6/23/66

Minneapolis
8-612-721-4821

Harold,

Here is Magill's report on the Blackbird Mine-

He met with Jack Vhay in Spokane and I believe there is no conflict in views-

I have not yet seen the metallurgy report by Carl Schacks of SLC as it was sent to me in Mpls.

I propose to review this report & Schacks and combine them in one report with a recommendation to the GSA committee - which will represent the Interior viewpoint -

If you have questions relative to this report you might call Jay & let me know of any points of significant ~~variation~~ difference

Also relative to Bisbee

3394

June 1[illegible]-June, 1[illegible] [illegible] Inc., another subsidiary of the Hecla Mining Co. Company, conducted a copper operation and produced:

	Tons	Cu	Co
Total	47[illegible],1[illegible]	.[illegible]	1.[illegible]

(Au and Ag values were recovered in Cu conc.)
(Co values were not recovered but are shown as a matter of interest.)

Hecla Mining Company shipped copper concentrates to [illegible] & S Co. at Tacoma, Washington and cobalt concentrates to its own refinery at Garfield, Utah.

(d) Mine reserves are:

	Tons	Cu	Co
Positive Ore	1,1[illegible],[illegible]	.67	1.[illegible]
Probable Ore	[illegible],000	.67	1.[illegible]
Total Ore	1,6[illegible],000	.67	1.[illegible]

Positive Ore is that which is delineated on two levels not more than 15 ft. apart and initially outlined by diamond drill holes at 20-[illegible] ft. intervals and/or chip samples at 5-15 ft. intervals with due regard to the geologic structure.

Probable Ore is that which is delineated on one level or on two levels more than 15 ft. apart and outlined as above.

All assays are corrected downward by 5-15% to allow for sampling and assay errors. Dilution is added at a calculated grade and varies from 15-20%. Mining extraction factors averaging about 90% have also been applied.

(e) The district is underlain by pre-Cambrian Belt quartzites of the Yellowjacket Formation of the Belt Series. Regionally striking east-west or northwesterly, they dip moderately to the north and northeast. In the south these rocks are overlain by the Tertiary Challis volcanic rocks, and to the north are bounded by the Cretaceous granitic intrusives of the Idaho batholith and the border facies rocks.

All the quartzites have been derived from thin bedded shallow marine sediments, but they can be divided into four reasonably distinct units by virtue of their composition, schistosity, and color. Though by no means equally distributed, cobalt-copper mineralized zones occur in all four units.

The Blackbird Unit, located in the center of the district, has so far proved to be of the greatest economic importance. Intense metamorphism and structural deformation have produced a highly schistose quartz-biotite rock with a strong mineral bearing capability. Folding of varying amplitude cut by much shearing and many faults have created a complex structure. These structures are pre-mineral

3431

and have combined to control a gradational hydrothermal quartz-sulfide replacement exhibited by veins and pipe-like ore shoots, some of which are set in an en echelon arrangement, and each of which are plunging 35° - 50° to the north.

Main ore minerals are cobaltite and chalcopyrite. Gold and silver occur in small amounts. Native bismuth occurs in two of the four productive zones although no recovery has been ever attempted. Indications are that these two zones constituting 40% of the ore reserves contain about .16% Bi.

The mineralized zones are completely leached to an average depth of 10 ft. Beneath this gossan capping is an area of mild supergene copper enrichment extending downward about 100 ft.

Ore widths vary from 5 to 50 ft. but average about 15 ft. Ore zones are usually more narrow along the limbs of folds and wider along the crests and in the troughs.

(f) Cleveland Iron (see accompanying maps)

This mineralized zone is situated along an overturned western limb of a major anticline near the southeastern end of the Blackbird Mine. The zone has been explored by a short adit crosscut accomplished probably more than 50 years ago. Geologic mapping and channel sampling revealed an ore zone about 7½ ft. wide averaging .75% Co and 1.5% Cu. The entire mineralized zone, however, is at least 50 ft. wide including much low grade material. Three spaced [illegible] crosscuts drilled in 1943 exposed a gossan trending to the north about 18 to 25 ft. wide. The drill holes failed to intersect mineralized rock of sufficient tenor. The zone may therefore be discontinuous. However, core recoveries were quite poor. Self potential work done by Calora Mining Company found a very strong anomaly superimposed over the gossan zone. This anomaly is as strong as that found over the major ore bodies and indicates a zone of considerable sulfide content. This mineralized zone appears to connect with the Idaho zone which has been explored in a limited way on the 7100 level, 6600 level, and by five surface drill holes. The underground work there has outlined about 1,000 tons of .41% Co and 1.55% Cu. The surface drill holes intersected very low Co values and 2.72% Cu over the average width of 35 ft. The Cleveland area appears to have a good chance for the discovery of an ore body of several hundred thousand tons and, despite the rather unfavorable topography, has very definite ores sit possibilities if a sufficient tonnage can be outlined.

Sandy Zone (see accompanying maps)

The Sandy Zone is situated at the southeast end of the main stoping area in the Blackbird Mine. As far exposed, it has an average width of 10 to 15 feet and a length of about 500 feet. Widths have not yet been determined. The zone is following strong water shears along the axial plane of the major anticline referred to in the Cleveland discussion.

