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(51) Item 15 (2)

A REPORT ON THE DELANO MINE AND VICINITY, ELKO COUNTY, NEVADA

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see also map files

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The Delano mine is located 37 miles northwest of Montello, Nevada in SE 1/4, NW 1/4, Sec. 28, T58E, R42N (Figure 1). The mine can be located on the Delano Mountains, Nevada 15' Quadrangle map.

Access from Montello is by 43 miles of graded gravel road. Access is also provided from Wilkins, Nevada, to the southwest and Jackpot, Nevada, to the north by graded gravel road.

Twelve buildings occupy the sight of the Delano, all in good repair (Figure 2). Water is available at the Delano well, eight miles to the northwest. Telephone service or electricity is not available at the present time.

The Delano mine portal is collared at an elevation of 6,400 feet with workings extending down dip 2,000 feet. One main haulway exists to the 1,300 foot level, where a 63 foot raise displaces the workings. From the top of the raise, a main haulway continues down dip of the ore for 700 feet. Lateral drifts with stoping are common throughout the mine.

HISTORY AND PRODUCTION

The Delano Mining District was discovered in the 1890's but no major production occurred until 1918. No separate mine totals are available for the early production, but by the end of 1957, total production for the district included 1,525,000 ounces of silver, 19,000,000 pounds of lead, 650,000 pounds of zinc, 138,000 pounds of copper and 270 ounces of gold. For greater detail on history see Wiggins, 1979.

The Delano Mine was in continuous production until 1962. John Ala of Montello, Nevada operated the mine in it's later years of production. Working extended down an incline approximately 2,000 feet. The workings are open and in good repair.

Smelter settlement sheets are available for the last 40 years of the Delano mine productions. Wiggins summarized production records for 14 years on average assay values for silver, lead, and zinc (see Table 1).

GENERAL GEOLOGY

The Permian rocks in the immediate vicinity of the Delano mine belong to the Park City formation (Wiggins, 1979). These rocks were

