Copper Mines Ship Ore to Smelter:

The Queen of Bronze mine located near Takilma has been reactivated for a short time and the tunnels opened up. A carload of copper ore containing about 70 tons was shipped to the Tacoma smelter during May. Max Pokorney is the operator.

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M060661
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... ODGMI 100-446
- MAP CODE NO. OF REC..

REPORTER
- NAME..... JOHNSON, MAUREEN G.
- UPDATED..... 81 02
- BY..... FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
- DEPOSIT NAME..... COWBOY MINE
- SYNONYM NAME..... EAST COWBOY

MINING DISTRICT/AREA/SUBDIST. ALDO

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... JOSEPHINE
DRAINAGE AREA..... 17100311 PACIFIC NORTHWEST
PHYSIOGRAPHIC PROV..... 13 KLAMATH MOUNTAINS
LAND CLASSIFICATION..... 01

QUAD SCALE	QUAD NO OR NAME
1: 62500	CAVE JUNCTION

LATITUDE	LONGITUDE
42-01-10N	123-36-29W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4651902.0	449653.9	+10

TWP..... 41S
RANGE.... 08W
SECTION.. 11
MERIDIAN. W.M.

LOCATION COMMENTS: NE 1/4

OTHER PRODUCTS: AU AG ZN

OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.....
OCCURRENCE..... CU NI AS

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CHALCOPYRITE, COBALTITE, CUBANITE, SPHALERITE, PYRRHOTITE
SUPERGENE: CHALCOCITE, MALACHITE, CUPRITE, TENORITE HEMATITE, LIMONITE

COMMODITY SUBTYPES OR USE CATEGORIES:
0.010 AU:AG

ANALYTICAL DATA(GENERAL)
15.1 -18.65% CU, .24% ZN, .15% CO, AS .11%, 0.11% NI, .08 OZ/TON AU, 8 OZ/TON AG.

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 6
PROPERTY IS INACTIVE
YEAR OF DISCOVERY..... 1900
BY WHOM..... MR. STRONG
YEAR OF FIRST PRODUCTION. 1903

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MASSIVE SULFIDE CYPRUS TYPE
FORM/SHAPE OF DEPOSIT: LENS

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
MAX LENGTH..... 170 FT.
MAX WIDTH..... 7-8 FT.
STRIKE OF OREBODY.... N
DIP OF OREBODY..... 45-65E
COMMENTS(DESCRIPTION OF DEPOSIT):
ROUNDED LUMPS OF MASSIVE SULPHIDE IN 6-8 FT. WIDE FAULT ZONE

DESCRIPTION OF WORKINGS
UNDERGROUND
LENGTH OF WORKINGS..... 2000 FT.

COMMENTS(DESCRIP. OF WORKINGS):
ADITS TOTAL 2000, WINZES, PIT

PRODUCTION
YES
MEDIUM PRODUCTION

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15 CU	EST	0000.750	TONS	1900-1940	
16 ORE	EST	0005.000	TONS	1900-1940	14 % CU; 0.03 OZ/TON AU, TRACE AG
23 ORE, EST		300.000+	DOLLARS	1900-1940	14 CU, 0.03 AU, TR. AG

RESERVES ONLY

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE OR USE
1		DEEP ORE		1933	INF

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... PERM-TRI
HOST ROCK TYPES..... SERPENTINE GREENSTONE GREENSTONE

PERTINENT MINERALOGY..... CALCITE, QUARTZ, EPIDOTE, SERPENTINE GANGUE

IMPORTANT ORE CONTROL/LOCUS.. CONTACT OF GREENSTONE AND SERPENTINE

LOCAL GEOLOGY
NAMES/AGE OF FORMATIONS,UNITS,OR ROCK TYPES
1) NAME: APPLEGATE GROUP
AGE: PERM-TRI

GEOLOGICAL PROCESSES OF CONCENTRATION OR ENRICHMENT:
OXIDATION TO 50 FEET

GENERAL COMMENTS
RECORD NUMBERS (M013259) AND (W000687) HAVE BEEN MERGED WITH THIS RECORD AND DELETED FROM THE OREGON FILE

GENERAL REFERENCES
1) RAMP, L. AND PETERSON, N.V., 1979, GEOLOGY AND MINERAL RESOURCES OF JOSEPHINE COUNTY, OREGON; ODGMI BULL. 100, P. 33.
2) OREGON METAL MINES HANDBOOK, 1942, ODGMI BULL. 14-C, VOL. 2, SEC. 1, P. 186
3) SHENNON, P.J., 1933, GEOLOGY AND ORE DEPOSITS OF THE TAKILMA-WALDO DISTRICT, OREGON; USGS BULL. 846-B, P. 170
4) COURY, ANNY B., ORIGINAL USGS REPORTER

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M060841
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... ODGMI 100-421
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PUFFETT, WILLARD P.
- DATE..... 74 04
- UPDATED..... 81 04
- BY..... FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
- DEPOSIT NAME..... QUEEN OF BRONZE MINE
- MINING DISTRICT/AREA/SUBDIST. TAKILMA DISTRICT
- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES
- STATE CODE..... OR
- STATE NAME: OREGON
- COUNTY..... JOSEPHINE
- DRAINAGE AREA..... 17 ILLINOIS RIVER - ROGUE RIVER
- PHYSIOGRAPHIC PROV..... 13 KLAMATH MOUNTAINS

QUAD SCALE	QUAD NO OR NAME
1: 62500	CAVE JUNCTION OREG-CALIF.

LATITUDE	LONGITUDE
42-02-59N	123-35-55W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4655256.5	450461.6	+10

- TWP..... 040S
- RANGE.... 008W
- SECTION.. 35
- MERIDIAN. WILLAMETTE

ALTITUDE.. 2200 FT

POSITION FROM NEAREST PROMINENT LOCALITY: 1 MILE E. OF TAKILMA, OREGON OR 8 MILES SSE OF CAVE JUNCTION, OREGON

MAJOR PRODUCTS.. CU
MINOR PRODUCTS.. AU AG

OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.....
OCCURRENCE..... ZN

ORE MATERIALS (MINERALS,ROCKS,ETC.):
PYRITE, CHALCOPYRITE, PYRRHOTITE, SPHALERITE; CHALCOCITE, MALACHITE, AZURITE, CUPRITE, CHRYSCOLLA, TENORITE, NATIVE COPPER

COMMODITY COMMENTS:
ORE OCCURS AS DISCONNECTED BODIES, IRREGULAR IN OUTLINE, RANGING FROM MERC STRINGERS TO DEPOSITS AS LARGE AS 10,000 TONS.

