

INTER-DEPARTMENTAL CORRESPONDENCE

## MINING DEPARTMENT

## INTERNATIONAL SMELTING AND REFINING COMPANY

818 KEARNS BUILDING

SALT LAKE CITY, UTAH

SUBJECT:

December 19, 1938

AIR MAIL - SPECIAL DELIVERY

Mr. C. E. Weed, General Manager of Mines,  
Anaconda Copper Mining Company,  
25 Broadway, Room 1726,  
New York City.

Dear Sir:

Tom Lyon received a letter today from Reno Sales regarding Walker development.

Mr. Sales said that both of you had approved the hanging wall crosscut, on the 1000 foot level to be driven from 1017 D. at a point just to the north of coordinate 15,800, and as indicated on Droubay's map in green color.

We also said that you did not approve the work on or from the 1100 foot level as outlined by Droubay.

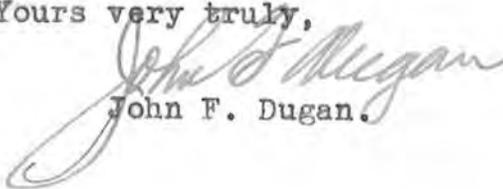
The crosscut just north of the 15,800 coordinate was laid out primarily for a diamond drill setup to prospect the downward projection of the ore body.

Mr. Lyon and myself are in somewhat of a quandry, as Mr. Sales did not say in his letter whether or not you intended to do any drilling.

If no drilling is contemplated, there is no use crosscutting at this particular point.

Will you please advise.

Yours very truly,

  
John F. Dugan.

JFD:H  
CC: TL.

Original to you by airmail.

**WALKER MINING COMPANY****WALKERMINE****PLUMAS COUNTY, CALIFORNIA**

December 21, 1938

L. F. BAYER, MANAGER

Mr. Reno H. Sales  
Chief Geologist, Anaconda Copper Mining Co  
Butte, Montana

Dear Sir:

Please find enclosed a few geological sketches from the Walker Mine, also a slightly revised tabulation of its available ore reserves dated December 1, 1938.

At the request of Mr. Gidel, several development headings were run while I was away this summer. The 800 level sketch of Piute shows how the same condition that seems to terminate the ore-body above was encountered. The heading followed a heavy clay slip that came in from the northeast and as soon as I returned I had the 826A XCW driven to be sure of an extension of the main foot wall slip. 904B DN will soon be started, as you have recommended, and further prospecting north will be done from there.

Prospecting along the high grade stringer in the south ore body did not locate anything of importance. The first ten feet exposed a good deal of disseminated chalcopyrite, mostly along the joints of the crystalline wall rock, but structure beyond this point was so weak that the heading was stopped when driven 45 feet.

We are well under the 517 fissure zone of the 712 ore body with the 619E crosscut, but as yet no vein has been encountered. A five inch veinlet of quartz showing scattered chalcopyrite and bornite has been exposed with the last couple of rounds. We are within 100 feet of the end of the mineralization as exposed on the 500 level.

The available ore reserve tabulation has been slightly revised into a more convenient form that will show breakage and production from headings and sideswipes as well as from stopes. As the engineering department formerly kept an independent record of broken ore, I have made several small adjustments so that from now on there will be but one set of figures.

May I offer humble congratulations with those who have honored you with the Penrose Medal.

Respectfully yours,

*S. K. Droubay*  
S. K. Droubay



# ANACONDA COPPER MINING COMPANY

Butte, Montana

## Geological Department

RENO H. SALES, Chief Geologist

M. H. GIDEL, Asst. Chief Geologist



New York, N. Y.  
December 23, 1938.

### AIR MAIL

Mr. Tom Lyon,  
820 Kearns Building,  
Salt Lake City, Utah.

Dear Tom:

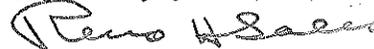
From Dugan's letter to Weed I take it that it is not clear what I had in mind when I wrote that we approved the hanging wall crosscut on the 1000 ft. level of the Walker mine.

It seemed to us, after careful consideration, that Droubay's suggestion of diamond drilling downward from the 1000 ft. level was the quickest way to learn something of the behaviour of the north orebody in depth. It seemed to us too long a time to wait until the 1100 ft. level could be driven northerly to the position of the proposed crosscut on the 1000. It appeared best, therefore, to get the down drilling from the 1000 suggested by Droubay started as quickly as possible.

While I think the down drilling from the proposed 1100 level crosscut may be desirable later, I hesitate to load that much expense on the mine at this time, furthermore, if the holes proposed from the 1000 level do not find better ore conditions in that part of the mine, it is extremely doubtful if it will be worth while drilling in that low grade portion of the vein below 706 shaft.

Mr. Weed is writing Dugan with reference to buying a drill for the mine. Since we will have to contract the deep holes now being considered, I think it would be much better to lay out everything in the nature of short holes that we could possibly want done and turn such work over to the contractor. I am sure the Walker mine will never have enough current drilling work to justify the expense of its own drilling outfit.

Very truly yours,



RENO H. SALES

RHS:F

CC: Mr. C. E. Weed.

# ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department  
RENO H. SALES, Chief Geologist  
M. H. GIDEL, Asst. Chief Geologist



New York, N. Y.  
December 24, 1938.

Mr. Tom Lyon  
820 Kearns Building  
Salt Lake City, Utah.

Dear Tom:

I have re-read your letter of December 8th on proposed Walker mine developments. Is it a fact that the 706 shaft is down to the 1200 level? I had the impression that the 1100 was the bottom. How far is the 1200 below the 1000?

If the shaft is to the 1200 and there can be any assurance that the level will be pushed rapidly to the north, your suggestion might be the best one.

As you know, I have two things definitely in mind for the Walker, one is the 900 drift north on the Piute, and the other the determination of the behaviour of the north orebody below the 1000 where it now shows to the best advantage in 1017 drift. As far as I am concerned, the important thing is speed but I want my ideas to be whatever will fit best with operating conditions.

Very truly yours,

*Reno H. Sales*  
RENO H. SALES

RHS:F

*279'*  
*Vertically below*  
*100'*  
*Bottom of shaft*  
*349'*

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## INTERNATIONAL SMELTING AND REFINING CO.



GEOLOGICAL DEPARTMENT  
KEARNS BUILDING

TOM LYON

SALT LAKE CITY, UTAH

December 28, 1938

Mr. Reno H. Sales  
Room 1726  
25 Broadway  
New York City, N. Y .

Dear Reno:

I have your letter of December 24th, regarding the Walker 1200.  
The 1200 level is 279 feet vertically below the 1000.

As stated in my previous letter it is 900 feet between the shaft  
and the vertical projection of the southern end of the north ore body.

The proposed hanging wall cross cut on the 1000 level is 379 feet.  
This, plus the station, plus several holes, will cost as much as a drift north  
on the 1200. The time element is an important factor as we are going to need  
some new stopes in a hurry. I wish to urge that no drilling be done from the  
1000 and that the 1200 be pushed out beneath the north ore body. If ore is  
encountered on the 1200, then before any further shaft sinking is done, it  
would be well to drill first.

I hope you have recovered from your cold.

With kindest personal regards, I am

Very truly yours,

Tom Lyon

TL/S  
cc. Mr. Dugan

New York, N. Y.  
December 30, 1938.

AIR MAIL

Mr. Tom Lyon  
820 Kearns Building  
Salt Lake City, Utah.

Dear Tom:

I have your letter of December 28th on the Walker  
development.

We are giving the matter consideration and will  
advise you shortly.

Yours very truly,

RENO H. SALIS

RHS:F

FILE NO. Walker Mine CLASS \_\_\_\_\_

NAME: History of Walker Mine

Prepared by L. F. Bayer-Year 1938

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SUBJECT: \_\_\_\_\_

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INDEX: \_\_\_\_\_

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WALKER MINING CO.

PLANT FACILITIES FOR EMPLOYEES

Townsite. Townsite comprises 114 company owned houses and 45 privately owned houses.

Bunkhouses. Two 3-1/2 and one 4 story wooden buildings 36' x 110', 36' x 78', and 35' x 78', respectively, with corrugated iron roofs. Respective capacities 74, 122 and 102 beds. Total capacity 298. Each bunkhouse has a change room with toilets, showers and change facilities. No. 1 bunkhouse includes the pool hall with pool and billiard tables, card tables and bar, also a two-chair barber shop and a beauty shop.

Staff Houses. Two 2-story wooden buildings 23' x 38' and 24' x 30' respectively, with corrugated iron roofs. Each house is equipped with toilets and showers. Capacities are 10 and 10 beds, respectively.

Mess Hall. One-story building 45' x 33', wooden frame with corrugated iron roof. Mess hall is equipped with complete kitchen equipment and has a seating capacity of 176.

Commissary Employees' Dormitory. One-story, wooden building with corrugated iron roof, 25' x 65', with accommodations for 21.

Store. Two-story wooden building with corrugated roof, 45' x 155', containing necessary store equipment, butcher shop, soda fountain and refrigerating plant. Upper floor of store is divided into four living apartments.

Storage Houses. Three buildings, 20' x 40', 15' x 20' and 12' x 20'. Two of these are wooden frame with corrugated iron roofs, and one is a concrete oil storage building.

Theater. One-story wooden building with corrugated iron roof, 24' x 75', with seating capacity for 175. Equipment consists of two Western Electric system projectors and sound apparatus.

Schoolhouse. One-story wooden building with corrugated iron roof, 25' x 20'. Equipped with heating unit in basement and necessary school equipment. Contains living quarters for school principal. Present enrollment, grade school and high school is 85.

Recreation Hall. One-story wooden building with corrugated iron roof, 20' x 66', equipped with game tables, punching bag, etc.

WALKER MINING COMPANY

PLANT FACILITIES FOR EMPLOYEES (Cont'd)

Other recreational facilities include two bocchet ball courts, three horse shoe courts and baseball diamond.

Public Gasoline Station. Wooden building, 15' x 12', with corrugated iron roof. Operated by the Standard Oil Co.

Post Office. Wooden one-story building with corrugated iron roof, 20' x 50', equipped with safe, office equipment, and 250 rental boxes.

Hospital

Two story wooden building 50' x 63' with corrugated iron roof.

Capacity

- 1 ward - 5 beds
- 2 private rooms, 1 bed each
- 2 semi-private rooms, 2 beds each
- Total 12 beds

Staff

- 1 surgeon
- 2 registered nurses
- 1 male nurse

Equipment

- 12 beds complete with linen
- 1 kitchen complete
- 2 baths
- Living quarters for surgeon
- 1 X-ray machine
- 1 sterilizing unit
- 1 small sterilizer
- 1 DeForest diathermy apparatus
- 1 Hanover ultra-violet lamp
- 1 1500 watt infra-red lamp
- 1 instrument cabinet, with assorted surgical instruments in numbers sufficient for minor and major operations
- 1 operating table

Blacksmith Shop

Steel frame building 35' x 30', with corrugated iron covering.

2 Coal burning forges. Anvils. Swage blocks.

1 Steam hammer 350 lb.

1 Steam hammer 50 lb.

1 Tire roller

1 Drill press 20" swing, 20" capacity.

2 men

Steel Shop

Inside dimensions 45' x 30' (continuous to blacksmith shop)

1 Power Saw:

14" belt driven through counter shaft. Motor 2 HP, 440 volt, 1800 RPM, GE.  
This also drives drill press in blacksmith shop.

3 Ingersoll-Rand drill sharpeners.

2 Oil-burning Ingersoll-Rand forges

1 Lindberg furnace, 32.5 KW, 110 volt, 1800°, with rotary hearth. Brown Indicating Pyrometer, 2000°.

1 Home made oil furnace. For heating bits for hot milling.

1 #1216 Gearhart oil-fired semi-muffle furnace, with door 12" wide by 6" high, and chamber 12" wide by 18" deep, for heating bits for hot milling.

1 Toledo rod threader 100MM. Serial 54, for detachable bit rods.

1 Messco bit grinder. 5 HP, 440 volt Westinghouse motor.

1 Ingersoll-Rand bit grinder. 2 HP, 220/440 volt, GE motor.

1 Pedestal Grinder. 2" x 12" wheel (2) = 5 HP 440 volt motor

1 Hot Miller. Ingersoll-Rand, J.E.M. No. 103

1 Quenching pot for bits.

Several sets of home made dies for forming rock drill side rods and through-bolts, mill liner bolts, etc.

7 men employed in steel shop

Machine Shop

Buildings

- 1 Main building 30' x 110', steel frame
  - 1 Addition for locomotive repairs 11' x 30', wood frame
  - 1 Acetylene generator room 6-1/2' x 6-1/2', wood frame
  - 1 Tool room 12' x 20', wood frame
- All above are covered with corrugated iron

Machines

- 1 Lathe:  
Putnam, gap 18" and 36" swing. Will take 6' and 10' respectively between centers. Quick change gear box, taper attachment. Direct connected to GE 3-1/2 HP 440 volt variable speed motor through controller
- 1 Lathe:  
Lodge and Shipley 18" swing, 4' bed, with patented head. Quick change gear box. Direct connected to GE 3HP, 220 volt, 1160 RPM motor
- 1 Planer:  
Ohio Machine Tool Company. 24" x 24" x 8'. Direct connected to U.S. 5 HP 220/440 volt, 1800 RPM motor
- 1 Shaper:  
Davis Machine Tool Company. Back geared. 10 speeds, 20" stroke. Direct connected to GE 5 HP 440 volt motor
- 3 Drill Presses:  
Snyder 28" x 3' sliding head, back geared. Direct connected (each separate) to GE 3 HP 440 volt, 1150 RPM motor.
- 1 Pipe Threading Machine:  
Jareki No. 68. Cap. 1-1/2" to 6" pipe. Direct connected to GE 3 HP 440 volt motor.
- 1 Bolt Threading Machine:  
Universal Machine Company. Capacity up to 1-1/2" bolt. Direct connected to GE 2 HP, 440 volt motor.
- 1 Power Saw:  
Atkins 18", capacity 6". Direct connected to master motor 1-1/2" HP, 440 volts
- 1 Punch and Shear Machine:  
Ryerson No. 4. Direct connected to GE 5 HP, 440 volt motor
- 1 Pedestal Grinder:  
Hisey No. 14. Capacity 14"x2" wheel (2). Motor 3HP 440 volt, 1750 RPM.
- 1 Wheel Grinder:  
Home made. Capacity 16" wheel; driven by air motor. Wheel mounted on extended shaft of Westinghouse 3 HP, 440 volt motor.