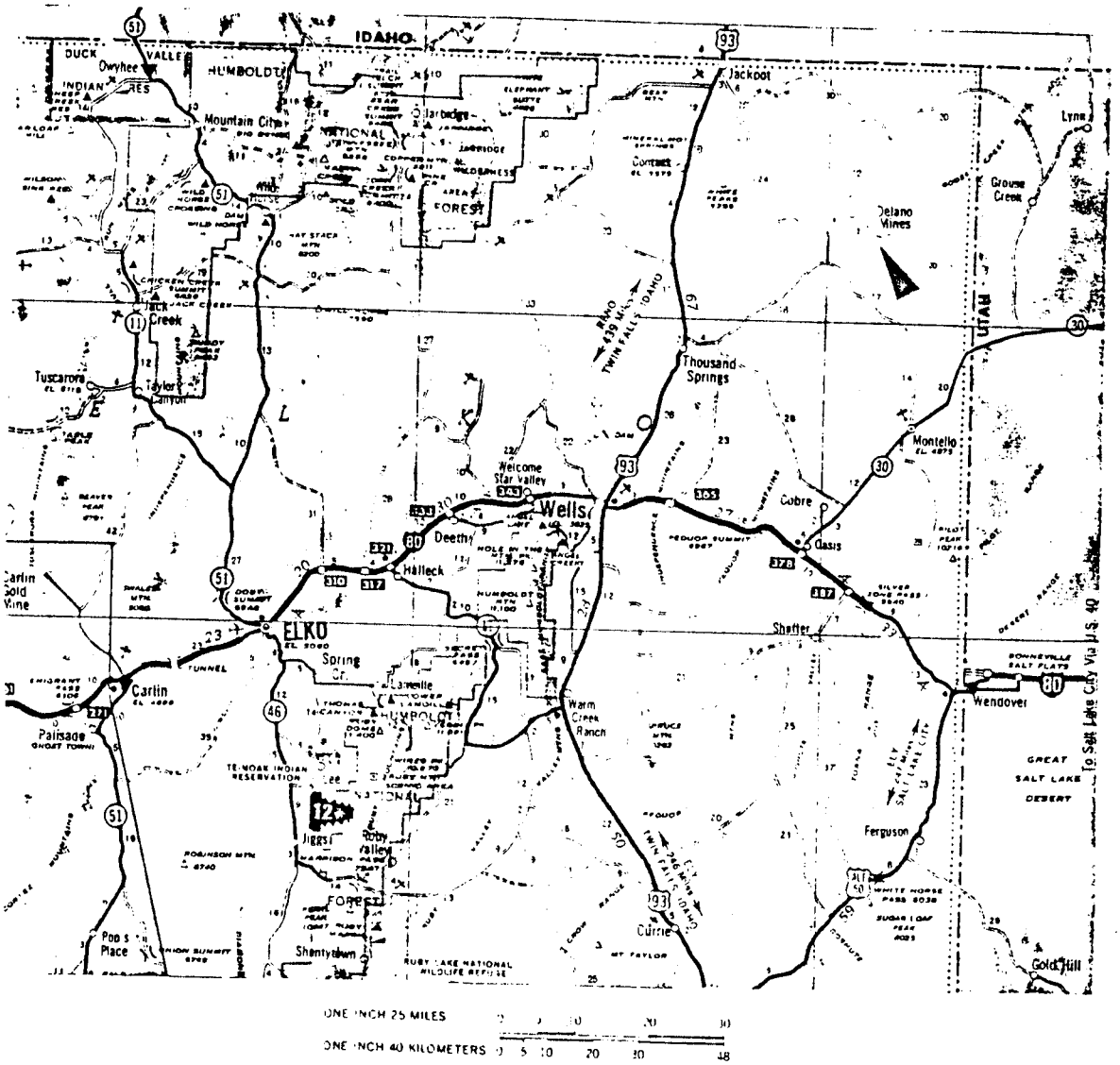


Figure 1. Map of northeastern Nevada showing access routes to the Delano Mine (arrow).

Figure 2. View to northwest of Delano mine hoist anb out buildings.

TABLE 1

AVERAGE ASSAYS FOR SAMPLE OF YEARS OF PRODUCTION AT THE DELNO MINE

YEAR	TONS	Ag oz./ton	Pb %	Zn %
1939	734	25.370	16.580	3.163
1940	903	30.099	17.238	4.797
1941	1067	20.700	14.480	1.920
1942	243	18.106	14.63	2.700
1943	195	15.475	8.60	1.20
1944	548	15.295	14.361	1.055
1953	1364	16.279	11.535	3.513
1954	2461	21.766	13.154	3.82
1955	2199	18.500	11.042	4.9
1956	2403	18.593	10.942	4.168
1959	1046	21.391	13.098	6.53
1960	195	22.731	15.581	2.025
1962	96	19.500	13.888	1.650
1963	126	17.096	12.033	2.9

GENERAL GEOLOGY, continued

deposited in shallow water in the central part of an epicontinental ocean that was bounded by a stable craton to the east, a positive area to the south and the Cordilleran miogeosyncline on the west (Ketner, 1979).

Two lead/silver/zinc ore beds are found concordant with bedding of the limestones and sandstones of the area. One ore horizon is found at the contact of limestone/sandstone. The other ore horizon is located at a limestone/dolomite contact, five feet above the limestone/sandstone contact.

A tin ore horizon occurs at a sandstone/limestone contact, approximately 400 feet below the lowest lead/silver/zinc ore bed.

DETAILED STRATIGRAPHY

The physical stratigraphy in the vicinity of the Delano mine consists of Permian limestones, sandstones, and dolomites with a series of Tertiary tuffs, basalts, and sediments overlying the Permian sequence (Plate I).

The Permian sequence, described in descending order is:

Quartzite/chert series/600+ feet thick - This series probably represents a siliceous replacement of a sandstone/limestone series. Quartzite and chert beds are interbedded, with beds ranging in thickness from 10 inches to 30 inches in thickness. The quartzite beds, on the average, are thicker than the chert beds. Individual beds appear to have lateral continuity, but due to poor exposure, this assumption cannot be verified. Fresh exposure is gray to black, weathers dark gray.

Bioclastic limestone - Averages 40 feet thick, ranges from 0-145 feet thick. Thin-bedded (6-12") to flaggy. The limestone ranges in composition from a siliceous crinoidal micrite to a bryozoan crinoidal bioclastic sparite. The bryozoans were identified as Rhombopora and Fenestella, shallow basin forms. Fresh exposure is dark gray, weathers light gray.

