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Evaluation

of the

White Cow Fluorspar Mine
Red Rock Fluorspar Mine
Bluebird Fluorspar Mine

of

Gila County, Arizona

By John O. Rud
Consulting Geologist

EVALUATION

of the

WHITE COW FLUORSPAR MINE
RED ROCK FLUORSPAR MINE
BLUEBIRD FLUORSPAR MINE

of

GILA COUNTY, ARIZONA

by

JOHN O. RUD
CONSULTING GEOLOGIST

TABLE OF CONTENTS

INTRODUCTION

Foreword	1
Vegetation and Climate	1
Ore Reserve Calculations	3
Lack of Mine Records	6

WHITE COW MINE

Location	6
Access	6
Mining History	7
Geology	7
Fluorspar Reserves	12

RED ROCK MINE

Location	12
Access	12
Mining History	13
Geology	15
Fluorspar Reserves	20

BLUEBIRD MINE

Location	20
Access	20
Mining History	21
Geology	23
Fluorspar Reserves	25

REFERENCES

DECLARATION OF QUALIFICATIONS

LIST OF ILLUSTRATIONS

Figure 1	Location Map	2
Figure 2	White Cow Longitudinal Sketch	11
Figure 3	White Cow Mine Map	9
Figure 4	Red Rock Longitudinal Sketch	19
Figure 5	Red Rock Mine Map	16
Figure 6	Bluebird Mine Map	Pocket
Figure 7	Bluebird Longitudinal Sketch	Pocket
Plate 1	View of Tonto Basin	5
Plate 2	White Cow Mine	5
Plate 3	White Cow Fluorspar Vein	8
Plate 4	White Cow Fluorspar Vein	22
Plate 5	Red Rock Mine	14
Plate 6	Bluebird Mine	22
Plate 7	Bluebird Mine	24
Plate 8	Bluebird Mine	24

INTRODUCTION

FOREWORD

An evaluation of Tonto Mining and Milling Company, Inc. fluorspar mines was conducted during June, 1978 at the request of Harry M. Knight. The primary purpose of the examination was to determine the readily accessible ore reserves and economic potential of the White Cow, Red Rock, and Bluebird fluorspar mines.

This report will be based on information obtained from the data covering the district, (1) U. S. Bureau of Mines Bulletins, (2) U. S. Bureau of Mines Investigation of the Bluebird Fluorspar Mine, (3) Arizona Bureau of Mines Bulletins, and (4) Arizona Fluorspar by E. A. Elevatorski.

In addition, geological mapping, surface sampling, underground mapping and sampling was completed on the three fluorspar mines during June, 1978.

VEGETATION AND CLIMATE

The fluorspar mines lie within the Sierra Ancha mountains that border Tonto Basin on the east. The vegetation in the area is sparce and consists of the usual desert variety. (Plate 1)

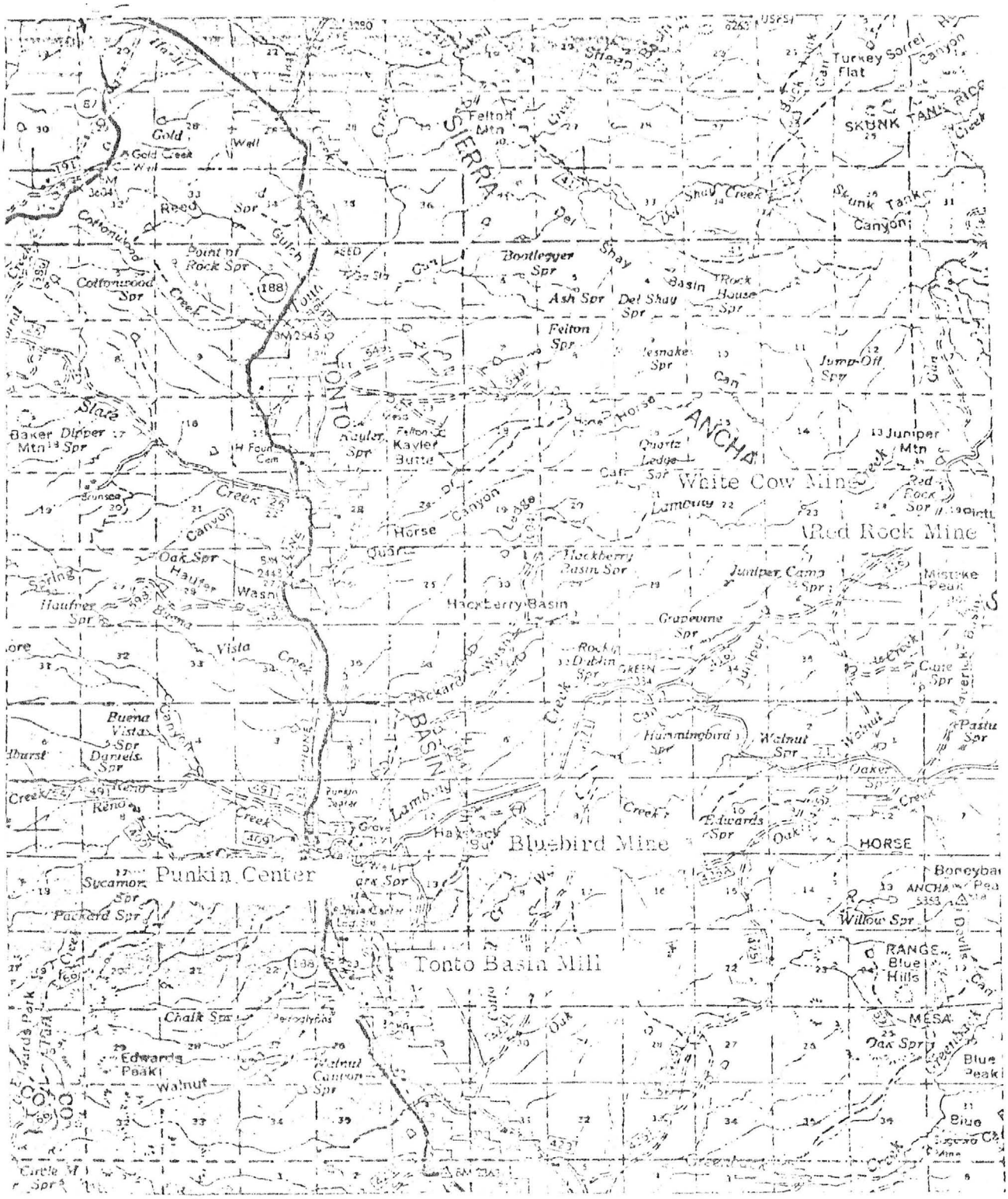


FIGURE 1 - LOCATION MAP

The summer climate is dry and hot with an average July temperature of 87.5 degrees. The winter climate is moderate with an average January temperature of 44.4 degrees. Rainfall recorded in the Sierra Ancha mountains during 1977 was 15.7 inches.

ORE RESERVES CALCULATIONS

The definition of fluorspar reserves in this report will utilize the terms agreed upon by the U. S. Bureau of Mines and the U. S. Geological Survey to designate respective classes of mineral reserves.

The ore reserve classes are:

MEASURED ORE is ore for which tonnage is computed from dimensions revealed in outcrops, trenches, workings and drill holes and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling and measurement are so closely spaced and the geological character is so well defined that the size, shape, and mineral content are well established. The computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to differ from the computed tonnage or grade by more than 20 per cent.

INDICATED ORE is ore for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to outline the ore completely or to establish its grade throughout.

INFERRED ORE is ore for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there is geologic

evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates of inferred ore should include a statement of the special limits within which the inferred ore may lie.

The ore reserves will be calculated from the data provided by the mine maps, geology of the mines, and production data from comparable mines in the geologic province. The ore body will be divided into two parts: the ore partly or completely developed (Indicated) and the ore probably present (Inferred) but not proven by drill holes or openings.

A vein depth of 200 feet has been estimated on the data from mines located in the same geologic setting and age of fluorspar mineralization.

The cubic-foot-per-ton factor has been calculated from Examination and Evaluation of Mineral Property by R. D. Parks utilizing the specific gravity of the vein material. An 11.5 cubic foot per ton factor will be employed in all ore reserve calculations.

The average mining width used in the calculations will be 3.5 feet with a cut-off grade of 50% fluorspar.

The dilution of the ore is minimal employing the mining methods of the present operators. For example, the Bluebird mine presently sorts the ore 3 to 5 times before shipping to the mill. In addition, when the fluorspar vein pinches, split

Plate 1 - View of Tonto Basin from Juniper Mountain.

Plate 2 - White Cow Mine head frame and hoist house.

shooting is employed to prevent dilution of the fluorspar with the wall rock.

LACK OF MINE RECORDS

In June of 1977, Tonto Mining and Milling Company's flotation mill had a fire that started in their assay facility. The fire quickly spread through the shop area and offices and destroyed all mine and mill records. Therefore, all fluorspar production from the three mines will be estimated by the amount of development work completed and inspection of the underground drifts, stopes and crosscuts.

WHITE COW MINE

LOCATION

The White Cow mine is located in T.7N., R.11E., section 16 of Gila County, Arizona. The mine lies in a small canyon occupied by Quartz Ledge Spring at an elevation of 3180 feet. The property is on the foothills of the Sierra Ancha mountains that border Tonto Basin on the northeast.

ACCESS

Access to the White Cow mine is via Greenback road from Punkin Center to the Quartz Ledge Spring junction.

Then 7 miles on a non-maintained one-lane road passable by two-wheel drive vehicles to the mine.

MINING HISTORY

The White Cow mine was purchased by Tonto Mining and Milling Co., Inc. during the early 1970's. Tonto Mining and Milling have excavated numerous trenches and sank a 100-140 foot decline on the fluorspar vein. The decline is at a -24 degree angle and has rail, headframe, and hoist house in good condition. (Plate 2)

At the present time the decline is full of water and must be pumped before actual mining operations can be resumed. Due to the lack of mine records, no data is available on the amount of ore mined from the White Cow mine. It is estimated by the amount of work completed that less than 500 tons of fluorspar has been produced from this mine.

GEOLOGY

The property is underlain by pre-Cambrian granite. The granite has large pinkish potash feldspar crystals in a hypidiomorphic groundmass. The quartz phenocrysts are clear and the plagioclase occurs in light colored grayish laths.

Plate 3 - White Cow Mine fluorspar vein. Vein is above decline portal.

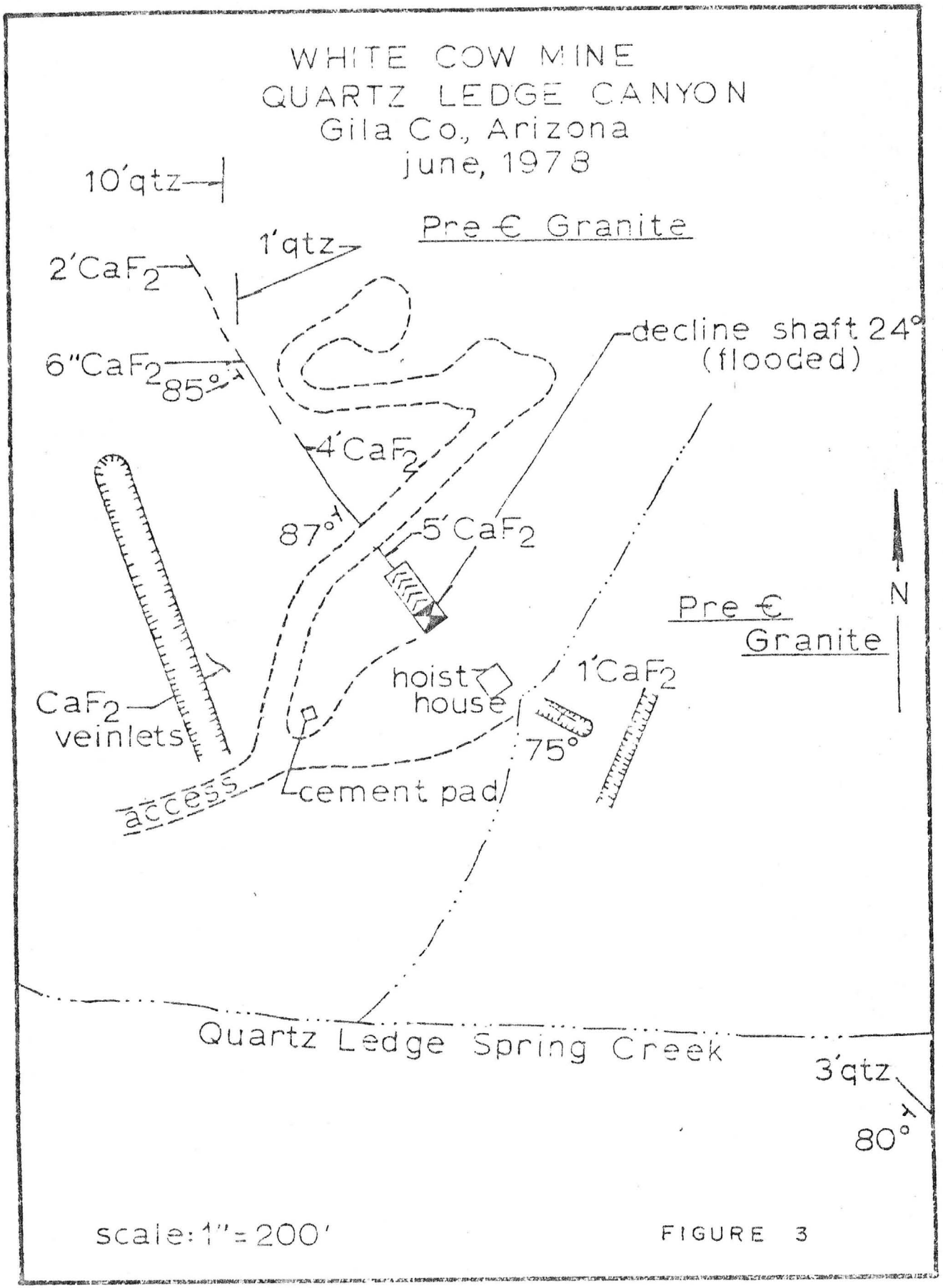

WHITE COW MINE
QUARTZ LEDGE CANYON
Gila Co., Arizona
june, 1978
10'qtz
Pre-€ Granite
1'qtz
2'CaF2
decline shaft 24°
(flooded)
6"CaF2
85°
4'CaF2
87°
5'CaF2
N
Pre-€
Granite
hoist
house
1'CaF2
CaF2
veinlets
75°
access
cement pad
Quartz Ledge Spring Creek
3'qtz
80°
scale: 1" = 200'

FIGURE 3

The fluorspar occurs as a fissure vein in the granitic rock and strikes N45-50W and dips 85 degrees southwest. (Figure 3) The fluorspar occurs as white and purple crystals and has a gangue of quartz with minor calcite. No metallic minerals was observed within the fluorspar mineralization.

The fluorspar vein in the vicinity of the decline is five feet wide (Plate 3) and narrows to 12 inches about 400 feet to the northwest. (Plate 4)

A quartz dike crops out approximately 500 feet northwest (Figure 3) of the portal. The quartz is a pure white color with minor amounts of iron staining and forms a conspicuous ledge for what the area is appropriately named.

To the southeast the vein pinches out and cross veining occurs. Within a trench cut in the canyon wall to the southeast of the hoist house a cross vein of fluorspar twelve inches wide was mapped. Continuing on strike to the southeast a quartz dike crops out similar to the dikes that crop out on the northwestern portion of the property. (Figure 2)

A 20 by 300 foot trench (Figure 3) has been excavated southwest of the fluorspar vein. It is reported that a 50 foot winze had been sunk in this area on a good fluorspar vein. No evidence of this can be found at the present time due to the caving of the trench walls.

WHITE COW MINE

QUARTZ LEDGE SPRING, GILA COUNTY, AZ.

LONGITUDINAL SKETCH — LOOKING EAST

SCALE 1" = 200'

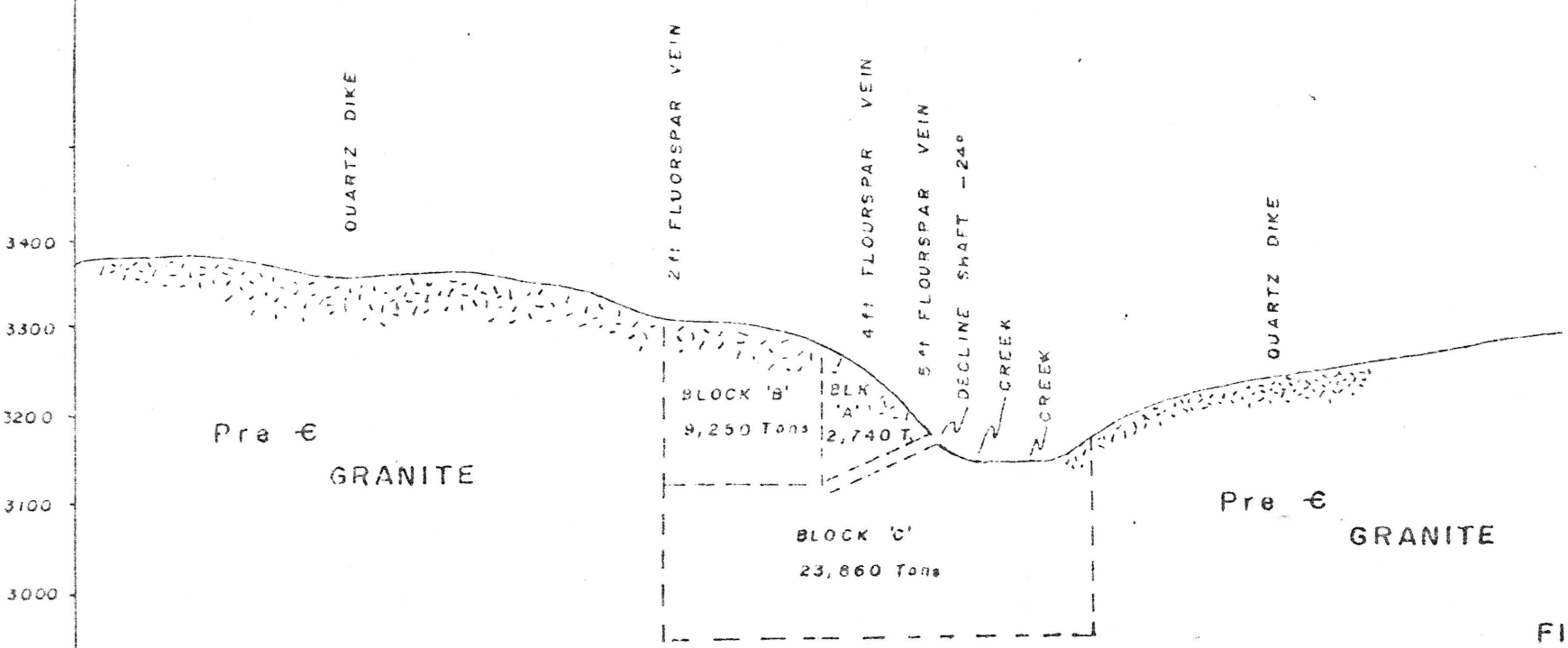


FIGURE 2

FLUORSPAR RESERVES

The White Cow fluorspar reserves are diagrammed in figure 2. The indicated ore reserves are blocked out above the existing decline and is continued as far north as the outcrop of a 2 foot wide fluorspar vein.