Machine Shop, continued

-2-

- 1 Pedestal Lathes Tool Grinder:  
10" x 1-1/2" wheel (2) Motor 1 HP, 440 volt, 1700 RPM, made by Cincinnati Motor Co.
- 1 Small Grinder with flexible shaft for Arc Welder. 1 HP, 440 volt, 1700 RPM Westinghouse motor.
- 1 Arc Welder:  
7.5 KW, 25 volt, 500 Amp., Westinghouse Electric Co.
- 1 Hydraulic Press:  
Caldwell 9" ram, 9" stroke, 100 ton; frame takes 35" x 8' piece. Driven by GM 5 HP, 440 volt, 1150 RPM motor.
- 1 "Orwold" Acetylene Generator of 80% capacity.
- 2 Sets of cutting and welding torches and gages, all Orwold made
- 1 Travelling Crane:  
Yale & Towne 3 ton block, covering entire shop. Hand operated.
- 1 Travelling Crane:  
Moore 3 ton block, covering loco. Repair Shop and extending to hydraulic press.
- 2 Forges. Coal burning, used for babbiting.
- 2 Anvils. Work benches and vises.

In addition to general repair work, Shop turns out water tubes, feed screws, and other parts for rock drills.

Connecting with main tunnel line, track runs through whole length of shop, in addition to spur going to loco. repair addition.

9 to 12 men are regularly employed in the machine shop

WALKER MINING COMPANY

HEATING PLANT

Heating plant consists of two Fraser & Chalmers 6' x 13' boilers, one wood and one oil fired. These supply steam for heating the mill, shops and hospital. Boiler house is a 25' x 40' wood frame building with corrugated iron roof.

SAWMILL

Sawmill is housed in a 30' x 78' wooden frame building with a corrugated iron roof. Equipment consists of one 5' circular saws, 1 4' circular saw, and one 18" re-saw. There is also a 5' circular saw for cutting up slabs. All saws are driven by belt connected electric motors. Daily capacity is 25,000 feet log scale. Inventory of cut lumber April 1, 1939 was 1,100,000 board feet.

FRAMING SHED

Framing shed is a 52' x 54' wooden frame building, with corrugated iron roof. Equipment consists of one 24' rip saw, one 48" crosscut saw, and one 18' x 7' framing machine with a 10" saw.

WALKER MINING CO.

SHOPS

Laboratory

- 1 Walker made jaw type sample crusher 6" x 5"
- 1 Morse Bros. jaw type sample crusher 5½" x 4"
- 2 Braun pulverizers, Type VA
- 1 Pulp balance, Ainsworth
- 1 Pulp balance, Thompson
- 1 Gold balance, Keller
- 1 Cupel machine
- 1 Muffle furnace, Dof.C. oil fired #4412
- 2 Electric hot plates, 2000 Watt and 7200 Watt
- 2 Electric hot plates @ 1000 watt
- 1 Sample dryer, electric
- 1 Sample dryer, steam
- 1 Still for distilling water, electric
- 1 Annealing muffle, electric, 2000 watt

Construction

Wooden building, roof and sides covered with corrugated iron.

Staff

2 assayers

**WALKER MINING COMPANY**

**ELECTRIC POWER**

Electric power is received at 44,000 volts from the Pacific Gas and Electric Company's sub-station at Yermont, California, over a nine mile power line. Power comes through three 1,250 Kva transformers, which reduce the power to 2,200 volts for general distribution.

Approximate monthly consumption is 1,000,000 KWH.

-1-

Electric Shop and Equipment

Shop

17 feet wide, 29 feet 6 inches long, and 10 feet high (working space)  
6 men employed

Equipment

- 1 Bake oven size 3' x 3' x 3' coil winding machine for making armature and stator coils, and field coils from 3" x 3" minimum to 15" x 17" maximum.
- 1 Dipping vat. Size 2.5' x 2.5' for dipping armatures and stators up to 50 h.p.
- 1 Tool grinder using a 10 inch emery wheel.
- 1 Motor generator 150 watt, 12 volt for charging 12 volt tractor batteries. Driven by a 3 h.p., 440 volt G. E. Motor.
- 2 60 Ampers, 600 volt Trumbull, Type A Safety, 3 pole, fused switches for testing motors up to 60 h.p., 600 volt.
- 1 General Electric CR-7006-D7 Magnetic Switch for testing motors up to 60 h.p., 600 volt.

Transformer Locations

Connected to P. O. & E. 44000 Volt Lines.

3 - Westinghouse, 1 phase, 44,000 to 2,200 volt, 1850 KVA.

784 Hoist Room

- 1 General Electric 1 phase, 2,200 to 220 volt, 10 KVA.
- 3 General Electric 1 phase, 2,200 110  
to 440 Volt, 75 KVA

Pump Room 874 Shaft

- 1 Allis Chalmers 1 phase, 2,200 to 220 volt, 10 KVA  
110

706 Sub-Station

- 3 Westinghouse, 1 phase, 2,200 to 440 volt, 100 KVA  
220
- 1 Westinghouse, 1 phase, 2,200 to 220 volt, 10 KVA  
110

-2-

Transformer Locations (Cont'd)

706 Hoist Panel Control

1 General Electric 1 phase, 2,200 to  $\frac{220}{110}$  volt, 10 KVA

Central Hoist Room

1 General Electric 1 phase, 440 to  $\frac{220}{110}$  volt, 1½ KVA

707 Hoist Room

1 General Electric 1 phase, 440 to  $\frac{220}{110}$  volt, 1½ KVA

712 Hoist Room

3 General Electric 1 phase, 2200 to  $\frac{440}{220}$  volt, 25 KVA

1 General Electric 1 phase, 440 to  $\frac{220}{110}$  volt, 5 KVA

Pinto Sub-Station

3 Westinghouse, 1 phase, 2,200 to  $\frac{440}{220}$  volt, 50 KVA

Pinto Sub-level

1 General Electric 1 phase, 440 to  $\frac{220}{110}$  volt, 5 KVA

Pinto Surface Hoist Room

3 Westinghouse 1 phase, 2,200 to  $\frac{440}{220}$  volt, 50 KVA

1 General Electric 1 phase, 2,200 to  $\frac{220}{110}$  volt, 5 KVA

Compressor Room

1 General Electric 3 phase, 2,200 to 440 volt, 100 KVA  
For M.C. Set and Machine Shop.

1 General Electric 1 phase, 2,200 to  $\frac{220}{110}$  volt, 25 KVA

For Compressor Room and snow shed lighting.

1 General Electric 1 phase, 2,200 to  $\frac{220}{110}$  Volt, 2 KVA

For Synchronous motor panel control.

Steel Shop Rack

3 General Electric 1 phase 2,200 to  $\frac{220}{110}$  VOLT, 10 KVA

3 Gardner Electric 1 phase, 2,200 to  $\frac{220}{110}$  volt, 15 KVA

Transformer Locations (Cont'd)

Steel Shop Bank (Cont'd)

- 1 Surges Electric 3 Phase, 220 to 110 volt, 33 KVA  
For motors and furnace.
- 1 General Electric 1 phase, 220 to 220 volt 3 KVA  
110  
Steel shop and timber shed lights.

Saw Mill

- 1 General Electric 1 phase, 440 to 220 volt, 1 1/2 KVA  
110

Distribution Tower (Electric Shop)

- 3 General Electric 1 phase, 2,200 to 440 volt, 25 KVA  
Crushing plant service. 220
- 2 General Electric 1 phase, 2,200 to 220 volt, 5 KVA  
Machine shop service. 110
- 1 Westinghouse 1 phase, 2,200 to 220 volt, 10 KVA  
110  
Electric and machine shop lighting.

Mill Sub-Station

- 1 General Electric 3 phase, 2,200 to 440 volt, 200 KVA  
Grinding, Flotation, and Filtering.
- 1 General Electric 1 phase, 2,200 to 220 volt, 25KVA  
Mill lighting. 110
- 1 General Electric 1 phase, 440 to 220 volt, 1 1/2 KVA  
Mill lighting. 110
- 3 General Electric 1 phase, 2,200 to 220 volt, 3 KVA  
Ball Mill Panel Control. 110

Blower Room

- 2 General Electric 1 phase, 2,200 to 440 volt, 50 KVA  
220  
Blower motors and assay office.

-4-

Transformer Locations (Continued)

Crushing Plant

1 Westinghouse 1 phase, 2200 to 220/110 volt 1-1/2 KVA

Tren Line Terminal

1 Westinghouse 1 phase, 2200 to 220/110 volt 1-1/2 KVA

Assy Office

1 General Electric 1 phase 2200 to 220/110 volt 25 KVA

Camp Service

- 1 General Electric 1 phase 2200 to 220/110 volt 25 KVA Back of main office
- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA Picture show
- 1 General Electric 1 phase 2200 to 220/110 volt 15 KVA Near House #41
- 1 General Electric 1 phase 2200 to 220/110 volt 15 KVA Near House #64
- 1 General Electric 1 phase 2200 to 220/110 volt 15 KVA Near House #83
- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA Near House #92
- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA Near House #125
- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA Near House #130
- 1 General Electric 1 phase 2200 to 220/110 volt 15 KVA South of Schoolhouse
- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA Near House #131
- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA Near House #150
- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA Near House #103
- 2 General Electric 1 phase 2200 to 220/110 volt 25 KVA In front of club house

Fland-Evans

1 General Electric 1 phase 2200 to 220/110 volt 25 KVA

Transformer Locations (Cont'd)

Fland-Ryans (Cont'd)

- 1 General Electric 1 phase 2200 to 220/110 volt 10 KVA
- 1 General Electric 1 phase 2200 to 220/110 volt 5 KVA  
For cook house and store
- 1 General Electric 1 phase 2200 to 220/110 volt 25 KVA  
For #1 and #2 dormitories
- 1 General Electric 1 phase 2200 to 220/110 volt 25 KVA  
For #3 dormitory

Other Transformers

- 2 General Electric 1 phase 440 to 220/110 volt 5 KVA, air cooled  
794 Hoist Room and sinker hoist room (in storage)
- 1 General Electric 1 phase 440 to 22 volt 10 KVA

Obsolete

- 3 General Electric 1 phase 2200 to 2200 volt 667 KVA (in compressor room)

Transformers - By Manufacturers

3	General Electric	1 phase	22000	to	2200	volt	667	KVA
1	"	"	3	"	2200	to 440	volt	200
1	"	"	3	"	2200	to 440	volt	100
3	"	"	1	"	2200	to 440	volt	100
2	"	"	1	"	2200	to 440	volt	75
2	"	"	1	"	2200	to 440	volt	50
9	"	"	1	"	2200	to 220/110	volt	25
6	"	"	1	"	2200	to 440/220	volt	25
4	"	"	1	"	2200	to 220/110	volt	15
1	"	"	3	"	220	to 22	volt	10
9	"	"	1	"	2200	to 220/110	volt	10
4	"	"	1	"	2200	to 440/220	volt	10
3	"	"	1	"	2200	to 220/110	volt	5
3	"	"	1	"	440	to 220/110	volt	5
1	"	"	1	"	2200	to 440/220	volt	3
4	"	"	1	"	2200	to 220/110	volt	3
1	"	"	1	"	2200	to 220/110	volt	2
5	"	"	1	"	440	to 220/110	volt	1 1/2

Transformers-By Manufacturers (Cont'd)

3 Westinghouse 1 phase 44000 to 2200 volt 1250 KVA  
 6 " 1 " 2200 to 440 " 50 "  
 1 " 1 " 2200 to 220/110 volt 10 "  
 1 " 1 " 2200 to 220/110 " 2 "  
 1 " 1 " 2200 to 220/110 " 1 1/2 "  
 1 Allis Chalmers 1 phase 2200 to 220/110 volt 10 KVA  
 3 Gardner Electric Co. 1 phase 440 to 220/110 volt 15 KVA  
 1 Sarges Electric 3 phase 220 to 110 volt 33 KVA

Totals

<u>No. of Transf.</u>	<u>Make</u>	<u>KVA</u>
63	G. E.	3535 1/2
18	West.	4033 1/2
1	A. C.	10
3	G. D.	45
1	S. E.	33
<u>80</u>		<u>7707</u>

7707 KVA less obsolete 2001 = 5706 KVA  
 5706 KVA less primaries 3750 = 1956 KVA

Haulage Equipment

Haulage Locomotives

800 Level Piute 18" ga.

2 Baldwin-Westinghouse, bar steel frame, hand operated spread brake equipped. 220 volt service. Weight 4 tons. R-26-H Westinghouse controllers using #901-B traction motors

900 Level 784 Shaft 18" ga.

1 Baldwin-Westinghouse, bar steel frame, hand operated, spread brake equipped, weight 4 tons. 220 volt service. R-26-H Westinghouse controller using #901-B traction motors.