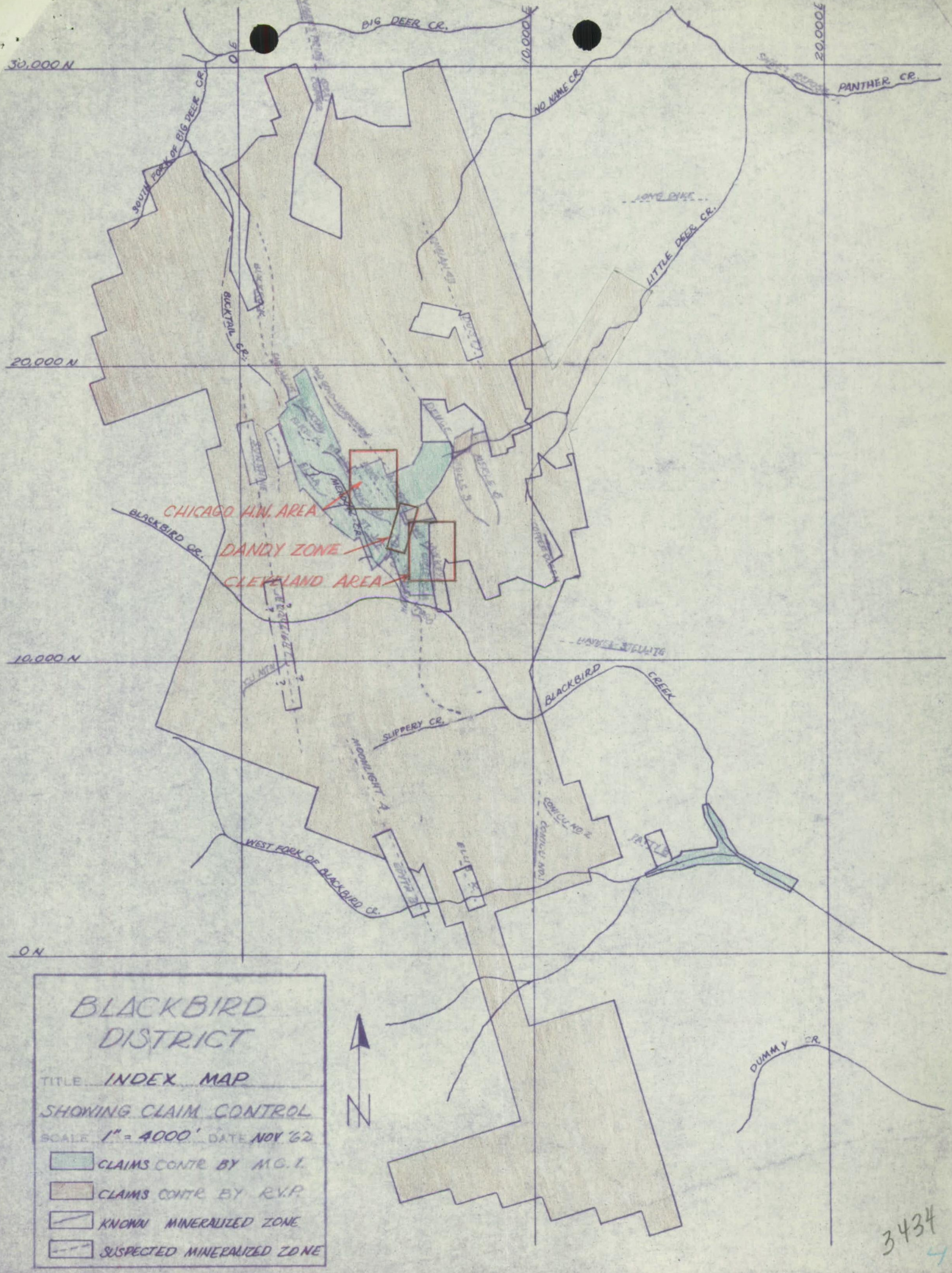
Of the four major producing zones in the Blackbird Mine, the Sandy is the smallest, having produced 15,600 tons .46% Co and 2.81% Cu and having a remaining reserve of 164,000 tons .46% Co and 2.37% Cu. It has, however, shown very definite improvement with depth. This zone needs to be tested to ascertain its behavior at a greater depth than now proven.

A few random samples have indicated that it may also contain about .03% Bi in the form of native bismuth. Situated in the core of a major structure and having demonstrated improvement over a short vertical range, this zone offers good possibilities for the discovery of larger tonnages at greater depth.

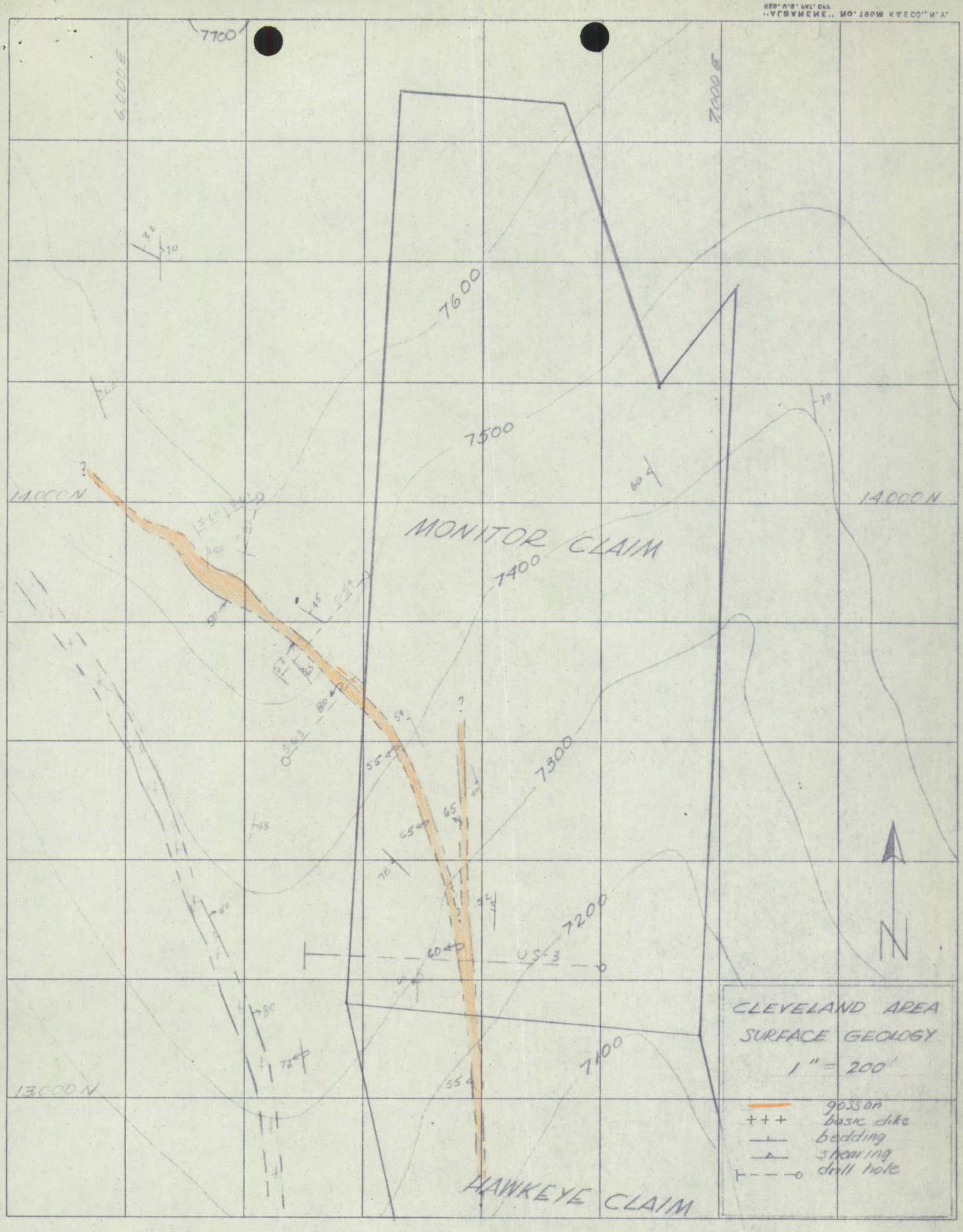
Chicago Hanging Wall Area (see accompanying maps)