ANALYTICAL DATA(GENERAL)
MANY SAMPLES ASSAY APPROXIMATELY 5% CU AND 0.10 OZ AU/TON

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 6
YEAR OF DISCOVERY..... 1862
BY WHOM..... P. ANDROIT
NATURE OF DISCOVERY..... A
YEAR OF FIRST PRODUCTION. 1903
PRESENT/LAST OWNER..... WAITE MINERALS, INC.

WORK DONE BY USGS
YEAR WORK TYPE GEOLOGIST AND RESULTS
1) 1930 GEOLMAP SHENON, P.J. BULL. 846-B

WORK DONE BY OTHER ORGANIZATIONS
YEAR WORK TYPE ORGANIZATION AND RESULTS
1) 1950 DIREXPL U.S.B.M. RPT. - INV. 5187

EXPLOR. AND DEVELOP. COMMENTS:
ORE BODIES TERMINATE ABRUPTLY AND IT IS HAZARDOUS TO PROJECT KNOWN ORE FAR AHEAD.

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MASSIVE SULFIDE
FORM/SHAPE OF DEPOSIT: IRREGULAR LENSES

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
DEPTH TO BOTTOM..... 225 FT
MAX LENGTH..... 500 FT
MAX WIDTH..... 500 FT
COMMENTS(DESCRIPTION OF DEPOSIT):
CYPRUS TYPE

PRODUCTION
YES
SMALL PRODUCTION

ANNUAL PRODUCTION (ORE,COMMOD.,CONC.,OVERBURD.)

	ITEM		ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
1	ORE		ACC	0001.818	TONS		
2	AU		ACC	0000.166	OZ		0.091 OZ/TON
3	AG		ACC	0000.514	OZ		0.283 OZ/TON
4	CU		ACC	0358.542	LB		197.22 LB/TON (9.8 % CU)

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

	ITEM		ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15	ORE	EST		0035.000	SDT	1903-1908, 1910, 1930; 5-15% CU, 0.04-0.44 OZ AU/TON	
16	CU		EST	0003.000	TON	1903-10; 1930	
17	AU		EST	0006.000	OZ	1903-10; 1930	

SOURCE OF INFORMATION (PRODUCTION).. USBM

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... PERM-TRI
HOST ROCK TYPES..... GREENSTONE (METABASALT AND METAGABBRO)

AGE OF ASSOC. IGNEOUS ROCKS.. MESO
IGNEOUS ROCK TYPES..... SERPENTINE

PERTINENT MINERALOGY..... PYRITE, PYRRHOTITE

IMPORTANT ORE CONTROL/LOCUS.. NEAR CONTACT WITH SERPENTINE

LOCAL GEOLOGY
NAMES/AGE OF FORMATIONS,UNITS,OR ROCK TYPES
1) NAME: APPLEGATE GROUP
AGE: PERM-TRI

NAMES/AGE OF IGNEOUS UNITS OR IGNEOUS ROCK TYPES
1) NAME: MESO ? GREENSTONE - METABASALT, METAGABBRO
2) NAME: MESO SERPENTINE

SIGNIFICANT ALTERATION:
OXIDATION EXTENDS 100 FT BELOW SURFACE

COMMENTS (GEOLOGY AND MINERALOGY):
PILLOW BASALTS HOST MINERALIZATION. INTENSE POST-MINERALIZATION FAULTING.

2/13/81

1130E	500N – 2600N	2,100 Ft.
1230E	" "	2,100
1370E	" "	2,100
1440E	" "	2,100
1540E	" "	2,100
1640E	" "	2,100
		12,600 ft
+ E-W base line ~~1,073~~ (1,073 – 1,640)		567
		13,167 ft

5 sets in "C" Level

4 sets in S. of B. + 1 set

Approx 1,000 ft random traverse ~~tieing~~ to tie North Q. of B. to South Q. of B area
Surveyed west end of 'A' Level
minor road improvements on South Q. of B. road and on road to 'c' Level portal

(1) ~~Ladder~~ Replacement 21 ladders in access from 'c' Level to east end of 'A' Level

(2) Installed 40 ft of ~~new~~ ladders in ~~40 ft of raise~~ first raise east of 'c' Level portal

(3) Ladder repairs and cleanup in raise ~~from~~ connecting 'c' Level to 150 Level

QUEEN OF BRONZE, JAPAN MAKE COPPER AGREEMENT

Queen of Bronze Mining & Smelting Company of Grants Pass, Oregon has agreed to export between 19,000 and 28,000 tons (copper content) of copper concentrate over a year's time to the Tokyo Boeki Shokai, a Japanese trading company, for use in Japanese smelters.

The initial shipment, which is expected to reach Japan by September, will be about 1,000 tons. The Queen of Bronze mine in Josephine County, Oregon, is said to have a stock of about 4,000 tons of copper concentrate. The mine had been closed since the end of the war.

The copper will be divided among six leading Japanese copper smelters and will be used to reduce smelting costs and also to meet the shortage of scrap copper.

Mining World, p. 39, August 1953.

U. S. COPPER ORE FOR JAPAN

TOKYO: The Tokyo Boeki Shokai, a Japanese trading company, has concluded a contract with the Queen of Bronze Mining Company, in Oregon, USA, for the importation of between 19,000 tons and 28,000 tons (copper content) of copper concentrates over a year, on behalf of Japanese smelters, it is learned here.

A spokesman of the Tokyo Boeki Shokai said the initial shipment of the copper concentrate is expected to arrive here by September at the latest. It will be about 1,000 tons.

The spokesman said the Queen of Bronze mine had been closed since the end of the war until recently, when the talks for shipment of its products to Japan were started. It is said the mine now has a stock of about 4,000 tons of copper concentrate.

The Nippon Mining Company, one of the largest smelters in Japan, said that the imports were being planned to reduce the smelting cost of copper and also to meet the shortage of scrap copper in Japan. The imported copper concentrate would be divided among six leading copper smelters.

