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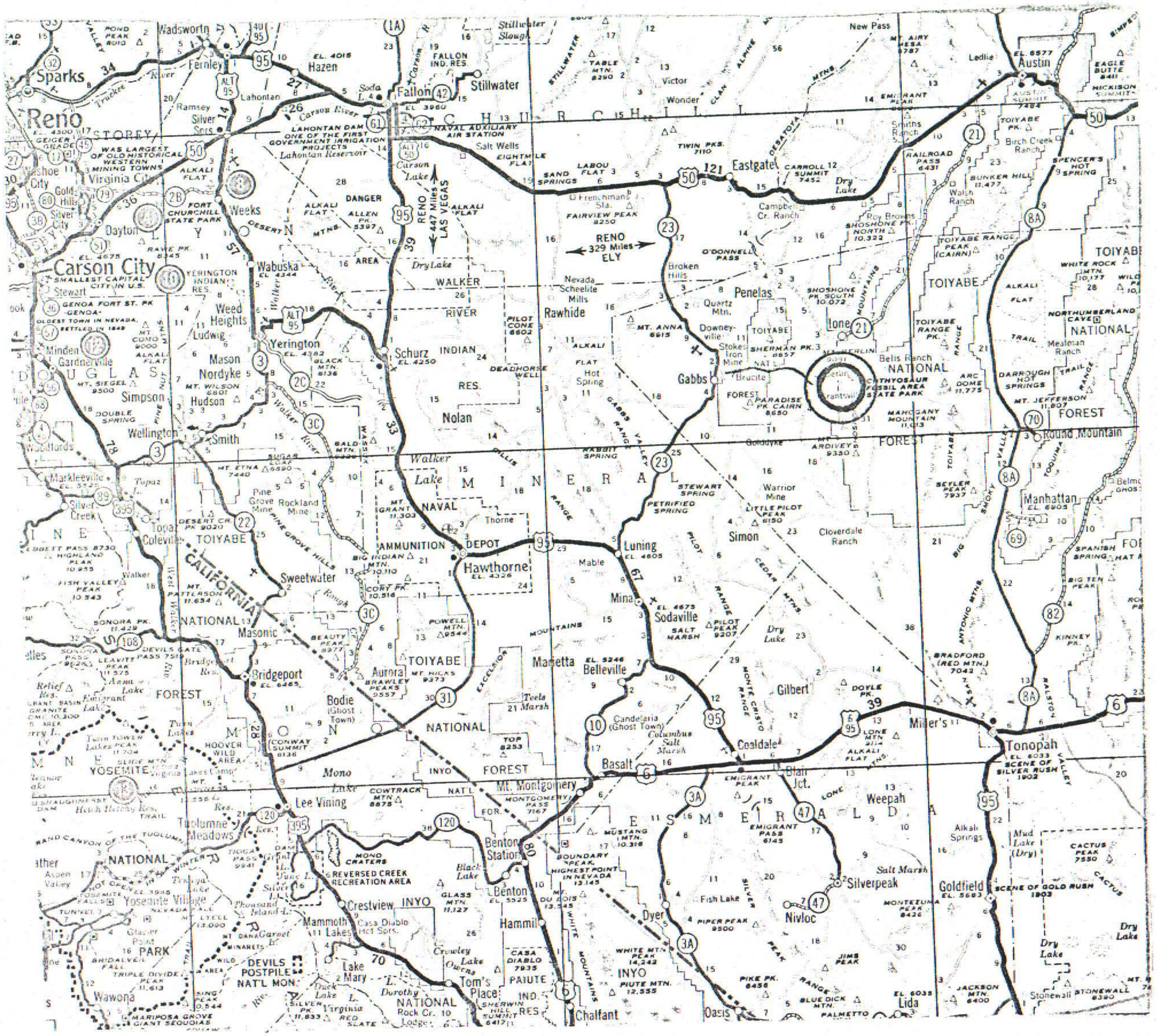

MAP'I LOCATION AND ACCESSIBILITY.

(TONOPAH 1:250 000)

SCALE 1:62500

1 2 3 4 MILES

000 6000 9000 12000 15000 18000 21000 FEET

1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1958
MR-0170

ROAD CLASSIFICATION

HARD-SURFACE ALL WEATHER ROADS		DRY WEATHER ROADS
Heavy-duty	4 LANE 16 LANE	Improved dirt
Medium-duty	4 LANE 16 LANE	Unimproved dirt

Loose-surface, graded, or narrow hard-surface

U. S. Route State Route

IONE, NEVADA

N3845—W11730/15

3. PHYSICAL DESCRIPTION - Cont'd

lost, misplaced or lacking on the past production and history of the area. The McMahon and Irvine operations of the shafts on the Centennial claim and exploration work to the south and across Milton Canyon, covered a period of approximately 4 years in the 1880's and the ore was hauled to Grantsville mills for treatment. The value of the ore was silver oxides and a little gold. Total production amounted to $350,000 to $500,000, according to the narrations of the individuals with whom I talked, but not one knew of the patented claims of the McMahon and Irvine operations or knew of any mineral outcrops where the located claims SW of the Centennial, which raises some doubts about the hearsay evidence on this area."