1000 Level 706 Shaft 24" ga.

1 Baldwin-Westinghouse, bar steel frame, hand operated spread brake equipped. Weight 4 tons. 220 volt service. R-26-H Westinghouse controllers using #901-B traction motors.

-7-

Haulage Equipment (Cont'd)

Haulage Locomotives (Cont'd)

1000 Level 706 Shaft (continued)

- 1 Baldwin-Westinghouse, solid frame, hand operated spread brake equipped. Weight 4 tons. 250 volt service D-66-B Westinghouse controller using #28007 traction motors.
- 1 Baldwin-Westinghouse, bar steel frame, hand operated spread brake equipped. Weight 4 tons. 250 volt service. Using #28007 traction motors.

700 Level - Main haulage 24" ga.

- 5 Baldwin-Westinghouse, bar steel frame, hand operated spread brake equipped; also "dynamic braking" by using C.E. D-62-A controllers. Weight 4 tons. 250 volt service. Using #9015 Westinghouse traction motors.

All levels fed by #2/0 figure eight trolley wire

700 Level also served by a 250,000 mil cable feeder from portal to 706 shaft. 250 volts used on all trolley lines.

Motor Generators for Haulage Locomotives

Compressor Room

- 2 General Electric, compound wound, 250 volt, D.C. generators. Each driven by a 75 HP, 2200 volt induction motor (General Electric). 50 KW
- 1 General Electric, compound wound, 250 volt, D.C. generator. Driven by a 50HP, 440 volt GE induction motor. This set is also used for #4 compressor excitation 35 KW

784 Hoist Room

- 1 General Electric, compound wound, 250 volt, D.C. generator. Driven by a 50 HP, 2200 volt, General Electric induction motor. Used to supply 1000 Level locomotive, or can be used for 700 Level haulage, or both 700 and 1000 Level haulages at the same time 35 KW

Plate Sub-station - 700 Level

- 1 General Electric, compound wound, 250 volt, D.C. generator. Driven by a 50 HP, 2200 volt General Electric induction motor. Used to supply both 800 level and main haulage 205 KW

Total H.P. 250      Total KW 205

-8-

Power Lines

Haulage Level

1. Lead covered, jute filled, 2500 volt, #8, three conductor cable, in conduit. From 706 sub-station to 712 hoist room
1. Lead covered, jute filled, 600 volt, #8, three conductor cable, in conduit, from 706 sub-station to 794 hoist room
1. Lead covered, jute filled, 600 volt, #8 three conductor cable, in conduit. From 712 hoist room to pump at 712 passing track.

One section of the above two lines, approximately 300 feet long, near 794, is of 1/0 three conductor 2500 volt, lead covered, steel armored cable.

Trolley Lines

#2/0 figure eight copper wire is used throughout the mine. There is also a 250,000 mil conductor used as an auxiliary trolley feeder from compressor room to 706 shaft.

Walker Mining Company

AUTOMOTIVE EQUIPMENT

- 1 White 3-ton truck, stake body, for heavy trucking from Portola 1928 model
- 1 1934 Chevrolet 1-1/2 ton dump body for general hauling
- 1 1929 Ford Model A pickup body (rebuilt from sedan), used for mail and general light hauling
- 1 1937 Ford V-8 coupe (Manager's car)

WALKER MINING COMPANY

PERSONNEL

OFFICERS

Manager's Office

Manager  
Secretary to Manager

Accounting Dept.

Chief Clerk  
Asst. Chief Clerk  
Timekeeper  
Asst. Timekeeper

Engineering Dept.

Chief Engr. & Geologist  
Asst. Geologist  
3 Engineers  
2 Jr. Engineers  
2 Samplers

Mill

Mill Supt.  
Asst. Mill Supt.  
Assayer  
Asst. Assayer

Mine

Mine Foreman

Tramway

Tramway Foreman

Mechanical Dept.

Master Mechanic

WALKER MINING COMPANY

PERSONNEL (Cont'd)

Hospital

Surgeon  
2 registered nurses  
1 male nurse

Warehouse

1 Warehouseman  
1

Spring Garden Terminal

Spring Garden Agent  
Spring Garden Telephone Operator

Deputy Sheriff

## WALKER MINING COMPANY

ENGINEERING AND GEOLOGICAL DEPT.

Staff. The engineering and geological departments are combined, and work under one head called the Chief Engineer and Geologist. He and an assistant geologist do all necessary geological work. In the engineering department are the assistant chief engineer and an engineer, who are responsible for all surveying, stope measurements, keeping up of all maps, etc. An office engineer compiles all report data, keeps daily records posted, and does odd drafting work. Two samplers spend part of each working day underground, and the other part in the office posting the records of their samples and keeping assay maps up to date. An efficiency engineer does cost work. Four times a month all members go underground to measure period advance in headings and stopes, and twice a month contracts are calculated.

Quarters & Equipment. The engineering office is 17' x 25', with a vault and print room adjoining. The geological office is a 13' x 20' room above the engineering office. Both are equipped with drafting tables, desks, files, and equipment ample to maintain a modern, up-to-date department.

The engineering department maintains a complete set of 50 scale base maps and longitudinal vertical projections for each of the separate orebodies. Stopping records are kept on 10 scale vertical cross sections and vertical longitudinal projections with individual records for each stope.

The geological department maintains 50 scale geological base maps with vertical cross sections numerous enough to keep geological structures correlated from level to level. Geologic cross sections through stopes are posted four times a month to keep a clear picture of stope operations with regards to ore limits and faulting.

50 scale composite maps of the entire mine are kept for general study and for development assay records. All samples are run for copper, gold and silver.

Numerous maps, plans and records, incidental to maintaining a technical department for a property of this size, are kept on file and are available for use.

List of Equipment

- 1 Y level - Curley - 24" telescope, with tripod
- 1 Curley mine type transit 8" telescope with tripod
- 1 Berger mine type transit 10" telescope with tripod
- 1 Lietz mine type transit 8" telescope with tripod
- Assorted tapes from 50 to 500 feet and stadia and level rods

WALKER MINING COMPANY

ENGINEERING AND GEOLOGICAL DEPT. (Cont'd)

List of Equipment (Cont'd)

- 1 Keuffel & Esser large suspended type, invar steel, precision pantograph No. 1131, Serial 5543
- 1 Eugene Dietzen 3-1/2'x6' tilting swivel sun printing table and ammonia developer
- 1 2-1/2' x 2' light table
- 1 3' x 2' " "
- 1 4' x 6' drafting table
- 1 4' x10' " "
- 1 4' x12' " "
- 1 Monroe hand operated adding calculator
- 1 small two-drawer fire proof filing cabinet
- 1 1-1/2'x4' 4-drawer filing cabinet
- 3 2-1/2'x4' flat top desks
- 1 large cabinet for drawings and books
- 1 small stationery cabinet
- 1 vault (shared with Accounting Dept.)
- 1 Monroe high speed adding calculator

ACCOUNTING DEPARTMENT

Accounting Department occupies a room 16' x 27' in the main office building, and is staffed by one Chief Clerk and an assistant.

Equipment

- 1 Lightning check writer Series FG 700 (old)
- 1 Diebold Safe & Lock Co. safe
- 1 Burroughs adding machine with stand
- 1 Monroe electric calculator - 2nd hand
- 1 Monroe hand operated calculator No. 99416
- 1 15" Underwood typewriter No. 47255805
- 1 12" " " " No. 5587478
- 1 roll top desk
- 1 glass covered flat top desk
- 1 8' plain table
- 2 6' tables
- 3 swivel chairs
- 3 straight back chairs
- 1 typewriter table - home made
- 1 parcel post scale
- 1 National postal scale
- 4 4-drawer filing cabinets
- 2 desk lamps
- 1 pencil sharpener - Dexter #3
- 2 waste baskets
- 2 time clocks
- 1 wood heater stove - box type

Time office occupies a wooden building with corrugated iron roof, 16' x 30', and is staffed by two timekeepers.

Equipment

- 1 large table
- 1 small table
- 1 typewriter table
- 2 straight back chairs
- 1 swivel chair
- 20 Macey steel files
- 4 Art Metal files
- 1 Burroughs calculator #5-743645
- 1 #3 Underwood typewriter #359684
- 1 #3 " " #787882-12
- 1 Elliott addressing machine
- 1 Emeralite desk lamp
- 1 #8 L.C. Smith typewriter - had order
- 1 home made steel safe
- 1 wood stove
- 1 waste basket
- 1 double drawer wooden file cabinet 15x15x7"

WAREHOUSE AND APPURTENANCES

Warehouse is a 30' x 95' wooden frame building with corrugated iron roof, and is located adjacent to the mill building. Warehouse staff consists of one storekeeper, one clerk, and one warehouse man. Average stock is approximately \$175,000.00.

Equipment

- 1 4-drawer desk, flat top shop made
- 1 2- " " " "
- 1 1- " " " "
- 1 2- " typewriter desk "
- 2 swivel chairs
- 1 19" steel shop made
- 40 Remington-Rand Kardex panels for stock cards
- 3 4-drawer Browne-Morse filing cases, steel
- 1 2-drawer oak filing case for 3x5" cards
- 1 1- " " " " 6x9" "
- 2 waste baskets
- 1 5000 W. 220 V. electric heater, GE
- 1 Underwood std. typewriter, 18", #85284
- 1 Monroe calculator, 8 key, hand operated #1150-142834
- 1 Burroughs " 9 key #5-585780
- 1 #200-2 Western pattern hand truck, rubber tired
- 1 56" paper holder and cutter
- 1 Columbia scale, 60# copy.
- 1 Fairbanks platform style scale, 1000# copy.
- 3 Fry Marvel oil pumps, 1 qt. copy. for use in barrels.

Air Compressor Plant

Inside dimensions of compressor building 29' x 25'. Cement stucco inside, covered with corrugated iron outside.

Comp. No. 1

I.R. Imperial Type 19 B, 2 stage, cyl. 17"x14" and 10"x14", 175 RPM. Belt driven GE Motor 100 HP, 2200 volt, 690 RPM, Pulley 21"x20". Belt 18" x 31'.

Comp. No. 2

Same as No. 1. Motor 100 HP, 2200 volt, 690 RPM, Westinghouse, pulley 17"x17".

Comp. No. 3

Same as No. 2. Theoretical displacement of these machines 800 cu.ft. of air each.

Comp. No. 4

I.R. PHB-2 Type. Cyl. 24"x16" and 14"x16". 225 RPM synchronous GE motor mounted on shaft. 250 HP 2200 volt separately excited. (See report on Electrical Equip.)

Comp. at Pinte

Same size and speed as No. 4, but with 300 HP 2200 volt synchronous motor, Westinghouse.

Theoretical displacement of above two machines 1000 cu.ft. of air each.

Receivers and air line mains:

#	Receivers	5" dia.	12' long	at main plant
1	"	4"	16'	at Pinte "
1	"	40"	9'	at Blacksmith Shop.
1	"	4"	9'	at South end.
1	"	4"	9'	at 712
1	"	4"	20'	not installed (From Montezuma-Apex)

6000 ft. of 5" air line from plant to 794

500 ft. of 6" air line from Pinte to 700 level

6000 ft. of 3" air line from 794 to Pinte

Mine Machinery

**Pumps - Electric Centrifugal**

- 3 Byron Jackson 4 stage 500 gal. 500 ft. head. Motor 135 HP, 2200 volt, 1800 RPM, horizontal type
- 2 Byron Jackson single stage 1200 gal. 70 ft. head. Motor 30 HP, 440 volt, 1750 RPM. Angle type.
- 1 Byron-Jackson single stage 800 gal. 300 ft. head. Motor 20 HP, 440 volt, 3475 RPM. Horizontal type.
- 1 Byron-Jackson 2 stage, 140 gal., 200 ft. head. Motor 10 HP, 440 volt, 1750 RPM. Horiz. type.
- 2 Byron-Jackson single stage sponge, 140 gal., 40 ft. head. Motor 5 HP, 220 volt, 1740 RPM. Vert. type.
- 1 Allis-Chalmers single stage, 250 gal., 70 ft. head. Motor 25 HP, 440 volt, 1750 RPM. Horiz. type.
- 1 Krough single stage, 300 gal., 100 ft. head. Motor 15 HP, 440 volt, 1800 RPM. Horiz. type.
- 1 Kimball-Krough 2 stage, 300 gal., 350 ft. head. Motor 30 HP, 220/440 volt, 3500 RPM. Any angle type.
- 1 Oliver single stage 150 gal., 60 ft. head. Motor 3 HP, 440 volt, 1250 RPM. Hor. type.

**Pumps - Electric Reciprocating.**

- 1 Aldrich 6" x 9" triplex single acting. Cap. 5 gal. per revolution. Head 350 ft. Motor 30 HP, 440 volt, 960 RPM. Double reduction gears. Speed of pump 64 RPM. Upright type.
- 1 Worthington 2-3/4"x3" triplex single acting, 1/3 gal. per rev. Head 300 ft. Single reduction gears enclosed in C.I. case. Ratio 6 to 1. Motor 25 HP, 440 volt, 1200 RPM. Horiz. type.
- 4 Gould Pyramid 2-1/4" x 2-3/4" single plunger double acting. Belt driven.