The Chicago Zone is the largest of the ore bodies so far found in the Blackbird Mine. It has produced 61,000 tons @ .67% Co and 1.55% Cu, and has a remaining reserve of 308,000 tons @ .65% Co and 1.66% Cu. It is situated along a broad syncline plunging about 45° to the north and attains its greatest width (50 ft.) right in trough of this syncline.

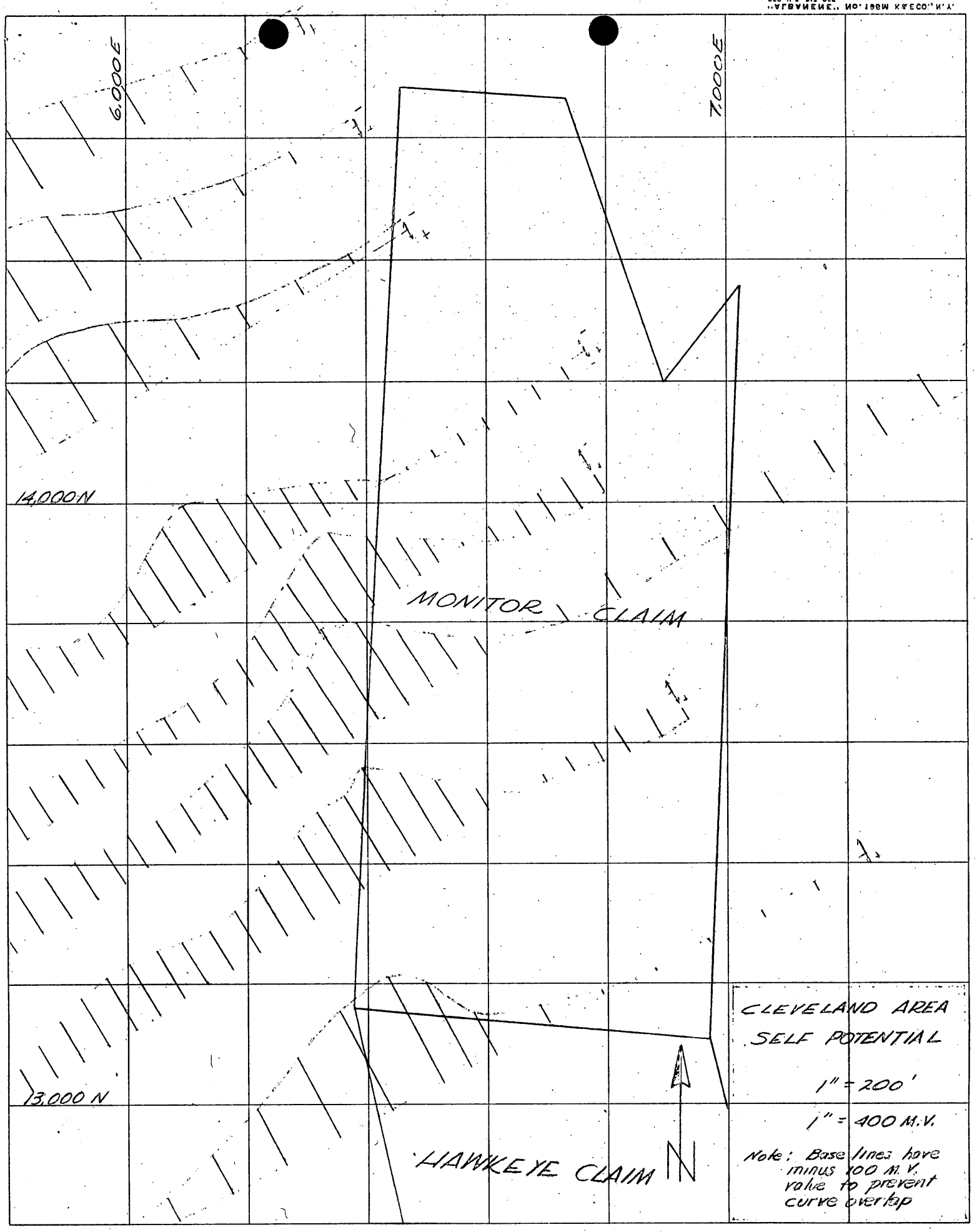
Self potential surveys reflect the Chicago Zone very prominently. However, the anomalous high extends far out into the hanging wall of the Chicago. Some trenching and limited drilling northeast of the Chicago have found a broadly mineralized area similar to the east end of the Chicago. Projection of these mineralized zones northwest along the hanging wall self potential high indicate one or more mineralized synclinal structures repeating due north along the axis of the Chicago syncline. The 6050 level offers the chance to test this area at depths up to 1000 ft.