Cherty limestone - Averages 40 feet thick, ranges from 25-96 feet thick. This limestone's composition is a chert clastic micrite. The chert clasts appear to be more abundant in the upper 15 feet of the unit. Fresh exposure is dark gray, weathers light gray. Sulfide odor is common in a fresh break.

DETAILED STRATIGRAPHY, continued

Upper Ore Bed - 1.5 to 4.5 feet thick. The ore has a general trend of thinning in the mine from east to west, (Plate II). At the 1,300 foot level, the ore averages 42 inches. Progressing west of here, the ore averages 40 inches. At the 1,800 foot level, the ore begins to thin to an average of 20 inches. The ore consists of jasperiod with occurrences of quartz crystals (1-3 mm), quartz veins, calcareous-to-siliceous clay material, chalcedony and turquoise veins, galena crystals and stingers (1-5 mm). The major ore minerals are galena, cerussite, and bind heimite (Slack, 1972). At the 1,700 foot level, the ore becomes a coarse crystalline calcite unit on the south wall with very little mineralization.

Dolomite - Averages six feet thick. Only one possible surface exposure was found. This is to the southeast of the Delano. Here, the dolomite is highly silicified, giving it the appearance of a fine grained quartz arenite (Plate II). The composition, in the mine, ranges from fine crystalline dolomite to a highly siliceous, fine crystalline dolomite. Fresh exposure is gray to greenish gray.

Lower Ore Bed - Averages three feet thick, ranges from 2.5 to 3.5 feet thick (Plate II). Similar to upper ore bed, but contains less clay material. Consists principally of jasperiod with occurrences of galena crystals, quartz crystals (1-3 mm), quartz veins, and chalcedony veins. Due to little working of the lower ore, it is not possible to conclude if the ore thickens or thins in any pattern in the mine. The ore minerals are assumed to be the same as the upper ore bed.

Sandstone - 50 feet thick. Consists of a fine to very fine grained quartzarenite, ranging from slightly calcareous to siliceous. Usually bedded (1-5 feet).

Bioclastic limestone - 75 feet thick. Micritic limestone with abundant fossils. Fossils include pelecypods and crinoids.

Sandstone - 75 feet thick. Similar to sandstone above, fine grained, siliceous quartzarenite.

Sparite limestone - 70 to 140 feet thick. Bedded, sparitic limestone, appearing to thicken from the south to the north.

Sandstone - 350+ feet thick. Similar to sandstone above, fine grained, siliceous quartzarenite.

DETAILED STRATIGRAPHY, continued

Tin ore horizon - Approximately 400 to 500 feet below the lower ore bed. The tin occurs in a zone approximately 18 inches thick in a jasperoided quartz/opal horizon conformable with bedding. The tin mineral is believed to be cassiterite (Olsen, 1960) and occurs in pale yellow stringers along the bedding.

The Tertiary stratigraphy in the Delano region consists of the following:

Basalt - 40+ feet thick. Bedded with phenocrysts of plagioclase. Brown to black on fresh exposures, weathering brown.

Tuffs - 40+ feet thick. Rhyodactitic tuffs air and water laid, pumice and lithic fragments present.

Sediments - 90+ feet of micaceous, unconsolidated fine-to-medium grained quartz grains. Cross-bedded to thin-bedded.

STRUCTURE

Faulting

Two sets of faults occur in the Delano region (Plates III and IV). The northwestern trending faults are presumed to be pre-ore due to the lack of ore in the fault zone. A set of north-south trending faults are found in the region. Presence of ore drag in the fault zone indicates these faults are post-ore. The majority of faults are high angle normals faults, with displacements of 10 to 50 feet. Some high angle reverse faulting occurs in the area, with displacements of 10 to 50 feet. Evidence for any thrust faulting was not found in this area.

Folding

A syncline-anticline system of folding is found west of the Delano mine (Plate V). The axis of the synclines and anticline are north-south (Plate III). The described system from the east to west is an asymmetrical syncline, with the east limb dipping 35° to 45° W. The west limb dips 65°E. This limb also forms the east limb of a breached, plunging anticline. It plunges 27° south, the east limb strikes N30W, dips 52°E. The west limb strikes N39W, dips 27°S (Figure 3). An east-west fault displaces this series of syncline-anticline to the east by approximately 150 feet (Plate III).

Figure 3. View to northwest of Delano mine hoist and out buildings. Breached anticline forms hill in background. It plunges out of the page.

