ 906	176.0	$ 5.15	$ 906
- 2 Comp. Timb. Raise	259.2	6.86	1,778	83.6	6.86	573	83.6	6.86	573	317.6	6.86	2,179	242.4	6.86	1,663	150.5	6.86	1,032
- Dog Hole Raise	43.7	9.89	432	250.5	9.89	2,477	270.3	9.89	2,673	75.5	9.89	747	175.0	9.89	1,731	87.4	9.89	864
- Slusher Drift	791.7	3.18	2,518	395.9	3.18	1,259	829.4	3.18	2,637	358.2	3.18	1,139	829.4	3.18	2,637	414.7	3.18	1,319
- Stoping	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2640.0	1.23	3,247
- Dia. Drilling	21	50.00	1,050	21	50.00	1,050	22	50.00	1,100	19	50.00	950	22	50.00	1,100	22	50.00	1,100
- Mine Timber	10	42.00	420	12	42.00	504	12	42.00	504	14	42.00	588	10	42.00	420	10	42.00	420
- Rail, Duct Wk. & Piping	100	9.25	925	100	9.25	925	100	9.25	925	100	9.25	925	100	9.25	925	100	9.25	925
Mill Supplies - Balls, Liners & Reagents	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,330	0.40	1,332
Electricity & Natural Gas	-	-	1,150	-	-	1,300	-	-	1,500	-	-	1,995	-	-	3,320	-	-	4,785
Fuels & Lubricants	-	-	500	-	-	600	-	-	750	-	-	800	-	-	900	-	-	1,200
Small Tools & Spare Parts	-	-	250	-	-	250	-	-	250	-	-	350	-	-	500	-	-	500
Office & Laboratory Expense	-	-	1,250	-	-	1,300	-	-	1,400	-	-	1,500	-	-	1,750	-	-	2,000
Vehicle & Trailer Rental	-	-	500	-	-	650	-	-	700	-	-	750	-	-	1,400	-	-	1,500
Miscellaneous Expense	-	-	500	-	-	550	-	-	600	-	-	650	-	-	700	-	-	750
Total Supplies & Gen. Exp.			$12,451			$12,798			$15,062			$13,661			$17,952			$21,880
GRAND TOTAL OPERATING COST			$35,331			$38,603			$42,119			$37,174			$51,604			$56,275

EXHIBIT I

SUMMITVILLE MINE - RIO GRANDE CO., COLORADO
REVENUES, COSTS AND EARNINGS
PROPOSED MINING & MILLING OPERATION

ITEM		PREPRODUCTION					PRODUCTION AFTER DECEMBER 31, 1970					
		AUG 1970	SEPT 1970	OCT 1970	NOV 1970	DEC 1970	AV. MONTH	1971	1972	1973	1974	1975
PRODUCTION DATA:												
Average Crude to Plt. or S.P.:	Nat. Tons	878	541	972	576	953	3,160	41,920	40,270	37,920	37,920	37,920
	Dry Tons	773	476	855	507	839	2,781	36,890	35,438	33,370	33,370	33,370
	% Copper	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	Oz. Gold	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
	Oz. Silver	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
Stockpile as of End of Period:	Nat. Tons	3,308	3,849	4,821	5,397	6,350	-	2,350	-	-	-	-
	Mine Value (34.39)	$113,762	$132,367	$165,794	$185,603	$218,377						
Plant Concentrates:	Nat. Tons						300	3,980	3,823	3,600	3,600	3,600
	Dry Tons						285	3,781	3,632	3,420	3,420	3,420
	% Copper						35.90	35.90	35.90	35.90	35.90	35.90
	Oz. Gold						0.41	0.41	0.41	0.41	0.41	0.41
	Oz. Silver						20.40	20.40	20.40	20.40	20.40	20.40
REVENUE:												
Gross Revenue at Smelter							136,900	1,816,203	1,744,631	1,642,797	1,642,797	1,642,797
Charges & Penalties							24,761	328,493	315,548	297,130	297,130	297,130
Net Revenue at Smelter							112,139	1,487,710	1,429,083	1,345,667	1,345,667	1,345,667
Transportation - Mine to Smelter							3,477	46,128	44,309	41,724	41,724	41,724
Net Smelter Return, F.O.B. Railhead							108,662	1,441,582	1,384,774	1,303,943	1,303,943	1,303,943
COSTS:												
Labor	- Wage Payroll	14,000	15,494	16,313	13,047	20,386	20,958	251,496	251,496	251,496	251,496	251,496
	- Salaried Payroll	3,600	4,350	4,500	5,000	5,500	5,500	66,000	66,000	66,000	66,000	66,000
	- Fringe Benefits & Overtime	5,280	5,955	6,244	5,426	7,766	7,937	95,244	95,244	95,244	95,244	95,244
General Expense	- Supplies	12,451	12,798	15,062	13,661	17,952	21,880	264,160	263,500	262,560	262,560	262,560
	- Royalties	-	-	-	-	-	5,607	74,386	71,454	67,283	67,283	67,283
	- Purchase Payments	-	-	2,500	-	-	833	10,000	10,000	10,000	10,000	10,000
	- Depreciation	-	-	-	-	-	10,024	123,867	121,906	118,551	118,551	118,551
	- Interest	-	-	-	-	-	4,160	103,350	67,600	46,800	26,000	5,850
Local Taxes	- Personal Property & Mining Tax	-	-	-	-	-	617	7,404	7,404	7,404	7,404	7,404
Total Cost Before Colorado Corporate Tax		35,331	38,597	44,619	37,134	51,604	77,516	995,907	954,604	925,338	904,538	884,388
EARNINGS:												
Total Earnings Before Colorado Corporate Tax		-	-	-	-	-	31,146	445,675	430,170	378,605	399,405	419,555
Depletion Allowance		-	-	-	-	-	-	211,999	203,644	189,302	191,758	191,758
Taxable Income		-	-	-	-	-	-	233,676	226,526	189,303	207,647	227,797
Colorado Corporate Tax		-	-	-	-	-	-	11,684	11,326	9,465	10,382	11,390
Total Earnings After Colorado Corporate Tax		-	-	-	-	-	-	433,991	418,844	369,140	389,023	408,165
CASH FLOW:												
Total Earnings After Colorado Corporate Tax		-	-	-	-	-	-	433,991	418,844	369,140	389,023	408,165
Depreciation		-	-	-	-	-	-	123,867	121,906	118,551	118,551	118,551
Gross Cash Flow		-	-	-	-	-	-	557,858	540,750	487,691	507,574	526,716
Debt Repayment		-	-	-	-	-	-	65,000	260,000	260,000	260,000	195,000
Net Cash Flow		-	-	-	-	-	-	492,858	280,750	227,691	247,574	331,716
Accumulative Net Cash Flow		-	-	-	-	-	-	492,858	773,608	1,001,299	1,248,873	1,580,589

EXHIBIT J

W. S. MOORE CO.

MAIN OFFICE:
400 TORREY BUILDING
DULUTH, MINNESOTA 55802

SUITE 201
575 FOREST STREET
RENO, NEVADA 89502

TELEPHONES:
DULUTH 727-5068
RENO 322-8818

January 19, 1971

Dr. Paul Eimon
4837 North Via Entrada
Tucson, Arizona

Dear Sir:

Enclosed herewith is the Summitville Mine report which Mr. Lawrence E. Smith requested we forward to you. Mr. Moore is out of town but will be in touch upon his return next week.

Yours truly,

Leona Hoggan
Secretary to Mr. Moore

EAGLE-A
TYPE-ERASE
25% COTTON FIBER