BIG DEER CR.
30,000 N
0 E
10,000 E
20,000 E
PANTHER CR.
NO NAME CR.
SOUTH FORK OF BIG DEER CR.
LITTLE DEER CR.
BUCKTAIL CR.
20,000 N
CHICAGO H.W. AREA
DANDY ZONE
CLEVELAND AREA
BLACKBIRD CR.
10,000 N
BLACKBIRD CREEK
SLIPPERY CR.
MOONLIGHT A.
WEST FORK OF BLACKBIRD CR.
0 N
DUMMY CR.
N
BLACKBIRD DISTRICT
TITLE INDEX MAP
SHOWING CLAIM CONTROL
SCALE 1" = 4000' DATE NOV '62
CLAIMS CONTR BY M.G.I.
CLAIMS CONTR BY R.V.P.
KNOWN MINERALIZED ZONE
SUSPECTED MINERALIZED ZONE

3434
4


7700
6000 E
7000 E
7600
7500
7400
7300
7200
7100
14000 N
13000 N
MONITOR CLAIM
HAWKEYE CLAIM
N
CLEVELAND AREA
SURFACE GEOLOGY
1" = 200'
gossan
basic dike
bedding
shearing
drill hole

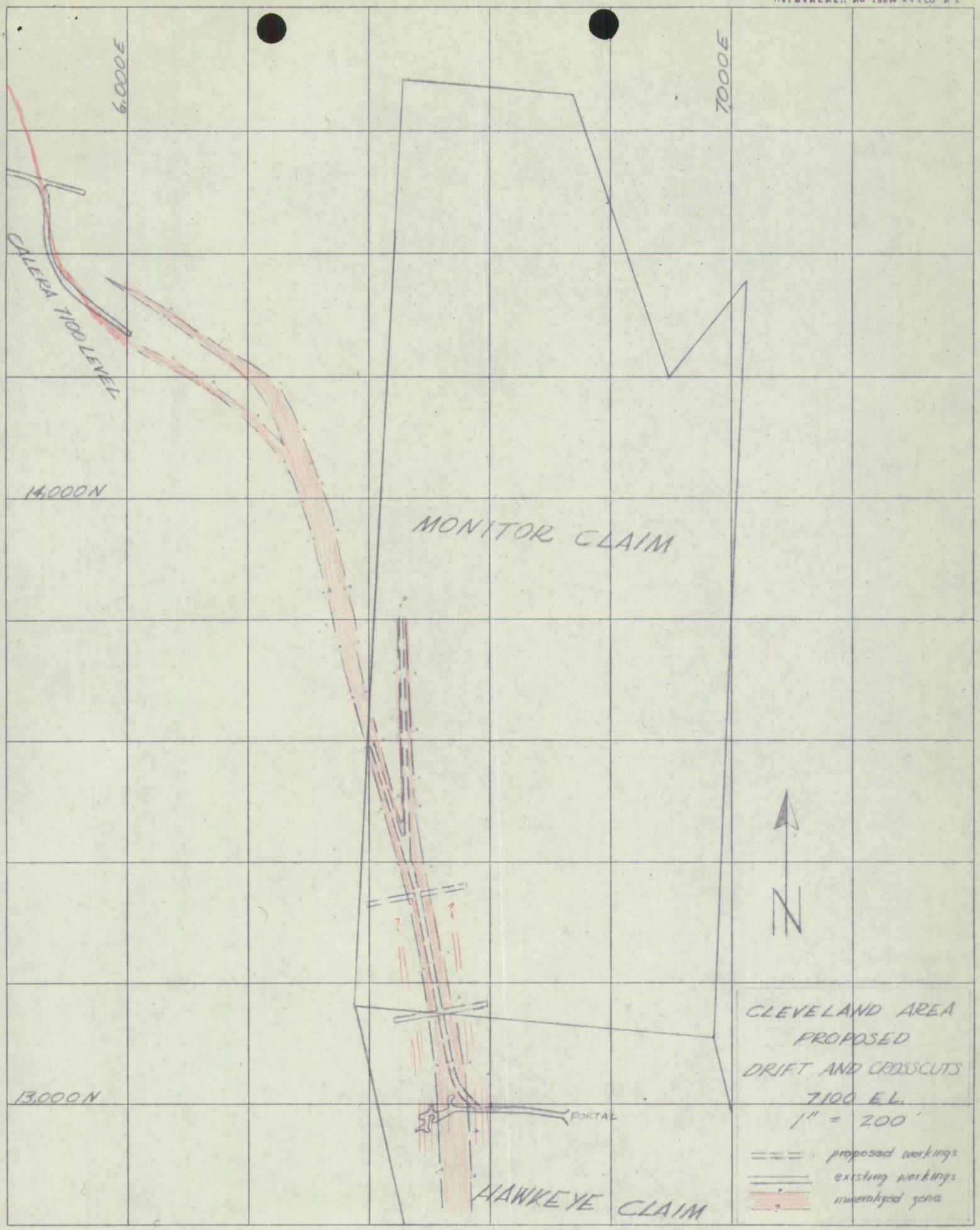
3435


6,000E
7,000E
14,000N
13,000 N
MONITOR CLAIM
HAWKEYE CLAIM
N
CLEVELAND AREA
SELF POTENTIAL
1" = 200'
1" = 400 M.V.
Note: Base lines have minus 100 M.V. value to prevent curve overlap