KL/h/BJ 28/6/53 REUTER

From a Reuter's dispatch, the Mining Journal, London, England

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER TRAVERSE
LINE 1640E

DATE OF TRAVERSE: _____ TRAVERSED BY: J. Wiscarson, R. Engle

LOCATION OF DIURNAL BASE STATION: 1370E, 1800N

DBS observation at 1:00 AM/PM: 53103 gammas
DBS observation at 4:00 AM/PM: 53116 gammas
DBS observation at _____ AM/PM: _____ gammas

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500N	2420	3	52636		
525N					
550N					
575N					
600N	2440	2	52677		
625N					
650N					
675N					
700N	2420	4	52484		
725N					
750N					
775N					
800N	2430	4	52540		
825N					
850N					
875N					
900N	2455	4	52631		
925N					
950N					
975N					
1000N	2465	2	52646		
1025N					
1050N					
1075N					
1100N	2460	4	52684		
1125N					
1150N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175 N					
1200 N	2440	4	52725		
1225 N					
1250 N					
1275 N					
1300 N	2435	4	52742		
1325 N					
1350 N					
1375 N					
1400 N	2425	4	52777		
1425 N					
1450 N					
1475 N					
1500 N	2440	4	52877		In outer edge of old skid trail.
1525 N					
1550 N					
1575 N					
1600 N	2470	4	52814		
1625 N					
1650 N					
1675 N					
1700 N	2480	4	52797		
1725 N					
1750 N					
1775 N					
1800 N	2470	3	52812		
1825 N					
1850 N					
1875 N					
1900 N	2460	3	52822		
1925 N					
1950 N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N					
2000 N	2460	2	52752		In inside edge of road cut.
2025 N					
2050 N					
2075 N					
2100 N	2440	4	52879		
2125 N					
2150 N					
2175 N					
2200 N	2420	4	52776		
2225 N					
2250 N					
2275 N					
2300 N	2390	4	52819		
2325 N					
2350 N					
2375 N					
2400 N	2365	3	52816		
2425 N					
2450 N					
2475 N					
2500 N	2355	4	52838		
2525 N					
2550 N					
2575 N					
2600 N	2305	4	52817		

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER PROFILE
LINE 1640 E

8/20/68

ADDENDUM REPORT

QUEEN OF BRONZE MINE — Josephine County

Subject: New Owners: - Mr. & Mrs. Buck Bryant
124 Patton Bar Road
Cave Junction, Oregon

As of Aug. 15, 1968

Purchased at Public Sale the mineral rights to the Queen of Bronze from Josephine County.

Longview Fibre Co. still owns the surface as private land.

NVP:amj

Litigation

QUEEN OF BRONZE-

Data Given by Mr. William Cox A.S.R.
Taken from an A. S. R. File Report by Noel Justin Davenport

Carload Shipped in September 1941:
Dry ton--61

Cu.--13.76%	As.-- .65%
Zn.-- 1.00%	Si02.-- 7.00%
Fe.--37.90%	Ag.-- .30 oz.
S.--27.30%	Ni.-- .21%
Au.-- .08 oz.	CaO.-- 1.00%

Carload gave net returns of $1,083.79

Carload shipped in November 1941:
Dry tons--52

Cu.--13.73%	As.-- .24%
Zn.-- 1.00%	Ag.-- .38oz.
Au.-- .06 oz.	Ni.-- .20%

Carload gave net returns of $838.06

Carload shipped August 1940:
Dry tons--53

Cu.--12.42%	Si02.-- 6.20%
Zn.-- .50%	Al203.- 2.90%
Fe.--39.00%	Ag.---- .27oz.
S.--28.00%	Ni.---- .27%
Au.-- .05oz.	CaO.--- 1.60%
As.-- .24%	

Data given by Mr. William Cox AS R taken
From an ASR file report by E. G. Spillsbury

Cu.--19.21%	Zn.--0.23%
Fe.--25.53%	Au.-- .20oz.
S.-- 0.23%	

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

702 WOODLARK BUILDING
PORTLAND 5, OREGON

Jan 29 1948

General Laboratory Number P-6503 Date received Jan 22

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

Identify

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

Si Ca

Queen of Bronze sorted ore

2. Elements present in concentrations 10% - 1%.

Al Fe Cu

3. Elements present in concentrations 1% - 0.1%.

Mg

4. Elements present in concentrations 0.1% - .01%.

Mn Ti Pb Cr Zn Co

As

5. Elements present in concentrations .01% - .001%.

Ni B V

6. Elements present in concentrations below .001%.

Ag Mo

Hoagy's Assay =

Cu = 5.10 %
Au = 0.10 oz
Ag = 0.30 oz

Thomas C. Matthews, Spectroscopist

T C Matthews

DENISON MINES (U.S.) INCORPORATED — MAGNETOMETER TRAVERSE

QUEEN OF BRONZE PROJECT — LINE 1540E

JOSEPHINE COUNTY, OREGON —

DATE OF TRAVERSE: 10/23/80 (500N - 2600N) 12/16/80 (1850N - 2100N) — TRAVERSED BY: J. Wiscarson, R. Engle

LOCATION OF DIURNAL BASE STATION: 1370E, 1800N

DBS observation at 4:15 AM/PM: 53092 gammas (10/23/80)

DBS observation at 11:00 AM/PM: 53096 gammas (12/16/80)

DBS observation at 12 noon AM/PM: 53091 gammas (12/16/80)