**Steam or Air Pumps.**

- 1 Cameron No. 9-A 200 gal. 200 ft. head
- 1 " No. 9 150 " 250 " "
- 1 " No. 6 80 " 250 " "
- 1 " No. 5 40 " 250 " "

## Mins Machinery (Continued)

## Steam or Air Pumps (Continued)

- 2 Worthington duplex double acting outside packed, 4-1/4" x 3-1/2" x 5"
- 1 Worthington duplex double acting, inside packed, 4-1/2" x 2-3/4" x 4"
- 1 Platt Iron Works, duplex double acting inside packed, 6" x 4" x 6"

## Air Sump Pumps:

- 1 Chicago Pneumatic-Byron Jackson, 20 gals. at 16 ft. head
- 4 Ingersoll-Rand Size 25. 200 gals. at 10 ft., 140 gals. at 40 ft.

## Hoists:

- 1 Hendrie & Bolthoff, two drum, double reduction. Size of drums 37" diameter, 29" wide, cap. 3500 ft. of 1" cable. Post brakes hand operated. Air cyl. on clutch gear. Lilly Simplex controllers. Speed of cable 300 ft. per minute. Motor 150 HP, 2200 volt, 460 RPM. 706 shaft
- 1 Denver Eng. Works, two drum double red. Size of drums 3 ft. dia., 27" wide. Cap. 5000 ft. of 7/8" cable. Band brakes and clutches. Speed of cable 300 ft. per minute. Motor 100 HP, 440 volt, 575 RPM. 784 shaft
- 1 Taylor Foundry & Mach. Co. Grace Valley, Calif. Two-drum double red. Size 42" dia. 24" wide. Cap. 2000 ft. of 7/8" cable. Band brakes, jaw clutch on counter shaft for clutches. Speed of rope 320 ft. per minute. Motor 55 HP, 440 volt, 520 RPM. Piute Shaft.
- 1 Single drum of 4 ft. dia., 3 ft. wide, cap. 3400 ft. of 3/4" cable. Band brakes, solid drive, double reduct. Motor 52 HP, 440 volt, 900 RPM. Speed of rope 350 ft. per minute. Piute at surface.
- 1 Ottumwa I. E. single drum, double red. Size of drum 3 ft. dia., 3 ft. wide. Cap. 1700 ft. of 3/4" rope. Band brakes, solid drive. Speed of rope 350 ft. per min. Motor 60 HP, 440 volt, 535 RPM. 712 Raise
- 1 Joshua Hardy single drum, 16" dia., 13" wide, cap. 1000 ft. of 3/4" cable. Double reduct. Band brakes, solid drive. Speed of rope 210 ft. per minute. Motor 20 HP 440 volt, 1160 RPM. 797 Winze
- 1 Single drum 24" dia., 20" wide, cap. 1200 ft. of 3/4" rope. Band brakes, solid drive. Speed of rope 350 ft. per minute. Motor 30 HP, 440 volt, 530 RPM. 794 Raise
- 1 single drum 12" dia., 32" wide, cap. 1100 ft. of e/r" rope, double reduct. Band brake, solid drive. Speed 300 ft. per minute. Motor 27 HP, 440 volt, 570 RPM. Sinking Hoist - now in Machine Shop

-3-

Mine Machinery (Continued)

Blowers - Stationary

- 1 Jeffrey 35,000 cu. ft. belt driven by a 50 HP 2200 volt, 870 RPM motor. Flute
- 1 Jeffrey 40,000 cu. ft. belt driven by a 50 HP 2200 volt, 870 RPM motor. 700 Portal

Blowers - Portable

- 1 Buffalo No. 8, belt driven
- 1 Buffalo No. 4, " "
- 1 Sturtevant 16" discharge, belt driven
- 4 Sirocco American Blower Corp. Size SA.R.S. Series 30, direct connected to 5 HP 220/440 volt, 3450 RPM ball bearing motor.
- 1 Coppus Vane blower, type B, P, 250. Air turbine.

Mechanical Loaders

- 1 Finlay No. 20
- 1 Finlay No. 11

Ore Cars

- 30 G. S. Card Co. Walker special gable bottom. 14" wheels mounted on Timken roller bearings. Cap. 157 cu. ft. Gage 24"
- 10 Home made cars of 70 cu. ft. cap., 16" manganese steel wheels, Timken bearings, gable bottom, toggle operated doors. Gage 24"
- 20 Home made cars of 50 cu. ft. cap., 16" manganese steel wheels, Timken bearings, gable bottom, toggle operated doors. Gage 24"
- 6 Phoenix Iron Works, side dump, 50 cu. ft. cap., Hyatt roller bearings, 14" C.I. wheels. Gage 24"
- 30 Rock-a-Dump 12" wheel, Hyatt bearings, cap. 10 cu. ft. Gage 12"
- 12 10-man capacity transportation buggies, 14" wheel, Hyatt roller bearings. 24" ga.
- 10 Timber trucks mounted on 16" Timken mounted C.I. wheels. 24" ga.
- 1 Totally enclosed, insulated, Powder Car of 30 cuss capacity. 24" ga.

-4-

Mine Machinery (Continued)

Tuggers - Air

- 2 I. R. K.A. type double drum
- 6 I. R. E.U. type single drum
- 1 I. R. C.U. type single drum
- 4 I. R. 11-H type single drum
- 1 I. R. 9-H type single drum
- 1 Sullivan turbineir single drum
- 1 " " double drum
- 1 Chicago Pneumatic M.H.1 type
- 3 Inacoda type
- 1 Locomotive type, reversible valve gear
- 1 Sullivan Electric H.D.X.2 Motor 15 HP, 440 volt, cap. of hoist 2150' at a speed of 250 ft. per min. (Now in mill fine ore bin)

Rock Drills, Column Bars

- 51 I. R. H-75 Leyners
- 7 I. R. S-70 Leyners
- 6 I. R. D.A. 35 Leyners
- 2 I. R. R-51 stopers
- 4 I. R. S.A.R. stopers
- 10 Gardner-Denver H-1110 stopers
- 4 I. R. 450 Jackhammers
- 5 I. R. H-12 "
- 10 I. R. R-39 "
- 10 I. R. L-69 "

-5-

Mine Machinery (Continued)

Rock Drills, Column Bars (Cont'd)

- 80 4" outside dia. column bars, ranging in length from 5-1/2ft. to 10 ft.
- 60 arms of 3 different lengths
- 50 Clamps  
Safety clamps, wrenches, oilers, etc.
- 90 Jackbit carriers of 36 bit capacity.
- 50 Tons of drills of various types and dimensions

Skips, Ore & Passenger

- 5 35" ga. of 55 cu. ft. cap. for 705 shaft
- 5 35" ga. of 40 cu. ft. cap. for Piute shaft
- 2 27" ga. of 30 cu. ft. cap. for 784 shaft
- 2 27" ga. of 20 cu. ft. cap. for shaft sinking
- 1 27" ga. of 8-man cap. for 794 Raise
- 1 27" ga. of 8-man cap. for 718 Raise
- 1 24" ga. of 6-man cap. for Piute Raise
- 1 35" ga. skip cage of 5-man cap. for 915 Raise
- 1 27" or 35" gage skip built for mounting pumps when dewatering shafts.

All skips mounted on cast iron axle housing, bronze bushed. Wheels 10" dia., C.I. with chilled tread.

WALKER MINING COMPANY

MINE

MINE RESCUE STATION

Mine rescue equipment is housed in a 8' x 16', wooden frame building with a corrugated iron roof.

Equipment

5 Gibbs self-contained, two-hour, breathing apparatus complete

Complete set of parts sufficient to assemble one additional apparatus

Extra parts for servicing all apparatus

1 Draeger oxygen pump

1 Wolf flame safety lamp

1 HI carbogen inhalator

1 MSA carbon monoxide detector

Tools, gauges, etc., for servicing and testing equipment

Concentrator

Course Crushing Division

- 1 Mine ore storage bin 30' dia. x 55' deep. Capacity 1250 tons. Steel plate on concrete base
- 1 Anaconda type steel pan ore feeder, 8'-6" wide x 16'-6" center to center of pulleys. Driven by a 5 HP 440 volt back geared motor, belt and gear connection
- 1 Bar grizzly with 3-1/2" spaces
- 1 Primary crusher, 24" x 15" Traylor jaw type, driven by a 150 HP, 2200 volt motor, belt connected
- 1 Coarse ore conveyor 257'-5" center to center of pulleys, equipped with 20" 6-ply rubber belt. Driven by 30 HP, 440 volt motor, belt connected.
- 1 Cutler-Massey electromagnet, size 39, for removing tramp iron from ore

Secondary Crushing Division

- 1 5-1/2 Ft. Symons standard head cone crusher, equipped with fine bowl. Driven by 200 HP, 2200 volt motor, Texrope connected
- 1 Symons crusher product conveyor 24'-9" center to center of pulleys, equipped with 20" 6-ply rubber belt. Driven by 3 HP, 440 volt, motorized speed reducer, direct connected
- 1 Symons crusher product elevator 70'-0" high, equipped with 18" 10-ply rubber belt and 6"x16" buckets spaced 14". Driven by 20 HP, 440 volt motor, belt and gear connected
- 1 Allis-Chalmers 4' x 8' Style B centrifugal vibrating screen, covered with 3/4" x 1-1/4" opening woven wire screen. Driven by 3 HP, 440 motor, Texrope connected. Oversize of screen returned to Symons crusher.
- 1 Fine ore conveyor 165'-0" center to center of pulleys, equipped with 18" 6-ply rubber belt and Anaconda type ore tripper. Driven by 10 HP, 440 volt motor, belt and gear connected

Fine Grinding Division

- 1 Fine ore storage bin 125' long x 14'-6" wide x 21'-4" deep. Capacity 2200 tons.
- 4 Belt type ore feeders, 8'-0" center to center of pulleys, equipped with 24" 6-ply rubber belt. Each driven by 3 HP, 440 volt, back geared motor direct connected through a Foote speed reducer

-2-

Concentrator (Continued)

Fine Grinding Division (Continued)

- 1 No. 86 Marcy ball mill, driven by a 250 HP, 2200 volt synchronous motor direct connected to ball mill pinion shaft through a Stearns Hi-duty magnetic clutch
- 1 Dorr classifier Type DSFA, 8' x 27', in closed circuit with above mill. Driven by 15 HP, 440 volt motor, Texrope connected.
- 2 No. 75 Marcy ball mills, each driven by a 200 HP, 2200 volt, slip ring, induction motor, connected to ball mill pinion through a Size 51/2 Falk gear reduction unit
- 2 Dorr classifiers, Type D, 6' x 23'-4", in closed circuit with above ball mills. Each classifier driven by 5 HP, 440 volt, back geared motor, belt connected.
- 1 No. 77 Marcy ball mill, driven by 200 HP, 2200 volt, synchronous motor, connected to ball mill pinion shaft through a Westinghouse No. 4, Style 173UR speed reduction unit
- 1 Dorr classifier, Type B, 6' x 23'-4", in closed circuit with above ball mill. Driven by 5 HP, 440 volt motor, belt connected

Flotation Division

- 4 Flotation reagent feeders, disc type
- 4 " " " pulley type
- 4 lime feeders, belt type

All above feeders belt driven from one line shaft, which is driven by a 3 HP, 440 volt motor, belt connected

- 1 Fagergren flotation unit, consisting of 6 - 56" rougher cells and 2 - 56" cleaner cells, each cell driven by a 7.5 HP, 440 volt, vertical motor, direct connected. Skimmer shafts driven by 2 - 1/2 HP, 440 volt motors, chain connected

- 6 Callow pneumatic flotation units, each consisting of 11 rougher cells 3' x 3' and 4 cleaner cells 3' x 3'

Air at 4 to 5 pounds pressure for Callow cells is furnished by the following blowers:

- 2 Roots blowers No. 6-1/2, each driven by a 150 HP, 2200 volt motor, belt connected
- 1 Conneraville blower, 10.7 cu. ft., driven by a 75 HP, 2200 volt motor, chain connected.

-3-

Concentrator (Continued)

Flotation Division (Continued)

- 1 Connerville blower, 10.7 cu. ft., driven by a 75 HP, 440 volt motor, chain connected
- 6 3" Krogh centrifugal middling pumps, each driven by a 15 HP, 440 volt motor, direct connected
- 4 Calligher automatic samplers, on flotation feed, concentrates and tailings, each driven by a 1/2 HP, 110 volt motor

Concentrate Filtering Division

- 2 Dorr thickeners 25' dia. x 12' deep, each driven by a 10HP, 440 volt, back geared motor, belt connected
- 1 Elevator, 32'-0" high, equipped with 3" 8-ply rubber belt and 6x8 buckets spaced 12". Driven by a 5 HP, 440 volt motor, belt and gear connected.
- 1 Oliver continuous filter, drum type, 8'x12', driven by a 5 HP, 440 volt, gear reduction motor set, chain connected
- 1 Concentrate conveyor 97'-3", center to center of pulleys, equipped with 12" 6-ply rubber belt. Driven by 5 HP, 440 volt motor, belt and gear connected
- 1 Centrifugal filtrate pump, driven by a 2 HP, 440 volt motor, direct connected
- 2 Oliver vacuum pumps 14" x 8", each driven by a 10 HP, 440 volt motor, belt connected
- 1 Oliver air compressor, 9-1/2" x 8", driven by a 15 HP, 440 volt motor, belt connected
- 2 3" Krogh centrifugal water pumps, each driven by a 5 HP, 440 volt motor
- 1 Concentrate storage bin, sloping bottom, timber construction, 48' long, 10 ft. wide, and 5 to 15 feet deep. Total capacity 300 tons

A platform for concentrate storage under the filter floor, having a capacity of 350 tons, is available in emergencies

Auxiliary Equipment

- 1 Lime feeder and mixer for conditioning mine water for mill use or previous to turning into Grizzly Creek. This unit consists of belt type feeder and spiral flight agitator for producing milk of lime. All driven by 5 HP, 440 volt motor chain driven.
- 1 Dorr thickener 50' dia. x 12' deep, driven by 15 HP, 440 volt motor, belt and gear connected. This tank used principally for recovering water from tailings for mill use.