(d) ORE RESERVES.

The present examination does not provide sufficient evidence to set up ore reserve figures.

In September 1957, Mr. E. E. Check, a mining engineer, is reported to have calculated approximately 7,000 tons of copper silver ore was in sight on the Pat, Jack and Ray claims, being approximately 6,000 tons of cupriferrous pyrite and approximately 1,000 tons of oxidized copper ores. Average assay being 17% copper and 20 oz. of silver. (See attached assay reports) Ore reserves on other claims and any increase of the above mentioned claims has not been determined as of April 1962.

The area of the Pat, Jack, and Ray claims was sampled by Mr. Check, in July 1957, at the following locations: (See Map #3 taken from a map by Mr. Simons) The Pat samples were taken across the outcrop nearest the location stake, near the top of the cut

3. PHYSICAL DESCRIPTION
(d) ORE RESERVES - Cont'd

and were taken across the outcrop a few feet along it, in the oxidized portion of the copper outcrop. The oxidized copper ore samples were taken across the vein on the Jack claim, and across the vein and approximately 7' below the surface. The oxidized ore samples of the Ray claim were obtained about 4' from the adit entry and about 15' from the surface along and across the vein face. These samples were cut by Mr. Check, and a composite sample was made up from one set of the samples from the Pat, Jack and Ray claims and sent to the American Smelting and Refining Co., in San Francisco. The other set was sent to C. M. Ball.

In September 1957, Mr. Check sampled the Jack claim at the bottom of the cut, taking a sample along the vein and across it and from the Ray claim and made it into a composite sample which was sent to Kennecott at McGill, Nevada. The sample was largely of a cupriferous pyrite ore."

In 1957 Mr. Gant and Mr. Simons sampled the Pat claim at a point approximately 100 feet from the location monument on the outcrop and near a junction with another outcrop. The sample was taken across the outcrop and for a distance of approximately 2 feet. The sample contained about 50% oxidized copper and about 50% cupriferous pyrite ore.

(e) GEOLOGIC FEATURES. (Map No. 2)

The general geology of the Union Mining district, of which the Centennial mine is a part, has been described by H. G. Ferguson and S. W. Muller in U.S.G.S. Professional Paper No. 216 on pages 40-44 and on P. 1, 12, and 13. A more detailed map of

3. PHYSICAL DESCRIPTION

(e) GEOLOGIC FEATURES. (Map No. 2) - Cont'd

the area and description of the area is covered in U.S.G.S. Professional Paper No. 322, 1959 "Pre-Tertiary Stratigraphy and Upper Triassic Paleontology of the Union Mining District, Shoshone Mountains, Nevada." by N. J. Silberling. The map of the district on a scale of 1:24,000 has been enlarged to 1:2,400 so that more details of structure and geology can be spotted, for this report. There is some difference in the mapping of the "aplite" in the Grantsville Canyon area, but in other parts the mapping is more or less identical, although there is some difference in the interpretation of the structures. Neither reports give much detail on ore deposition but an interpretation has been made by the writer.

Silberling's interpretation of the regional geology are summarized as follows: A nearly complete sequence of stratigraphic units ranging from late Paleozoic to middle Jurassic are exposed in an elongate belt about 12 miles long extending south from Ione, on the west flank of the Shoshone Mountains.

The basal Permian formation, the Pablo, is predominantly volcanic, consisting of three members, the lowest, a coarse to fine grained sedimentary interstratified with andesitic volcanics, gradationally overlain by a relatively thin limestone member, which is in turn overlain by a thick greenstone member, composed of altered andesite flows and volcanic breccia. The approximately 700 foot thick middle Triassic Grantsville formation overlies the Pablo with little, if any, angular unconformity. The Grantsville

3. PHYSICAL DESCRIPTION

(e) GEOLOGIC FEATURES. (Map No. 2) - Cont'd

is composed of a lower clastic member, of siliceous conglomerate grading upward to sandstone and argillite, and an upper limestone member.

The late Triassic, Lunning formation consisting of four members rests with erosional disconformity upon the Grantsville formation. In ascending order the lower clastic member consist of siliceous conglomeratic sandstone, and argillite with a thickness of about 600'; a shaly limestone, about 600' thick is followed by a calcareous shale member about 500' thick followed by the carbonate member of massive dolomite and limestone with an exposed thickness of at least 2,000'. The Centennial claim lies almost entirely in the upper carbonate member, except along the contact with the Tertiary lavas.