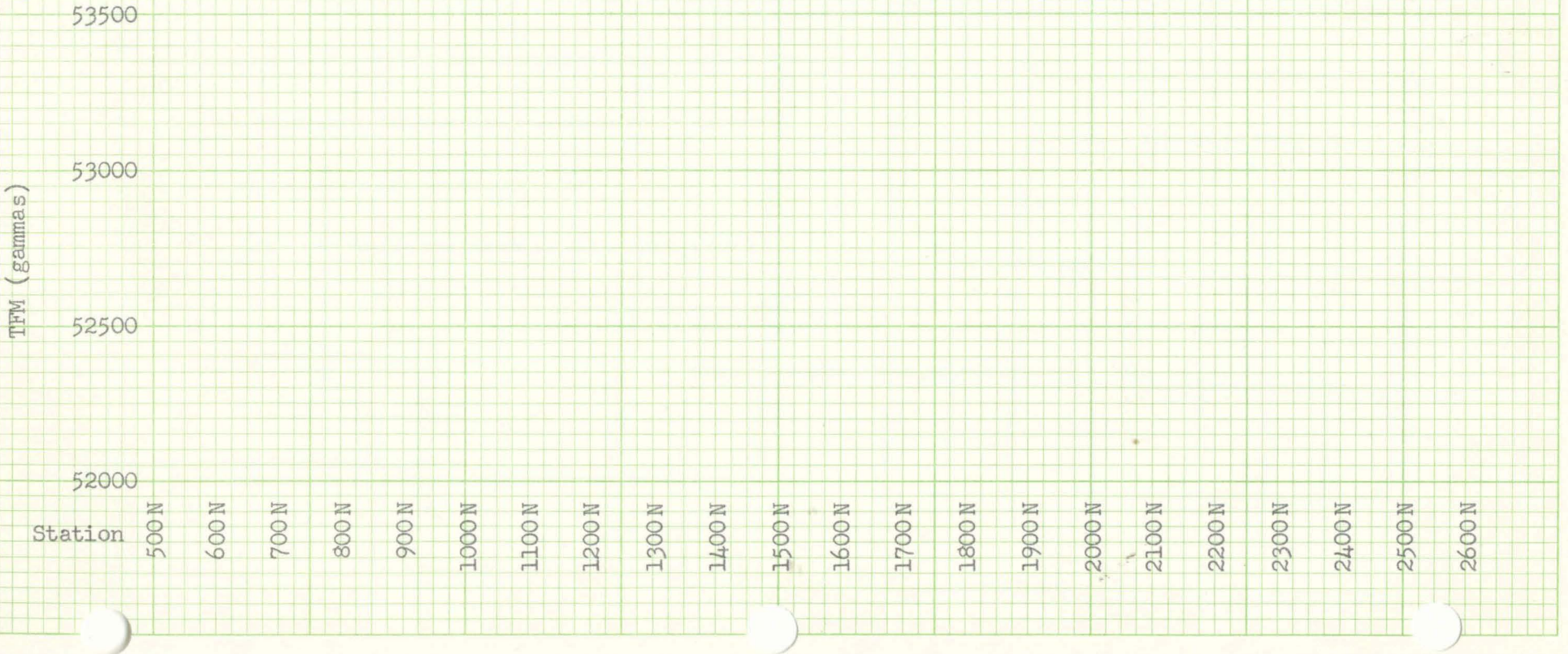
Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500N	2410	3	52808		Below old road cut.
525N					
550N					
575N					
600N	2430	2	52974		Outer edge of old road cut.
625N					
650N					
675N					
700N	2420	7	52827		Bottom of draw.
725N					
750N					
775N					
800N	2425	3	52607		In old road cut.
825N					
850N					
875N					
900N	2440	4	52608		
925N					
950N					
975N					
1000N	2460	2	52716		Adjacent to trench with shaft.
1025N					
1050N					
1075N					
1100N	2440	4	52715		
1125N					
1150N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175 N					
1200 N	2440	3	52791		
1225 N					
1250 N					
1275 N					
1300 N	2420	3	52791		
1325 N					
1350 N					
1375 N					
1400 N	2445	4	52809		
1425 N					
1450 N					
1475 N					
1500 N	2460	4	52830		
1525 N					
1550 N					
1575 N					
1600 N	2460	4	52801		
1625 N					
1650 N					
1675 N					
1700 N	2460	3	52860		
1725 N					
1750 N					
1775 N					
1800 N	2465	4	52813		Outer edge of road.
1825 N					
1850 N			52789	11:15	(begin 12/16/80 readings)
1875 N			52766	11:17	
1900 N	2460	4	52763	11:18	Outer edge of road.
1925 N			52809	11:21	
1950 N			52847	11:23	

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N			52897	11:25	
2000 N	2490	4	52944	11:30	Just below road cut.
2025 N			52980	11:35	
2050 N			52876	11:37	
2075 N			52839	11:39	
2100 N	2510	3	52834	11:41	
2125 N					
2150 N					
2175 N					
2200 N	2500	4	52860		
2225 N					
2250 N					
2275 N					
2300 N	2445	5	52906		
2325 N					
2350 N					
2375 N					
2400 N	2420	3	52868		
2425 N					
2450 N					
2475 N					
2500 N	2420	3	52921		Below road cut.
2525 N					
2550 N					
2575 N					
2600 N	2400	4	52864		

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER PROFILE
LINE 1540 E



DENISON MINES (U.S.) INCORPORATED — MAGNETOMETER TRAVERSE

QUEEN OF BRONZE PROJECT — LINE 1370 E

JOSEPHINE COUNTY, OREGON — PAGE 1 of 3

DATE OF TRAVERSE: 11/23/80 (1475N - 1800N), 12/10/80 (500N - 1450N), 12/10/80 (1825N - 2600N) — TRAVERSED BY: J. Wiscarson, R. Engle

LOCATION OF DIURNAL BASE STATION: 1370 E, 1800 N

DBS observation at 11:30 AM/PM: 53072 gammas; 2:30 PM: 53074 (both on 11/23/80)

DBS observation at 1:35 AM/PM: 53067 gammas; 3:25 PM: 53073 (both on 12/10/80)