The inferred ore block (Block C) extends the fluorspar mineralization to a depth of 200 feet.

Combining the indicated and inferred ore reserves, the White Cow mine is estimated to have 23,850 tons of fluorspar with a grade exceeding 50% fluorspar.

RED ROCK MINE

LOCATION

The Red Rock mine is located in T.7N., R. 12E., section 19 of Gila County Arizona. The mine is in a small narrow canyon cut by Red Rock spring. (Plate 5) The canyon is immediately northwest of Picture Mountain, a well-known landmark in the area. The portal is at an elevation of 5300 feet.

ACCESS

Access to the property is via Greenback road to Forest Service road 416 for a distance of 5 miles. This road is Forest Service owned and maintained by Gila County. The

mine is accessible by two-wheel drive vehicles.

MINING HISTORY

The Red Rock mine was purchased and opened by Tonto Mining and Milling Co., Inc. during the early 1970's. A reported 500 feet of drift was driven on the vein to provide a haulway for the stoping operation above this 1st level. (Plate 5)

The stopes examined indicate an average height of approximately 75-100 feet and a width of 3-8 feet. No record of production is available but it is estimated that less than 5,000 tons has been mined from the 1st level of the Red Rock mine.

A short 30 foot crosscut was driven at a later date approximately 40 feet below the 1st level and a small amount of ore was produced from this area.

During May and June, 1978, Earl Waite and Sons, a mining contractor, drove a 230 foot crosscut and intersected the vein about 70 feet below the 1st level. Upon completion of the crosscut, a drift to be used as a haulway was driven on the vein for a distance fifty feet in a southeast direction. Approximately 75 tons of ore was produced from this drift.

This work completed the contract with Earl Waite and

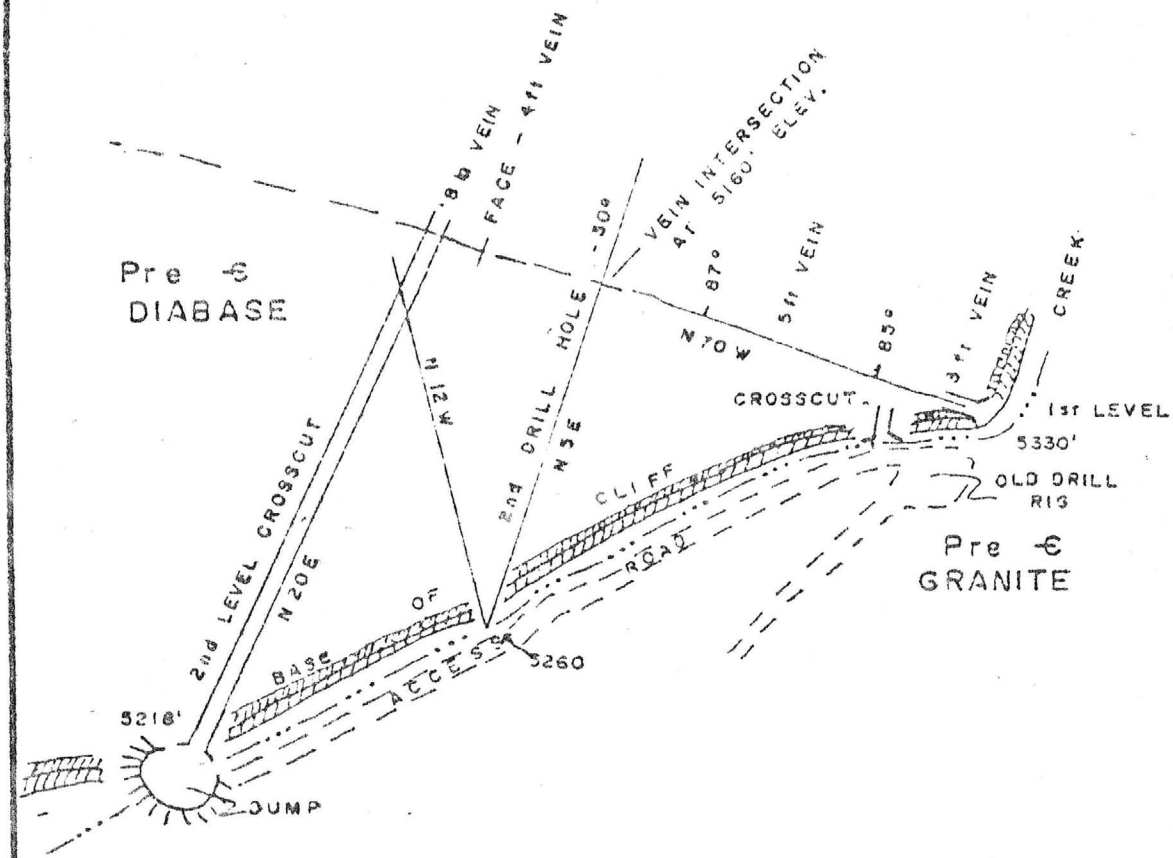
Plate 5 - Red Rock Mine. Note diabase sill forming cliff above 1st level portal of mine. (arrow) Fluorspar vein to right of portal.

the mine is now dormant pending approval from the U. S. Forest Service on the construction of a new access road from the new production level to Forest Service road 416. Approval of this project is expected during June and the construction of the three-quarter mile road will then be completed. Mining is expected to resume in July with an estimated daily production of 25 tons.

In addition to the mine development, two drill holes were completed during 1976. The 2nd drill hole intersected the fluorspar vein at 5160 feet of elevation with a vein width of 10 feet. This intersection is 100 feet below the 2nd level or the present working level of the Red Rock mine.

GEOLOGY

The Red Rock mine area is underlain by a diabase sill of pre-Cambrian age. (Figure 5) The diabase is fine to medium grained, medium to dark gray color and has an ophitic texture. The rock weathers to a reddish-brown color and forms a very thin soil cover on the sill. In a few instances, gravity differentiation was noted. Layers of feldspar concentration up to four inches thick were observed from outcrops in the uppermost section of the sill. Olivine



RED ROCK MINE

JUNIPER MT., GILA COUNTY, AZ.

N

FIGURE 5

Scale 1" = 200'

concentration was noted from float along the base of the cliff. No effort was made to locate the specific zone of olivine concentration at this time.

This intrusive has been mapped by Wilson and Moore of the Arizona Bureau of Mines and Cooper of the U. S. Geol. Survey and the intrusive appears on the geologic map of Arizona as a younger rock unit than the pre-Cambrian granite. The contact between the pre-Cambrian granite and the pre-Cambrian diabase is near the portal of the 1st level of the Red Rock mine. (Figure 5) The sill appears to be discordant in relation to the granite and dip less than 10 degrees to the northeast.

Mapping on the surface of the intrusive, above the mine workings, indicates numerous quartzitic dikes, quartzose aplite dikes and sills associated with the diabase. Fluorspar veins and veinlets also crop out on the surface of this sill and indicate additional fluorspar mineralization may be present.

A quartzitic unit, parelling the fluorspar vein in the Red Rock mine was sampled and assayed for fluorspar. Results indicate a definite correlation between quartzite and the fluorspar mineralization and may have provided the necessary mechanism for the fluorspar concentration in this area.

The fluorspar vein is exposed in the 1st level haulway for a distance of approximately 300 feet. The haulway is caved at this point and no attempt was made to examine the remaining workings.

The fluorspar vein is a fissure vein along a shear zone in the diabase sill. Silica and minor amounts of calcite are the common gangue minerals in the vein. The fluorspar vein pinches and swells at a random interval. The width varies from 18 inches to 5 feet. The mineralization within the vein also varies in fluorspar content. The swells have zones of high grade surrounded by numerous veinlets.

The vein seldom varies more than 10 degrees from vertical and has a consistent strike of N70W for the 300 feet of haulway examined.

The vein has been exposed in the 2nd level for a distance of 48 feet. It varies in width from 18 inches to 5 feet at the face. The vein has not been exposed for a sufficient distance to observe the pinch and swell characteristics of this type of mineralization. Samples taken from the dump and veins indicate that a grade of 50-60% fluorspar can be maintained during active mining operations.

RED ROCK MINE

JUNIPER MOUNTAIN, GILA COUNTY, AZ.

LONGITUDINAL SKETCH — LOOKING NORTHEAST

SCALE 1" = 200'

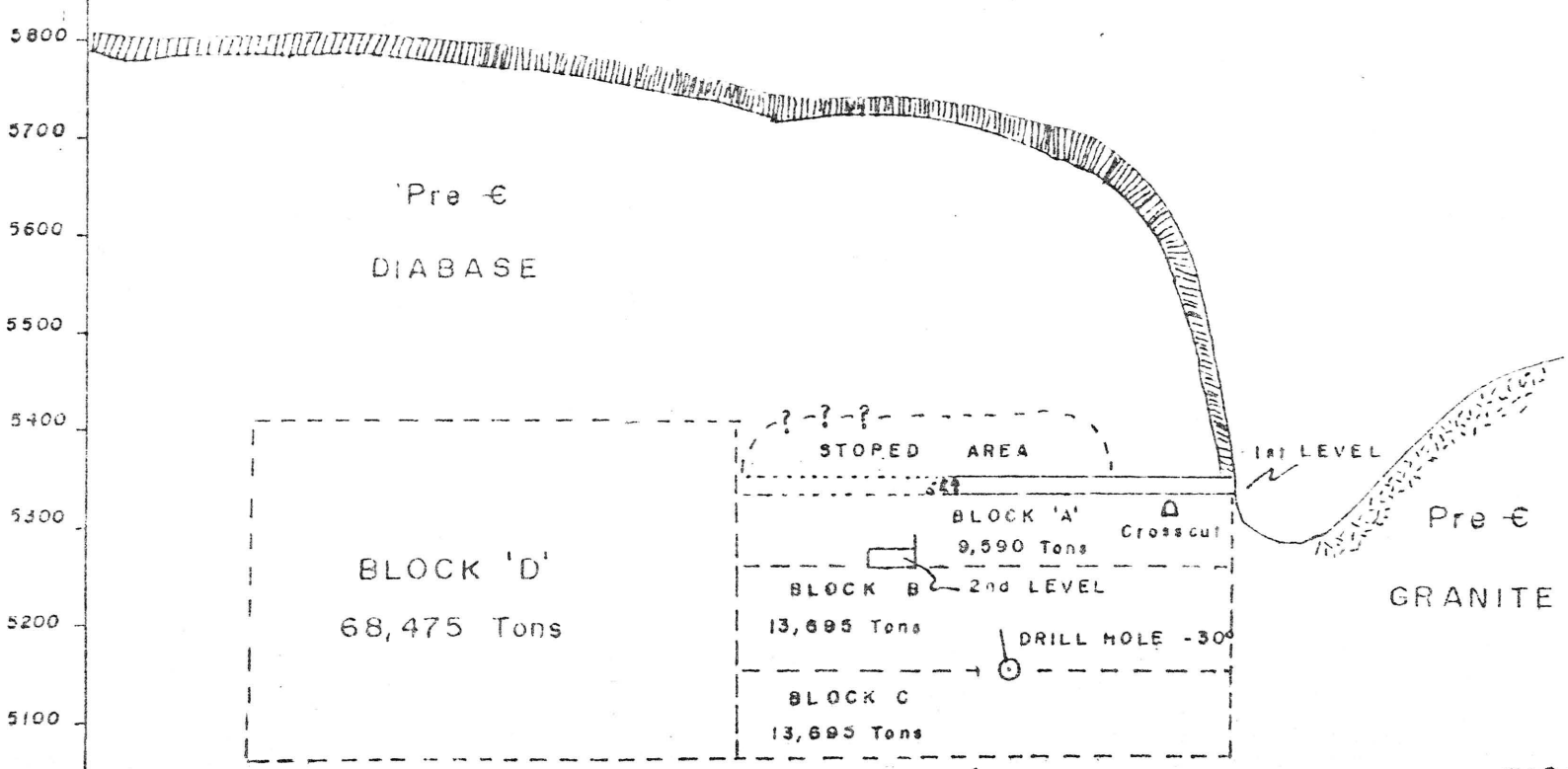


FIGURE 4

FLUORSPAR RESERVES

The Red Rock fluorspar reserves are diagrammed in figure 4. The indicated reserves are located below the 1st level and above the drill hole that intersected the vein at 5160 feet of elevation.

The inferred ore blocks extend the mineralization an additional 100 feet in depth and 500 feet laterally.

The total ore reserves for the Red Rock mine are estimated at 105,455 tons with a grade exceeding 50% fluorspar.

BLUEBIRD MINE

LOCATION

The Bluebird mine is located in T.6N., R.11E., section 9 of Gila County, Arizona. The mine lies in a canyon occupied by Edwards spring at an elevation of 3220 feet.

ACCESS

Access to the mine is from Punkin Center via Greenback Road to Tonto Mining and Milling Co., Inc.'s mill and then on 6 miles of semi-improved single lane road to the mine. The road is passable to a two-wheel drive vehicle.

MINING HISTORY

The Bluebird mine, (Plate 6) also known as the Packard fluorspar property, was examined by the U. S. Bureau of Mines during 1945. The Bureau conducted an exploration program consisting of overburden stripping, trenching, tunneling, surveying and sampling.

During 1958 a limited amount of production was reported from the 1st level of the Bluebird mine. The ore produced was trucked to a 25 ton flotation mill east of Punkin Center. The mill has been reported to have made small shipments of acid grade fluorspar during the year 1958.

During the late 1960's E. A. Elevatorski of the Arizona Bureau of Mines visited the Bluebird mine and reported:

> "Principal development working consist of two adits, the lower adit of which was advanced 75 feet, and exposes a white, green and purple, coarse to medium grained crystalline fluorspar vein, about 2 ft. in width. The upper adit extends 320 feet and exposes a 3 ft. wide vein of white, green and purple fine grained crystalline to massive fluorspar."

In the early 1970's Tonto Mining and Milling purchased the mine and began a small mining operation. The 2nd level was advanced over 600 feet on the vein and became the principal haulway. No production records are available and the stopes are presently in unsafe condition, therefore, no estimate on the amount of production can be made at this time.

Plate 4 - View of White Cow fluorspar vein looking northwest. Arrow indicates location of portal.

Plate 6 - Bluebird Mine. A = 1st level, B = 2nd level, C = 3rd level.

A decline has been sunk to establish the 3rd level, approximately 150 feet below the 2nd level and is now the present working level.

A core drilling program was also initiated at this time to intersect the vein near the access road. The drill hole was never completed and the core drill is still on site. (Plate 7)

At the present the mine is operated by John Roberds, mining contractor, and is producing 25-35 tons of fluorspar a day at 60% grade.

GEOLOGY

The Bluebird mine is underlain by pre-Cambrian granite. (Figure 6) The granite has large pinkish potash feldspar crystals in a hypidiomorphic groundmass. The quartz phenocrysts are clear and the plagioclase occurs in light colored grayish laths. The granite weathers into the typical fine granular material that is characteristic of granitic weathering.

The fluorspar vein occupies a fault zone (Plate 8) which strikes N75W and has a 75°NE dip. (Figure 6) In the eastern part of the claims the fault zone is within the creek bed and is largely concealed by overburden. Gouge on the hanging

Plate 7 - Bluebird Mine. Note drill rig still on location.

Plate 8 - Bluebird Mine. Post mineralized fault is denoted by broken line.

wall contains fluorspar fragments which indicated the fault is post-mineralization. Numerous cross shears were also noted on the surface of the 3rd level and are believed to have influenced the ore deposition.

The fluorspar vein can be traced for a distance of 2,000 feet in an east-west direction. It varies in width from 18 inches to 6 feet. The vein outcrops in the creek bed approximately 700 feet east of the 2nd level portal. It has a width of 4.5 feet and has a 6 inch zone of gouge with fluorspar fragments on the hanging wall.

The fluorspar occurs as very fine grained material for the most part. In some instances large crystals of white to purple fluorspar can be seen. Quartz, along the hanging wall, up to 5 inches in width, is also common.

The mineralization to the west becomes increasing siliceous and the fluorspar appears to die out approximately 500 feet west of the 1st level portal. A fluorspar outcrop was located about 3500 feet west of the workings and has a vein of 30 inches wide. The vein could not be traced laterally due to the amount of overburden.

FLUORSPAR RESERVES

The Bluebird fluorspar reserves are diagrammed in Figure 7.

The indicated ore blocks are located above the present haulage level and below the 2nd level. The ore is blocked out on three sides and could be classed as measured in most instances. In this case a comprehensive sampling program was not carried out so the ore blocks will be classed as indicated.

The inferred ore blocks extend the mineralization 200 feet below the 3rd level and 1000 feet laterally to the east. The lateral extension is warranted due to the fluorspar outcrops in the creek bed.

The total reserves of the Bluebird mine are estimated at 118,205 tons with a grade exceeding 50% fluorspar.