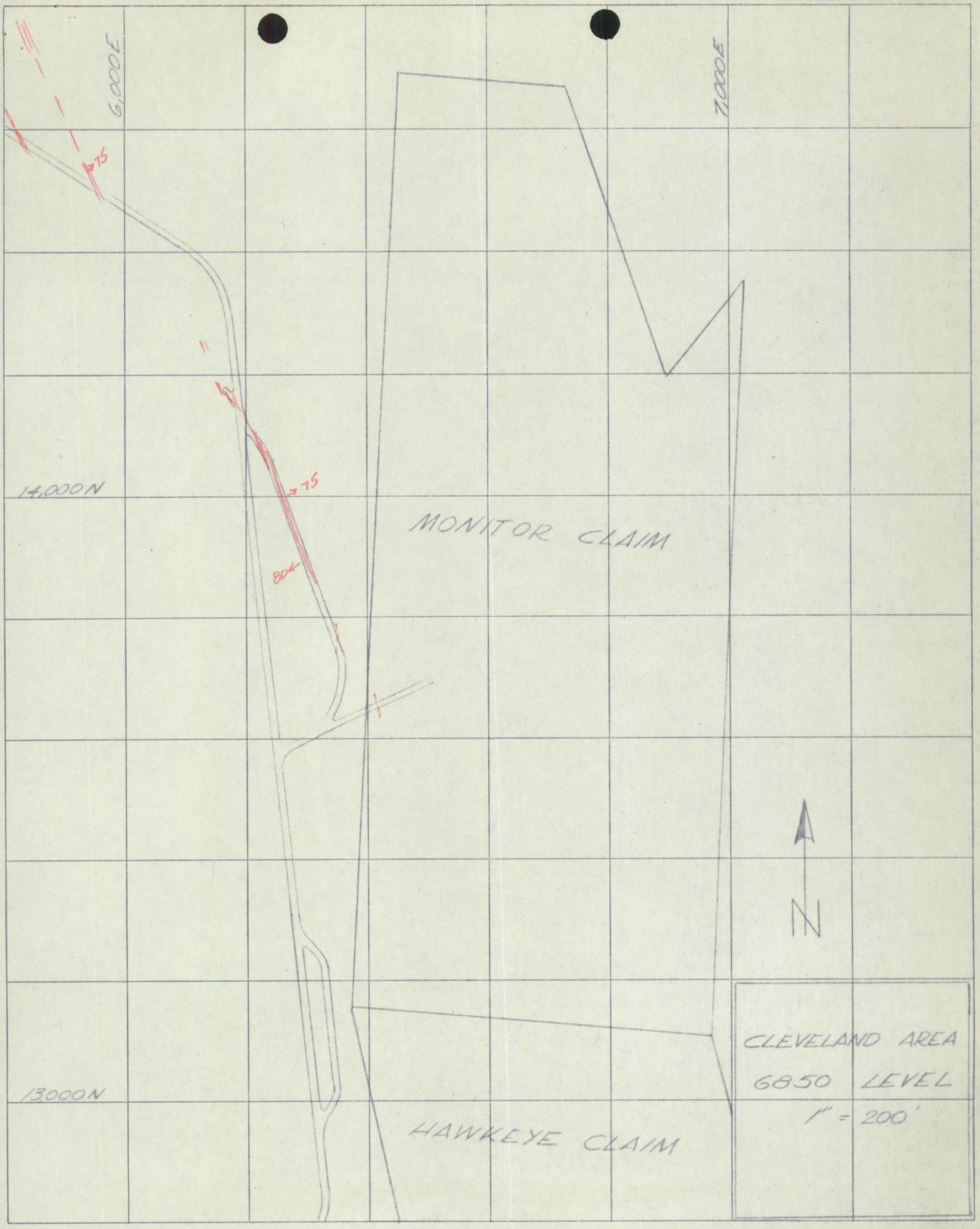
3436

13,000N
CLEVELAND AREA
HAWKEYE MINE
LOWER TUNNEL
1" = 40'
PORTAL
N
45
58
5'0.05,0.11
20'0.41,0.51
30'0.05,0.78
10'1.42,3.21
5'0.31,0.65
10'1.47,3.43
5'0.10,0.45
5'1.23,1.04
10'0.19,0.45
5'0.40,0.25
10'0.10,0.41
20'0.13,0.34
5'0.20,1.93
5'0.05,0.32
5'1.01,1.40
15'0.07,0.27
5'0.45,0.30
10'0.68,0.50
30'0.06,0.30
5'0.05,0.71

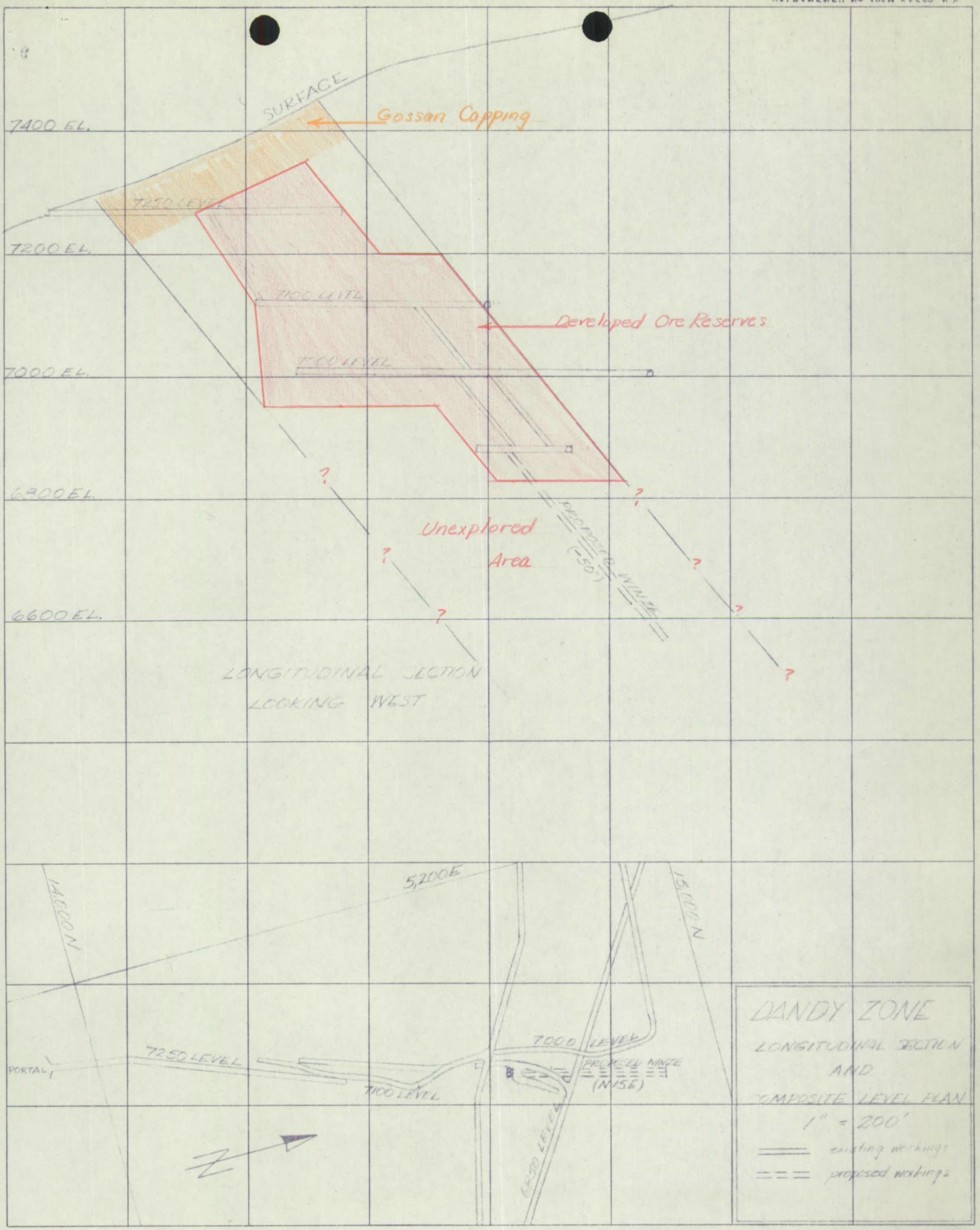
3437


6,000E
7,000E
CALERA 7100 LEVEL
14,000N
MONITOR CLAIM
N
13,000N
PORTAL
HAWKEYE CLAIM
CLEVELAND AREA
PROPOSED
DRIFT AND CROSSCUTS
7100 EL.
1" = 200'
proposed workings
existing workings
mineralized zone