DBS observation at _____ AM/PM: _____ gammas

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500 N	2460	4	52902	15:13	Station amid old rusty cans.
525 N			53460	15:11	
550 N			53277	15:09	
575 N			53335	15:07	
600 N	2470	2	52982	15:05	Station over serpentine.
625 N			52669	15:04	
650 N			52639	15:02	
675 N			52536	15:00	
700 N	2470	4	52516	14:58	
725 N			52676	14:56	
750 N			53014	14:54	
775 N			52929	14:52	
800 N	2450	3	52207	14:50	
825 N			52842	14:48	
850 N			52789	14:46	
875 N			52458	14:45	
900 N	2460	3	52526	14:44	At south edge of "glory hole".
925 N			52130	14:42	In "glory hole".
950 N			52286	14:41	In "glory hole".
975 N			52462	14:38	Edge of "glory hole".
1000 N	2450	3	52561	14:37	At north edge of "glory hole".
1025 N					
1050 N					
1075 N					
1100 N	2450	2	52689	14:35	
1125 N					
1150 N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175 N					
1200 N	2440	7	52674	14:33	In bottom of gully.
1225 N					
1250 N					
1275 N					
1300 N	2470	3	52710	14:29	In road cut.
1325 N			52718	14:27	
1350 N			52784	14:26	
1375 N			52925	14:24	
1400 N	2450	3	52871	14:22	In middle of road.
1425 N			53016	14:21	
1450 N			53076	14:20	(end 12/10/80 readings)
1475 N			52768	13:35	(begin 11/23/80 readings)
1500 N	2470	4	53336	13:37	
1525 N			52768	13:39	
1550 N			52733	13:41	
1575 N			52896	13:43	
1600 N	2480	4	52794	13:45	
1625 N			53214	13:47	
1650 N			52928	13:49	
1675 N			52628	13:51	
1700 N	2490	3	52652	13:53	
1725 N			52599	13:54	
1750 N			52767	13:56	
1775 N			52990	13:58	
1800 N	2500	4	53074	14:00	In middle of road. (end 11/23/80 readings)
1825 N			52961	13:45	(begin 12/10/80 readings)
1850 N			52917	13:47	
1875 N			52863	13:49	
1900 N	2550	4	52821	13:50	
1925 N					
1950 N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N					
2000 N	2565	4	52784	13:51	Station directly below road cut.
2025 N					
2050 N					
2075 N					
2100 N	2580	2	52846	13:53	On inner edge of road cut.
2125 N					
2150 N					
2175 N					
2200 N	2560	4	52892	13:55	On outer edge of road cut.
2225 N					
2250 N					
2275 N					
2300 N	2520	5	52853	13:57	
2325 N					
2350 N					
2375 N					
2400 N	2470	4	52915	13:59	
2425 N					
2450 N					
2475 N					
2500 N	2450	4	52860	14:01	
2525 N					
2550 N					
2575 N					
2600 N	2410	4	52869	14:03	

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER TRAVERSE
LINE 1230E

DATE OF TRAVERSE: _____ TRAVERSED BY: J. Wiscarson, R. Engle

LOCATION OF DIURNAL BASE STATION: 1370E, 1800N

DBS observation at 4:00 AM/PM: 53126 gammas
DBS observation at 5:00 AM/PM: 53128 gammas
DBS observation at _____ AM/PM: _____ gammas

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500N	2460	4	53480		
525N					
550N					
575N					
600N	2490	2	52994		
625N					
650N					
675N					
700N	2470	4	53056		
725N					
750N					
775N					
800N	2460	4	52541		In road cut and old dump.
825N					
850N					
875N					
900N	2450	4	52502		Below "glory hole", South Q of B
925N					
950N					
975N					
1000N	2460	4	52592		Below old workings.
1025N					
1050N					
1075N					
1100N	2400	4	52612		
1125N					
1150N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175 N					
1200 N	2430	4	52674		
1225 N					
1250 N					
1275 N					
1300 N	2420	4	52638		
1325 N					
1350 N					
1375 N					
1400 N	2440	4	52846		
1425 N					
1450 N					
1475 N					
1500 N	2480	4	53326		
1525 N					
1550 N					
1575 N					
1600 N	2480	4	52278		Below road cut.
1625 N					
1650 N					
1675 N					
1700 N	2500	4	53019		
1725 N					
1750 N					
1775 N					
1800 N	2500	4	52698		
1825 N					
1850 N					
1875 N					
1900 N	2480	4	52819		
1925 N					
1950 N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N					
2000 N	2480	4	52809		At edge of "glory hole", No. Q of B
2025 N					
2050 N					
2075 N					
2100 N	2480	5	52801		In "glory hole", North Q of B.
2125 N					
2150 N					
2175 N					
2200 N	2500	2	52881		At edge of "glory hole", No. Q of B
2225 N					
2250 N					
2275 N					
2300 N	2460	4	52984		Below old workings.
2325 N					
2350 N					
2375 N					
2400 N	2440	4	52836		
2425 N					
2450 N					
2475 N					
2500 N	2420	4	52934		
2525 N					
2550 N					
2575 N					
2600 N	2380	4	52906		In old road cut.

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER PROFILE
LINE 1230 E

Basic key to topography

(1) steep sided Ridge top or hill top

(2) Less steep Ridge top or hill top

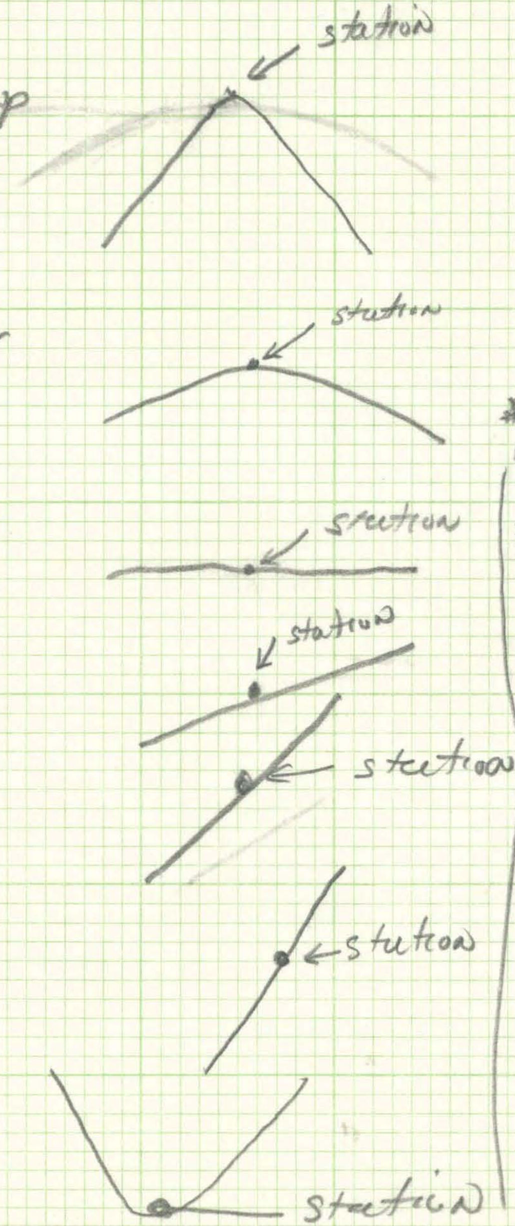
(3) Flat around

(4) side hill 0-30°

(5) side hill 30-45°

(6) side hill 45°-90°

(7) creek bottom



John - Bob -

Be sure and Record your Di-urnal reading at same spot in AM + PM. Also Be sure and Record the Gamma - setting that the tune knob is set ON.