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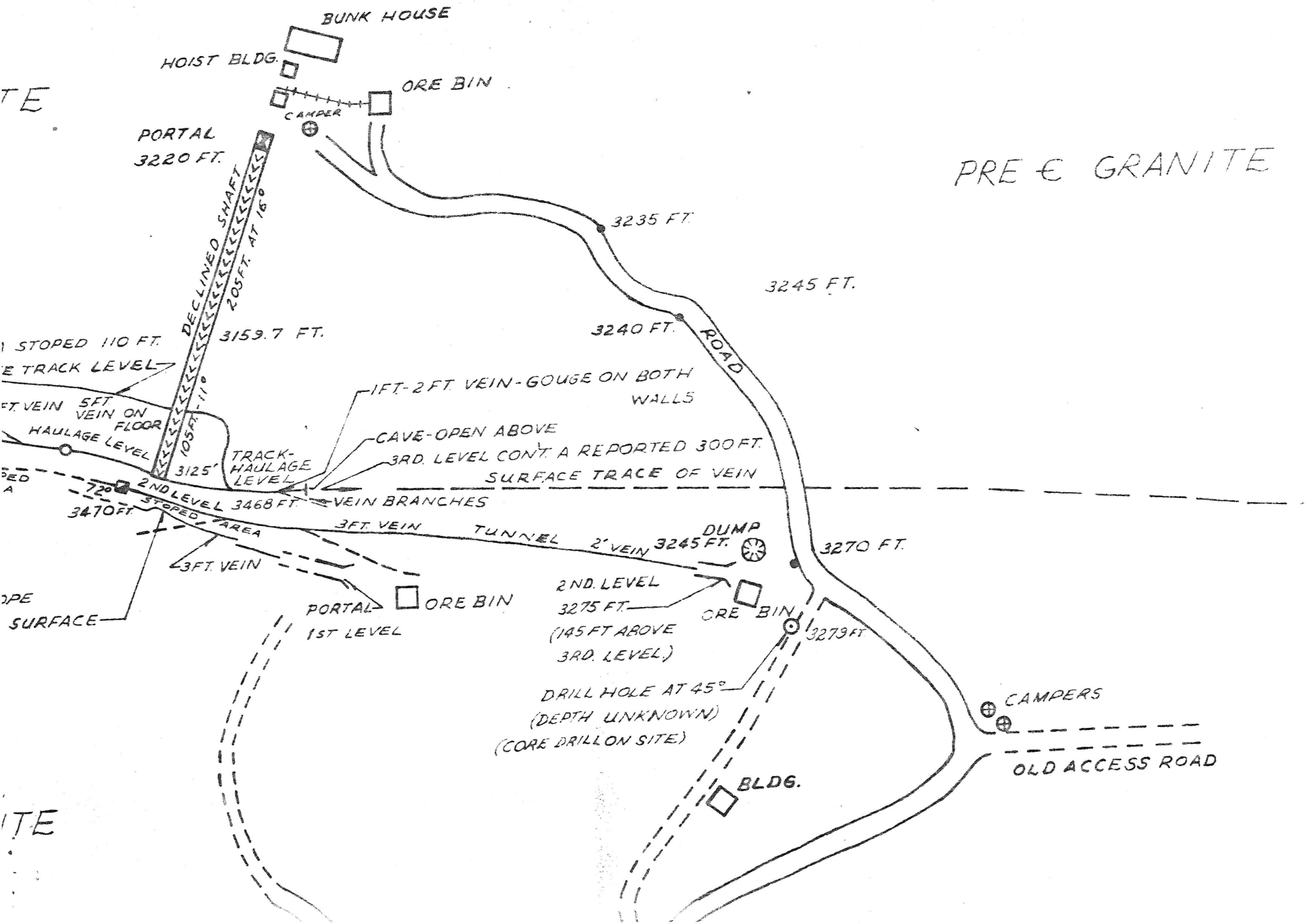
BLUEBIRD MINE
GILA CO, ARIZONA

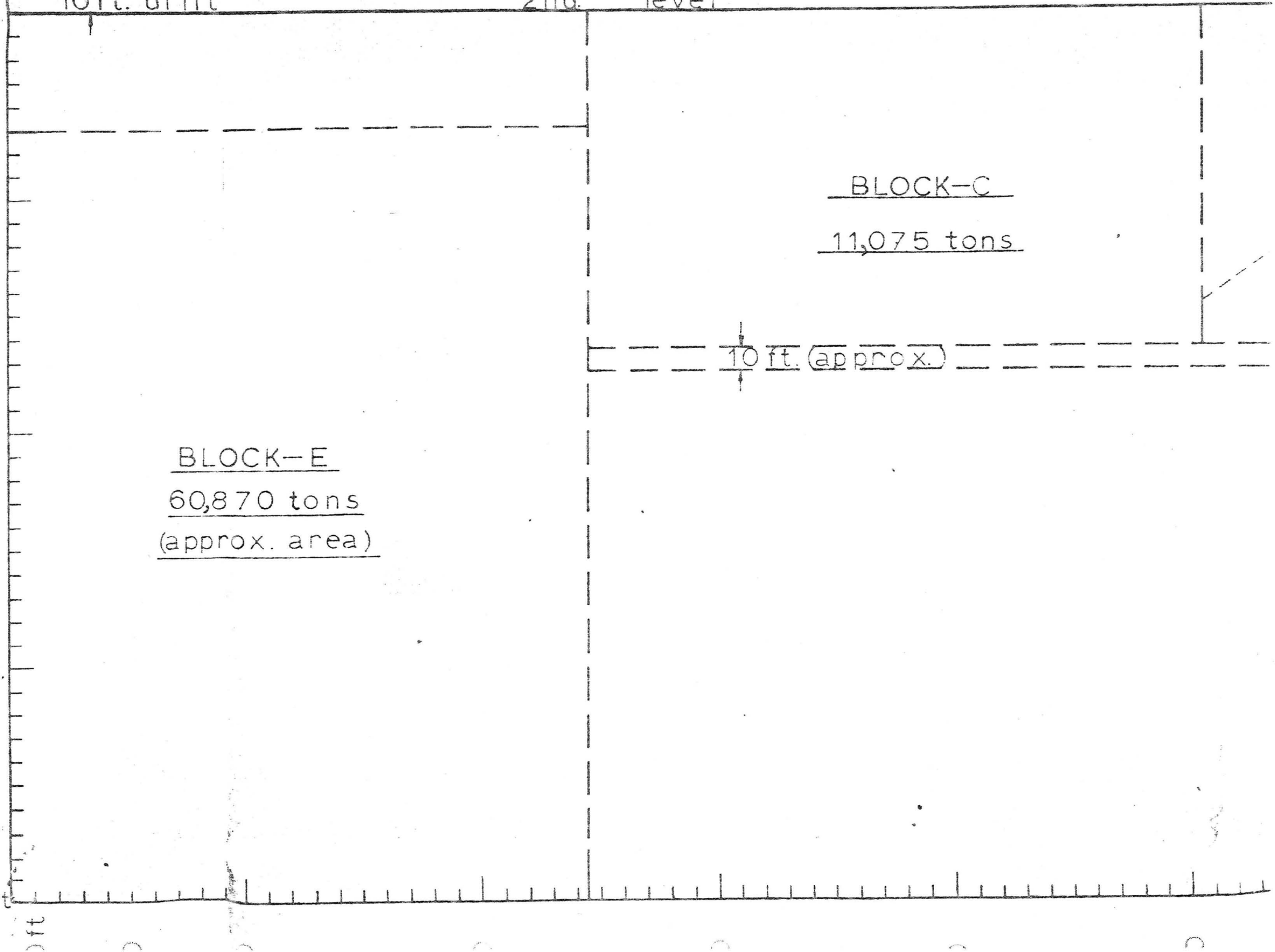
longitudinal sketch

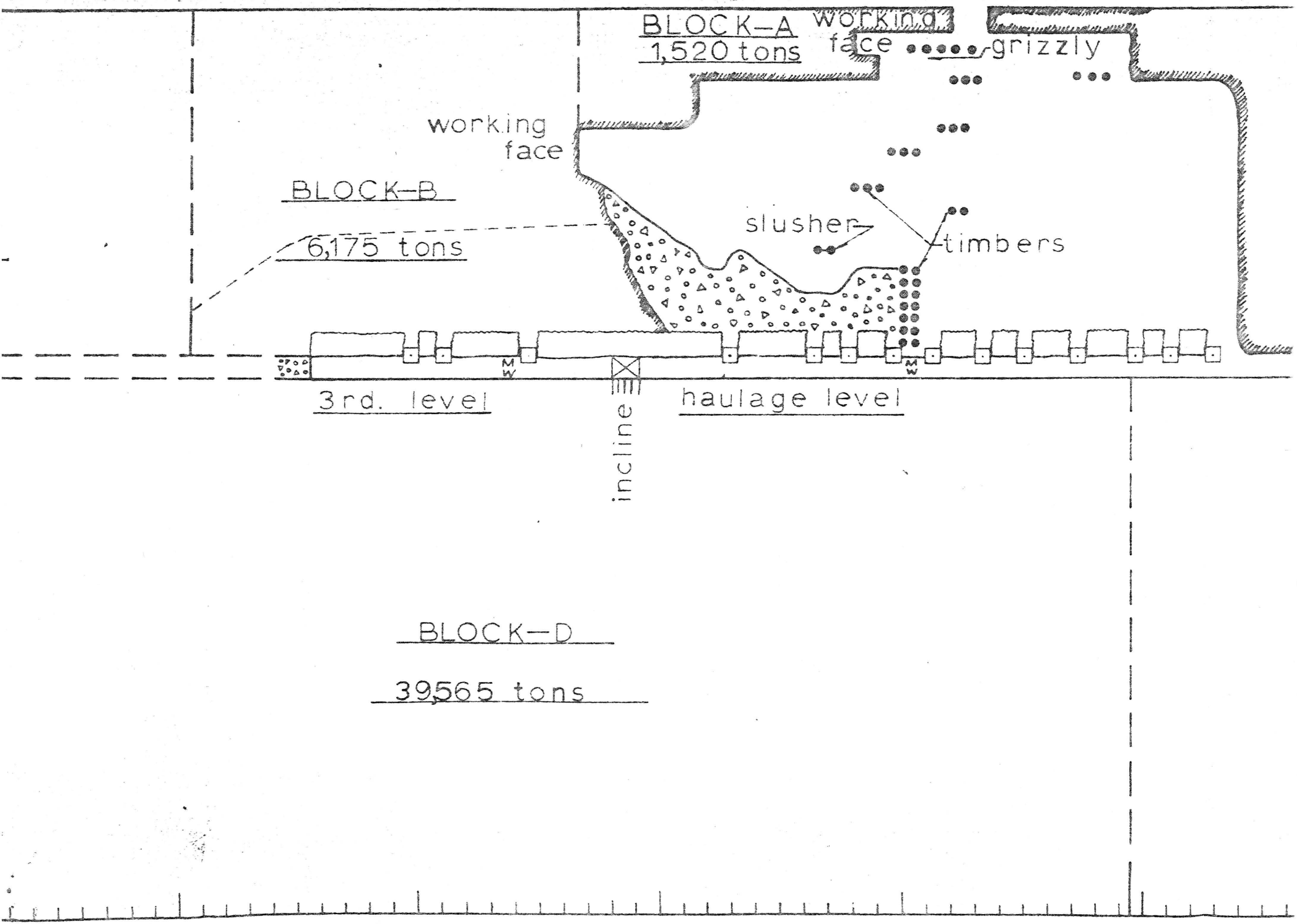
looking south—(decline portal)

scale: 1"=50'

june-1978


BUNK HOUSE
HOIST BLDG.
ORE BIN
CAMPER
PORTAL
3220 FT.
DECLINED SHAFT
205 FT. AT 16°
105 FT. - 11°
3159.7 FT.
STOPED 110 FT.
TRACK LEVEL
FT. VEIN
5 FT. VEIN ON FLOOR
HAULAGE LEVEL
3125'
TRACK-HAULAGE LEVEL
1 FT.-2 FT. VEIN-GOUGE ON BOTH WALLS
CAVE-OPEN ABOVE
3RD. LEVEL CONT. A REPORTED 300 FT.
SURFACE TRACE OF VEIN
72°
2ND LEVEL 3468 FT.
VEIN BRANCHES
3470 FT.
STOPED AREA
3 FT. VEIN
TUNNEL
2' VEIN
3245 FT.
DUMP
3270 FT.
3 FT. VEIN
SURFACE
PORTAL
1ST LEVEL
ORE BIN
2ND. LEVEL
3275 FT.
(145 FT ABOVE 3RD. LEVEL)
ORE BIN
3279 FT
DRILL HOLE AT 45°
(DEPTH UNKNOWN)
(CORE DRILL ON SITE)
BLDG.
CAMPERS
OLD ACCESS ROAD
3235 FT.
3245 FT.
3240 FT.
ROAD
PRE € GRANITE


BLOCK—C
11,075 tons
10 ft. (approx.)
BLOCK—E
60,870 tons
(approx. area)


BLOCK—A
1,520 tons
working face
grizzly
working face
BLOCK—B
6,175 tons
slusher
timbers
3rd. level
incline
haulage level
BLOCK—D
39,565 tons

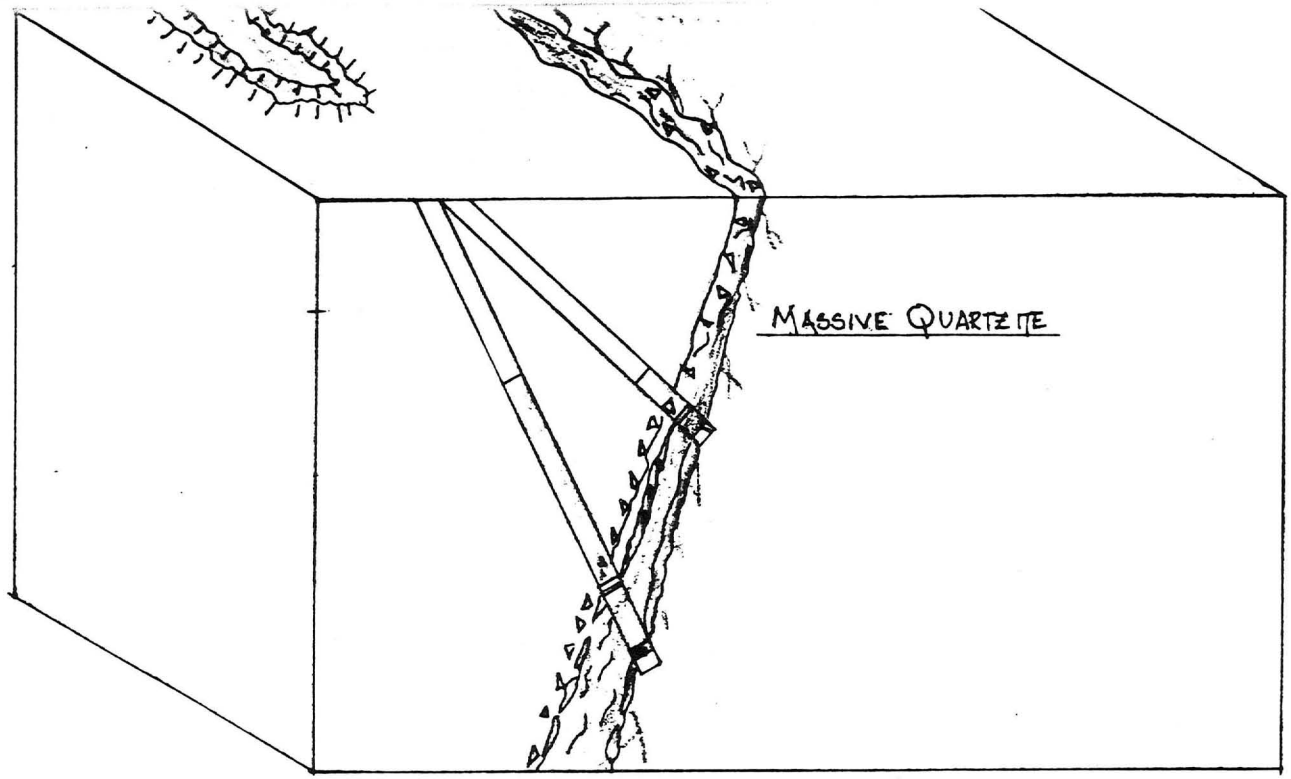
SHEET NO. ....OF....

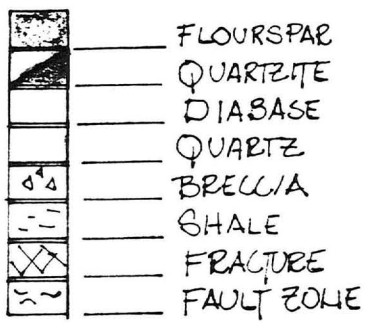
JOB NO. .....

SUBJECT .....

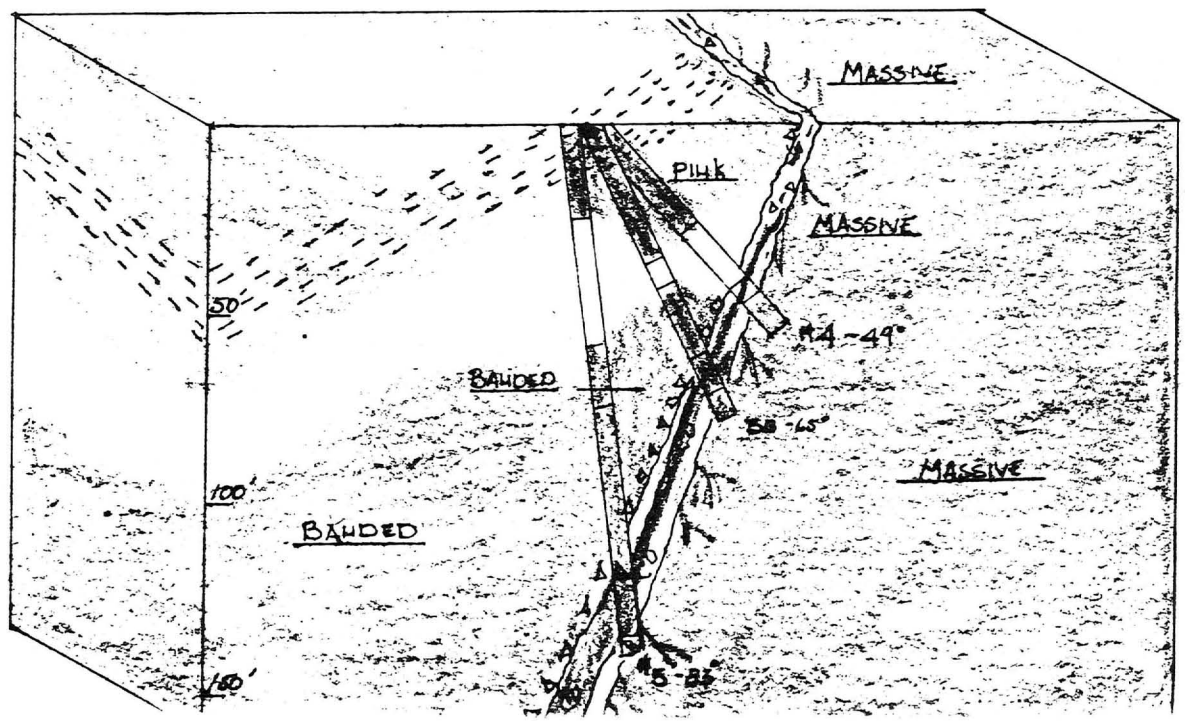
DATE .....

CHKD. BY ..... DATE .....