SAMPLING

Underground Sampling

The Delano mine is collared at 6,400 feet msl. A main haulway extends down dip to the 1,300 foot level, where a 63 foot raise displaces the haulway up. At the top, the haulway continues down dip 700 feet. There is a total of 2,820 feet of haulway in the mine of which, 1,720 feet is in ore (Plate IV).

Underground sampling was primarily concentrated in the lower 700 feet of the mine due to the better access to stoping and less timbering and steel collaring. Here, sampling was conducted on 50 foot intervals (Plate VI). Where the lower bed was accessible, it also was sampled on 50 foot intervals. Lower bed samples on Plate IV are indicated by LB preceding the sample number. Sampling, conducted October 1979, included 51 sample locales, where 134 vertical channels were sampled.

The samples were assayed for silver, lead, zinc, copper, and gold (Appendix 1). The average assay values for the ore samples are:

Silver	6.43 oz/ton
Lead	5.6%
Zinc	3.8%
Copper	0.209%
Gold	0.11 ppm

The ranges from the ore assays are:

Silver	0.1168 oz/ton	to 41.54 oz/ton
Lead	0.0009%	to 23.8%
Zinc	0.035%	to 28.9%
Copper	0.0045%	to 0.63%
Gold	0.1 ppm	to 0.6 ppm

Surface Sampling

Ore appears on the surface as float, with the only outcrop at the hoist house at the Delano mine. Nine sample locations with a total of 11 samples were originally taken. The average ore assays are:

Silver	2.29oz/ton
Lead	1.87%
Zinc	5.71%
Copper	0.088%
Gold	0.18 ppm

SAMPLING, continued

Surface Sampling, continued

The ranges in the ore assays are:

Silver	0.058 oz/ton	to	5.75 oz/ton
Lead	0.014%	to	9.8%
Zinc	0.021%	to	36.8%
Gold	0.0022%	to	0.22%

Trenches have been cut and sampled near the Delano mine. The average assay for silver is 3.20 oz/ton, with the range from 0.0 oz/ton to 29.18 oz/ton (see Appendix 2 for assay results and Plate VI for locations). The average lead value is 4.26%, with the range from 0.9% to 8.8%.

TONNAGE ESTIMATES

In the immediate vicinity of the Delano mine, the ore body is mapped for 2,800 feet from a point 1,400 feet north of the collar to a point 1,400 feet south of the collar, (Plate III). It is conservative to state the ore extends down dip at least 2,000 feet (same as the length of the Delano mine). Thus, an estimate of ore tonnage is arrived by the following:

$$\frac{\text{2,800' length X 2,000' width X 6' thick}}{\text{12 cu. ft/ton}}$$

$$\frac{\text{33,600,000 cu. ft.}}{\text{12 cu. ft/ton}} = \text{2,800,000 tons of ore}$$

There could also be 800 feet more added to the length to the north, but further detail mapping is needed here.

If drilling delineates ore to the west, a possible 2,000 feet could be added to the width of the ore in the area.

TRENCHES

As of January, 1980, 12 trenches have been cut in the Delano mine vicinity (Plate VII). Of the 12 trenches, seven trenches crossed the ore body. The ore was sampled from silver and lead. The average silver value is 3.20 oz/ton, with values ranging from 0.0 oz/ton to 29.18 oz/ton. The average lead value is 0.18%, with values ranging from 0.0% to 0.87%.

RECOMMENDATIONS

Exploratory drilling should be conducted to the north and west of the Delano mine to delineate the ore body in the subsurface. In conference with Dennis Duewel, 27 drill sites have been suggested with 19 of these sites to be drilled immediately (Plate VII).

Detail mapping needs to be conducted on the area 1,400 feet north of the Delano mine to define the position of the ore, since trenching has determined that the ore does not lie in the area as originally mapped.

BIBLIOGRAPHY

Ketner, K. B., 1979 — Phosphatic Permian Rocks of the Adobe Range, Nevada, and their Environment of Deposition, USGS Open File Report 79-239.

Olsen, D.R., 1960 — Geolgoy and Mineralogy of the Delano Mining District and Vicinity, Elko Co., Nevada. Ph.D. dissertation, University of Utah, June 1960.

Slack, J. F., 1972 — Structure, Petrology and Ore Deposits of the Indian Springs (Delano Mountains) Region, Elko County, Nevada. Master of Science thesis, Miami Univ., Oxford, Ohio, 1972.