Your Note book should include the following into:

* Elevation	Station	Reading	topography	Location Notes, etc.
3,100	18N, 4E	57,562	3	state here if you are going up a hill, contouring a side hill, going down hill, etc., to your next station.

* I will bring down an altimeter for you to use

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER PROFILE
LINE 1370E

10/23/80

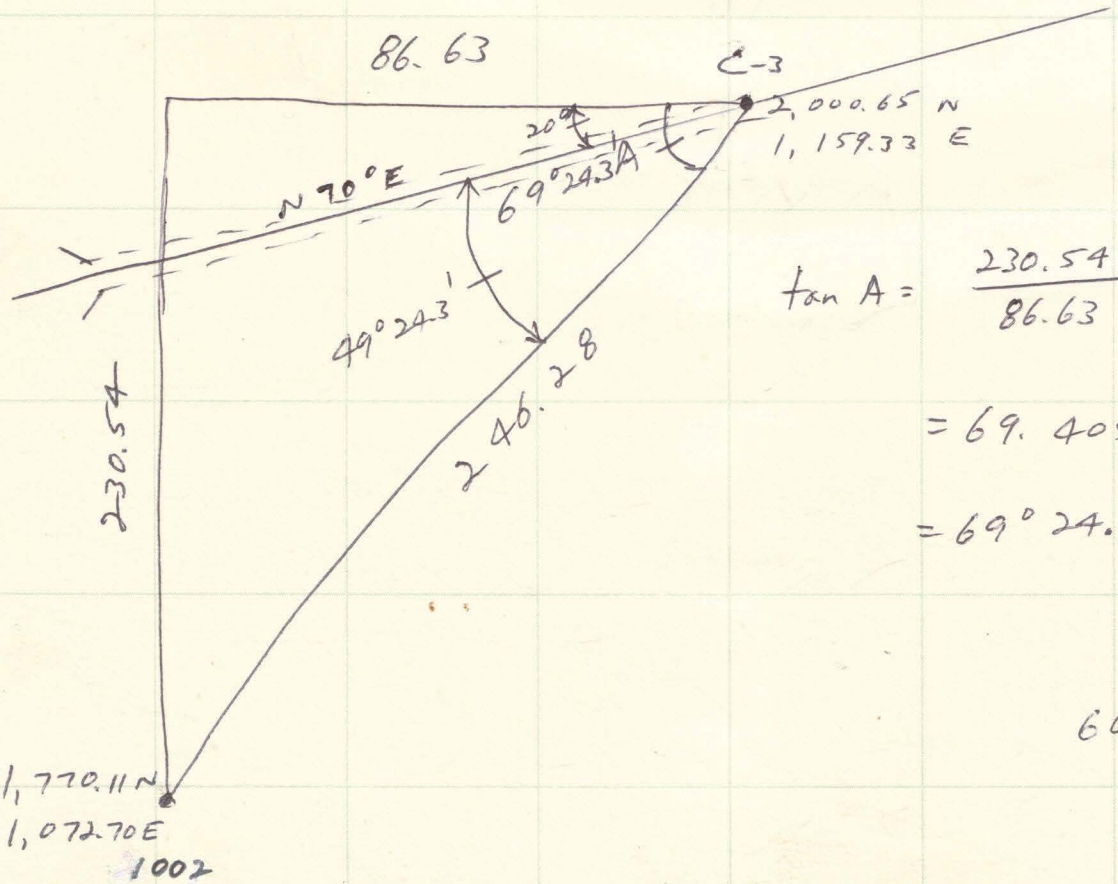
ELEVATION	STATION	READING	TOPOGRAPHY	LOCATION NOTES ECT.	Setting
— URINE TEST 1:00 PM — AT					⇦
12/10	LINE 1370E				
52869	2600 N	52873	4	N. End of N-S line	53
52860	2500 N	52860	4		
52915	2400 N	52921	4		
52853	2300 N	52858	5		
52892	2200 N	52905	4	Station at	outer ^ edge of road cut
52846	2100 N	52844	2	station on	inner edge of road cut
52784	2000 N	52786	3 4	Station Imme	diately below road cut
52821	1900 N	52823	3 4		
11/23 53074	1800 N	53071	4	Station in	middle of road
52652	1700 N	52640	3		
52794	1600 N	52771	4		
53336	1500 N	53467	4		
12/10 52871	1400 N	52852	3	Station middle	of road
52710	1300 N	52711	3	station in	road cut
52674	1200 N	52674	3 7	station in	bottom of gully
52689	1100 N	52700	3 2	station on	top of gen
52561	1000 N	52561	3	station on	N. edge of South Bronze glory hole
52526	0900 N	52507	3	station on	S. edge of South Bronze glory hole
52207	0800 N	53246	3		
52516	0700 N	52507	4		
52982	0600 N	52925	3 2	over Serpen	tine
52902	0500 N	52819	4	station in	midst of old rusty cans
	arbitrary reading 100ft S. of last				station → 52981

1900 N LINE 1370 E — 53140

Station nos. will decrease to the South.

C-3 2,000.65 N
1,159.33 E

1002
~~2001~~ 1,770.11 N
1,072.70 E



$\tan A = \frac{230.54}{86.63} = 2.6612$

$= 69.4053$

$= 69° 24.3'$

60,653.449

MINE LOCATION LEVEL
GEOLOGY BY SURVEY DATE SCALE
N E EL.