The undifferentiate lower Jurassic Sunrise and Gabbs formations have a thickness of approximately 2,700' and are composed largely of argillaceous silty limestone and calcareous siltstone. These formations are found to the west of Grantsville Ridge, under the Shoshone overthrust. Several hundred feet of the middle Jurassic Dunlap formation consisting mainly calcareous, possibly non-marine sandstones including two relatively thin dolomitic carbonate units near the top of the exposed section.

The generally eastward dipping pre=tertiary rocks in the northern two-thirds of the area are considered part of the upright limb of a large scale overturned anticline, the axis of which strikes and plunges southeast. The complexly folded and thrust faulted Mesizoic rocks in and south of Grantsville Canyon repre-

3. PHYSICAL DESCRIPTION

(e) GEOLOGIC FEATURES. (Map No. 2) - Cont'd

sent the axial region and overturned limb of this fold. Subsequent to folding and thrust faulting, an intricate pattern of normal faulting developed. Most of the normal faulting developed. Most of the normal faulting preceeded the deposition of Tertiary volcanic rocks, but some of the faults displace both PreTertiary and Cenozoic rocks. Ferguson and Muller show (Pl. 13 and pp. 41 USGS pp. 216) and describe areas of "aplite" and quartz monzonite in Grantsville Canyon whereas Silberling maps this area as mostly Pablo, Grantsville and Luning sedimentaries although he makes the following statement (pg. 322) "Altered volcanics and sedimentary rocks of the Pablo, Grantsville, and Luning formations be recognized within the area mapped as "aplite" in Grantsville Canyon by Ferguson and Muller. Although no intrusive rocks were observed on the surface, the granitic rocks responsible for the contact metamorphism at Grantsville are said to occur in the underground mine workings." The above statement is considered of utmost importance as an explanation of the mineralization of the Grantsville area.

The "dark siliceous reefs" mentioned by Silberling (pg. 18) were carefully mapped during the course of this examination as the writer believes them to be genetically connected with the "aplite" intrusives because of the presence of the fluorite in the fissure systems in the vicinity of the Chicago claims. Further south and east the presence of the antimony east of the "dikes" suggest a connection with the strong mercury mineralization to the north which is connected with the Tertiary vulcanism.

3. PHYSICAL DESCRIPTION

(e) GEOLOGIC FEATURES. (Map No. 2) - Cont'd

The north south trend of the silicified "dikes" shows much similarity to the silicified outcrops along the mercury Mine fault, northeast of Ione.

Large masses of rhyolitic material lie in fault (?) contact with Pre-Tertiary south of Grantsville and towards the Milton Ranch. The exact relationship cannot be determined in the area, although the fault contact condition is evident to the north, where normal faulting is evident along the Mercury Mine fault. The topography of the contact zone strongly suggests faulting.

According to Silberling "the structural features of the Pre-Tertiary rocks exposed, in the Union District, are the results of normal faulting of the Basin Range system superimposed on large scale folds that are broken by thrust faults developed during folding," (pg. 32-35).

The Grantsville Canyon area can be interpreted as the axial region of an asymetric anticline, the axis of which lunges southeast. Thrusting has affected the altered greenstones of the Pablo formation, on the north wall of Grantsville Canyon. During folding, the Triassic rocks in the steep southwestern limb of the anticlime were sheered between the Pablo and the overlying carbonate, uppermost, member of the Luning formation. Note that the upper member of the Pablo and the three lower members of the Luning have been cut out on the thrust. "Both of these units are relatively thick, homogeneous and competent. Dislocation may have taken place along some of the faults of the

3. PHYSICAL DESCRIPTION

(e) GEOLOGIC FEATURES. (Map No. 2) - Cont'd

Grantsville system during the Tertiary block faulting of the region, but these structural features were originally formed before the igneous intrusion and contact metamorphism at Grantsville."

The associated faults referred to are a series parallel to the N. 55°-60° W series in Grantsville Canyon and to the south where the Shoshone Fault has the same strike. Another set of N. 58° W faults cuts and offsets the "reefs", and has apparently caused considerable brecciation at the intersection with the N. 58° W set in Grantsville Canyon, which was the site of the mineralization of the mines in that area. Certain structural similarities may be noted, where the dikes are crossed and offset by the N. 28° E. faulting, and therefore considered very favorable sites for exploration. Mineralization on the N. 58° W. set is demonstrated on the Chicago claim by the concretionary fluorspar found and worked in that area.

The structural control of the deposition of the entire Union District in both pre-Tertiary and Tertiary deposits is well demonstrated.

The mineral deposits on the Centennial property are genetically connected to the "aplite" intrusions along pre-mineralization structural zones and as replacements in the bedding planes and shear zones parallel to the anticlinal axis.