SCALE 1 INCH = 50 FEET

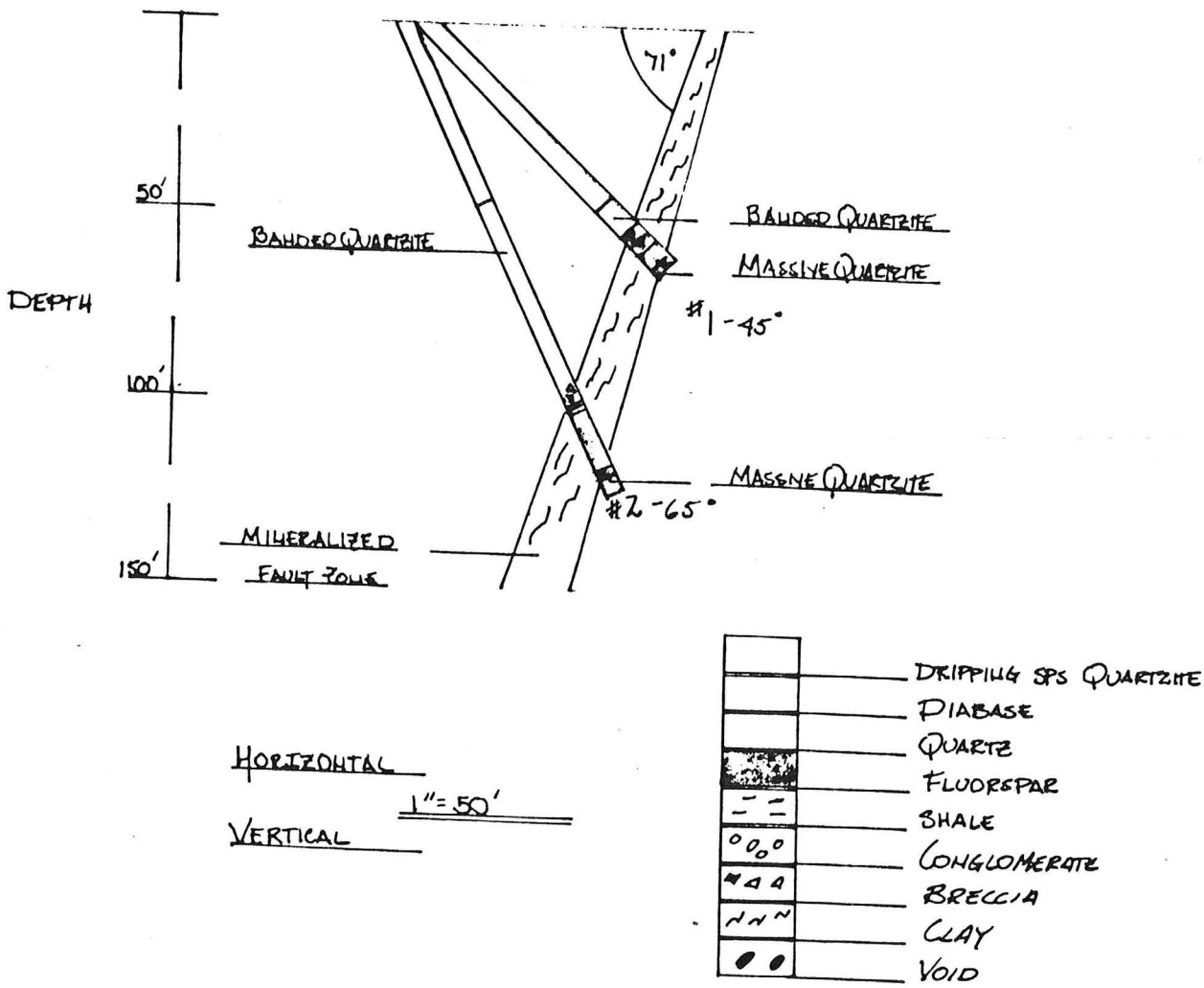


GENERALIZED BLOCK DIAGRAM
WESTERN FLUORSPAR D.H. #1-#5
MACK ("JERKY") CLAIMS

WESTERN FLUORSPAR

Mack (Jerky) claim area

D.H. #1 & #2

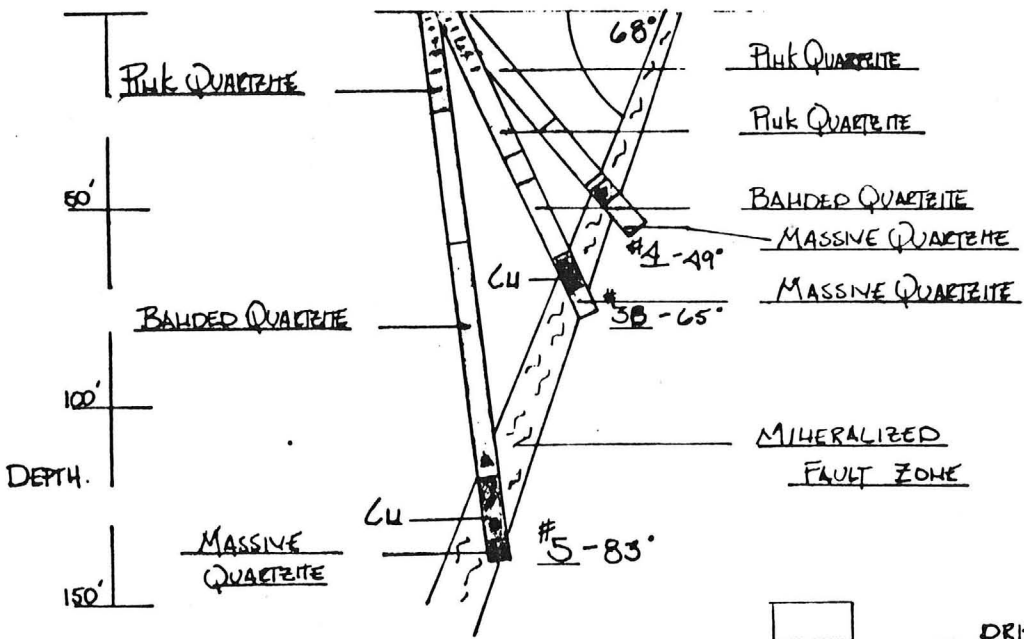


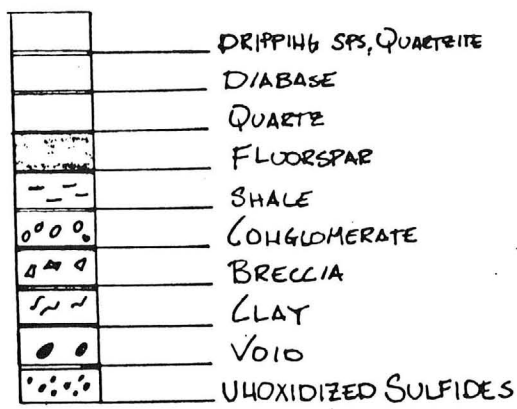
M.S. 9/6/77

WESTERN FLUORSPAR

Mack (Jerky) claim area

D.H. #3B - #4 - #5





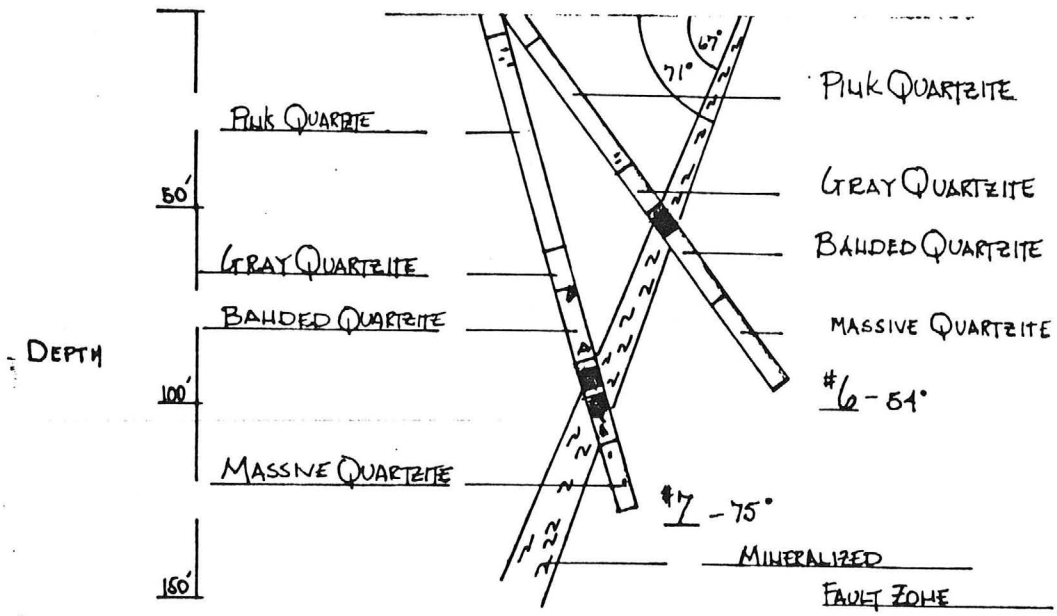
Horizontal
1" = 50'
Vertical

M.S. 9/6/77

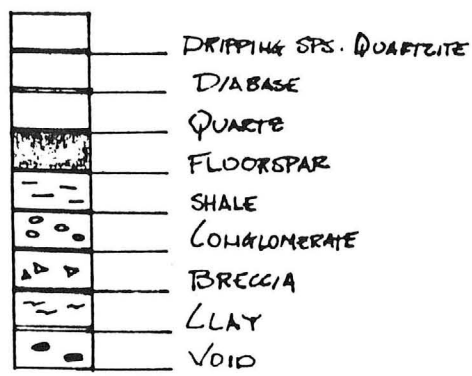
WESTERN FLUORSPAR

Mack (Jerky) claim area

D.H. #6 - #7



Horizontal
1" = 50'
Vertical

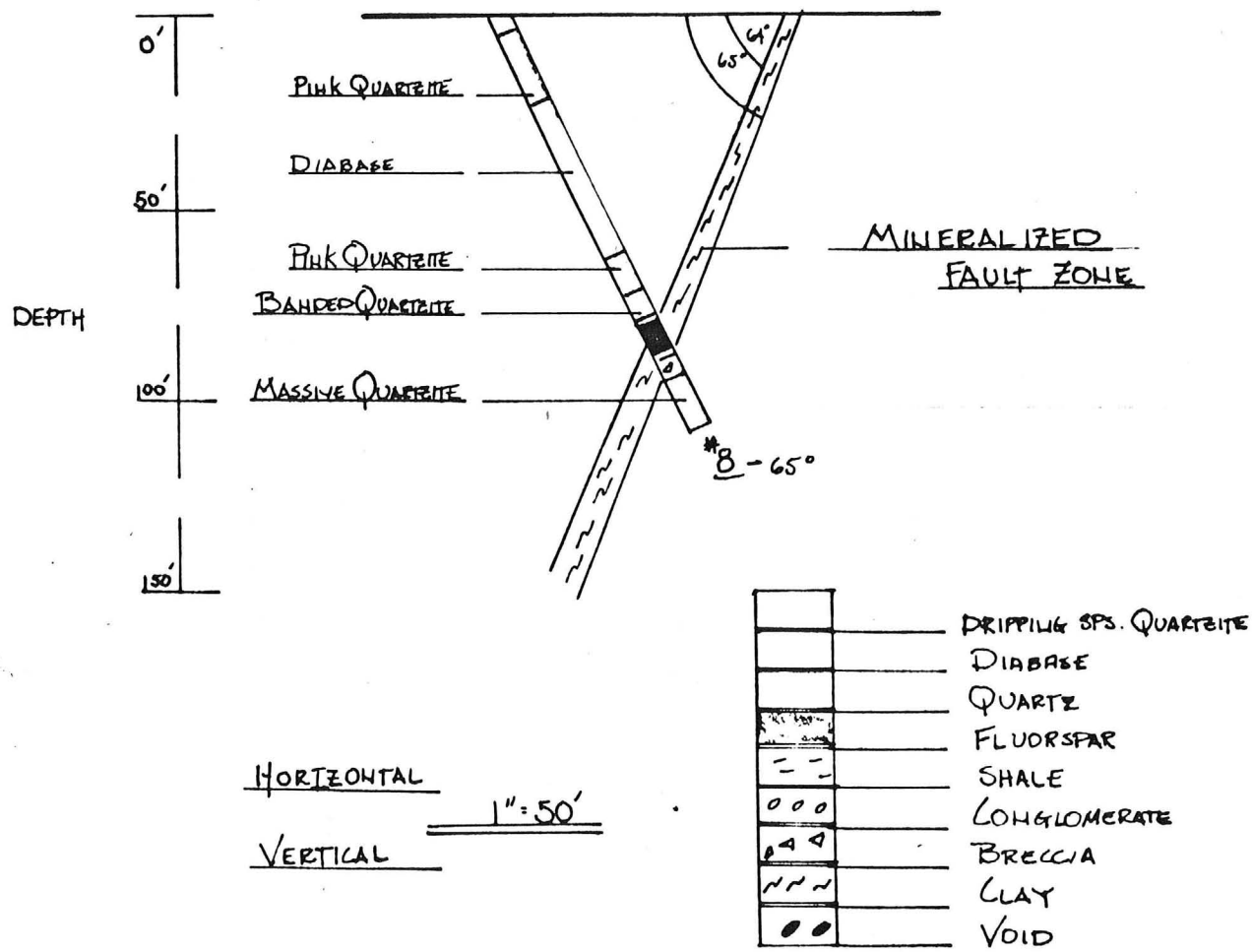


M.S. 9/6/77

WESTERN FLUORSPAR

Mack (Jerky) claim area

D.H. #8

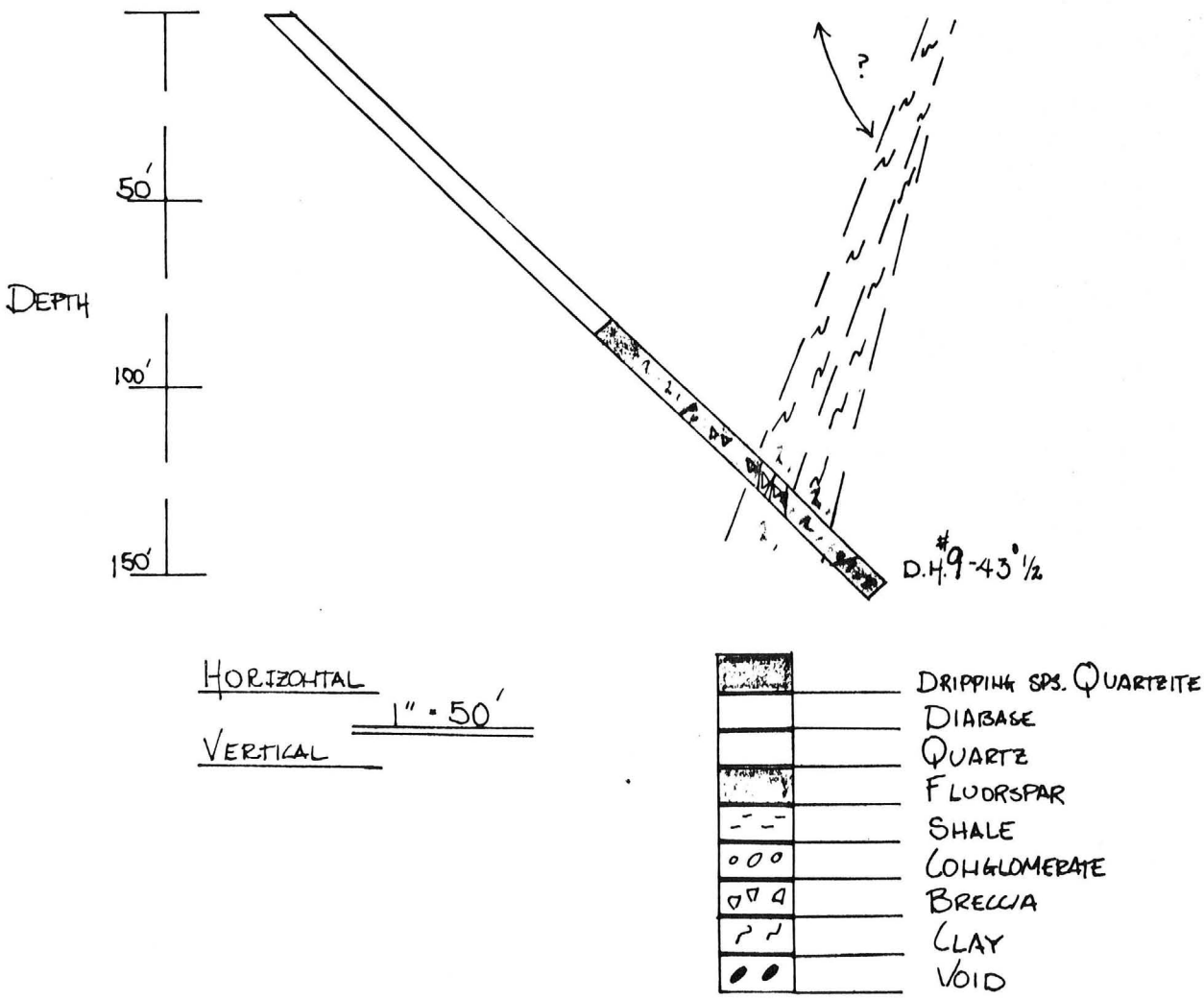


M.S. 9/6/77

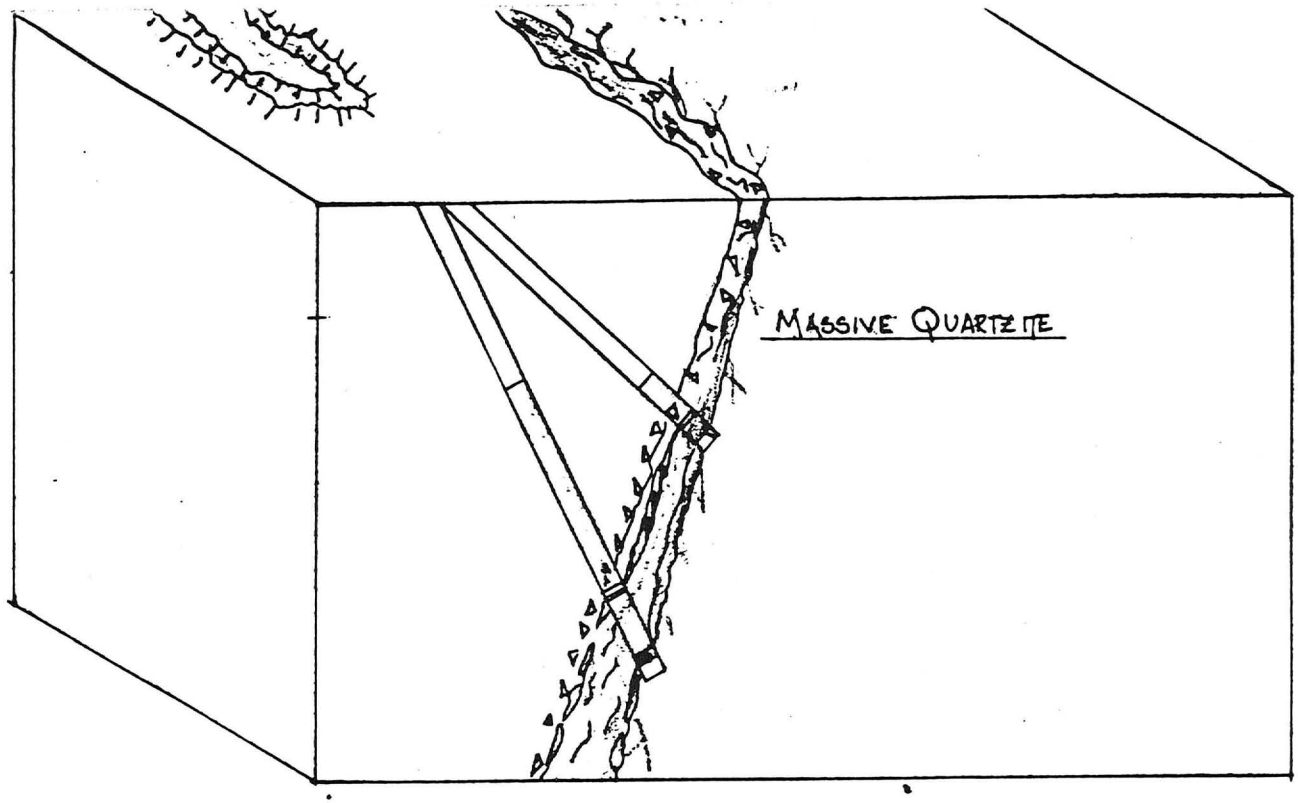
WESTERN FLUORSPAR