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER TRAVERSE
LINE 1230E

DATE OF TRAVERSE: _____ TRAVERSED BY: J. Wiscarson, R. Engle

LOCATION OF DIURNAL BASE STATION: 1370E, 1800N

DBS observation at _____ AM/PM: _____ gammas
DBS observation at _____ AM/PM: _____ gammas
DBS observation at _____ AM/PM: _____ gammas

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500N	2460	4			
525N					
550N					
575N					
600N	2490	2			
625N					
650N					
675N					
700N	2470	4			
725N					
750N					
775N					
800N	2460	4			In road cut and old dump.
825N					
850N					
875N					
900N	2450	4			Below "glory hole", South Q of B
925N					
950N					
975N					
1000N	2460	4			Below old workings.
1025N					
1050N					
1075N					
1100N	2400	4			
1125N					
1150N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175 N					
1200 N	2430	4			
1225 N					
1250 N					
1275 N					
1300 N	2420	4			
1325 N					
1350 N					
1375 N					
1400 N	2440	4			
1425 N					
1450 N					
1475 N					
1500 N	2480	4			
1525 N					
1550 N					
1575 N					
1600 N	2480	4			Below road cut.
1625 N					
1650 N					
1675 N					
1700 N	2500	4			
1725 N					
1750 N					
1775 N					
1800 N	2500	4			
1825 N					
1850 N					
1875 N					
1900 N	2480	4			
1925 N					
1950 N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N					
2000 N	2480	4			At edge of "glory hole", No. Q of B
2025 N					
2050 N					
2075 N					
2100 N	2480	5			In "glory hole", North Q of B.
2125 N					
2150 N					
2175 N					
2200 N	2500	2			At edge of "glory hole", No. Q of B
2225 N					
2250 N					
2275 N					
2300 N	2460	4			Below old workings.
2325 N					
2350 N					
2375 N					
2400 N	2440	4			
2425 N					
2450 N					
2475 N					
2500 N	2420	4			
2525 N					
2550 N					
2575 N					
2600 N	2380	4			In old road cut.

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER TRAVERSE
LINE 1230E

DATE OF TRAVERSE: _____ TRAVERSED BY: J. Wiscarson, R. Engle

LOCATION OF DIURNAL BASE STATION: 1370E, 1800N

DBS observation at 4:00 AM/PM: 53126 gammas

DBS observation at 5:00 AM/PM: 53128 gammas

DBS observation at _____ AM/PM: _____ gammas

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500N	2460	4	53480		
525N					
550N					
575N					
600N	2490	2	52994		
625N					
650N					
675N					
700N	2470	4	53056		
725N					
750N					
775N					
800N	2460	4	52541		In road cut and old dump.
825N					
850N					
875N					
900N	2450	4	52502		Below "glory hole", South Q of B
925N					
950N					
975N					
1000N	2460	4	52592		Below old workings.
1025N					
1050N					
1075N					
1100N	2400	4	52612		
1125N					
1150N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175 N					
1200 N	2430	4	52674		
1225 N					
1250 N					
1275 N					
1300 N	2420	4	52638		
1325 N					
1350 N					
1375 N					
1400 N	2440	4	52846		
1425 N					
1450 N					
1475 N					
1500 N	2480	4	53326		
1525 N					
1550 N					
1575 N					
1600 N	2480	4	52278		Below road cut.
1625 N					
1650 N					
1675 N					
1700 N	2500	4	53019		
1725 N					
1750 N					
1775 N					
1800 N	2500	4	52698		
1825 N					
1850 N					
1875 N					
1900 N	2480	4	52819		
1925 N					
1950 N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N					
2000 N	2480	4	52809		At edge of "glory hole", No. Q of B
2025 N					
2050 N					
2075 N					
2100 N	2480	5	52801		In "glory hole", North Q of B.
2125 N					
2150 N					
2175 N					
2200 N	2500	2	52881		At edge of "glory hole", No. Q of B
2225 N					
2250 N					
2275 N					
2300 N	2460	4	52984		Below old workings.
2325 N					
2350 N					
2375 N					
2400 N	2440	4	52836		
2425 N					
2450 N					
2475 N					
2500 N	2420	4	52934		
2525 N					
2550 N					
2575 N					
2600 N	2380	4	52906		In old road cut.

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER TRAVERSE
LINE 1640E

DATE OF TRAVERSE: _____ TRAVERSED BY: J. Wiscarson, R. Engle

LOCATION OF DIURNAL BASE STATION: 1370E, 1800N

DBS observation at 1:00 AM/PM: 53103 gammas
DBS observation at 4:00 AM/PM: 53116 gammas
DBS observation at _____ AM/PM: _____ gammas

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500N	2420	3	52636		
525N					
550N					
575N					
600N	2440	2	52677		
625N					
650N					
675N					
700N	2420	4	52484		
725N					
750N					
775N					
800N	2430	4	52540		
825N					
850N					
875N					
900N	2455	4	52631		
925N					
950N					
975N					
1000N	2465	2	52646		
1025N					
1050N					
1075N					
1100N	2460	4	52684		
1125N					
1150N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175N					
1200N	2440	4	52725		
1225N					
1250N					
1275N					
1300N	2435	4	52742		
1325N					
1350N					
1375N					
1400N	2425	4	52777		
1425N					
1450N					
1475N					
1500N	2440	4	52877		In outer edge of old skid trail.
1525N					
1550N					
1575N					
1600N	2470	4	52814		
1625N					
1650N					
1675N					
1700N	2480	4	52797		
1725N					
1750N					
1775N					
1800N	2470	3	52812		
1825N					
1850N					
1875N					
1900N	2460	3	52822		
1925N					
1950N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N					
2000 N	2460	2	52752		In inside edge of road cut.
2025 N					
2050 N					
2075 N					
2100 N	2440	4	52879		
2125 N					
2150 N					
2175 N					
2200 N	2420	4	52776		
2225 N					
2250 N					
2275 N					
2300 N	2390	4	52819		
2325 N					
2350 N					
2375 N					
2400 N	2365	3	52816		
2425 N					
2450 N					
2475 N					
2500 N	2355	4	52838		
2525 N					
2550 N					
2575 N					
2600 N	2305	4	52817		