The exploration and development on the Centennial group was all done on the upper or western side of the "dikes". Little has been done on the structurally more favorable areas where

3. PHYSICAL DESCRIPTION

(e) GEOLOGIC FEATURES. (Map No. 2) - Cont'd

the "dikes" are cut by the cross faults and highly breeciated, similar to those explored and mined in Grantsville Canyon. The ores so faulted are mainly masked by wash material in the draws, which are apparently the surface expressions of the faults.

(f) REASONS FOR EXPECTING TO FIND ORE.

The structural and igneous intrusive features of the area are similar to those existing in the nearby productive Grantsville area.

Assays of various area in the claim group are attached, (See Map #3) some from outcrops and others from drilled and blasted outcrops, and others from drill hole cores, fractured cores, and sludge samples. Most of these assays show very encouraging values averaging 0.02 oz. of gold, 14.8 oz. of silver, 12.82% copper and considerable antimony, some lead and without enough zinc to make high treatment charges.

The area which we propose to explore, particularly the line from Milton Canyon through the Mike shaft towards the Centennial shaft are shown on Map #2. These include surface as well as samples from underground workings and drill holes. It must be understood that some of these samples were taken prior to an understanding of the structural conditions believed to control ore deposition.

(g) Not applicable.

4. ACCESSIBILITY OF PROPERTY.

(a) Access to the mine area is shown on Map No. 1 and 1A. Access via U.S. 50 is from the turnoff at Middlegate, 59 miles east of Fallon, thence southerly on Nevada State Highway 23 to Gabbs, load with gas, thence back two miles north of Gabbs on gravel road (Nevada 91) going east towards Ione past the Baxter Mill and Stokes Iron Mine, across the Paradise Range and Ione Valley. The road is plainly marked from the intersection with the north-south Ione Valley Road to Gransville. From Gabbs to Grantsville is 20 miles.

An alternate route is via 50 to Austin, thence south 41 miles on Nevada 21 to Ione, thence 11 miles south to Grantsville.

From Tonopah to Grantsville, the shortest route is via the Cloverdale Ranch, some 60 miles of gravel road, which may not be passable during heavy snowfall.

No service or supplies are available in the area and information should be obtained regarding road conditions before leaving the main highways.

Mr. R. F. Simons, 555 Jones Street, San Francisco, California, or William L. De Carbonel, P. O. Box 529, Tonopah, Nevada, will meet the O. M. E. representative who may wish to visit the property. It is suggested that previous arrangements be made to see that the parties are available.

Telephone service is NOT available at Ione, 11 miles from Grantsville.

Small planes may land on the road between Ione and Grantsville.

4. SHIPPING AND SUPPLY POINTS.

(b) The nearest supply point is at Gabbs, 23 miles distant. Fallon on U. S. 50 is some 100 miles by dirt road. Considerable more and better facilities, service and prices may be obtained in Fallon.

Ore shipments would be to one of the following smelters: McGill, Nevada (222 miles) or Tooele, Utah (410 miles). The latter would probably give the better economic return. Ore shipment rates to Tooele would be in the neighborhood of $25.00 per ton.

Road conditions may be poor during the winter and early spring due to heavy snowfalls or cloudbursts.

The older workings are all in bad condition for access due to timber rot. The upper adits on the Pat and Tom claims are accessible but off the main structures.

The closest railhead is at Luning, Nevada, is approximately 60 miles distant on the Southern Pacific Railroad. Loading ramps are available.

5. EXPLORATION WORK.

(a) The following exploration work is proposed:

1. Clean out Centennial (Map #2) shaft working and make it sufficiently safe for a proper sampling program. According to Mr. Simons, who went into these workings some years ago, sulphide ores showed, which ores were not amenable to treatment in the mills of the '80's. Necessary shaft repair could be accomplished by replacing some sets with spags and some lagging, and ladder installation. The drifts from this shaft are

5. EXPLORATION WORK - Cont'd

standing fairly well so that little additional timbering or cleanout would be necessary for the sampling program. A tripod headframe could be used for this work. High assays secured from this area must be checked.

Should geologic conditions shown by careful sampling and mapping of these areas warrant further exploration, the decision will have to be made as to the economics of further sinking versus diamond drilling with AX equipment from the surface. The present shaft is 80' deep, with three levels. All the workings showed that only oxidized silver ores were mined leaving the complex copper silver mineralization alone. All workings are on the upper side of the dikes except for the Centennial adit from the lower side which stopped on encountering the "dike". The "dike" on the lower side shows antimony mineralization which runs up to 12% Sb as shown by assay. The extreme hardness and complex nature of the ores encountered probably shut down the operations as they did in the main Grantsville area. This condition makes a careful resampling necessary.

It is felt that although diamond drilling would be faster, the advantages of resampling over a larger area would be a better approach to the problem. The area to the south of the shaft, more particularly, must be prospected as in this area the "dike" is crossed by strong faulting and offset giving better structural conditions for ore deposition.