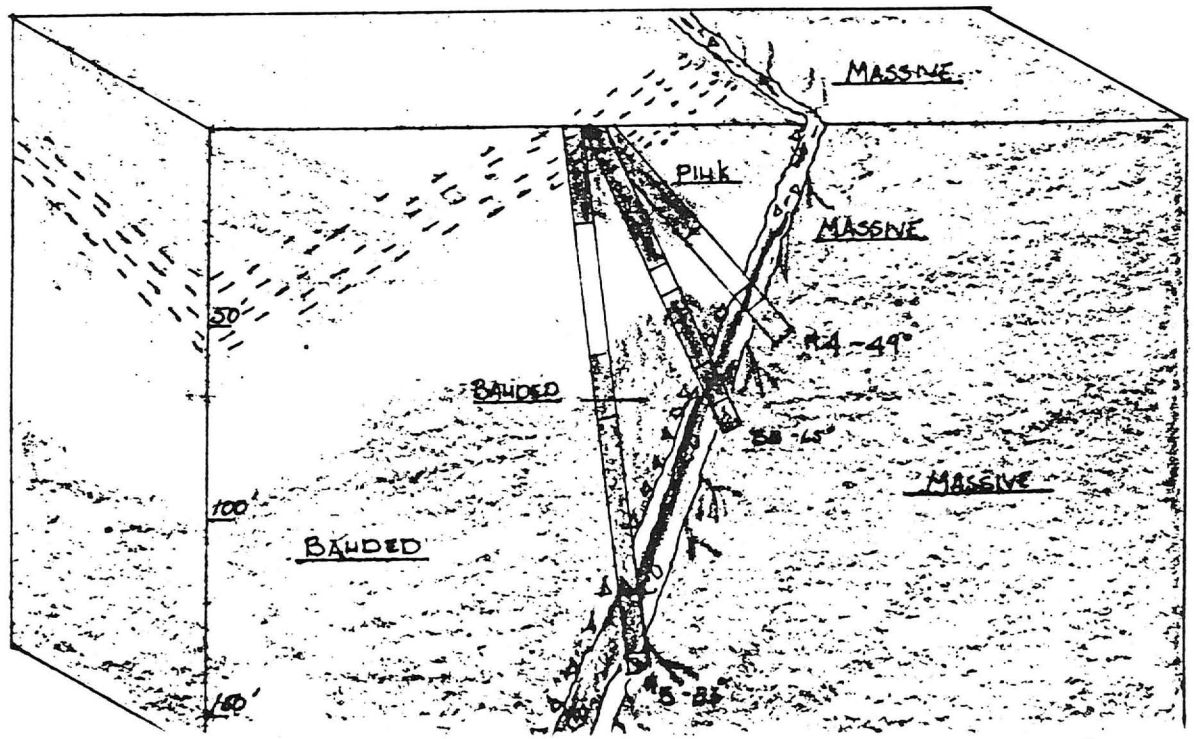
Mack (Jerky) claim area

D.H. #9



M.S. 9/6/77





FLOURSPAR
QUARTZITE
DIABASE
QUARTZ
BRECCIA
SHALE
FRACTURE
FAULT ZONE

SCALE 1 INCH = 50 FEET

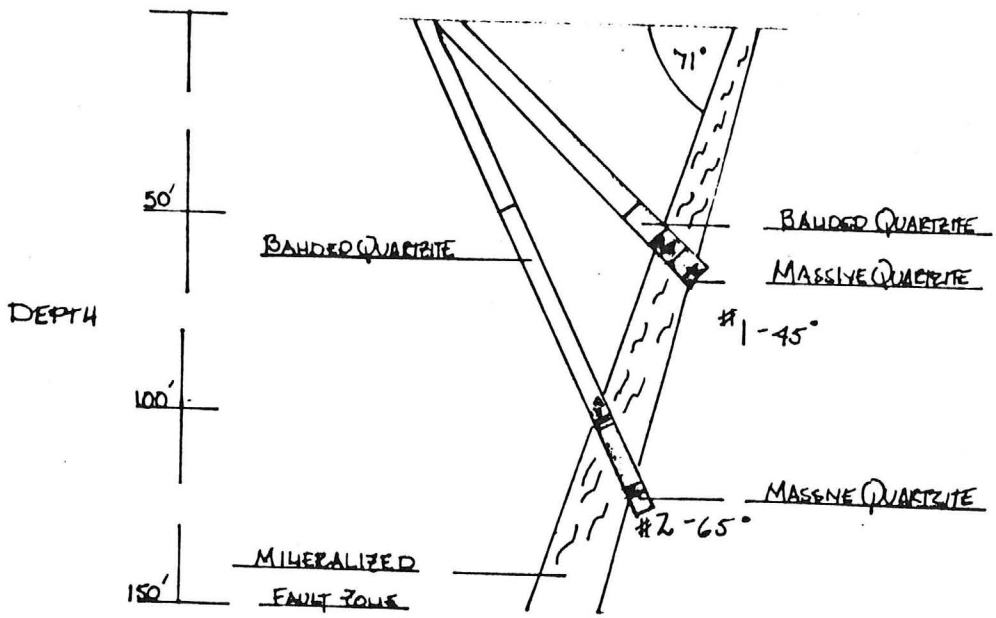
GENERALIZED BLOCK DIAGRAM
WESTERN FLUORSPAR D.H. #1-#5
MACK ("JERKY") CLAIMS

SHEET NO. ....OF....
JOB NO. .....
SUBJECT .....
DATE .....
HKD. BY ..... DATE .....

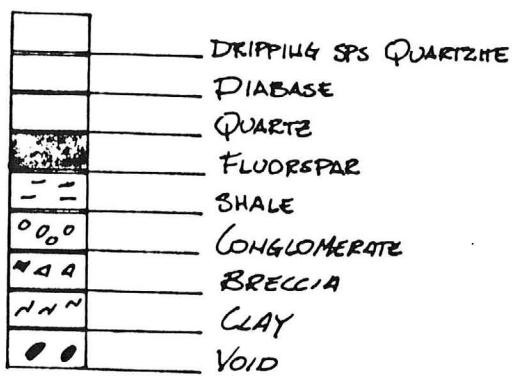
WESTERN FLUORSPAR

Mack (Jerky) claim area

D.H. #1 & #2



HORIZONTAL
1" = 50'
VERTICAL

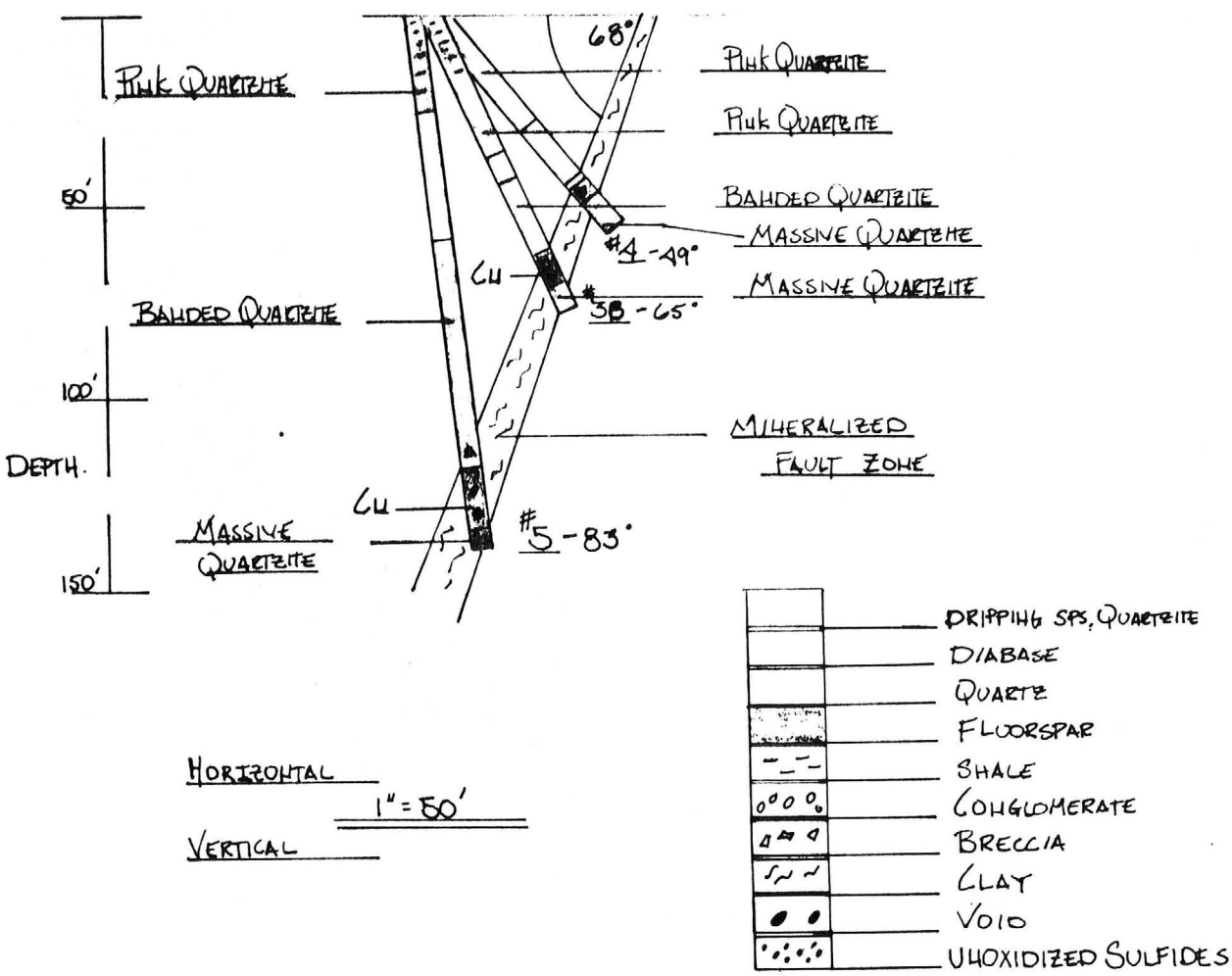


M.S. 9/6/77

WESTERN FLUORSPAR

Mack (Jerky) Claim area

D.H. #3B - #4 - #5

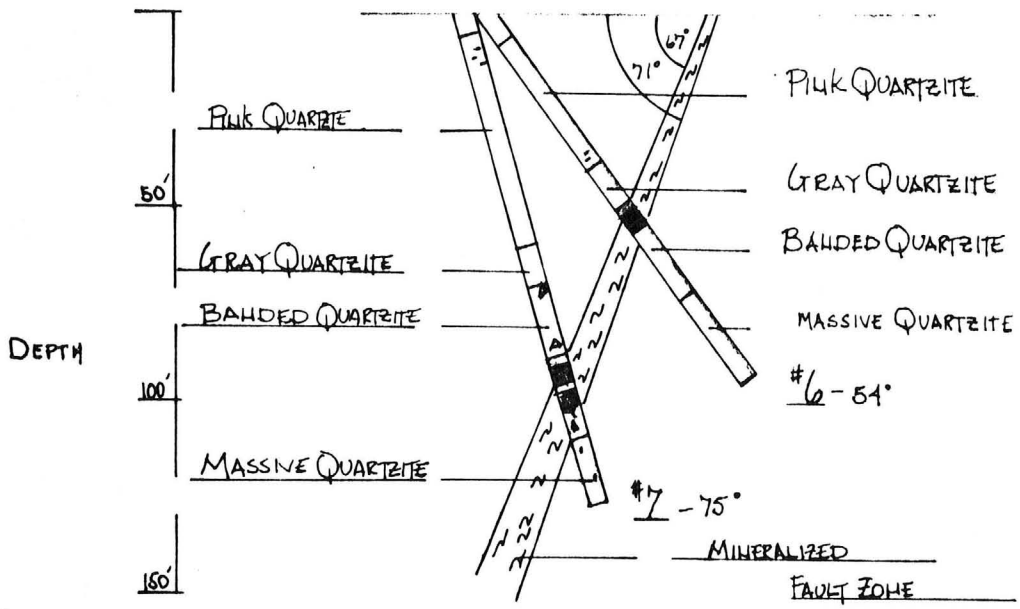


M.S. 9/6/77

WESTERN FLUORSPAR

Mack (Jerky) claim area

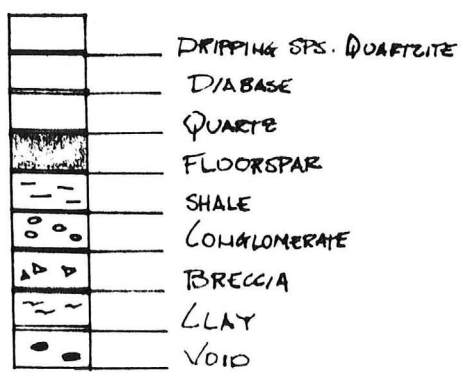
D.H. #6 - #7



HORIZONTAL

1" = 50'