-4-

Concentrator Data

Crushing Division

180 tons per hour, minus 1 1/2 inch feed to minus 3/4 inch product.

Fine Grinding Division

Minus 3/4 inch feed to 5% on 48 mesh product.

2 #75 Ball Mills	⊙	363 tons per 24 hours	730
1 #77 Ball Mill	⊙	320 tons per 24 hours	320
1 #86 Ball Mill	⊙	643 tons per 24 hours	643
Total tons per 24 hours			<u>1693</u>

Flotation Division

1 Fagergren Unit		Tons per 24 hours	750
6 Cellow units	⊙	500 tons per 24 hours	<u>1800</u>
Total tons per 24 hours			2550
2 Concentrate Thickeners		tons per 24 hours	60
1 Tailings dewaterer		Tons per 24 hours	700
1 Oliver Filter		Tons per hour	7

Assays

	<u>Copper %</u>	<u>Silver %</u>	<u>Gold %</u>
Feed	1.00 to 1.25	.75 to .85	.04 to .05
Concentrate	25.0	13.0 to 16.0	.61 to .90
Tailing	.10 to .15	.12 to .20	.012 to .018
Recovery %	85.0 to 92.0	78.0 to 92.0	85.0 to 95.0

-5-

Construction of Mill Buildings

All mill buildings are structural steel frame covered with one inch boarding and corrugated iron or zinc, except the following:

Addition to primary crusher building.

Course ore conveyor building.

50 ft. Dorr Thickener building.

Oil and reagent storage.

All above exceptions are wooden frame with corrugated iron roofs.

Tailings Disposal

The mill tailing is run to the tailing pond through a 18" wooden launder 4500 ft. long.

The tailing pond is formed by a gravel dike approximately 4700 ft. long, having a maximum height of 25 ft. on two sides, and natural hillside on the other two sides. It is provided with two spillway overflows, one 22 ft. long and one 16 ft. long. The overflow water goes directly to Little Crissaly Creek.

State Conservation Department ruling prohibits the contamination of natural streams by anything that is injurious to fish, game or animal life, and in the case of soluble copper, the maximum allowance is one part per thirty million.

ANACONDA COPPER MINING COMPANY

25 BROADWAY

NEW YORK

OFFICE OF THE  
GENERAL MANAGER OF MINES

January 4, 1939.

Mr. J. F. Dugan, Gen. Supt. of Mines  
International Smelting & Refining Co.  
Kearns Building  
Salt Lake City, Utah.

*Walker*

Dear Jack:

Messrs. Sales, Gidel and I have gone over your recommendations for diamond drilling at the Walker mine, and have reached the following decision:

You are authorized to start work on the 1200 level drifting along the vein in both directions from the shaft to see what the vein looks like on this level. We believe that the decision in regard to drilling under the 1200 level should be deferred until our return from South America in April. By that time, we will know the general character of the vein on the 1200 level and be able to make some decision in regard to what should be done in the line of deeper work.

I think Mr. Sales will also write Mr. Lyon in this connection.

Yours very truly,

*Chew*

CEW:F

CC: Mr. J. R. Hobbins  
Mr. Reno H. Sales ✓  
Mr. J. O. Elton.

# ANACONDA COPPER MINING COMPANY

Butte, Montana

## Geological Department

RENO H. SALES, Chief Geologist

M. H. GIDEL, Asst. Chief Geologist



New York, N. Y.  
January 5, 1939

Mr. Tom Lyon,  
820 Kearns Building,  
Salt Lake City, Utah.

Dear Tom:

We may be in need of a geologist at Chuqui. Broadwater, who is now at the Walker, has many times indicated his desire to go to Chile. Since there isn't much future for a geologist at the Walker, I would like to give Broadwater a chance for the Chile job, should it materialize.

I am sending this application blank to you to be forwarded on to Broadwater for two reasons, so you will know about it and so you can replace Broadwater should you be willing to let him go to Chile.

Ask him to fill out the blank and send it to the Chile Exploration Company, 25 Broadway, New York, N. Y., addressing his letter to Mr. J. A. Jacobsen.

Very truly yours,

RENO H. SALES

RHS:D

CC - Mr. J. A. Jacobsen

# ANACONDA COPPER MINING COMPANY

Butte, Montana

Geological Department  
RENO H. SALES, Chief Geologist  
M. H. GIDEL, Asst. Chief Geologist



New York, N. Y.  
January 5, 1939

Mr. Tom Lyon,  
820 Kearns Building,  
Salt Lake City, Utah.

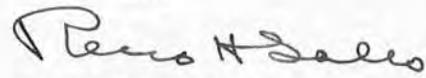
Dear Tom:

Weed, Gidel and I have discussed the Walker situation. We agreed that the 1200 level should be extended to the north as rapidly as possible, and you are authorized to go ahead with that development. As I understand it, the shaft is filled with water to a distance below the 1100.

I think a little study is necessary on the matter of the location of the north work on the 1200; that is, as to whether we should first pick up the vein and drift on it, or lay out a lateral on lines in order to reach our main objective as quickly as possible. Speed is the essence of the thing and I think the manner of doing the work is for you, Dugan and the mine management at the Walker to decide.

Incidentally, it is suprising that our Walker maps and sections do not show that the shaft is down to the 1200 level.

Yours very truly,

  
RENO H. SALES

RHS:D

CC - Messrs. C. E. Weed  
J. F. Dugan

New York, N. Y.  
January 6, 1939

Mr. S. K. Droubay  
Walkermine, Plumas County  
California

My dear Droubay:

This will acknowledge your letter of December 21st together with your section maps of mine developments; also, a copy of your later estimate of ore reserves.

Between having a heavy cold and some heavy work, I have had but little time to give to Walker matters. I am going to Chile for three months during which time you should communicate geological matters to Lyon, but I would like you to send copies of your letters and maps to M. H. Gidel in Butte.

With best regards, I am

Very truly yours,

RENO H. SALES

RHS:D

**WALKER MINING COMPANY**

WALKERMINE

PLUMAS COUNTY, CALIFORNIA

L. F. BAYER, MANAGER

January 25, 1939

Mr. Tom Lyon  
Chief Geologist  
818 Kearns Bldg.  
Salt Lake City, Utah

Dear Tom:

Please find enclosed four recommendations for development work at Walker Mine. These have been more or less under consideration for some time, and now that the mine will soon be in condition to have this work started, I have drawn up the 200 scale sketches.

As the No. 1 hanging wall fault steepens below the 1000 level, being 70° between the 1000 and 1100 levels, it is questionable just how it will act to the north and south. Recommendations No. 15 and No. 16 were drawn up by projecting structure to the 1200 level and making it fit the known position of the fault at 706 winze.

Recommendations No. 17 and No. 18 have to do with Piute. No. 18 is to prospect for ore north of our present extreme exposures of mineralization as recommended by Mr. Sales in his letter of October 27, 1937, a copy of which was sent to you. The slip coming in from the northeast just ahead of the present face is projected down from the 600, 700 and 800 levels. It may be well to prospect back through this from a point several hundred feet ahead if no mineral is found in the zone indicated. No. 17 is to keep the 800 level from taking off on an east split, as happened on the 700 and 600 levels. It looks as though we are at the end of our commercial ore here, but we should continue going south as long as we are able to drift on ore. When this fails, any further prospecting could be done from the 700, where the level is not so congested for handling waste. We have located hanging wall with 450° raises, which cost much less to run than do crosscuts.

All copies of the annual ore reserves were sent to you, and the additional long section that you requested will be sent in as soon as Ed Broadwater can finish making it up.

In the past, Mr. Sales requested that I keep him posted on our development work here. He wrote me on January 6th that he was going to South America and that in communicating geological matters to you I should send a copy of the letters and maps to Mr. Gidel at Butte. I will also send Mr. Dugan a copy of the recommendation maps, and tell him they are subject to your approval.

Mr. Tom Lyon

-2-

January 25, 1939

Any comments or suggestions as to the proposed development will be very gladly received.

Respectfully yours,

*S. K. Droubay*

S. K. Droubay

cc-Mr. Gidel ✓

January 28, 1939

Mr. Tom Lyon

Offices

Dear Sir:

The following comments are submitted on the last four development recommendations for the Walker mine (Nos. 15, 16, 17, 18) as submitted for your approval by Mr. Droubay in his letter of January 25, 1939.

Recommendation No. 15

This is the recommendation applying to the drift northerly on the 1200 level off of 1082 winze. It follows the general plan already agreed upon and appears to be satisfactory with the possible exception of the two pairs of crosscuts designated to be run from this drift at distances of 140 and 340 feet from the winze. If no strong mineralization is encountered along the fault zone in the crosscut easterly directly off the winze station, it is believed that the north drift should be pushed as rapidly as possible along the footwall of #1 fault until a point under 1060 A drift and on the downward projection of the north ore body is reached -- without delaying this drift to run the first two sets of crosscuts as shown on the recommendation sheet. When a point about 600 feet north of the winze is reached, crosscutting of the zone should be done to locate the downward projection of the north ore body along which, if found, the drift can be continued to the north as shown.

Recommendation No. 16

This applies to a drift southerly from 1082 winze on the 1200 level. Its general plan is suitable but if sufficient development funds are not available at the present time for both the north and south drifts on the 1200 level, this proposed drift to the south should be left in abeyance until the north drift is completed. The ore zone of the central ore body on the 1000 level in this area is narrow and it is believed that the northerly development drift under the north ore body is more important than this drift to the south.

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2- Mr. Tom Lyon

January 28, 1939

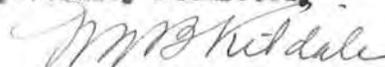
Recommendation No. 17

This applies to the continuation of the south drift on the 800 level in the Piute ore body. It now appears possible that the southern limit of the commercial ore on the 800 level has been reached in the vicinity of 828 A and 829 A crosscuts. However, as shown on the recommendation sketch, the 836 drift on the 800 level has reached the area below the point where the Piute vein splits into two branches on the 700 level, one split following the footwall fault to the south, the second branch turning to the southeast. Thus the 800 level drift should be continued along the footwall fault as shown on the sketch and the proposed crosscut easterly at a point about 100 feet ahead of the present face should be driven a sufficient distance to be sure of cutting any southeasterly split as shown on the 700 level. The mineralized zone shown as being cut in D.D. hole #15, drilled from the sub-level above the 700, may represent this easterly branch. Recommendation as outlined covers these possibilities except that the easterly crosscut as shown should probably be extended about 50 feet further than shown.

Recommendation No. 18

This recommendation applies to the prospecting of the area north of the present Piute ore body on the 900 level off of the Piute shaft, according to the general plan already agreed upon. It is recognized that in this area two possibilities must be tested - (1) the continuation of the ore zone northerly along the flat footwall fault and (2) the presence of other ore bodies along the northeast-striking fault which appears to branch off the footwall fault in this area. This fault may itself be mineralized or may be a fault of the "cross-over" type which will lead to another ore body parallel to but lying north and east of the Piute ore body. The recommendation as submitted calls for the continuation of 904 B drift northerly along the footwall fault, with frequent long crosscuts easterly toward the northeast branch fault. It appears to the writer that these long crosscuts are neither so economical nor so satisfactory as would be a drift directly along the northeast fault. Such a drift will require less footage than the long crosscuts and give more geological information. The geological mapping of the two drifts along the footwall and northeast faults should detect any branching mineralized zones which may split off into the area between the two drifts. Hence it is recommended that this recommendation be revised to call for a drift along the northeast fault and the elimination of the long crosscuts off of the extension of 904 B drift.

Respectfully submitted,



M. B. Kildale

MRK:P

cc: Mr. M. H. Gidel  
Mr. J. F. Dugan

ANACONDA COPPER MINING Co.

C O P Y

*Extra Walker*

Feb. 1, 1939

Mr. Tom Lyon,  
820 Kearns Bldg.,  
Salt Lake City, Utah.

Dear Tom:

I received a copy of S. K. Droubay's letter of January 25th, descriptive of and including four recommendations for development work as planned on the 800, 900 and 1200 levels of the Walker Mine. These are good recommendations, especially the proposed work on the vein to the north and south of the shaft on the bottom or 1200 level.

In discussing the matter with Mr. Weed a few weeks ago, he requested that drifting be done on any ore that may be cut in new foot-wall or hanging wall test crosscuts, in preference to continuing the laterals parallel to an orebody.