5. EXPLORATION WORK - Cont'd

Exploration of the area to the north of the Mike location (Map #2) is proposed due to the extremely favorable structural conditions existing in this area. Crossfaulting of the "dike" and silicification as well as antimony-lead-silver mineralization is shown in the shaft and from the brecciated area. Proposed exploration in this area would consist of a crosscut, after dozing of an adit area, as low as possible in the canyon and then drifting in the recemented brecciated areas.

Two possible adit sites are available; one in Milton Canyon to the south of the location, giving backs of approximately 100' across the faulted zone making the nose of Grantsville ridge where mineralization can be seen; or just below the brecciated zone where some 50' of backs would be available. The first adit proposal would be entirely on or against the "dike" and across two cross faults a total distance of 1,100', all in possibly productive ground, against some 200' of dead work crosscut and 600' of drift in the geologically favorable brecciated zone. The first proposal is considered most economic as giving a better look at the zone.

The recent paper by Williston and Hawkes on mercury halos also present possibilities for exploration of the Tertiary contact zone. Arrangements have been made for free evaluation of samples by the Nevada State Bureau of Mines. It is believed that this zone is responsible

5. EXPLORATION WORK - Cont'd

for the antimony mineralization on the east side of the "dike". The claims to the west have not been scheduled for exploration under the present program due to the lack od auitable markets for lead, zinc, or copper. The silver mineralization in these claims must however be noted along with the base minerals as an indication of the dissemination and possible bedding deposits possible in these heavy dolomite beds.

(b) ACCESS ROAD CONSTRUCTION.

An access road would have to be built from Station 136 to the adit location. Inasmuch as dozing would be done in this area for adit location it would be included as preparatory work for the adit. This work proposal is shown on Map #2.

(c) TIMES AND DATES OF WORK.

If an OME contract is executed, work could start immediately thereafter subject to weather conditions. Inasmuch as the original work also includes dozing, snow would not prove much of an obstacle. All necessary supplies could be hauled in and stored in existing building and the working force properly housed.

The work proposed would require approximately six months with an average of four feet per day on drifting with contract crew, shaft, drift cleaning and sampling to be carried on concurrently. The extent of future work, after the sampling, is, of course, dependent on results of this sampling and should be subject to a possible revision of the exploration contract.

6. EXPERIENCE.

Mr. R. Simons, who will supervise the work, has had four years at Indiana and Purdue where he majored in industrial and structural engineering with special courses in metallurgy and cost accounting. He was on industrial and field engineering by the U. S. Steel Corp., of Carnegie, Illinois Division; by United Engineers as Production Superintendent in steel fabricating, machine shop, and industrial. His mining experience includes prospecting and exploration in Nevada, New Mexico, Colorado and Arizona on a remunerative basis. He has had experience in road construction, heavy equipment maintenance and repair, and considerable experience in the installation and care of electronic equipment.

Mr. W. de Carbonel's background and experience in mining extends from his graduation from the University of California, College of Mining in 1929. Since then he has been engaged in mining and geology in various parts of the world. He has worked for the U.S. Bureau of Mines and for a short time with the DMEA in Joplin, Missouri. He has a G.S. 11 rating as a Mining Engineer and as a Geologist and has practiced his profession in Nevada for the past five years.

7. ESTIMATE OF COSTS:

$51,274.99 = total estimated cost of Exploration by Account + Bulldozer Operations Contract. These costs are derived from bids by various contractors, and local sources of information. Costs have been calculated on the basis of Company Operations as well as by a Contractor. Summary and Comparison Costs on Page 47 and 48.

7. (a) INDEPENDENT CONTRACTS:

(a) (I) Bulldozer Operations, trenching & Preliminary Road building to drift site & Shaft clean-out ---

Bulldozer Rental with operator & supplies except Explosives, $16.00 per hour - 10 days, 80 hours - includes travel time of Contractor. $1,280.00

Portable Compressor & drilling Equipment for necessary drilling on Roads & Approaches, $8.00 per hour - 16 hrs. total Does not include explosives --- 128.00

Explosives + Fuse + Caps --- 140.00

Supervision & Engineering --- 150.00

Contract Bulldozer Operator Totals: $1,698.00

(a) (II) Drift Operations & Crosscuts Contract for 1000':

Bid costs include all labor, insurance, equipment, supplies & some supervision, at least of their own labor,

7. ESTIMATE OF COSTS - Cont'd

but does not include Timbering ---

Timber bid = $11.00 per ft.

Estimated Timbering needed in

drift: 100' @ $11.00 = $1,100.00

Drifting & Cross-cuts Bid:

(a) INDEPENDENT CONTRACTS;

(a) (II) - Cont'd

$31.00 per ft. for first 300' = $9,300.00

$36.00 per ft. for next 700' = $25,200.00

Drift & Crosscuts Cost Total: $34,500.00

1000' of Drift & Crosscuts without

Timbering = $34,500 ÷ 1000' = $34.50 per ft.