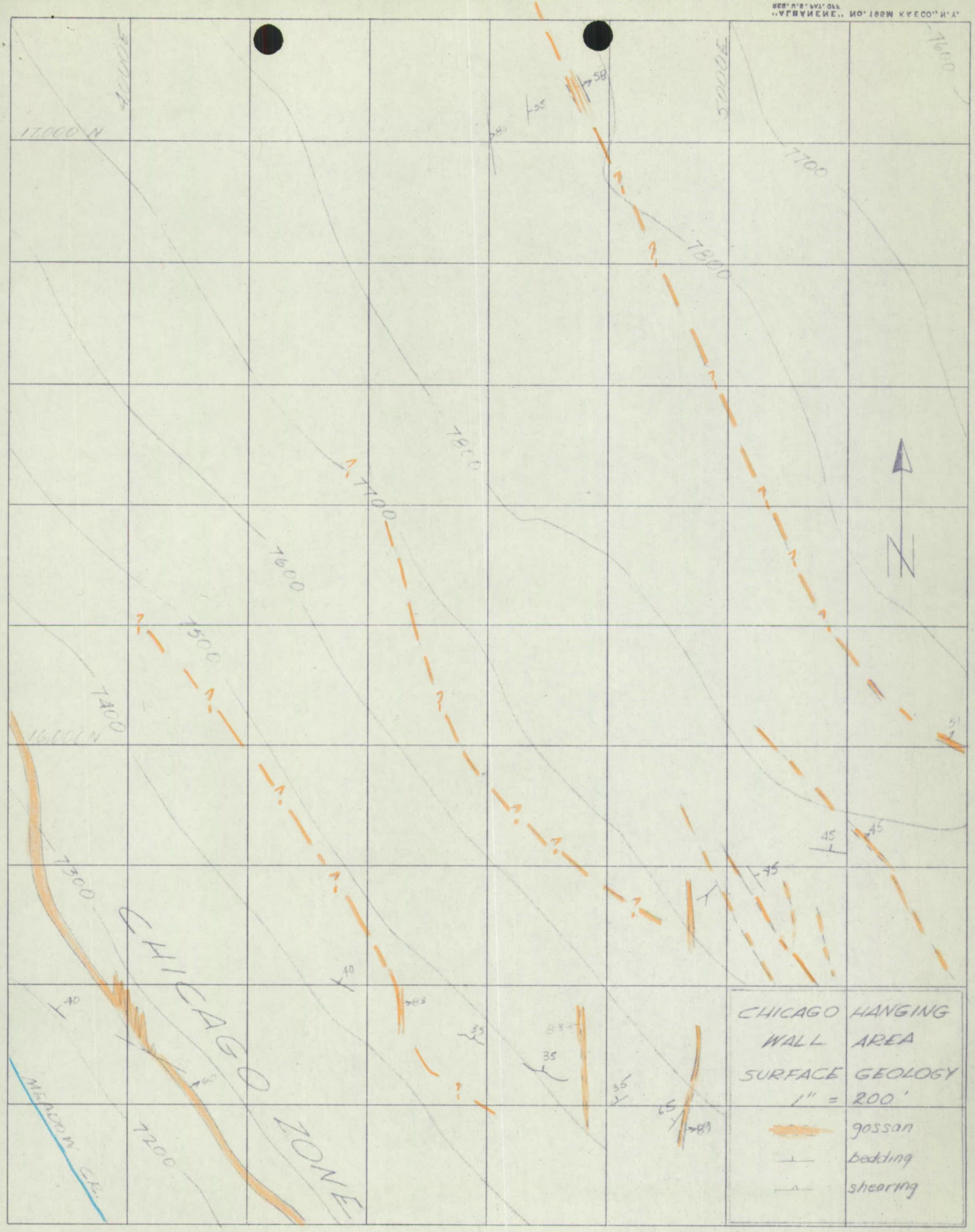
3438


6,000E
7,000E
14,000N
13000N
75
75
80
MONITOR CLAIM
HAWKEYE CLAIM
N
CLEVELAND AREA
6850 LEVEL
1" = 200'