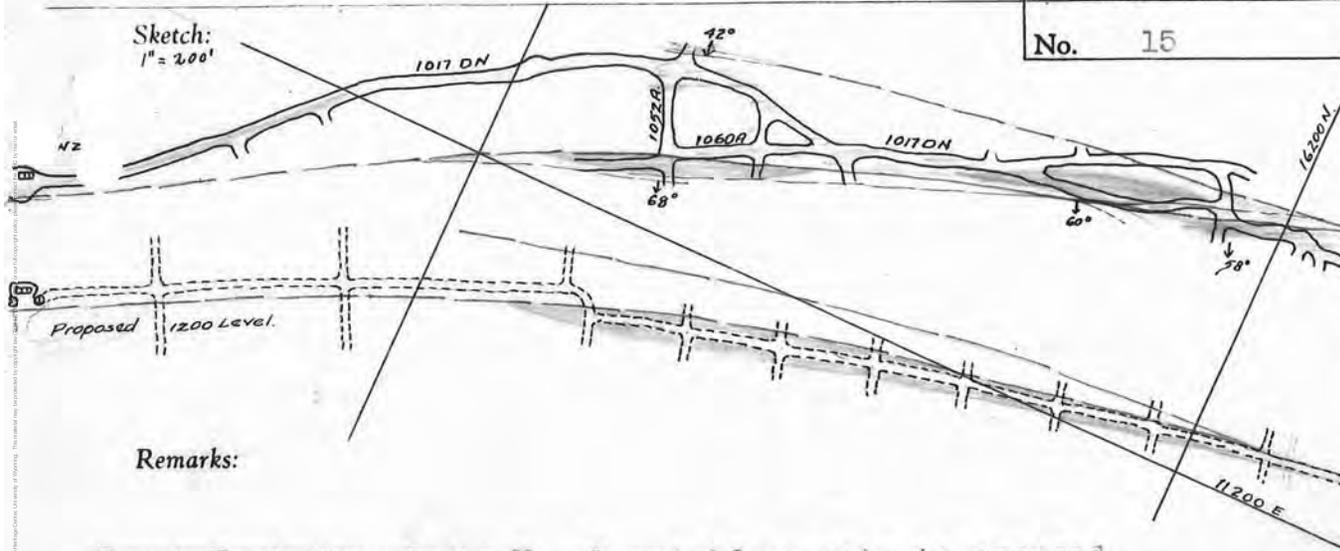
Yours very truly,

MHG:KM  
cc:Mr.C.E.Weed

M. H. GIDEL

RECOMMENDATION FOR DEVELOPMENT WORK  
 GEOLOGICAL DEPARTMENT  
 INTERNATIONAL SMELTING & REFINING CO.

Mine	Walker
Level	1200
Ore Body	North
No.	15



Remarks:

X-cut East thru fault No. 1 and if no vein is exposed immediately, drift Northerly along foot-wall mineralization. Drift along and cross-cut vein when it is located. Cross-cutting and direction of lateral to be controlled by position of mineralization and faulting.

Amount of work 1400' Drift. 4800' XC. Recommended by S. K. Droubay

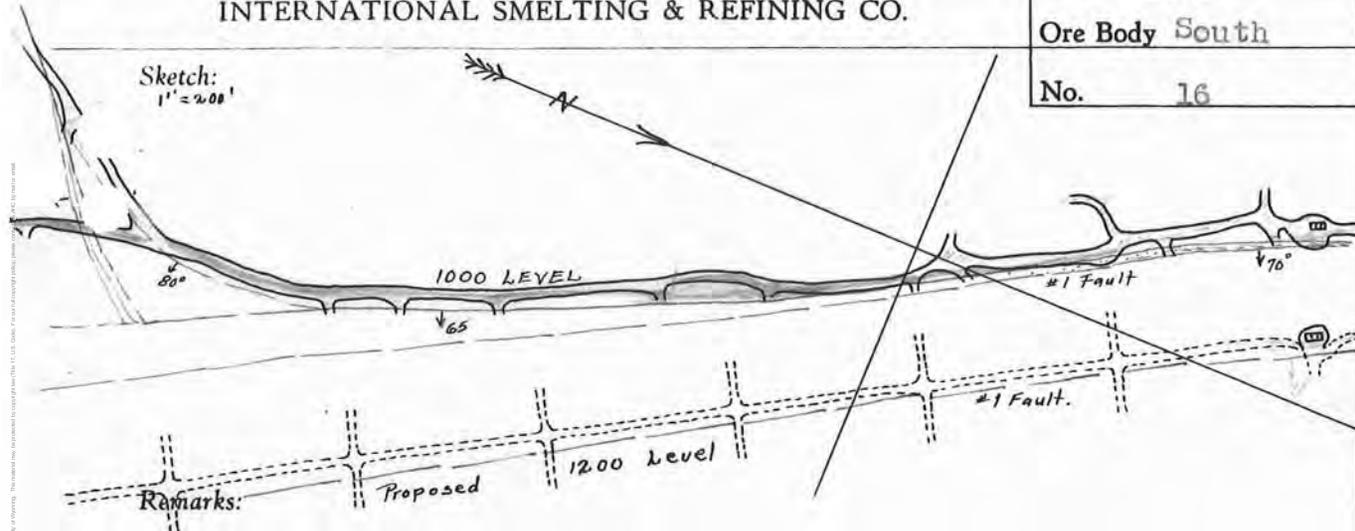
Date of recommendation 1-20-39

Date started \_\_\_\_\_ Approved by \_\_\_\_\_

Date completed \_\_\_\_\_

RECOMMENDATION FOR DEVELOPMENT WORK  
 GEOLOGICAL DEPARTMENT  
 INTERNATIONAL SMELTING & REFINING CO.

Mine Walker
Level 1200
Ore Body South
No. 16

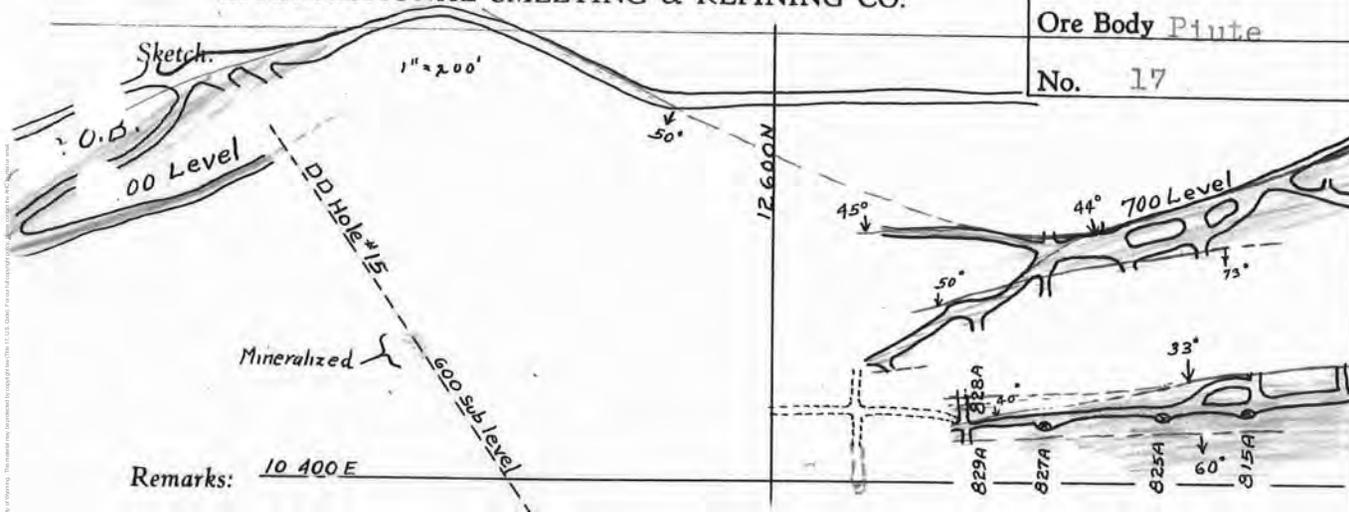


Drift south along footwall mineralization and prospect footwall and hanging wall at 200 foot intervals. If no vein is located to drift on, it will be necessary to prospect farther into the foot wall and hangingwall than indicated on the sketch. Exact position of drift and length of cross cuts will depend on the location of mineralization and faulting.

Amount of work 1300' Drift & 600' X cuts Recommended by S. H. Droubey  
 Date of recommendation January 23, 1939  
 Date started \_\_\_\_\_ Approved by \_\_\_\_\_  
 Date completed \_\_\_\_\_

RECOMMENDATION FOR DEVELOPMENT WORK  
 GEOLOGICAL DEPARTMENT  
 INTERNATIONAL SMELTING & REFINING CO.

Mine Walker
Level 800
Ore Body Plate
No. 17



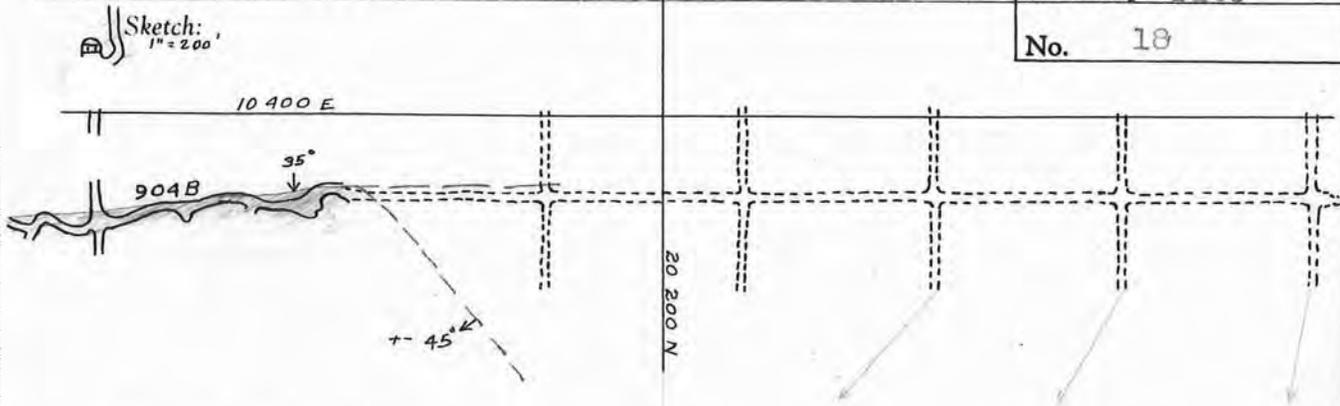
Remarks: 10 400 E

Stop 829A. XCE until 827A Rs., (+50° in hanging wall) is up 40 feet. If 827A Rs. shows no minable ore, continue 886 DS along foot wall mineralization to end of ore. Longer range prospecting South should be done from the 700 level to avoid hoisting waste.

Amount of work 200' drifting: 60' X-cut. Recommended by S. M. Drouley  
 Date of recommendation 1/23/39  
 Date started \_\_\_\_\_ Approved by \_\_\_\_\_  
 Date completed \_\_\_\_\_

RECOMMENDATION FOR DEVELOPMENT WORK  
 GEOLOGICAL DEPARTMENT  
 INTERNATIONAL SMELTING & REFINING CO.

Mine Walker
Level 900
Ore Body Piute
No. 18



Remarks: Extend 904 BDN and prospect footwall and hanging wall every 200 feet. Longer range prospecting than is shown on the sketch should be done if no extension of the piute mineralization is located within the zone indicated.

Amount of work 1000' drift & 1000' X cut Recommended by S. K. Droubay.  
 Date of recommendation January 25, 1939  
 Date started \_\_\_\_\_ Approved by \_\_\_\_\_  
 Date completed \_\_\_\_\_

**WALKER MINING COMPANY**

WALKERMINE

PLUMAS COUNTY, CALIFORNIA

L. F. BAYER, MANAGER

January 25, 1939

Mr. Tom Lyon  
Chief Geologist  
818 Kearns Bldg.  
Salt Lake City, Utah

Dear Tom:

Please find enclosed four recommendations for development work at Walker Mine. These have been more or less under consideration for some time, and now that the mine will soon be in condition to have this work started, I have drawn up the 200 scale sketches.

As the No. 1 hanging wall fault steepens below the 1000 level, being 70° between the 1000 and 1100 levels, it is questionable just how it will act to the north and south. Recommendations No. 15 and No. 16 were drawn up by projecting structure to the 1200 level and making it fit the known position of the fault at 706 winze.

Recommendations No. 17 and No. 18 have to do with Piute. No. 18 is to prospect for ore north of our present extreme exposures of mineralization as recommended by Mr. Sales in his letter of October 27, 1937, a copy of which was sent to you. The slip coming in from the northeast just ahead of the present face is projected down from the 600, 700 and 800 levels. It may be well to prospect back through this from a point several hundred feet ahead if no mineral is found in the zone indicated. No. 17 is to keep the 800 level from taking off on an east split, as happened on the 700 and 600 levels. It looks as though we are at the end of our commercial ore here, but we should continue going south as long as we are able to drift on ore. When this fails, any further prospecting could be done from the 700, where the level is not so congested for handling waste. We have located hanging wall with 450° raises, which cost much less to run than do crosscuts.

All copies of the annual ore reserves were sent to you, and the additional long section that you requested will be sent in as soon as Ed Broadwater can finish making it up.

In the past, Mr. Sales requested that I keep him posted on our development work here. He wrote me on January 6th that he was going to South America and that in communicating geological matters to you I should send a copy of the letters and maps to Mr. Gidel at Butte. I will also send Mr. Dugan a copy of the recommendation maps, and tell him they are subject to your approval.

Mr. Tom Lyon

-2-

January 25, 1939

Any comments or suggestions as to the proposed development will be very gladly received.

Respectfully yours,

*S. K. Droubay*

S. K. Droubay

cc-Mr. Gidel ✓

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BUTTE, MONTANA, FEB. 2, 1939.

Form 2

TOM LYON,  
818 KEARNS BLDG.,  
SALT LAKE CITY, UTAH.

VIRGIL CHAMBERLAIN MINES GRADUATE WHO WAS ON GEOLOGICAL SURVEY WORK LAST SUMMER RECENTLY SAMPLER AT LEONARD, SINGLE, AVAILABLE FOR WALKER JOB AT ONE HUNDRED SIXTY MONTHLY STARTING RATE STOP CAN REPORT IMMEDIATELY BUT SUGGEST WE GIVE HIM COUPLE WEEKS PRELIMINARY TRAINING IN BUTTE GEOLOGICAL DEPARTMENT ON WALKER ACCOUNT. ASSUME WALKER WOULD PAY TRAVELING EXPENSE FROM BUTTE STOP WE RECOMMEND HIM WILL AWAIT YOUR REPLY.