With Timbering - 100' Est. @ $11.00 per ft.

$34,500 + $1,100 = $35,600 ÷ 1000'= $35.60 per ft.

(a) (III) Shaft Cleanout & Sampling:

Contractor bid on basis of

$25.00 per day per man for labor + taxes

& Insurance, + Supplies & Equip. at cost + 10% --

2 Men (Miners) @ $25.00 per day for 10 days	$ 500.00
Insurance & FICA - 12% of Wages	60.00
Supplies & Equip. (includes Timber)	350.00
Cost:	$ 910.00
10% Cost Plus:	91.00
Contract Total:	$ 1,001.00
Total Drift, Timbering & Shaft Cleanout Contract:	$36,601.00

(Does not include Company Overhead Costs -
Item 7 (b) through 7 (g)

Total Bulldozer Operations Contract:	$ 1,698.00
Total Contract Costs:	$38,299.00

7. ESTIMATE OF COSTS - Cont'd

7. (b) PERSONAL SERVICES:

(b) (I) Overhead Acc't - 12.5 Mo. Operation

1 - Supervisor @ $400.00 per Mo. + Expenses $150.00 per Mo. $550.00 x 12.5 Mo. = $ 6,875.00

Rental on 3/4 ton Pick-up Truck & Fuel - for use of Supervisor on job & hauling of Supplies, etc.- Average Milage per Mo.- 1700 Miles - $238.00 per Mo. x 12.5 Mo. $ 2,856.00

Cost per Mile = .14

1 - Consulting Mining Engineer & Geologist - Fees $400.00 per Mo. includes expenses - $400.00 x 12.5 Mo. = $ 5,000.00

Indirect Labor Expense: $14,731.00

(b) (II) Direct Labor;

Drifting, Crosscuts total 1,000', 4 ft. advance per day, 250 working days, 5 day week, 12.5 months.

Wages - Miners - $25.00 per day - $3.125 per hr.

2 Men (Miners) @ $25.00 per day for 250 days = $12,500.00

$12,500 ÷ 1000' = $12.50 per ft.

(b) (III) Shaft Clean-out & Sampling;

2 Men - (Miners) @ $25.00 per day - 8 hrs. per day

7 day Est. time to do the job = $50.00 x 7 days = $ 350.00

Labor costs are based on local sources & these Services are available, although, the wage scales set by the A.E.C. in this area has made labor costs & labor somewhat difficult and higher than normal.

7. ESTIMATE OF COSTS - Cont'd

(c) Operating Materials & Supplies; under $50.00 unit cost. For 1000 ft. of Drift & Cross-cut Work;

(c) (I)		Per ft.	Total
Explosives + Caps = Fuse		$ 4.00	$ 4,000.00
Fuel, lube oil, Drill oil & Anti-Freeze for Compressor, Water Pump, Elec. Welder, Drill & Mucking Machine	-	4.10	4,100.00
Drill Steel & bits	-	.50	500.00
Spare Parts for Equipment	-	.30	300.00
Carbide	-	.18	180.00
Rail 20#	-	.80	800.00
Spikes for Rail	-	.03	30.00
Ties	-	.125	125.00
2" Air lines & fittings - 1000'	-	.30	300.00
1" Water line & fittings - 1000'	-	.25	250.00
Timbers - Miscellaneous	-	.10	100.00
Small Tools	-	.40	400.00
Timber for Drift	-	1.10	1,100.00
		$12.185	Total: $12,185.00

Water furnished from Well of Applicant and hauled to site with Pick-up Truck. Sufficient Supplies & Spare Parts should be kept on hand for at least 2 weeks operation, due to distance from Supply points & due to possible Road Washouts & severe winter conditions at times.

(c) (II) Supplies & Timber for Shaft Clean-out - $ 250.00

Total Operation & Supplies: $12, 435.00

7. ESTIMATE OF COSTS - Cont'd

(d) Operating Equipment:

Much of the Equipment Required is available at Gabbs, Nevada, which would make for a low hauling charge on these items;

(d) (I) Equipment to be purchased;

Compressor - 300 cfm - Diesel - used	-	$3,000.00
Jack leg mounted Drill - used	-	300.00
Air & Water hoses	-	250.00
Water pressure Tank	-	50.00
Water storage Tank	-	50.00
Water Pump - Gas - for Water supply	-	75.00
Air Receiver	-	350.00
2 Mine Cars - end dump	-	100.00
Mucking Machine	-	2,000.00
Portable Elec. Gas Power Welder & Portable Acetylene Gas Burning & Welding Outfits complete with Supplies	-	1,500.00
		$7,675.00

Based on 5 yr. write-off $\frac{\$7,675.00}{60}$ =

$127.92 per Mo.; $127.92 x 12.5 Mo. = Total: $1,598.90

$1,598.90 ÷ 1000' = $1.599 per ft. for 1000' of Drift.