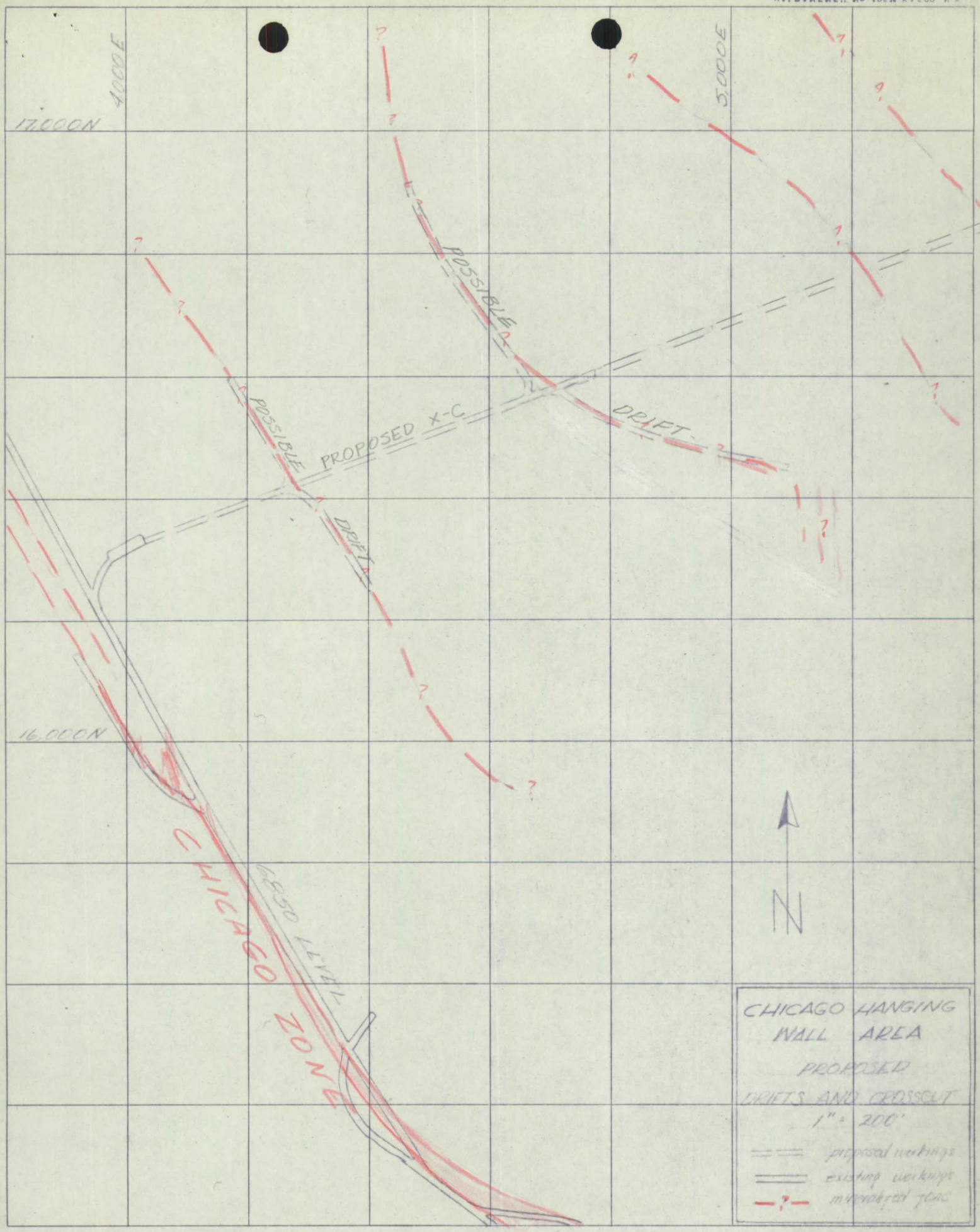
3439
9


SURFACE
Gossan Capping
7400 EL.
7250 LEVEL
7200 EL.
7100 LEVEL
Developed Ore Reserves
7000 LEVEL
7000 EL.
6900 EL.
Unexplored
Area
PROPOSED MINE (-50')
6600 EL.
LONGITUDINAL SECTION
LOOKING WEST
14,000N
5,200E
15,000N
7000 LEVEL
PROPOSED MINE (N15E)
PORTAL
7250 LEVEL
7100 LEVEL
6650 LEVEL
DANDY ZONE
LONGITUDINAL SECTION
AND
COMPOSITE LEVEL PLAN
1" = 200'
existing workings
proposed workings

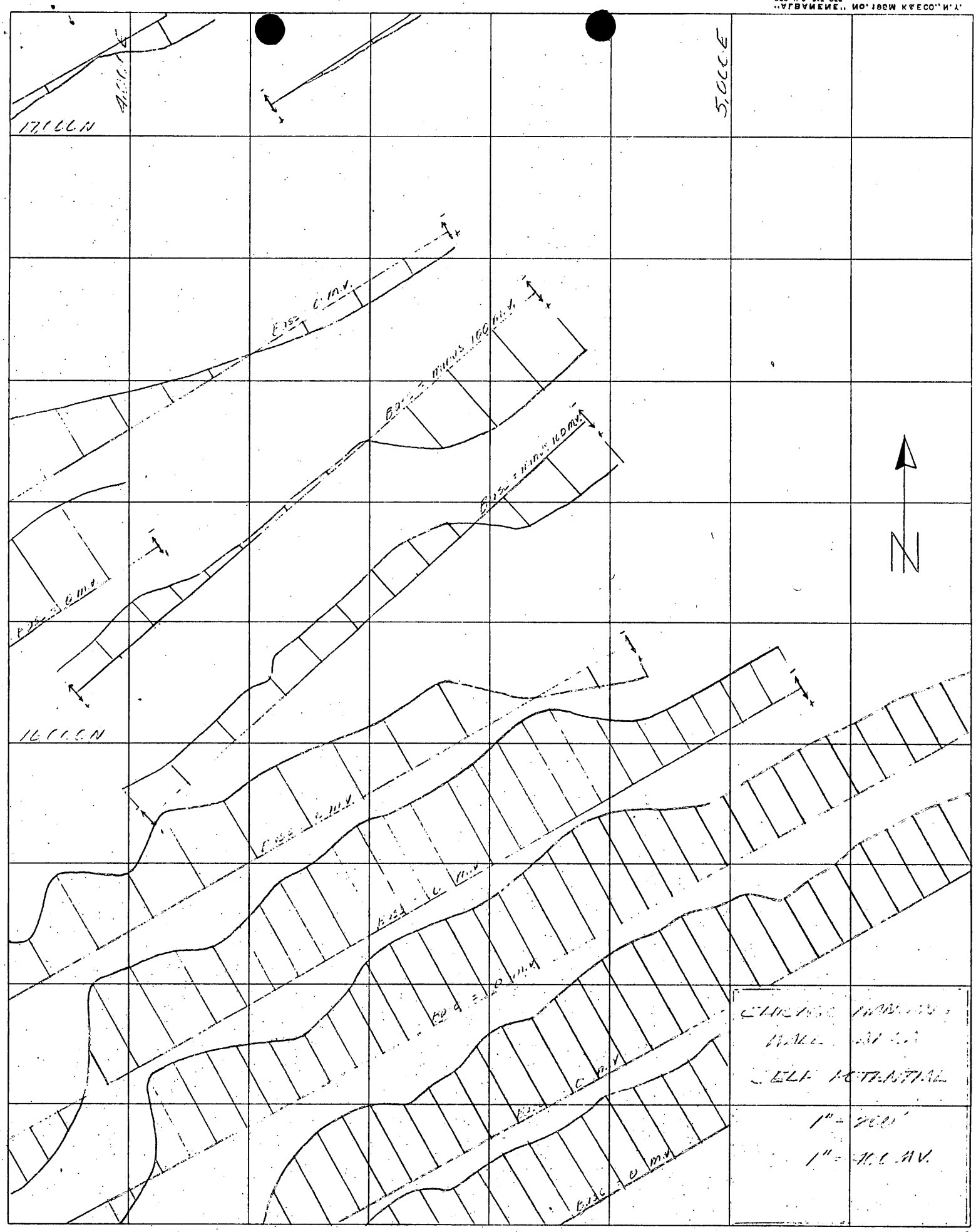
3440


CHICAGO WALL SURFACE 1" = 200'
HANGING AREA GEOLOGY
gossan
bedding
shearing
CHICAGO ZONE
MENDON CK.
17000 N
16000 N
7000 E
7100 E
7200
7300
7400
7500
7600
7700
7800
7900
8000
N