VERTICAL

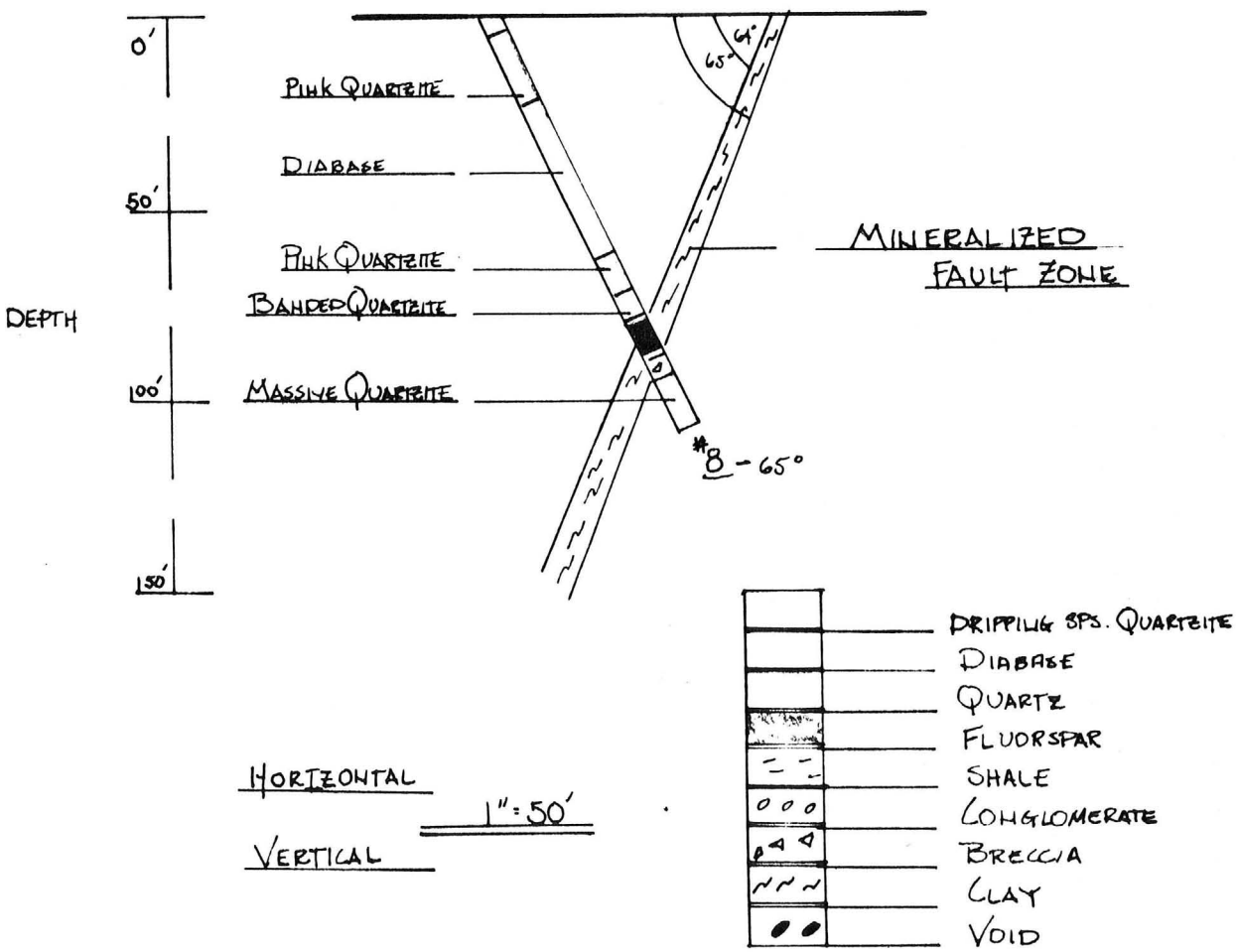


M.S. 9/6/77

WESTERN FLUORSPAR

Mack (Jerky) claim area

D.H. #8

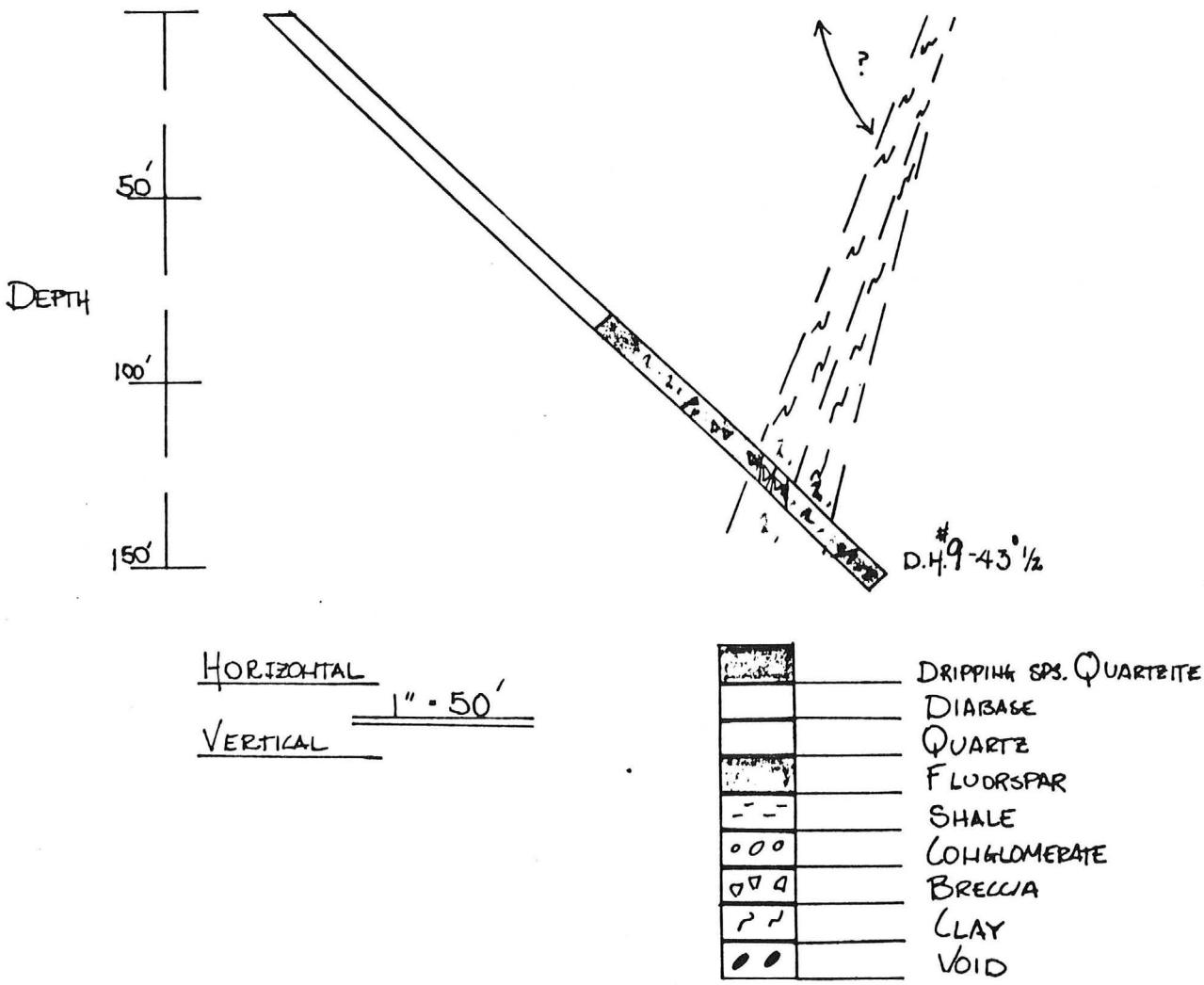


M.S. 9/6/77

WESTERN FLUORSPAR

Mack (Jerry) claim area

D.H. #9



M.S. 9/6/77

BUILDINGS

1 40x80' shop-office-supply building (insulated)
1 25x50' chemical building (insulated)
1 Mill building

1 crusher covering building 19x70'
1 steam boiler building 14x15'

MILL BUILDING

1	Jeffrey vibrating feeder - operating
1	" " " - less controls
1	Universal jaw crusher 10x20 with hp motor & v-belts
1	conveyor belt 16"x40'
1	Symons cone crusher - 20 hp motor
1	vibrating screen 3'x5' - 5 hp motor
1	conveyor belt gear reducer 24"x21 drive - 1 hp
1	elevator
1	wooden ore bin
1	feeder conveyor - vari-speed drive 16"x13'
1	cross conveyor 20"x18'
1	Marcy Ball Mill 6'x5' - 100 hp motor and drive with controller and grids controls - rubber liners and grates except head liners of manganese with ball charge
1	4x3 Galliger vac sel pump with 10 hp U.S. vari-drive
1	D-10-B Krebs cyclone
1	5'x5' conditioner
3	Fag cells 66" with 10 hp motor each cell
3	" " 55"
1	6 cell bank Denver 18 sp. flot cells
1	6 cell bank Denver 21 sp. flot cells
1	3"x2" Galliger vacseal pump
1	4"x4" Galliger vacseal pump
3	1½"x1" Galliger vacseal pump(300 ea.)
1	16' thickener - Denver
1	4" Denver adj. diaphram pump
1	6' 3 disc American filter with Nash vac. pump and accessories
1	10' thickener - Denver with 2" Denver adj. diaphram pump
1	Thickener with WEMCO diaphram pump
1	conveyor with drive
1	short 4' screw conveyor to dryer
1	x30 gas fired concentrate dryer
1	12"x screw conveyor
1	12'x30' coned silo supported
1	6"x5"x60' chain elevator for dry concentrate
1	Hardinge Ball Mill with drive
1	Dorr duplex rake classifier Model C
1	Steam boiler - McKee - 100 hp - gas fired needs tubes rolled
1	6' 3 disc Olver filter- complete I.R. - with vac pump
2	5 hp 2" water pumps (400 ea)
1	12000 gal propane tank
1	Galligher sump pump
1	Roto clone dust collector
1	submersible pump - hp
1	" " - "
1	23 ton soda ash bin tank - steel
1	400 amp electric welder (electric driven)
	12" Denver dry reagent feeder
1	18" " " " "
8	Clarkson reagent feeders
1	4x5 conditioner
1	Time clock
2	Stainless reagent tanks
1	Denver 10" laboratory pressure filter
1	Denver pulp scale

MILL BUILDING CONT.

1	3 hp air compressor (shop)	300
	Fire extinguishers	
	1½ tons of 3" steel grinding balls	
1	3" diaphram pump - Denver - burned in fire	
1	2" Allen-Sherman Hoff sand pump	
1	pipe vise	
1	1" Denver vertical pump	
1	Platform scale for feed weight	
1	Drill hammer	

ASSAY OFFICE

1	Electric furnace - Thermolyne 1500
1	Hot plate and hood - gas
1	Water still - Wheaton - electric
1	Ph meters
1	Voland 100 pulp balance with weights
7	Large Nalgen bottles for water and acids
	All glass-ware and chemicals to assay fluorspar
2	Buretts stands with 4 burettes
2	Guth spray bottles
4	100 cc graduates
1	1000 cc graduates
1	Suction fan with 440 motor
	Drying pans
20	Galvanized sample buckets - various sizes
1	small sample splitter
1	Braun pulverizer with spare plates
1	Ohaus sample scale
1	set weights - 100 to 1000 grams
1	sample pulverizer
1	sample jaw crusher 4x3
1	sample splitter - 10x18 with pans
1	1000 gram Denver test cell
1	set screens 100-150-200-325
1	2000 gram Denver test cell incomplete (SHOP)

CHEMICAL BUILDING

Mill Equip.

1	25 hp submersible pump
1	30 hp " "
1	5 hp gear reduced motor
1	vertical compressor - Chicago - pneumatic 5x4"
1	new 5 hp motor for water pumps
1	used 5 hp " " " "
1	15 hp rebuilt motor for deep well pump
19	motors - various sizes - most need repairs
	used pump parts for mill sand pumps - some rebuilt
7	new troughing idlers for conveyor belt
1	Deming water pump - 1½"
2	Filter blowers
1	3 hp pump - filtrate - pump needs repair
	various V-belt pulleys
	various bearings - some good some bad
1	set of used Timken bearings for BallMill roller
	1300 lbs Quebracho
	25# Separan MP-10
3	bags copper sulfate crystals
	various ohter chemicals - old
	1200 lbs hydrated lime
1	3" sand pump - incomplete
11	10' pieces 4" pipe - new
36	10' pieces 2" pipe
	used valve parts for filter
1	set conveyor belt take-ups (small)
	various V-belts
	25' 6" channel iron
	60' 1" round steel
	20' 4" schedule 80 PVC pipe
	15' ¼x4" flat steel
	10' 3/8x2½" angle iron
	10' 3/16x3" " "
	20' 5/8 round steel
1	3" flange valve
	various pieces roller chain
1	deep well pump - needs repair - for 40' setting

Mine Equp.

1	20' long hole drill steel 7/8
1	15' " " " " "
14	2' drill steel - used 7/8
20	4' " " "
22	6' " " "
10	8' " " "
	various pieces ventilation tubing
1	mine air tugger - Ingersoll Rand single drum
2	Copco sump pumps - air
1	air timber saw
9	air legs
2	stoper drill machines
2	pavement breakers - air
8	jack-leg drill machines - need repair

Mine Equip.

	various air hoses ½" to 1½"
1	rail-bender
2	oilers for drill machines
1	3 sheave rope block
7	snatch blocks

YARD

MINE EQUIPMENT

1	Gardner-Denver truck - wagon drill
1	Jaeger 600 cfm compressor with 671 diesel mounted on Chev. truck
1	LeRoy 250 cfm compressor with 453 GMC diesel - portable (excellent)
1 (?)	Gardner-Denver 500 cfm compressor with D-13000 Cat engine - portable on 4 steel wheels - needs motor overhaul
1	Gardner-Denver mucking machine - 18 ga.
1	Model ATD 3100 Track drill - Garnder Denver
1	Single drum mine hoist

(?) is this same as on patio?

PATIO

1	12" potable screw conv. 30' long
1	Gardener Denver mucking machine 18"
1	Bucket belt elevator 8x6 buckets - 45 high
1	Eimco mucking machine
1	Chicago pneumatic horizontal stationary compressor
1	Mine hoist - single drum (Hendric)
1	Murphy scale - 65 ton - 50' long - portable

ROLLING STOCK

1	Mod 500 Bobcat loader - diesel - needs repair
1	Mod 600 " " " " "
1	Hough Mod 50 front end loader - need motor overhaul - gasoline
1	Hough Mod " " " has some leaks
1	Michigan 125 loader - need motor overhaul
1	1965 Chev. 2½ ton truck - dump bed flat
1	Mack tractor 1971 - 335 Cummins
1	Hobbs end dump trailer
1	Mack dump truck - 10 wheeler - custom
1	1973 3/4 ton 4WD Chev. pick-up
2	Fruehauf concentrate trailers
1	Galion road grader - need motor and extensive repairs - parts?
1	1978 4WD CHEV ½ TON

SHOP EQUIPMENT

1	300 amp Airco DC welder - gasoline driven - portable
1	60 gal air receiver tank with 3 25' lengths 3/8 air hose
1	set gas welding and cutting equipment
1	oxygen bottle
1	Acetylene bottle
1	1 ton chain hoist
1	½ hp Sears grinder on stand
1	Wilton bench vise
1	work bench
1	2 hp water pump
6	C clamps - various sizes
2	new Alemite lever grease guns
2	used grease guns
1	oil suction gun
1	O ring kit
1	oxygen regulator - needs repair
1	hose repair tool (welding hose)
4	rolls various gasket material
1	oil pump for 80-14D oil for transmissions
2	conduit benders
2	rolls emery cloth
1	electric grinder (sears)
1	Sears ½" electric drill
1	Sears electric chain saw
1	hand saw
1	Sears 7" electric saw
1	Scroll saw with blades
1	4 amp battery charger
1	large puller - 3 leg
1	small puller - 3 leg
1	pipe vise
1	4" pipe threader
1	set bolt dies - some went thru fire - some replaced
1	set 1/8 to 2" pipe threaders - some dies replaced
1	pipe cutter to 2"
1	set end wrenches 3/8 to 1¼"
1	set allen wrenches
1	wood bit brace
4	pipe wrenches 8-14-14-24"
1	tin snips
1	railroad jack - no good
2	chain binders
	fire extinguishers
1	set ½" sockets
1	15 Kva transformer
1	4# hammer
1	chipping hammer
1	claw hammer
1	set 3/8 sockets - no good
1	floor jack
1	20 ton jack
1	5 ton jack
1	gas hot water heater
1	barrel pump
1	station gasoline pump

SHOP CONT.

1	new 1000-20 tire
2	new 1000-22 tires for Black Mack
1	5 gal can oil pump for 90 wt. oil
1	5 gal grease gun filler pump
1	Tachometer
1	Sears 3/8" drill
1	Mine vent fan - 5 HP motor
1	100 KW Cat Power plant

SUPPLY ROOM

2	4" PVC female adapter couplings
6	3" PVC couplings
3	3" PVC ells
5	3" PVC splicing couplings
3	3" PVC male adapters
3	2½" PVC tees
3	2½" PVC ells
8	2½" PVC couplings
2	3"x1½" PVC reducer
2	2½"x2" PVC bushings
3	2½"x1½" PVC reducers
3	2½" PVC tees
1	2½" PVC adapter, male
37	assorted pipe bushings
23	" " couplings
18	" " bell reducers
66	" " unions
52	" " ells
22	" " tees
53	" " nipples
	large amount PVC small pipe fittings
1	1 HP Teel water pump (new)
3	cans Nordback crusher liner cement
1	band-it tool with stainless strap
2	bearings and seals for concentrate trailer wheels
	assorted nuts & bolts
	" all thread
	small amounts of lock washers & cotterpins
1	set 3/4" sockets (went thru fire)
1	¼ & 3/8 socket sets
	parts for Clarkson reagent feeders
	various filters for trucks
4	diaphrams for 3" diaphram pump
	assortment of roller chain
5	10' pieces of ½" conduit
2	10' pieces of 1½" conduit
4	gal Ridgid threading oil
	various wood nails
1	box baler wire
	various cans of paint
1	bronze worm for thickener
	various small V-belts
1	box block grease for Ballmill trunions
56	100 W H.D. BULBS
4	F40 CW Floor.
	Assor Elec Cond FITTINGS, BOXES, ETC.
3 -	600 V 200,000 AMP FUSES
23 -	MOTOR HEATER Coils 1023-1035
1 -	3" VALVE

OFFICE

1	6 drawer desk
1	secretary chair
1	straight back chair
1	book case
1	Underwood typemaster typewriter
1	paper punch
2	staplers
3	desk top paper file baskets (stacked)
1	4 drawer file cabinet
1	Texas Instrument model TI-5100 calculator
1	Apeco Super Stat II copy machine
1	Titan dual watt heater
1	First Aid kit
1	Fire extinguisher
2	Kenmore air conditioners (window)
1	Postal scale
1	Pencil sharpener
	various office supplies - pencils, pens, paper clips etc.

TONTO MINING & MILLING CO., INC.

TONTO BASIN, ARIZONA 85553

GENERAL OFFICE & MILL
P.O. BOX 275
TONTO BASIN, ARIZONA 85553
602/467-2350

ADMINISTRATIVE OFFICE
P.O. BOX 2314
MUSCLE SHOALS, ALABAMA 35660
205/383-7322

11/12/79

Black Diamond Milling Project
On loan with option to purchase
the following equipment

1 pH Meter
1 Clarkson reagent feeder
1 Denver dry reagent feeder
1 Filter Blower

Fred Murphy

C. R. SEWELL
CONSULTANT GEOLOGIST

CHECK w/ SCINTILLATOR & BLACK LIGHT
U, W, Mo
ALSO Cu Ag Au Fe Zn

NOTE (A) AT LEAST 2 GENERATIONS OF QUARTZ & CaF_2
OLDEST
① MAIN QUARTZ (PLUS SPECULARITE)
② MAIN CaF_2 MINERALIZATION
③ MINOR CaF_2 + CuS + Qtz
④ POSSIBLY MINOR QUARTZ
⑤ LATE LONG TERM P.S. (CHALCEDONY)
YOUNGEST
(B) AT LEAST 2 GENERATIONS OF SULFIDES: (1) DISSEM. PYRITE SLIVER (2) FRACTURE FILLING IN QTZ + CaF_2 VEINS & FRACTURES.

STATE: ARIZONA
COUNTY: GILA
DISTRICT: INSPIRATION MINING DIST.
PROJECT: WESTERN FLUORSPAR CO.
PROPERTY: MACK CLAIMS (JENNY)

STARTED:
COMPLETED:
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 93 FEET
TYPE DRILL: CORE (DIAMOND) NX-JOY 12
DRILL CONTRACTOR: ALLEN DRILLING CO.