(d) (II) Equip. to be Rented;

For Shaft Clean-out & Sampling;

1 - Tripod with Power Winch & Accessories	$ 100.00
Total Cost Oper. Euip.:	$1,698.90

7. ESTIMATE OF COSTS - Cont'd

(e) Initial Rehabilitation & Repairs:

Some housing is available at Grantsville, but requires certain repairs & improvements to comply with "Changing Room" & winter conditions.

Repair of Roofs, Siding, Windows & Doors of existing buildings. Repair of Stoves and Water Heater & Propane Gas Refrigerator. - Total: $ 500.00

(f) New buildings, fixtures, Installations;

Not Applicable

(g) Miscellaneous:

(g) (I) Repairs & Maintenance of Operating Equipment listed in 7 (d) ---

Mechanical Repair of Moving parts & ignition Systems of Power operated equip., Renewal of gaskets of Air & Water hoses & clamps & repair of same, Compressor & Mucking Machine gaskets, Maintenance & Repairs of Mucking Machine Air Hose, air Motor & Valves, & drive Chain. Drill Maintenance & Repair of Needles, Port valves and slides.

Per foot for 1000' Drift = $ .50 Total: $500.00

(g) (II) Assay Costs;

Costs are based on current prices in the locality for this type of work.

50 Assays x $7.50 each = $375.00

7. ESTIMATE OF COSTS - Cont'd

(g) Miscelleneous - Cont'd

(g) (III) Accounting;

Costs include Supplies & Fees of Accountant for services - $100.00 per Mo. x 125 Mo. = $ 1,250.00

(g) (IV) Workmen's Compensation & FICA;

based on 12% of Wate Costs ---

From Item 7 (b) (I) Supervisor total at $400.00 per Mo. $400.00 x 12.5 Mo. = $5,000.00 x 12% = $ 600.00

From Item 7 (b) (II) - Wages Miners for 1000' of Drift for 12.5 Mo. = $12,500.00 x 12% = $ 1,500.00

From Item 7 (b) (III) - Wages Miners for Shaft Clean-out & Sampling - 7 days = $350.00 x 12% = $ 42.00

(g) (V) Heavy Equipment & Material Transport Charges by Trucking Company.

From Item 7 (c) (I) Hauling charge from Tonopah, Nevada - for Timbering for 1000' Drift --- $ 90.00

From Item 7 (c) (II) Hauling charge frm Tonopah, Nevada = for Timbering for Shaft Clean-out & Rented Tripod & Power Winch & Equipment --- $ 30.00

From Item 7 (d) Hauling charge for Equip. from Gabbs, Nevada --- $ 55.00

Total Company Cost Items 7 (b) through 7 (g): $46,656.90

SUMMARY:

Summary of total estimated Costs of Exploration Project by Company Operation & Contract Operation & Comparison of Costs follows:

7. ESTIMATE OF COSTS - Cont'd
SUMMARY - Cont'd
Overhead Account:

Item 7 (b) (I) -	Consulting, Supervision, Transport;	$14,731.00
Item 7 (e) -	Repair of Housing & Equip. for Housing;	500.00
Item 7 (g) (II) -	Assay Costs;	375.00
Item 7 (g)(III) -	Accounting;	1,250.00
Item 7 (g) (IV) -	Insurance & FICA - Supervisor;	600.00
	Company Overhead, Total:	$17,456.00
	Total Company Cost Items - 7(b) through 7 (g):	$46,656.90
	Direct Cost Company Items - 7 (b) thru' 7 (g) - Sub-Total:	$29,200.90
	+ 10% of $29,200.90, Direct Cost Items for Contingencies; =	2,920.09
	Total Est. Amt. of Direct Cost Items - 7 (b) thru' 7 (g):	$32,120.99

Total Company Overhead:	$17,456.00
Total Company Direct Costs + 10%:	32,120.99
Contract Bulldozer Oper. Item 7 (a) (I):	1,698.00
Grand Total Estimated Cost of Project by Co. Operation + Contract Dozer Oper.:	$51,274.99

Shaft Clean-out Cost by Company:

Item 7 (b) (III) Labor;	$350.00
Item 7 (c) (II) Supplies;	250.00
Item 7 (d) (II) Equip. Rental;	100.00
Item 7 (g) (IV & V) Hauling & FICA;	72.00
	$772.00
+ 10% of $772.00 =	77.20
Total Cost by Company Oper: =	$849.20

Shaft Clean-out by Contr.
Item 7 (a) (III) $1001.00

Cost per ft. for 1000' Drift by Co. Oper:
Total Co. Direct Cost Items 7(b) thru' 7(g) = $32,120.99
$32,120.99 - $849.20 = $31,271.79 ÷ 1000' = $31.272 per ft.