Wiggins, R. A., 1979 — Delano Mine, prepared for Nevada-Montana Silica and Gypsum, Inc.

1980 Noranda Memo

The Delano Mine is apparently a replacement type ore body and limestone dipping some 25° to the southwest. The limestone is a member of the Park City formation. The ore is primarily a oxide/sulfide ore and production to date has been approximately 22,000 tons which has averaged 18.5 ounces of silver and 13.5% lead and 3% zinc. There are two ore beds, the upper averaging some 4 feet in thickness, separated from the lower bed which is 3 feet thick by dolomite which averages 6 feet. The dolomite where sampled show an average grade of some 1-2 ounces of silver, so under present prices, the entire bed may be mineable.

According to Noranda Exploration, in the semi-developed ore zone, assuming that Moshannon's maps and assays are accurate, there could be some 240,000 tons of indicated ore, averaging, 6.43 ounces of silver, 5.6% lead and 3.8% zinc with minor values in copper and gold. Noranda Exploration is of the opinion that the geologic potential is far greater than this and could possibly be several million tons which could be explored at a reasonable cost by surface drilling. The ore outcrops on surface and has been followed down dip by a decline for several hundred feet. In addition, there are several other places on surface where ore grade material is present but it has not been tested down dip. Because of the outcrop of the ore, and the shallow dip, development and exploration of the ore body could be done at a minimal cost. It would seem to me that perhaps a ramp with an LHD could be driven following the ore down the dip similar to methods that are used in Elliot Lake, from the surface. Some limited drilling has been done by Moshannon and two ore grade intercepts have been found, and the two holes completed offset the ore zone by some 350 feet. In addition, Noranda Exploration has taken a grab sample of seemingly unmineralized limestone a considerable distance away and come up with two to three ounces of silver. Initial testing of surface samples has indicated that we could recover perhaps 80% of the silver, 62% of the zinc and 87% of the lead by flotation. It would seem reasonable to expect that a fresh sample, not exposed to this extent of oxidation, these values could be improved.

Moshannon maintains they have spent approximately $350,000 on the property to date. This would include property acquisition, title perfection, sampling, mapping, etc. From looking at their data, it would appear that this is perhaps an accurate estimate. We have met with Moshannon and agreed on a potential deal which is outlined in the letter of intent attached. The important points to note in the letter of intent is that we do have the month of July as a free option period to examine the property and determine if we want to continue on. There would be a payment due of $30,000., August 1, 1980, which would give us two additional months for further work, at which time we would have to exercise our option with an additional payment of $70,000. These two payments are in lieu of the indicated ore and the property payments that Moshannon has made to date. Should we decide to exercise our option, Noranda Mining and Noranda Exploration, Inc. would then be committed to spend a minimum of $350,000. over the next year on the property. At that point, we could walk away from the property with no further obligation, or if we decided to stay in, continue to work on the property to place it into production. We can earn a 60% interest in the property or or the expenditure of $2,000,000. or place the property into production, whichever is less.