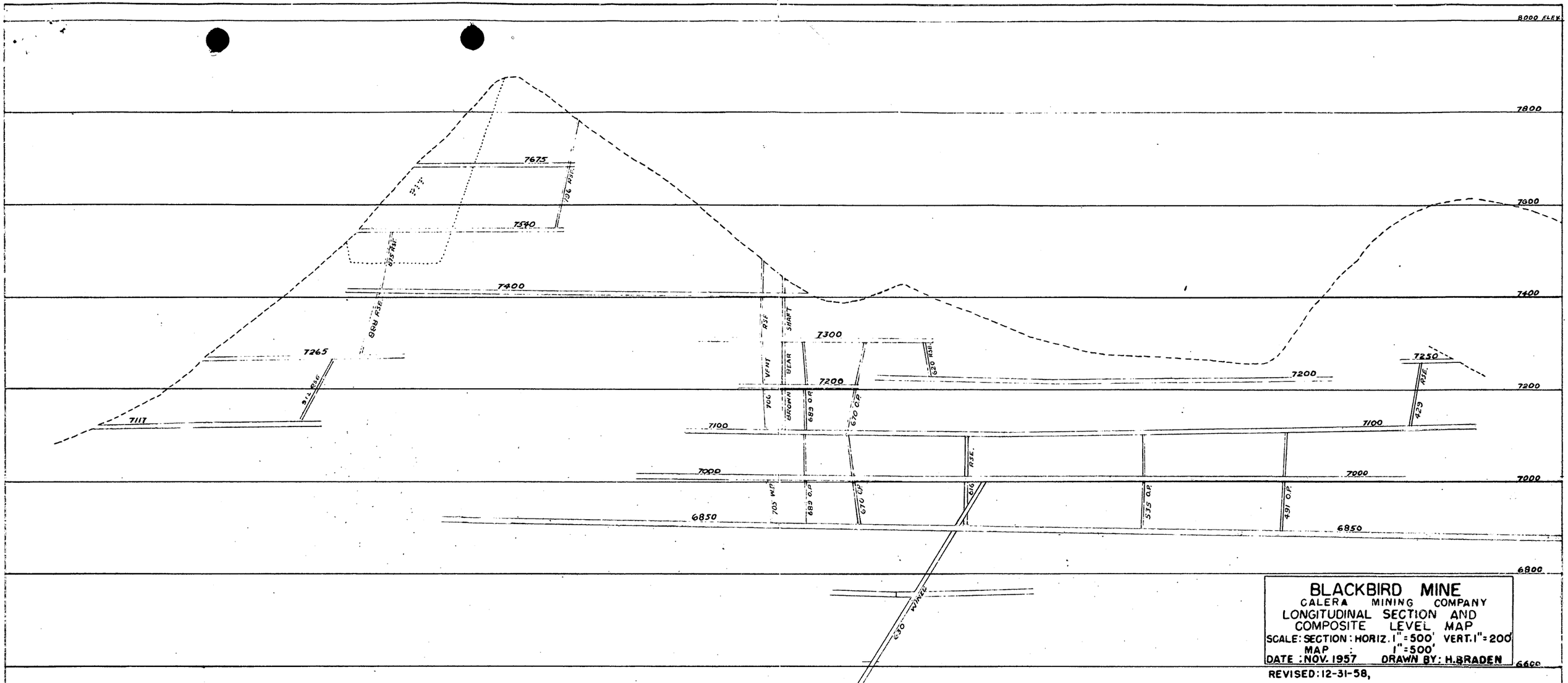
3441


4000E
5000E
17,000N
16,000N
POSSIBLE
POSSIBLE
PROPOSED X-C
DRIFT
DRIFT
CHICAGO ZONE
6550 LEVEL
N
CHICAGO HANGING WALL AREA
PROPOSED DRIFTS AND CROSSCUT
1" = 200'
proposed workings
existing workings
mineralized zone

3442



3443



BLACKBIRD MINE

CALERA MINING COMPANY

LONGITUDINAL SECTION AND COMPOSITE LEVEL MAP

SCALE: SECTION: HORIZ. 1" = 500' VERT. 1" = 200'

MAP : 1" = 500'

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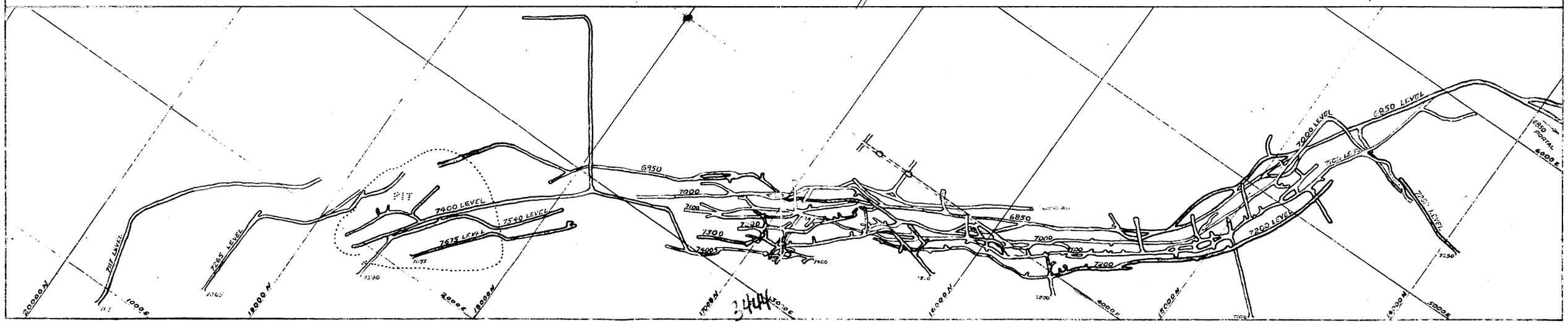
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