M. H. GIDEL

(Chg. A.C.M.Co.)  
(Geological Dept.)

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# WESTERN UNION

1201

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R. B. WHITE  
PRESIDENT

NEWCOMB CARLTON  
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J. C. WILLEVER  
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1939 FEB 2 PM 2 15

KHA73 22=SALT LAKE CITY UTAH 2 205P

M H GIDEL=

526 HENNESSY BLDG BUTTE MONT=

BROADWATER HAS RECEIVED NOTICE TO BE IN NEWYORK AS SOON AS POSSIBLE. HAVE YOU SOMEONE IN MIND TO REPLACE HIM AT WALKER=

TOM LYON..

*Virgil P. Chamberlain  
Phone 3413.*

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Form 16

408 23 NL=MX SALT LAKE CITY UTAH 3

1939 FEB 3 PM 9 31

M H GIDEL=

526 HENNESSY BLDG BUTTE MONT=

PLEASE GIVE CHAMBERLAIN TWO WEEKS TRAINING AND SEND HIM TO WALKER  
ADVISE DROUBAY WHEN HE WILL LEAVE. WALKER WILL STAND EXPENSE OF  
TRANSFER=

TOM LYON.

*Chamberlain started in Fed. Dept on Monday Feb. 6th  
preliminary training for 2 weeks - base rate \$160 per month.*

*M-H. Gidel*

Feb. 6, 1939.

Mr. W. J. Wilcox,  
General Office,  
Butte, Montana.

Dear Sir:

Pursuant to the request of Mr. Tom Lyon, of the International Smelting and Refining Company, Mr. Virgil R. Chamberlain will start to work today in the Geological Department at Butte, for a period of about two weeks to obtain preliminary training in our local work, following which he will go to the Walker Mine as a junior geologist and sampler. Therefore, Mr. Chamberlain's time is to be charged to the Walker Mining Company beginning today, Feb. 6th. His base rate of salary is to be \$160.00 per month. The Walker Mining Company will stand the expense of transfer from Butte to Walkermine.

Mr. Chamberlain was employed as a sampler at the Leonard Mine, his last shift being on January 23rd, following the closing of the mine.

Yours very truly,

MHG:KM  
cc:Mr. Tom Lyon

M. H. GIDEL

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*Walker Mine*

Feb. 8, 1939.

Mr. Tom Lyon,  
818 Kearns Bldg.,  
Salt Lake City, Utah.

Dear Tom:

Thank you for copy of Mr. Kildale's letter concerning the recommendations for development at the Walker Mine, which were submitted by Mr. Droubay.

With limited funds for development, Recommendation No. 15, proposing development of the North Orebody on the 1200 level, undoubtedly is the most important one to start first, to determine whether or not commercial grade ore extends beneath the best ore exposure on the 1000 level.

In regard to prospecting the northerly extension of the Piute orebody on the 900 level (Recommendation No. 18), I believe it would be best to extend the drift on its present course through all possible footwall branches of the fault, 100' to 200' into solid ground before turning a crosscut to the east to test for a right hand displacement or an eschelon branch of the vein structure. In the stope at the north end of the 700 level, I noted "drag" blocks of vein material to the right, implying a throw in that direction. The first test crosscut should give some idea of structure to the north, and thereby govern the plan of prospecting beyond that point; which might be considerably different from that sketched on the Recommendation Sheet. Any lateral that is to be driven should not be too distant from the vein structure.

Should a diamond drill be available at the mine, I would suggest that some drilling be done in lieu of crosscutting off the new lateral. If ore should be found in any of these projects, drifting should be done on same in preference to lateral work, unless heavy, wet ground should preclude making desired advances.

In other words, the recommendations as written suggest a plan for development, subject to whatever changes it may be desirable to make as the work proceeds, based on the relation and character of vein and fault structures.

Yours very truly,

MHC:S

M. H. GIDEL

cc - Mr. Reno H. Sales  
Mr. C. E. Weed

*2/19/39  
Sent sketch of  
1st Fl. - N. Face Piute  
Orebody on 700 level.  
M. H. G*

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*Walker*

Feb. 20, 1939.

Mr. S. K. Droubay,  
Walkermine,  
Plumas County, Calif.

Dear Mr. Droubay:

Mr. Virgil R. Chamberlain, who has been employed to fill the vacancy at the Walker Mine, resulting from the transfer of your assistant Edward Broadwater to a position in Chile, started to work in our Geological Department on Feb. 6th, and is leaving this evening, Feb. 20th, for the Walker Mine. He has received a check for \$84.85 (excluding \$0.86 Social Security) for 15 days work while in Butte, which will be charged to the Walker Mining Company. Therefore, he will have 8 days more pay due him through the 28th of February on your payroll. His salary rate is to be \$160.00 per month.

Railroad transportation, amounting to \$39.25 from Butte to Spring Garden, has been purchased here and will also be charged to the Walker Mining Company. Chamberlain may have a small additional expense for meals enroute, which he will submit through you.

Mr. Chamberlain was formerly a sampler at the Leonard Mine. During the past two weeks he has been given a review of our work; taking geological notes, posting, making cross-sections, summarizing sampling and stope data, all of which we feel will be of use to him in assisting in your work. Broadwater was given similar preliminary training in our Department.

You will find that Chamberlain is ambitious and desirous of doing his best on the job.

MHG:KM  
cc:Mr. Tom Lyon  
Mr. W. J. Wilcox

Yours very truly,

M. H. CIDEL

March 14, 1939

Mr. S. K. Droubay  
Walker Mining Company  
Walker Mine, California

Dear Red:

Mr. Lyon has requested me to acknowledge receipt of your last letters which were accompanied by the geological notes and progress maps for the Walker mine for the month of February. We have noted all your comments on the same.

The new mineralization exposed in 673 E. crosscut in the 517 ore zone looks interesting. I hope that you can raise on it to the 500 level and can follow it southwesterly in case the 517 ore shoot should rake in that direction. I note also that 471 C drift on this vein did not connect directly with the top of 559 B raise. Didn't the vein extend to the top of 559 raise or is there a split here?

The mineralization in the 828 drift south on the Piute ore zone seems to have become weaker and more scattered south of 828 A and 829 A crosscuts but I believe some additional drifting and crosscutting according to your previous recommendation should be done here before this exploration is stopped.

Regarding the northward exploration on the 900 level in the Piute ore body and your question to Mr. Lyon concerning the direction to be taken by the 904 B heading, we are quite sure that Mr. Gidel's idea is to continue the drift northerly along the main footwall slip. Such a drift will serve to prospect the footwall fault and at the same time determine if there are any other faults or slips branching off to the northeast in the footwall of the one already known. I note that the last geological notes on the 800 drift north show the footwall

**WALKER MINING COMPANY****WALKERMINE****PLUMAS COUNTY, CALIFORNIA****L. F. BAYER, MANAGER**

April 20, 1939

Mr. Tom Lyon, Chief Geologist  
International Smelting & Refining Co.  
818 Kearns Building  
Salt Lake City, Utah

Dear Tom:

Please find enclosed the geological sketches of development during the first half of April also recommendation #22 with regards to extending 903B DS of the Piute Orebody.

We have stopped 619ExcW because the mineralization is so weak, and because it has been extended far enough to allow for a raise that will enable us to mine the ore below 517 Stope. It may be better to explore the extension of this fissure zone on the 500 or 400 foot levels where the vein is much stronger. We will continue 471C along the vein beyond 559B raise.

The 904B DN was extended 36 feet and has passed from the grey, sheared fissile schist into a more crystalline formation. It will probably be wise to extend a crosscut to the footwall slip to be sure we do not get too far away from it. If we try to follow the slip, the drift is run crooked, and has to be timbered.

Mr. Bayer has informed me that he must receive an OK from the Mining Department in Salt Lake before any new development project is started.. I will submit copies of such recommendations to you- and to Mr. Dugan, including the estimated cost, and the approval or rejection could be sent in by letter making reference to the recommendation number. I will assume that any approved recommendation received by Mr. Bayer has had your OK.

Very truly yours,



S. K. Droubay

SW

S. K. Droubay

# WALKER MINING COMPANY

WALKERMINE

PLUMAS COUNTY, CALIFORNIA

L. F. BAYER, MANAGER

April 21, 1939

Mr. M. H. Gidel, Asst. Chief Geologist  
 Anaconda Copper Mining Company  
 Butte, Montana

Dear Sir:

Please find enclosed several geological sketches that may be of interest to you, a copy of recommendation #22 as submitted to Mr. Lyon and Mr. Dugan for approval and the last three monthly tabulations of our available ore reserves which should bring up to date the set I had been sending to Mr. Sales from time to time.

The composite sketch and section of the 517 footwall fissure zone of the 712 Orebody gives a picture of development to date. 619E has been stopped for the time being. Mineralization was so weak and scattered, that it seemed wiser to see what the extension of 471C beyond 559B raise would bring. Although we have ample information and mineralization to warrant a raise being driven, in preparation of mining ground under the 500 Level, we may have to extend 654ExcNW to determine whether the vein steepens or pinches below the 500 Level.

The 904B DN from the Piute Orebody is well under way. We are out of the grey, sheared fissle schist and into a more crystalline formation. It may be wise to extend a crosscut to the footwall slip to be sure we do not get too far away from it.

If 904B is continued on its present course for 800 feet it will be 500 feet in the hanging wall of the ground explored by surface diamond drill hole #10.

Recommendation #22 gives a general picture of how the ore along the Piute 800 Level pinches to the south. Although it is questionable whether strong mineralization will extend to the 900 Level, there will be a substantial tonnage of ore to be mined from below the 800.

Vergil Chamberlain is getting along very nicely.

(Copy to:  
 Messrs. Kelley  
 Weed  
 Sales  
 Lyon  
 Dugan  
 SW

Very truly yours,

*Seth K. Droubay*  
 S. K. Droubay

April 25, 1939

Mr. J. F. Dugan  
General Superintendent of Mines  
International Smelting and Refining Company  
O f f i c e s

Dear Sir:

Development recommendation No. 22 for the Walker mine, as submitted by Mr. Droubay, has been received and after consultation with Mr. Lyon has been approved by this department.

This recommendation calls for the extension of 903 B drift south in the Piute ore body for a distance of approximately 400 feet. Its purpose is to develop the south end of the Piute ore body under 886 drift south. Although the mineralization in the present face of 903 B drift south is low-grade, the ore extended in 886 drift for a distance of approximately 400 feet beyond this point. Thus there is certain to be some stoping ground in this area between the 800 and 900 levels and the ore may again come down to the 900 level ahead of the present face of 903 B drift. Thus the carrying out of this recommendation should add to the assured ore reserves and will open up another stoping area in the Piute ore body.

Very truly yours,

MEK:P

M. B. Kildale

ANACONDA COPPER MINING Co.

C O P Y

April 26, 1939.

Mr. Seth K. Droubay,  
Walkermine,  
Plumas County, Calif.

Dear Mr. Droubay:

I received your letter of April 21st with geological sketches showing recent advances made in 471-C drift and 904-B drift in the Walker Mine, also copy of recommendation No. 22, and three tabulations of available ore reserves in the mine on February 1st, March 1st and April 1st.

I note the following monthly decreases in ore reserves to be:

During January	22,599 Tons
" February	22,599 "
" March	5,994 "

which, on April 1st leaves a total reserve of 1,338,922 tons, averaging 1.27% copper.

I concur with your suggestion to drive 471-C drift southwesterly beyond 569-B Raise on the extension of 712 Ore zone, in preference to drifting on the weaker vein structure exposed in the southwest faces on the 500 and 600 levels. Last summer, Mr. Kildale and I traversed the surface above this mineralized zone and concluded that it would be desirable to drift some distance to the southwest towards a plug of diorite porphyry, which terminates a highly silicified, iron-stained, sheared zone that cuts across the schist. The porphyry plug is approximately 1600 feet, S. 50° W. from the face of 471-C drift.

I also note that Recommendation No. 22 proposes a plan for the normal development on the 900 level of the downward projection of the south

ANACONDA COPPER MINING CO.

Mr. Seth K. Grayson--2

C O P Y

April 26, 1939.

portion of the Piute orebody. This proposed work should make available a considerable tonnage of ore.

I find that our maps do not show the position of diamond drill hole No. 10, drilled from the surface and in the area north of the Piute orebody. Did this hole cut any mineralization? Judging from the north-west strike of the northernmost ore found in 904-B north drift, it may be advisable to soon turn a crosscut to the west from the north face of the drift to test the possibility of the vein structure extending in that direction.

I am glad to know that Virgil Chamberlain is rendering good work.

Yours very truly,

MHG:EM

cc: Messrs. Kelley

Weed

Sales (Inc. sketches and  
Lyon Apr. 1, ore reserve  
Dugan: Statement).

M. H. GIDEL

ANACONDA COPPER MINING COMPANY

25 BROADWAY

NEW YORK, May 2, 1939.

*Walker*

Office of the President

Mr. M. H. Gidel,  
Assistant Chief Geologist,  
Anaconda Copper Mining Company,  
Butte, Montana.

Dear Sir:

I have for acknowledgment a copy of your letter of the 26th ultimo, addressed to Mr. Seth K. Droubay of Walkermine, Plumas County, regarding the recent advances made in 471-C and 904-B drifts of the Walker Mine.