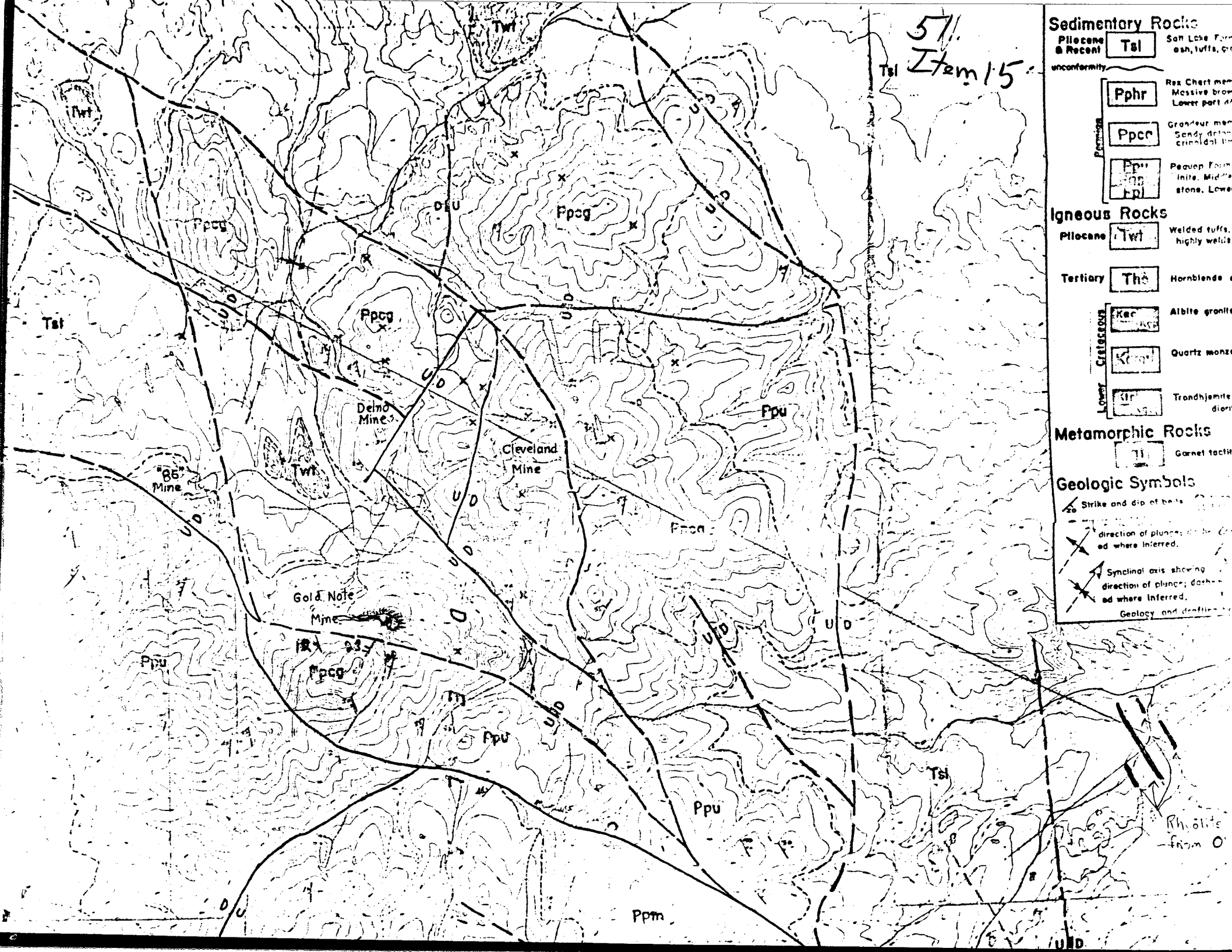
BIBLIOGRAPHY

Ketner, K. B., 1979 — Phosphatic Permian Rocks of the Adobe Range, Nevada, and their Environment of Deposition, USGS Open File Report 79-239.

Olsen, D.R., 1960 — Geolgoy and Mineralogy of the Delano Mining District and Vicinity, Elko Co., Nevada. Ph.D. dissertation, University of Utah, June 1960.

Slack, J. F., 1972 — Structure, Petrology and Ore Deposits of the Indian Springs (Delano Mountains) Region, Elko County, Nevada. Master of Science thesis, Miami Univ., Oxford, Ohio, 1972.