BEARING: N10°E
INCLINATION: -45
COORDINATES:
ELEVATION:

DRILL SITE SAME FOR D.H. 1 & 2

THE CORE HAS NO ANOMALOUS RADIOACTIVITY

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY				FLUORSPAR CaF_2	ROCK TYPE	DESCRIPTION	REMARKS
	0	5	0	0		SOIL					SOIL		
											ALTERED DIABASE	DEEPLY ALTERED (WEATHERED) OXIDIZED BROWN	0-5 MIXED SOIL & ALT. D
1	5	34	8½'	29							0-69	MED. YELLOW Up. pt. DIABASE COMPACT FINE GRAINS	5'-34' OXID. DIABASE
	34	69	0	0								LOCAL MODE OF FRACTURES.	34-69 NO SAMPLE RECOVERY
2	69	77	1½'	88							OXIDIZED QUARTZITE	BROKEN, BANDED (ALT. THIN BELS OF TAN TO SHADES OF	MOSTLY OXIDIZED
3	77	92.5	7¼'	47	50						69-77.9	GRAY QUARTZITE); [illegible]	ABUT 65°? POSSIBLE
4	92.5	93.0	½	100								INC. BELOW 75° BLEEDING ALONG BEDDING & FRACTURE	BX w/ TR. CaF_2 [illegible]
						??						PLANES (PYRITE DISSEM. IN QTZITE MAY BE SECONDARY)	AT CONTACT WITH DIA
						BANDED						LOCAL FIRING OF JASPER? OR [illegible] BLEACHING?	
												BETWEEN 77-77.9 STRONGLY FRACTURED & BANDED	BLEACHING OF QTZITE
					100	MASSIVE					SILICIFIED BX OF QUARTZITE	WITH PERVASIVE HEMATITE STAINING ALONG FRACTURES.	FAULT?
											77.9-85.9	ROTATED QTZITE BX. POSSIBLY LOCAL AMOUNT FX SUGARY CaF_2	TRACES OR MORE CaF_2
											VEIN (?)	REPLACEMENT (77.9-85.9) BUT SILICIFICATION	QUARTZ VEIN 77.9-85.
												IS WELL DEVELOPED; POOR RECOVERY IN	
					150							THIS SECTION.	
											VEIN OF CX		
											CaF_2 85.9-91.0	CX WHITE TO LT. GREEN CaF_2 85.9-91.0 WITH	MOST CaF_2 IS VOID
												LOCAL SUGAR FX CaF_2, PROBABLY VOID FILLING	BUT SOME REPLACE
												WITHIN QUARTZ VEIN. ALL VEIN MATERIAL LOCATED	OF BX. INTERSECTED
					200							IN A GOUGE - BX ZONE ALONG A E-W FAULT.	WIDTH 5.1 FEET CaF_2
												ALL CaF_2 WITHIN QUARTZITE. BUT DIABASE	BUT TRUE THICKNESS
												ALTERATION MAY REFLECT HYDROTHERMAL	= ? CaF_2 EST 65
												ACTIVITY IN THAT ROCK (OR SIMPLY WEATHERING)	CaF_2 LOCALLY VUGGY
													SOME VUGS CREATED
					250						QTZITE LOCALLY	MOTTLED, SPOTTED, (ALTERED) LT. GRAY QUARTZITE	BY OXID & LEACH CuFe
											BX w/ CaF_2	WITH STRINGERS OF PURPLE FX-MX CaF_2 ±S.O.	SULFIDES & SPECULARITE
											VEINLETS	ALONG BX ZONES (TO 3" WIDE). CaF_2	
											91.0-93 (T.D.)	VEINLETS DEC. IN ABUNDANCE AWAY FROM FAULT	

Sheet 1 of

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN MINING DIST.
PROJECT: WESTERN FLUORSPAR CO.
PROPERTY: JACK CLAIMS (BERRY)

STARTED: 12/ /76
COMPLETED: 1/2/77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 135.4'
TYPE DRILL: CORE (DIAMOND) NX-JOY 12
DRILL CONTRACTOR: ALLER DRILLING

BEARING: N10°E
INCLINATION: -65°
COORDINATES:
ELEVATION:

DRILL SITE SAME FOR D.H. 1 & 2

THE CORE HAS NO ANOMALOUS RADIOACTIVITY

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	FLUORSPAR CaF2	ROCK TYPE	DESCRIPTION	REMARKS
	0	50.5	0	0				SOIL ALT. DIABASE? 0 - 50.5?	NO SAMPLE RECOVERED 0-50.5'	
1	50.5	59.5	8¾'	97						
2	59.5	72	9⅗'	78						
3	72	80	8'	80		SILL?		OXIDIZED	MASSIVE OXIDIZED UPPER PC DRIPPING	
4	80	90	9'	90	80			MASSIVE	SPRINGS QUARTZITE. PROMINENT ALTERNATING	
5	90	99	8⅗	96				QUARTZITE	LIGHT AND DARK GRAY BANDS (BEDDING)	
6	99	110	7½'	68				50.5 - 110.5	GRAIN SIZE IN BEDS VARY FROM F TO C	
7	110	123	8¾	67		BANDED			GRAINED; LOCAL PINK RED COLOR ABUNDANT	LOCAL INC. FX
8	123	135.4	7¼	59					K-FELDSPAR FRAGMENTS. SECTION IS FRACTURED	(54.0-55.0)-(71-
		T.D			100			VEIN OF QUARTZ	AND HEMATITE BLEEDS OUT OF BROKEN ZONES	71.5)-(72-75)-
								← CaF2 BX.	INTO ADJACENT QUARTZITE. 50.5-70, DOMINANT	(77.5-78.5)-(82-8
								WITH VUGS 110.5-	COLORS ARE PINK & GRAY - BELOW 70 CORE	BELOW 86' FRAC. IN
								110.8 (RADIATING	MORE BROKEN & ALTERED (BLEACHED) &	
						MASSIVE		THIN PLATES ½" LONG	STAINED BY HEMATITE. FRACTURES INC.	
					150			IN QTZ & CaF2 ARE	BELOW 70. VEINLETS TO ¼" WIDE (QUARTZ +	
								NOW VUGS AFTER	SULFIDES (OXIDIZED)) LOCALLY PRESENT (72-74)	QTZ-SULFIDE VEINLET
								SPECULARITE (?)	JAROSITE (AFTER OXID. PYRITE?) ABUNDANT	(72-74).
									IN FRACTURES 77-90. IT IS BEST DEV. WHERE	101.5 JAROSITE MIXED W
									HEMATITE IS LESS ABUNDANT & LOCALLY	OXIDES?
					200				IS LATER THAN HEMATITE. LIMONITE	OXID. SULFIDES (Cu & Fe)
									SHADES OF BROWN MORE ABUNDANT THAN	& SPECULARITE IN VUGGY Ca
									HEMATITE OR JAROSITE BELOW 99'.	ABUNDANT VUGS IN CaF2
								MASSIVE VEIN		CaF2 18½' AS OF
								CaF2 110.8-	CX WHITE TO GREEN, CaF2 W/ ABUNDANT VUGS	DRILL BUT TRUE
								129.3: LOCAL ORG.	LINED LATE CLEAR EUHEDRAL QTZ XALS, BROWN CLAY,	THICKNESS-
					250			Fe & CuS & SPEC.	Mn & Fe OXIDES, ORGANIC MATERIAL. 65% CaF2	LOCAL JARGITE IN CORE
								QTZITE 129.3	MASSIVE FG LT. GRAY QUARTZITE WITH	COPPER-?
								- 135.4 (TD)	A FEW SiO_2 - CaF_2 - SULFIDE (OXID CuS)	133.2

C. R. SEWELL
CONSULTANT GEOLOGIST

ROCK SOUTH OF FAULT (FROM SURFACE TO FAULT) DIABASE SILL(S) IN DRIPPING SPRINGS QUARTZITE

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN MINING DIST.
PROJECT: WESTERN FLUORSPAR CO.
PROPERTY: MACK CLAIMS (JERKY)

STARTED: 1/10/77
COMPLETED: 1/15/77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 86
TYPE DRILL: CORE (DIAMOND) NX ?-76 1/2
DRILL CONTRACTOR: ALLEN DRLG. CO.

BEARING: N10°E
INCLINATION: -65°
COORDINATES:
ELEVATION:

DRILL SITE SAME FOR DH 3B, 4 & 5 (DH 3A ABANDONED AFTER 10')

THE CORE HAS NO ANOMALOUS RADIOACTIVITY

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	[redacted]	FLUORSPAR CaF2	ROCK TYPE	DESCRIPTION	REMARKS
	0	18	0	0					ALT. db. OR BAN SHALE 0-18'		
1	18	14.5	8½'	15							
2	14.5	86.0	9¼'	80		PINK			QUARTZITE 18'-69' (?)	MASSIVE FG POROUS (SOFT) (X GRAINS FELDSPAR)	
		T.D.								QUARTZITE w LOCAL 6"-12" BEDS OF MORE INDURATED LT. GRAY (QTZ GRAINS) QUARTZITE (22-22.5) (37-42)	ALT. DIABASE SILL? (42-47) POOR REC. BUT FRAGS ARE QTZITE (DRILLER REPORTS HIGH CLAY CONTENT).
					70	BANDED GRAY			BASEN/SILL DIABASE WITHIN ZONE 42'-48'	POSSIBLY SILL OF DIABASE IN QUARTZITE (42-48). QTZITE CHANGES FROM SOFT PINK POROUS ROCK TO HARD BANDED GRAY QTZITE BELOW 48'	FEW FRAGS OF BANDED LT-DARK GRAY QTZITE IS ALL THE SAMPLE RECOVERED (48-69)
						CU MASSIVE ???				POOR RECOVERY 48-69 PROBABLY PART OF CaF2 VEIN NOT RECOVERED ABOVE 69'	
					100				VEIN CaF2 w/ CuFeS (OXID) ?69'-78.6 FEW VUGS	MASSIVE DARK GRAY, WHITE GREEN FX BANDS TO CX CaF2 SOME POST MINERAL FRACTURING. CaF2 REPLACEMENT OF BX QTZITE & QTZ CX CaF2 CUT BY LATER VEINS OF CaF2 WITH CuFeS (OXID TO LIM & GREEN OXIDES INCLUDING MALACHITE).	GREEN Cu OX & Cu-LIMONITE PSEUDOMORPHS ALSO RADIOMETRIC PLATES SPECULARITE (OXID) IN CaF2 9.6' CaF2 AS CUT BY ANGLED DRILL HOLE - TRUE THICKNESS - ?
									QTZITE 78.6-86 (T.D.)	MASSIVE LT GRAY FG QTZITE CUT BY FRACS (HEMATITE) & QTZ-MAGNETITE (OXID HEM) VEINLETS TO 3/4" THICK. - QTZITE ALTERED (BLEACHED & SPOTTED) & MORE HEMATITE BELOW 81 - POSSIBLY MORE CaF2 IF HOLE WAS CONTINUED.	CaF2 EST. 65% WITH Cu

Hole 3-B
Sheet 1 of

C. R. SEWELL
CONSULTANT GEOLOGIST

3 KINDS OF QTZITE
UPPER PINK K-FELDSPAR
SILL
BANDED GRAY
MASSIVE GRAY
FAULT? —

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN MINING DIST.
PROJECT: WESTERN FLUORSPAR Co.
PROPERTY: MACK CLAIMS (JERRY)

STARTED: 1/15/77
COMPLETED: 1/18/77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 75'
TYPE DRILL: CORE (DIAMOND) NX-JOY 12
DRILL CONTRACTOR: ALLEN DRILLING Co.

BEARING: N10°E
INCLINATION: -49
COORDINATES:
ELEVATION:

DRILLSITE SAME FOR DH 3B, 4, & 5

THE CORE HAS NO ANOMALOUS RADIOACTIVITY

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	FLUORSPAR CaF2	ROCK TYPE	DESCRIPTION	REMARKS
1	0	19	9	47				CLAY (SHALE	WEATHERED (ALTERED) SHALE (DIABASE)	CLAY (0-2)
2	19	39	7.5	37.5				OR ALT. DIABASE)		
3	39	49.9	7.5	69				0-2		
REC.	49.9	54.5	11.0	33						
4	54.5	71.0				SILL?		PINK QUARTZITE	PINK MASSIVE FG (K-FELDSPAR) POROUS QUARTZITE	STEEP FRACTURES (0-?)
5	71.0	75.0	4	100		MASSIVE	-?-?-?-	WITH CLAY (SHALE)	FEW FRACTURES. BRN CLAY ZONES AT (17-18),	
								2-39 (?)	(24-26) & (29-30). LT. GRAY INDURATED SiO_2	
									FG-MG QTZITE (24-24.3). BX 33-39	SLUDGE: FROM 38.5-
								ALTERED DIABASE	— (POOR RECOVERY)	64.0 - CaF_2 IN CUTTING
								?39-58.5?		PROBABLE CaF_2 + SiO_2
										(58.5-63.5) (5 FEET)
								QUARTZ-SPECULARITE	FEW FRAGS OF MASSIVE XALLINE WHITE TO CLEAR	CaF_2 ? WITH
								VEIN? POSSIBLY	QUARTZ XALS WITH OPEN PLATY VUGS (SPECULARITE)	QUARTZ-SPECULARITE
								CaF_2 ? 58.5-63.5?	(TO +1" LONG) RADIATING HABIT	(?) VEIN? 58.5-63.5
								(POOR RECOVERY)		
								QUARTZITE	MASSIVE FG LT. GRAY QUARTZITE LOCALLY	CHLORITIC ZONE
								?63.5-75 (T.D.)	SPOTTED & FRACTURED, FRACTURES FILLED WITH	ALSO PINK, ORANGE,
									JAROSITE & $Mn O_2$ (SOME LIMONITIC CLAY)	YELLOW, & BROWNISH
									DARK ERREG. BLACK ORGANIC (?) ZONE 70-72	W/ VITREOUS [illegible]
									MOST FRACS HAIRLINE & STEEP ANGLE (90°) TO	MINERALS + $Mn O_2$
									CORE	

Hole 4
Sheet 1 of

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN MINING DIST.
PROJECT: WESTERN FLUORSPAR CO.
PROPERTY: MACK CLAIMS (JERKY)

STARTED: 1/19/77
COMPLETED: 1/28/77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 144
TYPE DRILL: CORE (DIAMOND) NX-JOY 12
DRILL CONTRACTOR: ALLEN DRILLING CO.

BEARING: N 10° E
INCLINATION: (—) 83°
COORDINATES:
ELEVATION:

DRILL SITE SAME FOR DH 3B, 4, & 5

THE CORE HAS NO ANOMALOUS RADIOACTIVITY

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	FLUORSPAR CaF2	ROCK TYPE	DESCRIPTION	REMARKS
1	0	26	8.1	31		SOIL		SOIL (CLAY) 0-4½	CLAY RICH RED BROWN SOIL WITH FRAGS. OF QTZITE.	
2	26	41.5	8.0	52		PINK				
3	41.5	52	7.5	71						
4	52	62.5	6.0	57				QUARTZITE 4½-25	MASSIVE POROUS PINK (K-FELDSPAR) SOFT QUARTZITE	FEW STEEP FRACS w/ NO VEIN MATERIAL
5	62.5	72.5	9.5	95	60					
6	72.5	81.5	8.5	94						
7	81.5	91	9.0	95				DIABASE (ALT.) SILL, 25-58.2	SHADES OF BROWN TO GRAY & GRAY GREEN MX DIABASE SILL(?). ALT TO CLAY, CHALORITE LIMONITE ETC. UPPER ZONE (TO 40') MOST ALT. & STAINED BROWN BY LIMONITE & CLAY. FROM 40-58.2 LESS ALTERED & LESS LIMONITE. THIS ZONE IS MORE INDURATED. FROM 44.5-58.2 DIABASE CUT BY NUMEROUS SHEAR ZONES FILLED WITH HAIRLINE TO ½ VEINS OF WHITE CALCITE (GYPSUM?) & MINOR LIMONITE, CLAY, JAROSITE. FROM 44.5-54 MOST FRACS ARE AT A STEEP ANGLE WITH THE CORE BUT 54-55 THE STEEP SHEARS ARE INTERSECTED BY CALCITE VEINLETS OF DIVERSE ORIENTATION	SOME FRACTURES FROM 25-44.5 BUT NO VEIN MAT. DITTO FROM 55-58.2
8	91	99.5	8.25	97						
9	99.5	108.3	8.5	97		BANDED				
10	108.3	120.7	7.5	60	100					
11	120.7	137.6	6.5	38						
12	137.6	144	4.2	65						
		T.D.				CU				
					120	MASSIVE				
								QUARTZITE 58.2-120.7	MASSIVE OXIDIZED INDURATED QUARTZITE WITH ALTERNATING DARK & LIGHT BANDS (BEDS). OVERALL COLOR, BANDS OF LIGHT TO DRK GRAY. LOCALLY PYRITIC & BEDS IF K-FELDSPAR BUT MOSTLY COMPOSED OF QUARTZ GRAINS. SOME ORGANIC MATERIAL(?) LOCALLY FRACTURED & LIMONITE STAINED WITH SOME CLAY & JAROSITE BELOW 117.5 QTZITE IS BROKEN	EXHIBITS SOME GRADED & CROSS BEDDING QTZ-Sulfide (OXID) VEINLETS 79-81.5 SLUDGE: 116.7-120.7 120.7-121.7

Hole 9 Sheet 1 of 1

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: _____ STARTED: _____ BEARING: _____
COUNTY: _____ COMPLETED: _____ INCLINATION: _____
DISTRICT: _____ GEOLOGIST: _____ COORDINATES: _____
PROJECT: _____ TOTAL DEPTH: _____
PROPERTY: _____ TYPE DRILL: _____ ELEVATION: _____
DRILL CONTRACTOR: _____

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	ASSAYS Mo	Cu					ROCK TYPE	DESCRIPTION	REMARKS
												MOSTLY LIMONITE ABOVE AND BELOW (100-104).	SLUDGE: 123-124; 124-12
													131.5-134.1; 136-137
											FLUORSPAR	FLUORSPAR MOSTLY CX GRAY TO GREEN WITH	Cu
											120.1-140	LOCAL AREAS OF PURPLE, SOME FX SUGAR	SMALL VUGS IN
											(with Cu)	SPAR BUT MOSTLY CX FRIABLE TO MASSIVE	COMPACT CaF2 PRE
												& COMPACT WITH IRREGULAR ZONES OF	MORE VUGS IN REST OF
												OXIDIZED CHALCOPYRITE(?) (TO GREEN OXIDES)	CaF2 (POOR REC OF
												PYRITE & RADIAL BLADES OF SPECULARITE	
												(TO LIMONITE & HEMATITE & CLAY).	
												ABOUT 1/2 IS CX FRIABLE (VOIDFILLING?) (120.1-134.1)	
												CYCLTS FINER X COMPACT GRAY MASSIVE	
												REPLACEMENT OF BX & QTZ (?) WITH	CaF2 IN ALL
												COPPER SULFIDES (134.1-137.6 & 127-128)	SLUDGE SAMPLES:
												LOWER PART MORE PURPLE CaF2 & appears	116.7-120.1 (GOOD CaF2)
												to be replacement of BX (137.6-140).	SiO2 + FeOX + BIOTITE
													120.1-121.7 (LESS CaF2
											QUARTZITE	MASSIVE INDURATED LT-MED GRAY	+ SiO2 & FeOX
											140-144	QUARTZITE CUT BY STEEP FAULTS	123-124 CaF2+SiO2
											T.D.	& BX ZONES HEALED BY QUARTZ-SULFIDE	124-126.5 HI GRADE CaF2
												(OXIDIZED) CaF2(?) VEINLETS (142-145).	131.5-134.1 " " "
													136-137 " " "

Hole U
Sheet 2 of 2

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN
PROJECT: WESTERN FLUORSPAR Co.
PROPERTY: MACK (JERKY) Claims

STARTED: 2/2/77
COMPLETED: 2/12/77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 117
TYPE DRILL: CORE (DIAMOND) NX Joy 12
DRILL CONTRACTOR: ALLEN DRILLING Co.