Yours very truly,  
*[Signature]*

K/S

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C O P Y

*Walker*

May 25, 1939

Mr. Seth K. Droubay  
Walker Mining Company  
Walkersville, California

Dear Red:

I have your letter of May 18 regarding the necessity of locating some additional claims to protect the area which we are prospecting north of the Piute ore body.

I believe sufficient claims should be located to make us absolutely safe on this work. Will you please see that this is done.

Very truly yours,

*Tom Lyon*  
Tom Lyon

TL:P

cc: Mr. M. H. Cidel

ANACONDA COPPER MINING CO.

C O P Y

May 23, 1939.

Mr. S. K. Droubay,  
Walker Mining Co.,  
Walkermine, Calif.

My dear Droubay:

In reply to your letter of May 19th, addressed to  
Mr. Gidel.

While I do not feel that we could find enough mineral showing in the basalt covering at the north end of the Walker, to sustain a mineral location, I think we should cover the ground with locations about as you indicated on your map. This should be done in order that we might have whatever possessory rights that might be flowing to such location. If we extend our 900 level, or any other level, northerly on the Piute Vein, we could claim discovery at such time as our drift or drifts reached a point beneath one of these surface locations on basalt.

Under the above plan, I think we would be able to hold the ground as against anyone else trying to locate it. Instead of covering the entire area indicated by blue line locations on your map, we might add smaller groups of locations, keeping the same within, say two or three claim lengths of our present boundaries, and it might not be necessary to cover so much ground in an east-west direction as you indicate.

Yours very truly,

RHS:KM

cc: Messrs. Elton  
Lyon ✓  
Bayer

RENO H. SALES

*Walker*

July 1st, 1939.

Mr. J. O. Elton,  
220 Kearns Bldg.,  
Salt Lake City, Utah.

Dear Jim:

I spent Monday, June 26th, at the Walker Mine. Since returning I have read Tom Lyon's letter of June 23rd, in which he recommends a certain drilling program for the Walker Mine. I have also gone over the matter very fully with Mr. Droubay, the mine geologist.

There is but little doubt that the Walker Mine has reached a critical stage. The mine is operating and there is being added to the ore reserve nothing substantial in the way of tonnage. If the mine is to continue operations very far into the future, important ore discoveries or developments must be made.

Viewing the Walker as a general picture, there are two angles to any development program. There are certain ore possibilities which might be developed under the so-called short range development recommendations, and there are the longer range possibilities of orebody extensions and new ore discoveries. The short range program can do nothing more than prolong the present situation for a limited time. I believe the prospecting for important ore extensions or ore discoveries is the vital matter needing our serious consideration.

The Walker Mine is essentially a low grade ore operation. The margin of profit even in good times has been relatively small, considering the tonnage handled. In the past it has enjoyed the advantage of a large proportion of the ore coming from above the tunnel level. It has enjoyed the very low cost ore produced from that portion of the wide Piute orebody lying above the tunnel.

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Mr. J. C. Elton---2

July 1, 1939.

Looking to the future, the mine is facing higher ton cost ore from below the tunnel level, because of sinking, pumping, ventilation, etc. There is also the possibility of stoping costs being increased in depth, due to the presence of a strike fault along the vein. On the basis of present metal prices, say with copper at 12¢ or under, we must hope therefore, that the Walker ore extensions in depth will not only be maintained in size, but that there will be an increase in metal content. Otherwise a profitable operation may not be possible.

The behavior of the vein in depth below the 700 level adit tunnel has been far from satisfactory. The extreme south end crossoots have been on a par, or alightly better perhaps than above the adit level. The Central orebody which averaged around 4% copper above the 6th level, dropped to low grade at the 700, 800 and 900, and is too poor to mine at the 1000. The north orebody, 1200 feet long at the 700, is only half that long at the 1000, but the grade at the 1000 is better. The 712 crossoot has not been tested below the adit level. The Pluto crossoot, over 1200 feet long at the adit level, is too poor to mine on the 900 and 1000 levels.

In the light of the above facts, the question naturally arises, what are the prospects, if any, that the Walker Mine can be rehabilitated? In my opinion, the prospects are poor but not entirely hopeless. There are several pieces of mine development work which should be carried out as rapidly as possible and, in addition, a number of drill holes are advisable. These recommendations are listed below:

#### Mine Work.

1. Continue 1017 drift north, followed by sufficient crosscutting to test the downward extension of 712 orebody. This might require 500 to 800 feet

Mr. J. O. Sitem--S

July 1, 1959.

of drift and several hundred feet of crosscut depending upon results.

2. Extend the 1200 northerly from 706 A Shaft to develop the north orebody. Probably 1000 feet of work. A few hundred feet of drifting to the south from 706 S Shaft may also be advisable.

3. Extend the 900 Plute drift northerly for 1000 feet with sufficient crosscutting or diamond drilling to prove the vein.

The above three projects will probably either make or break the Walker Mine in my opinion. In spite of the unfavorable behavior of the Walker vein in depth, the expenses of the above projects are justified, partly because of the excellent mine and milling plant facilities on the property, and because of the fact that the Walker vein zone is a very strong one, having been developed on strike for 7500 feet, of which, a length 4200 feet was minable at the elevation of the tunnel level. The chief copper mineral is chalcopyrite, and in one ore-shoot at least, the south orebody, the best grade of ore is at the bottom (10th) level.

In addition to the mine development work above suggested, I recommend the following diamond drill projects:

1. A hole run easterly 500' either from the 900 or 1000 level to cut the mineralization disclosed in old D.D.Hole #8 run from 6th Sub-level.

2. A hole run easterly into hangingwall country in the general vicinity of N-S coordinate 17500. The purpose of this hole is to test the possibility of a south continuation of the Plute zone to the east of the 712 and North orebodies. Old Drill Hole #15 indicates such an extension. As to elevation it can be run from the face of crosscut 1036-S or 1043-B, or from the 7th level, or 6th Sub-level. Favorable results should be followed by additional holes

Mr. J. O. Elton---4

July 1, 1939.

fanned from the same set-up or in next crosscut to south.

3. Drill westerly from the face of 1000 level crosscut just north of Raise 1026. Distance 500-600 feet. To test footwall vein zone in 713 A drift.

4. Drill northwesterly on 1000 level, probable location 1055 B crosscut, to test downward continuation of 517 vein zone .

5. Drill angle hole from surface 500 feet ahead of present 900 Piute north drift. To test extension of Piute vein zone. Any favorable results to be followed by a second hole.

In addition to the diamond drill projects above specified, there are a few shorter prospect holes in different parts of the mine which can be drilled when convenient, but they are relatively unimportant. Some of the short hole projects recommended by Droubay should be replaced by crosscuts.

Yours very truly,

RHS:KM

cc: Messrs. Kelley  
Weed  
Lynn  
Dugan

RENO H. SALES

**WALKER MINING COMPANY****WALKERMINE****PLUMAS COUNTY, CALIFORNIA****L. F. BAYER, MANAGER**

July 12, 1939

Mr. Tom Lyon, Chief Geologist  
International Smelting & Refining Co.  
818 Kearns Building  
Salt Lake City, Utah

Dear Tom:

Please find enclosed available ore tabulation for the months of May and June, also some cost data that may be of interest to you.

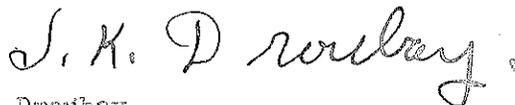
There was a slip up and your May reserve sheet was not sent in. The cost data was compiled to give the operating department a picture of how much margin they had in mining each of the ore blocks.

Unless a person is familiar with the stopes, and the stages of their development, these figures may be misleading in certain places, especially where a stope is first being put into operation. However, it may be used as a general guide.

Mr. Sales spent a day going over the geological maps with me. I suppose he wanted to refresh his memory in regards to the future possibilities of Walker Mine for the purpose of considering the extension of its credit to see it through a development program.

The gold property at Downieville is not ready for inspection as yet. I am going to look at a large gravel deposit next week. It belongs in part to a fellow who works here at the mine, and he and his family want to sell it. Lindgren examined the property in 1916 and wrote a very favorable report on it. If it looks too big for the several fellows that are going to make the trip to handle, it may be worth while for the International to look over.

Very truly yours,



S. K. Droubay

SW

Encl.

**WALKER MINING COMPANY****WALKERMINE****PLUMAS COUNTY, CALIFORNIA**

L. F. BAYER, MANAGER

July 12, 1939

Mr. Reno H. Sales  
 Chief Geologist  
 Anaconda Copper Mining Co.  
 Butte, Montana

Dear Sir:

The enclosed tabulations of available ore reserves for the months of April, May and June should bring up to date the set that has been sent in to your office from time to time.

The sheet listing the operating margin of the respective ore blocks (as shown on the available ore reserve sheet) was compiled from the accompanying curve made up from mill recovery during the month of May. The cost to date figure in each case is taken from the cost clerk's monthly report, and is weighted in case two or more stopes come under one block. We spoke of these during your recent trip to Walker Mine, and these are the later figures I was to send you.

As the month to month assay of production from any one block may vary considerably, these figures should check out only after the entire block is mined. Also, as the cost of preparing stopes is high, it may be expected that the cost to date will decrease and be at a minimum when the stope is finished.

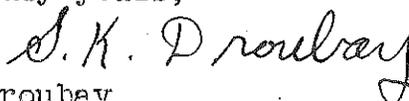
I might add that the upper levels of the Piute Orebody yielded ore that was delivered to the mill for a few cents over one dollar per ton, while the rest of the mine production during the same period cost a little over two dollars per ton. ✓

Stope Costs - January 1937 to September 1937, Incl.

Piute	198,648 tons delivered @ \$1.041 per ton
Rest of Mine	144,925 tons delivered @ \$2.207 per ton

I show these figures to indicate the desirability of locating additional ore of the Piute type. These figures do not check exactly with the accounting department's figures because development ore is not included, however, they are close enough for practical purposes.

Very truly yours,



S. K. Droubay

cc-Mr. Lyon  
 cc-Mr. Dugan

*Handwritten initials*

C O P Y

August 2, 1939

Mr. Seth K. Droubay  
Walker Mining Company  
Walkermine, California

Dear Red:

On July 1 Mr. Sales recommended a diamond drilling program for the Walker mine. In addition to the underground holes, Mr. Sales recommended that a hole be drilled from the surface 500 feet ahead of the present 900 Piute drift north for the purpose of testing the main shear zone at that location. This hole will have to be drilled at an angle so as to cover all possibilities of the shear zone to the north. Will you please prepare a plan map and sections showing all possible drill locations to prospect this area. Please send this information to Mr. Sales, Mr. Weed, Mr. Dugan and me.

From the information we have in this office it looks as though it will be necessary to drill at least 900 feet. If that is the case it will probably take from 45 to 60 days to complete this hole. Consequently, we will have to get started immediately if the hole is completed before bad weather.

Please have the information in the hands of Mr. Weed and Mr. Sales as soon as possible so that the location of the hole can be decided upon.

Very truly yours,

*Handwritten signature of Tom Lyon*  
Tom Lyon

TL:P

cc: Messrs: Weed  
Sales  
Dugan

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*Walker*

Aug. 11, 1939.

Mr. Tom Lyon,  
620 Kearns Bldg.,  
Salt Lake City, Utah.

Dear Tom:

I am in receipt of Droubay's letter of August 7th and his map showing the location of a proposed drill hole on the Piute surface, north of the Piute shaft.

I have discussed the matter with Mr. Weed and we are of the opinion that such a prospect hole should cut the vein at, at least, 50 feet below the elevation of the 900 level. In this particular instance, the question of the strike northerly from the present 900 is an extremely important one, or if there should be an intervening faulting, drilling results may prove to be difficult to interpret correctly. I am inclined to think that the tendency is for the vein to maintain its general north 15° west course, in which event the proposed drill hole will cut the vein at or below the 900 level. Because of the length of hole necessary, I do not believe we should try to cut the vein at a much deeper elevation.

If the vein should strike more northeasterly, there is the chance that the proposed hole would miss it entirely, or strike within the oxidized zone. I guess we will have to take our chances on this first location, and I suggest that arrangements be made to go ahead with it at the earliest possible date.

Yours very truly,

RHS:KM  
cc: Messrs. Elton  
Weed  
Bayer

RENO H. SALES

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29 AUG 1917 8 25

KHA 118 112 NL=WALKERMINE CALIF 16

C E WEED, GEN MGR=

MINES ANACONDA COPPER MINING CO BUTTE MONT=

MIDDLE OF OCTOBER IS EARLIEST DATE OF COMPLETION FOR ELEVEN HUNDRED FOOT DIAMOND DRILL HOLE DRILLED FROM SURFACE NORTH OF PIUTE STOP BY THIS TIME NINE NAUGHT FOUR DRIFT WILL BE ADVANCED FOUR HUNDRED FEET OR OVER EIGHTY FEET SOUTH OF ORIGINAL LOCATION ON MAP SENT YOU STOP DROUBAY SUGGEST AND WE AGREE THAT PROPOSED HOLE SHOULD BE DRILLED ON TONTOUR SIXTY SIX FIFTY AT COORDINATE TWENTY ONE TWO HUNDRED NORTH TO PROSPECT FIVE HUNDRED FEET NORTH POSITION BREAST OF NINE NAUGHT FOUR DRIFT AT MIDDLE OF OCTOBER STOP PLEASE ADVISE IF PROPOSED NEW LOCATION MEETS WITH YOUR APPROVAL OR SHALL WE DRILL HOLE IN ORIGINAL POSITION AS SHOWN ON DROUBAYS MAP=

JOHN F DUGAN

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