Wiggins, R. A., 1979 — Delano Mine, prepared for Nevada-Montana Silica and Gypsum, Inc.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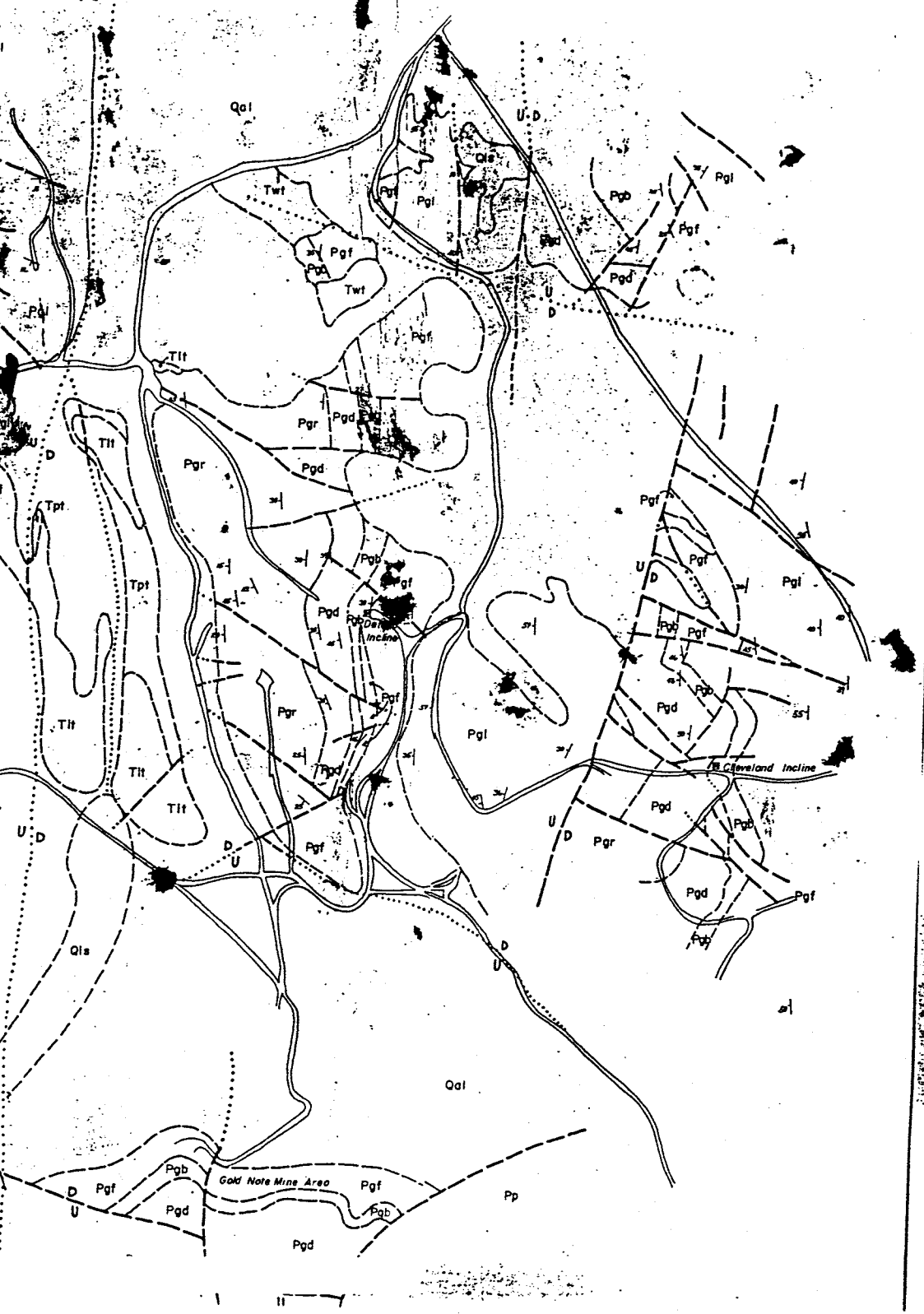
Item 15
Sedimentary Rocks
Pliocene & Recent
Tsl
unconformity
Pphr
Ppcr
Permian
Igneous Rocks
Pliocene
Twt
Tertiary
Thb
Cretaceous
Lower
Metamorphic Rocks
Geologic Symbols
Strike and dip of beds
Synclinal axis showing direction of plunge; dashed where inferred.
Twt
Tsl
Ppcg
Ppcg
Ppcg
Ppcg
Ppcg
Ppcg
Ppu
Ppu
Ppu
Ppu
Ppm
Delno Mine
Cleveland Mine
"86" Mine
Gold Note Mine
Tsl
Rhyolite from O
U D

DELANO MOUNTAINS QUADRANGLE
NEVADA–ELKO CO.
15 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



GEOLOGIC MAP OF THE DELANO DISTRICT, Elko County, Nevada

Explanation

Qal	Alluvium. (Qls = Quat. landslide)	
Tlt	Green welded vitric latite tuff.	
Tpt	Pumaceous ash flow tuff.	
Twt	Water-laid vitric tuff.	
Pgr	Rasta Carbonate member.	Grandeur Formation
Pgd	Delano Sandstone member.	Grandeur Formation
Pgb	Basque Carbonate member.	Grandeur Formation
Pgf	Footwall Quartzite member.	Grandeur Formation
Pgl	Lower Bioclastic member.	Grandeur Formation
Pp	Pequop Formation.	

500 0 500 1,000

Scale: 1" = 500'