BEARING: N1°W
INCLINATION: (-) 54° 65°?
COORDINATES:
ELEVATION:

DRILL SITE SAME FOR DH 6&7

THE CORE HAS NO ANOMALOUS RADIOACTIVITY

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	FLUORSPAR CaF_2	ROCK TYPE	DESCRIPTION	REMARKS
	0	10	0	0		SOIL & QTZITE		SOIL & PINK QTZITE (0-10)	NO SAMPLE RETAINED	— 0 —
1	10	25.5	7	45						
2	25.5	43	15	43						
3	43	54.5	8	10				PINK QTZITE & BROWN SHALE (10-48)	PINK POROUS FG-MG QTZITE WITH ABUNDANT K-FELDSPAR. - SEAMS OF WELL INDURATED GRAY QTZITE (14-16 & 19.5-20) & CLAY (SHALE OR GOUGE IN FRACTURES) REDDISH BROWN (24.5-25.5, 29-30; 30.8-31; 32-34; 43-44). INCLINED TO VERY STEEPLY INCLINED FRACTURES (14-41 & 43-48).	CLAY ZONES MIXED W/ QTZITE FRAGS
4	54.5	62.5	7.8	98	50	PINK QTZITE				
5	62.5	74.5	8.5	71						
6	74.5	83.3	8.8	98						SLUDGE (25-28)
7	83.3	92	8.5	98						
8	92	101.0	9.0	86						
9	101.0	109.6	8.0	MISSPARKED	100	MASSIVE BANDED QTZITE				
10	109.6	117	7.0	95						
								GRAY QTZITE (48-64.5)	MASSIVE TO THIN BEDDED (BANDED) & LOCALLY GRADED BEDDING, WELL-INDURATED QTZITE ABUNDANT FRACTURES AND MANY ATTITUDES; ALMOST DX (NOT ROTATED). ABOVE 63' FRACS OPEN OR CONTAIN CLAY, LIMONITE, MnO_2 BUT 63'-64.5 FRACS ARE STEEPLY INCLINED & FILLED W/ WHITE QTZ. VEINLETS	SMALL VUGS IN BROKEN ZONES 60-64.5 (BANDED 62.2-64.5) FAULT ZONE (63-68.8 & VEIN QTZ, SULFIDES (OXID) & CaF_2 IN FAULT (64.5-68.5). NO REC. (64.5-6
								VEIN IN FAULT (64.5-68.5) — NO CORE (64.6-66) CaF_2, SiO_2, SULFIDES (OXIDIZED)	MX-CX CaF_2 - LT GRAY to GREEN; NEAR FOOTWALL CaF_2 IS PURPLE. LOCAL SiO_2 & RELICT RADIAL PLATES (FORMERLY SPECULARITE?) IN CaF_2. MASSIVE GRAY-GREEN SOMEWHAT. SULFIDES MOSTLY IN LOWER PART OF CaF_2	HANGINGWALL GRAY QTZITE & FOOTWALL BANDED GRAY QTZITE SMALL VUGS WITH MnO, & Fe + SiO_2
								BANDED QTZITE 68.5-92.0	FG DRK-GRAY-BLACK-LT. GRAY BANDED (BEDDED) WELL INDURATED QTZITE, LOCALLY FRACTURED & STAINED BY LIMONITE CLAY MnO_2	MOST INTENSE FRACS (68.8-77.5)

Hole 6
Sheet 1 of 1

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: _____ STARTED: _____ BEARING: _____
COUNTY: _____ COMPLETED: _____ INCLINATION: _____
DISTRICT: _____ GEOLOGIST: _____ COORDINATES: _____
PROJECT: _____ TOTAL DEPTH: _____ _____
PROPERTY: _____ TYPE DRILL: _____ ELEVATION: _____
DRILL CONTRACTOR: _____

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	ASSAYS Mo	Cu					ROCK TYPE	DESCRIPTION	REMARKS
												BELOW 88.5 CORE IS LESS BANDED LIGHTER	IS DEVELOPED 1/4"-1/2
												GRAY IN COLOR. FX AT +45° TO CORE 84-86	OUT FROM THE MOST
												AND NEARLY PARALLEL TO CORE 90.7-93	STEEPLY INCLINED
													FRACTURES.
											MASSIVE QTZITE	MASSIVE LIGHT GRAY QTZITE WITH OCCASIONAL BANDS (BEDS)	
											92 - 117 (T.D.)	OF DARKER GRAY (98-103). FX AT +45° TO CORE	HEMATITE IN FRACS 89-9
												(96-98). FX +45 (MOSTLY STEEP) 100 - TO 117 TD.	MnO_2 ON SOME FRACS 98
												LIMONITE ON FX 110-115. MOST BROKEN (100-104).	117) HEAVY VEINLETS MnO_2
												ALMOST BX (FAULT NEARBY)? LOWER PART OF CORE	@ 103.
												ALMOST PORCELLANEOUS QTZITE SPOTTED (MET.)	

Hole 4
Sheet 2 of

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN
PROJECT: WESTERN FLUORSPAR Co.
PROPERTY: MACK (JERKY) CLAIMS

STARTED: 2/ /77
COMPLETED: 2/20/77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 130
TYPE DRILL: JOY 12 DIAMOND CORE (NX)
DRILL CONTRACTOR: ALLEN DRILLING Co.

BEARING: N1°W
INCLINATION: (-) 75°
COORDINATES:
ELEVATION:

DRILL SITE SAME FOR DH 6 & 7

(NO ANOMALOUS RADIOACTIVITY)

SLUDGE: 92.5-97
97-99.5
99.5-102

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	[redacted]	FLUORSPAR CaF2	ROCK TYPE	DESCRIPTION	REMARKS
	0	4	-0-	-0-					SOIL & QTZITE (0-4)		
1	4	30.5	8.5	32							
2	30.5	66.3	6.8	19					PINK QTZITE W/	PINK POROUS QTZITE WITH ABUND. K-FELD	SH. (4-13); (24-30.5);
3	66.3	81.0	7.0	48					RED-BRN SHALE BEDS	& BEDS OF RED-BRN SHALE. OCCASIONAL THIN	(33.5-35); 36.5-37)
4	81.0	102.3	7.0	33					(4-62.1)	BED HARD LT GRAY QTZITE	
5	102.3	111	8.0	92							
6	111	119.1	8.0	98					GRAY QTZITE	MASSIVE (OXID) MED GRAY QTZITE BRNSTAINED & WELL INDURATED CUT BY LIMONITE	CORE VERY BROKEN
7	119.1	128.5	7.5	79					(62.1-72.1)	FILLED (OXID SULFIDES) FRACTURES (& DISSEM.).	BX?? (62.1-81)
8	128.5	130 T.D	1.3	87						OCCASIONAL BANDS (BEDS) DRK GRAY QTZITE	
									BANDED QTZITE	LIKE ABOVE (62.1-72.1) BUT INC. IN BANDS	PROMINENT OXID.
									(72.1-92.5)	BELOW 75' & CORE DARKER GRAY. MANY ATS	SULFIDE VEINLET (72.1-
										IN CORE ARE OXID. PYRITE (DISSEM). SOME LIMONITE	-73.5) NEARLY
										& HEMATITE IN FRACTURES. — STYOLITES? (80-82),	PARALLEL TO CORE.
										CORE VERY BROKEN (BX) 82-92.5	LOCAL COARSE (LIGHTER
											COLORED THICKER BEDS
									VEIN CaF2	MOSTLY CX GRY-GRN CaF2 IN BX QTZITE	ARE K-FELD RICH.
									PLUS SiO2 (99-98.5)	AS VOIDFILLING & REPLACEMENT FEOX	(86.5-87).
									92.5-105	AFTER SULFIDES. PROBABLY SOME FX SUGAR SAR	
									IN FAULT ZONE	GROUND UP IN CORE 92.5, SiO2 @ 97-98.5	CaF2 IN MASSIVE
										& IN SOME VUGS AND CaF2 AS DRUSY XALS	SECTION = 65 +%
										LIMONITIC CLAY IN VUGS & FXS.	LOCAL VUGS
									BRECCIATED QTZITE	FINER XALLINE WHITE-GRY-PURPLE CaF2	(98.5-99.5) REM.
									& VEINLETS CaF2	MOSTLY AS MATRIX MATERIAL IN BX FX ZONES	OF BLADED SPECULARITE
									105-112.5	1/4"-2" WIDE AT STEEP ANGLE TO CORE.	(?) XALS
										CORE AS QTZITE (HORNFELS?) & SOME VUGS	EST. CaF2 104-112.5
										PARALLEL FILLED WITH LIMONITIC CLAY (OXID SULFIDES)	@ 25-30%

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: _____ STARTED: _____ BEARING: _____
COUNTY: _____ COMPLETED: _____ INCLINATION: _____
DISTRICT: _____ GEOLOGIST: _____ COORDINATES: _____
PROJECT: _____ TOTAL DEPTH: _____
PROPERTY: _____ TYPE DRILL: _____ ELEVATION: _____
DRILL CONTRACTOR: _____

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	ASSAYS Mo	Cu					ROCK TYPE	DESCRIPTION	REMARKS
												NOTE VEINLET OF PURPLE CaF_2 HORIZONTAL TO BORE IS OFFSET BY VEINLETS OF CaF_2 (PURPLE & GRAY) WHICH ARE STEEPLY INCLINED WITH RESPECT TO THE CORE (≈106)	
											QTZITE (HORNFELS?) PLUS LOCAL CaF_2 IN BX ZONES 112.5 - 130 (T.D)	MASSIVE FG SPOTTED (CHLORITE) LT. TO MED. GRY (HORNFELS) QTZITE. MODERATELY FX WITH SOME CaF_2 ≈ 115. SOME BX ZONES (VUGGY) BELIEVE WERE FILLED WITH CaF_2 (WASHED OUT) & MnO_2 (118)	MASSIVE F.G. TO T.D. (130') VERY BX 120-127

Hole 1
Sheet 2 of 2

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN MINING
PROJECT: WESTERN FLUORSPAR CO.
PROPERTY: MACK (JERKY) #1

STARTED: 2/ /77
COMPLETED: 3/ /77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 117
TYPE DRILL: JOY 12 NX DIAMOND CORE
DRILL CONTRACTOR: ALLEN DRLG. Co.

BEARING: N 9°W
INCLINATION: (-) 65°
COORDINATES:
ELEVATION:

S 80°E TO PK. SOUTH OF (YOUNG ROAD) FAULT
N 12°W TO McFADDEN PK RANGER STA

DH 8 IS
170' SOUTH OF STADIA STATION 88
≈ 350' ENE OF D.H. 6 & 7
(N 83½°E DH6 to DH8)

SLUDGE 91-95 & 95-99

{CORE WEAKLY RADIOACTIVE BELOW CaF_2 (95')}
{DOUBLE BG ≈ 106' & 108'}

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	[redacted]	FLUORSPAR CONC.	ROCK TYPE	DESCRIPTION	REMARKS
0	0	3	0	0		SOIL PINK QTZITE			SOIL & QTZITE (0-3)		
1	3	21.7	8.5	45							
2	21.7	34.5	7.0	55					PINK QTZITE & BRN SHALE 3-22.5	PINK K-FELD.-RICH POROUS QTZITE INTERBEDDED WITH BRN SHALE (OXID.) AT (17.2-19) & (19.5-21.9) & (22-22.5).	
3	34.5	47	7.0	56							
4	47	71.5	7.0	29		DIABASE					
5	71.5	91.5	8.0	40							
6	91.5	110	6.5	35		PINK BANDED					
7	110	117	3.0	43							
									DIABASE SILL(?) (22.5-67)	ALTERED (WEATHERED?) MX DIABASE NOW MOSTLY CLAY WITH SOME LIMONITE STAINS	
									PINK QTZITE (67-77)	SIMILAR TO (3-22.5) BUT MORE INDURATED LOCALLY & INCL. IN GRY COMPACT QTZITE BELOW 70'.	
									GRY QTZ WITH SOME BANDING (77-87)	WELL INDURATED MG GRY MASSIVE QTZITE WITH BANDS (BEDS) LOCALLY DEVELOPED. SOME VUGGY QUARTZ SULFIDE (OXID.) VEINLETS 83-87	GRADED BEDDING
									FLUORSPAR VEIN (87-95)	GRY-GRN MOSTLY MASSIVE CX FLUORSPAR (VUGGY) REPLACEMENT & VOID FILLING WITHIN FAULT BX & GOUGE ZONE. SOME LIMONITE AFTER SULFIDES & QTZ	EST. 65% CaF_2 SOME SUGAR SPAR SULFIDES (PARTLY OXID) 95'
									SILICIFIED MASSIVE QTZITE BX WITH FLUORSPAR & SULFIDES (OXID.) (95-102.3)	BX GRY MASSIVE QTZITE HEALED BY QTZ-SULFIDE (OXID.) VEINLETS WITH SOME CaF_2.	
									MASSIVE ASTA	FRACTURED MASSIVE GRY QTZITE [illegible]	MR. JARISITE @ 105'

Hole 8
Sheet 1 of 2

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: _____
COUNTY: _____
DISTRICT: _____
PROJECT: _____
PROPERTY: _____

STARTED: _____
COMPLETED: _____
GEOLOGIST: _____
TOTAL DEPTH: _____
TYPE DRILL: _____
DRILL CONTRACTOR: _____

BEARING: _____
INCLINATION: _____
COORDINATES: _____
_____
ELEVATION: _____

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	ASSAYS Mo	Cu					ROCK TYPE	DESCRIPTION	REMARKS
												WITH LIMONITE & HEMATITE (MnO_2) STAINS IN	
												AND ADJACENT TO FRACTURES.	

Hole
Sheet 2 of 2

C. R. SEWELL
CONSULTANT GEOLOGIST

STATE: ARIZONA
COUNTY: GILA
DISTRICT: McFADDEN
PROJECT: WESTERN FLUORSPAR CO.
PROPERTY: MACK CLAIMS (JERKY)

STARTED: 3/9/77
COMPLETED: 3/25/77
GEOLOGIST: C.R. SEWELL
TOTAL DEPTH: 220'
TYPE DRILL: CORE DIAMOND (NX) TOY-12
DRILL CONTRACTOR: ALLEN DRLG. CO.

BEARING: N15°W
INCLINATION: (-) 43½°
COORDINATES:
ELEVATION:

BOX NUMBER	FOOTAGE		SAMPLE REC.	% REC.	STRUCTURE	LITHOLOGY	ASSAYS	FLUORSPAR CaF_2	ROCK TYPE	DESCRIPTION	REMARKS
	0	80	NONE	—		?			PROBABLY DIABASE (0-119)		
1	80	89	8.0	89%		?			DIABASE (80-119)	DIABASE: MED GRY MX (80-81.5) - CX (81.5-106) - FX (106-119) LOCALLY CUT BY STEEPLY INCLINED VEINLETS W/ CHLORITE & CALCITE	LOCALLY OXID (BROWN STN.) (82-85 (102-106) C (109-119)
2	89	107	9.0	50%		?			DIABASE	(LIKE ABOVE)	
3	107	122	7.5	50%	50	?			DIABASE.		
	122	124.5	1.0	29%		?			DRIPPING SPRINGS QUARTZITE (119-220) (TD?)	LT TAN THINBEDDED QTZITE W/ LOCAL BEDS OF COARSER SAND SIZED ARKOSE (?) INTERBEDDED WITH VFX SIZE SIZED QTZITE (PIX) — JARUSITE ON FRACS. W/ LIMONITE 131-143.2	MINO2 NEAR QTZ-SULFIDE VEI
4	124.5	146.2	7.5	35%		FX CX					LOCAL QTZ-SULFIDE (OXID) VEINLETS (143.5-145) (14 150) (166-169) (191) (210-
					100				MASSIVE (REDDED)		LOCALLY CLAY RICH BX
5	146.2	157.5	9.5	83%		FX			PLATIC QTZITE (209-220)		ZONE W/ LIMONITE 163-16
										LT GRY. MASSIVE QTZITE 209-220. (MOSTLY UNOXID (DRL. LOG. YELLOW CLAY 138-143).	175-182. BX ORSTN ZONE (FAULT?) 17 193). MOST QTZITE OXI (119-209).
6	157.5	165	7.0	93%	150						
7	165	175	7.0	70%			? ? FAULT ZONE ?			NOTE: POOR CORE RECOVERY IN CRITICAL ZONE (175-210). WAS SLUDGE COLLECTED? IF SO, WE SHOULD EXAMINE IT FOR C_2F_2	LOWER 9 FT OF QTZITE (211-220) LT GRY-M
8	175	189.5	6.5	45%	200			? ? ?			MASSIVE LOCAL BX W/ HEM. & LIM. EST. 3%
9	189.5	210	6.5	32%			PYRITE ? Mo?				DISSEM. PYRITE. (NOTE: DRL. LOG. CHALK? 1202.5-2
10	210	220	9.5	95%							C_2F_2 - SiO_2 VEINLET (¼") PURPLE (210.5)
											MoS (?) IN VEINLET (216) (HEMATITE ?)

Hole 1 Sheet 1 of 1

MnO2 VERIFIED?

June 18, 1978

Dear Sir,

As per your request I am attaching an evaluation of the plant, property and facilities of Tonto Mining & Milling Company Incorporated at Tonto Basin, Arizona.

The figures are based on the assumption that an ore supply is available for the plant and the cost and problems of duplicating these facilities today using comparable equipment.

With the present ecological problems as well as the increase in labor and all other costs it would be very difficult to place a figure on the value of an operable plant with sufficient land for tailings disposal and other necessities such as water supply, sewage disposal etc.. However, it is my estimate that with EPA permits and other required permits it would add an additional 15% to 20% to the costs, which I have not considered in my evaluation, as well as requiring 1½ to 4 years time before any actual construction could be attempted.

The various cost items are based on experience and, I am certain, would be by anyone in the business although I would probably be considered as underestimating by any large construction or engineering firm.

I trust that this evaluation will satisfy your requirements. If any other questions arise, please contact me.

Sincerely,

T. T. Biddle

AN EVALUATION OF TONTO MINING & MILLING CO. INC. PLANT AND FACILITIES

Equipment and other costs based on a capacity of 200 tons per day Fluorspar concentration facility including drying.

Equipment value as per inventory (used)	$264,000
*Equipment value as per inventory (new)	$395,000

All other costs based on installation and construction costs using new equipment.

Field erection @ 20% of new equipment value	$ 79,000
Foundations and supports @ 14% of new equipment value	53,300
Piping and chuting @ 18% of new equipment value	71,100
Electrical installation @ 20% of new equipment value	79,000
Miscellaneous site preparation & cleanup @ 5% of new equipment value	19,750
Service facilities @ 22% of new equipment value	86,900
Building - 11,945 Sq. ft. @ $10/sq. ft. with floors and foundation	109,000
Land - 45 acres patented & 15 acres Millsite claims	~~420,000~~ 150,000
Tailings disposal preparation & transporting	65,000
Contingency @ 15% of new equipment costs	171,900
Total	$1,169,950

*New equipment with possible exception of used grinding mill and part of crushing equipment.