7.ESTIMATE OF COSTS - Cont'd

SUMMARY - Cont'd

Total Estimated Costs of Exploration Project by Independent Contractor:

Item 7 (a) (I) - Contract Bulldozer Operation;	$ 1,698.00
Item 7 (a) (II)- Contract for 1000' of Drift & Timbering;	35,600.00
Item 7 (a)(III)- Shaft Clean-out & Sampling;	1,001.00
Total Contract Cost, Less Company Overhead:	$38,299.00
Company Overhead Cost (See Page 47)	17,456.00
Grand Total Estimated Cost of Exploration Project by Contractor --- :	$55,755.00

Cost per ft. for 1000' Drift by Contractor:

Total Contractor Cost items - Item 7 (a) (II); $35,600.00

$35,600 ÷ 1000 ft. = $35.60 per ft.

Total Estimated Cost by Company Operation:

$51,274.99

Total Est. Cost by Contractor:

$55,755.00

1000 ft. Drift:

Cost per ft. by Company Operation;

$31.272 per ft. (See Page 47)

Cost per ft. by Contractor;

$35.60 per ft.

L. J. MANNING & ASSOCIATES LTD.
CONSULTING MINING ENGINEERS

610–890 WEST PENDER STREET VANCOUVER 1. B.C.

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May 1, 1970

Mr. G. Bleiler,
President,
Hogan Mines Ltd.,
811 - 850 West Hastings Street,
Vancouver, B. C.

Dear Mr. Bleiler:

GRANTSVILLE PROPERTY, NEVADA

Summary and Recommendations:

The Grantsville is a silver-lead-zinc property that produced in the late 1800's. Irregular shear and fracture zones are mineralized with quartz-calcite stringers with associated pyrite, galena, and sphalerite.

Where these structures intersect a ~~± 40'~~ 2- 300' limestone horizon, replacement type mineralization occurs. The old stopes were up to 150' x 100' x 30'. The limestone horizon is fairly flat dipping and outcrops only at the base of a valley floor. All old workings were driven from this valley floor, but an Examination of dumps from old shallow shafts indicates that exploration did not extend to any great extent along the favourable limestone horizon.

A sample across a 30' wall width (partial width) of an old stope returned 7.92 oz. Ag/ton - 0.045% Cu - 1.02% Pb - 1.00% Zn. It must be assumed that this was cut-off grade in the earlier days of mining. This assumption is somewhat substantiated by a wall sample which returned 6.69 oz. Ag - 0.05% Cu - 0.77% Pb - 2.10% Zn/15' height.

The unprospected area remaining on the property presents a good exploration target for Ag-Pb-Zn mineralization.

A program of $125,000 for an induced polarization survey, mapping, sampling and drilling is recommended. Before work commences it is necessary to stake claims to make a contiguous group and extend at least one claim length beyond the presently acquired ground.

Property:

There are 15 Grantsville patented claims, and one unpatented claim.

Location and Access:

Grantsville, 38°50' - 117°35' is in Nye County, Nevada. It is located in and on the edge of the Toyabe National Forest, but is still in desert type country. Access is by approximately 24 miles of good dirt road from Gabbs, Nevada. The small village of Iona is eight miles north of the property.

Water Supply:

Sufficient water is probably available for drilling, but wells would be required for milling.

General Geology and Structure:

The ± 200' thick capping rock in the area is a highly siliceous rock which may be a rhyolite. Underlying the unit is a ± 40' horizon of medium-grey limestone. The footwall rocks are a light grey shale, which is only exposed for a vertical thickness of several feet.

Intrusives were not mapped, but some skarn rocks were observed in the dumps.

The sequence is fairly flat lying, but one anticlinal structure was observed with limbs dipping 25°. The limestone near the main workings dip at 35° which probably represents a limb of an anticline.

Mineralization:

Irregular shears and fracture zones in limestone are mineralized with quartz-calcite stringers and associated pyrite, galena and sphalerite, while replacement type mineralization occurs in the limestone wall rocks. Some of the old stopes are up to 150' x 100' x 30', with mineralization still observed in the walls and backs.

Sampling:

Sample Number	Silver Oz/ton	Lead %	Zinc %	Copper %	Description
11191	1.29	0.15	0.77	0.035	Bench - Partial stope width - 40'
11192	7.92	1.02	1.00	0.045	Wall - Partial stope width - 30'
11193	1.01	0.12	2.02	0.110	Face Sample - Exploration drive - 5.0' width
11194	6.69	0.77	2.10	0.050	Wall - Stope - 15' height.

Gold values were from Tr - 0.01 oz/ton.
Samples indicate a silver-lead ratio of 8:1

Conclusions:

The structural control in a stratigraphic unit; the siliceous capping with the obvious exploration problems for the old timers; the shallow shafts indicating lateral extent of the limestone and the size of the stopes mined, present a favourable area for exploration.

Respectfully submitted,

L. J. MANNING & ASSOCIATES LTD.

John W. Hogan, P.Eng.

JWH:mjb