OPTION AGREEMENT

1. For and in consideration of the sum of $50 cash in hand paid to SELLER, receipt of which is hereby acknowledged by SELLER, and the mutual covenants herein contained, JOSEPHINE COUNTY OREGON, pursuant to the duly and regularly authorized action of its Board of County Commissioners, hereinafter called SELLER, hereby gives and grants unto LLOYD E. FRIZZELL, RAYMOND SALISBURY, FRED DAYTON, LOUIS F. SCHULTZ, GEORGE S. FUJII, PAUL C. DEIZKILL and NORMAN I. EASLEY, their successors and assigns, hereafter called BUYER, the exclusive option to purchase, for the sum of TWENTY-FIVE THOUSAND ($25,000.00) DOLLARS cash, on or before one (1) year from date hereof, all of the minerals, mineral rights and claims owned by JOSEPHINE COUNTY, OREGON, which are situated in Josephine County, Oregon, in Townships 40 and 41 South in Range 8 West of the Willamette Meridian, being on the real property more fully described as follows:

PARCEL I: The West Half of the Northeast Quarter and the East Half of the Northwest Quarter of Section 35, Township 40 South, Range 8 West of the Willamette Meridian, in Josephine County, Oregon, Less the Northwest Quarter of the Southeast Quarter of the Northwest Quarter, and also less 1 acre described as follows: Beginning at the Northwest corner of the East Half of the Northwest Quarter of Section 35; thence run South 207.4 feet to the Corner No. 2; thence South 89°42' East 210 feet to Corner No. 3; thence North 207.4 feet to Corner No. 4; thence North 89°42' West 210 feet to the place of beginning.

PARCEL II: The Northwest Quarter of Section 36, Township 40 South, Range 8 West of the Willamette Meridian, in Josephine County, Oregon.

PARCEL III: Mineral Lot 416, according to the official Government Survey as described in Mineral Patent from the United States of America, recorded in Volume 24, Page 272 of Josephine County Deed Records.

Mineral Lot 522, according to the official Government Survey as described in Mineral Patent from the United States of America, recorded in Volume 25, Page 346-349, of Josephine County Deed Records.

Together with all appurtenances, improvements and hereditaments thereunto appertaining.

2. BUYER may exercise this option at any time during one (1) year from date

effectuate such purpose.

3. This option may be exercised only by payment to SELLER of the option price of $25,000 in cash at any time on or before one (1) year from the date hereof. The performance of geophysical and geological work mentioned hereafter is not a condition precedent to exercise of such option, it being secured by said cash deposit, or so much as remains with SELLER.

4. BUYER shall be entitled to enter on such property for purposes of performing the geophysical and geological survey, and throughout the term of this agreement only, and this right shall terminate at the end of the option period. SELLER shall not use such property or allow it to be used so as to conflict or interfere with BUYER'S study, the survey, or BUYER's rights hereunder.

5. Should BUYER fail to exercise this option strictly within the time and in the manner herein prescribed, or breach any term or condition hereof, SELLER shall be entitled to the immediate and exclusive possession of the said property, with absolute and unconditional right of possession, regardless of any act or acts before that time performed by BUYER, and regardless of any improvements, part performances hereof or other acts of the parties hereto, and in any of such events, BUYER shall be deemed to be a trespasser and SELLER shall be entitled to all summary remedies to remove BUYER, their heirs, successors and assigns from the premises immediately.

6. All improvements placed on said property by BUYER shall be owned absolutely by SELLER, and title thereto shall vest in SELLER upon expiration of this option agreement unless it be exercised.

7. On proper exercise of this option, SELLER will convey merchantable title in and to all of its right, title and interest in and to the aforementioned property to BUYER, and transfer same by appropriate Bargain and Sale Deed. SELLER agrees to remove prior encumbrances against the property therefrom by such time.

8. On execution hereof, in addition to the $50 option money, BUYERS have deposited with SELLER the sum of $2,500 in cash, receipt of which SELLER acknowledges, in addition to the $50 option money. Such $2,500 is to be held by SELLER as security for the

geophysical work to a qualified geophysical company, and such geological work will be done by LLOYD FRIZZELL, and SELLER agrees that upon being presented with an executed copy of a contract between BUYER and such geophysical company, agreeing to perform such work, SELLER will refund to BUYER $750 of said $2,500 deposit. The remaining $1,750 will be held as security for the completion of such work and report thereof. BUYER agrees that from the completed geophysical and geological report, on or before expiration of this option, and regardless of whether the same be exercised, they will turn over to SELLER so much of such report as covers SELLER's property herein described, or lose the security deposit then remaining or a copy of the full report. Upon proper completion of the full report, and delivery thereof to an agreed-upon escrow agent, SELLER agrees to simultaneously pay the balance of such deposit; namely, $1,750, to such company or to BUYER as directed. Such full report is to be held by the escrow agent, in the strictest confidence, until the expiration of this option period or until that portion of such report covering SELLER's property is delivered by BUYER to SELLER, whichever first occurs. If such partial report last mentioned is not delivered to SELLER by expiration of this option, then said escrow shall deliver the copy of the full report to SELLER; if such partial report be delivered on or before such time, the copy of the full report will be returned to BUYER, and its contents will remain the exclusive and confidential property of the BUYER, except as to the information in the partial report. It is understood that the said $2,500 deposit, or, in event of a partial refund, the remaining $1,750, is the entire security for performance in this paragraph provided, and should BUYER fail to so perform the security deposit remaining with SELLER will become the absolute property of the SELLER as full and exclusive compensation for BUYER's failure to so perform. Performance under this paragraph is secured by such deposit, and is not a condition precedent to exercise of the option. The escrow agent will be LEN RAMP, or, in the alternative, NORMAN PETERSON, either of the Southern Oregon Office of the State of Oregon Department of Geology and Mineral Industries, in Grants Pass, Oregon; provided that, for purposes of securing the completed report initially from the geophysical company, another temporary escrow may be chosen by the parties.

9. BUYER expects to assign their rights under this option within the near future, and it is expressly understood that there is no restriction on assignment hereof. The

terms and conditions hereof, and rights and privileges conferred hereunto, shall inure to the benefit of and be binding upon the heirs, successors and assigns of each of the parties hereto, and likewise, wherever the term "BUYER" and the term "SELLER" is used, it shall include within its meaning, the heirs, successors and assigns of such person or entity, and the plural as well as the singular.

IN WITNESS WHEREOF, pursuant to authority duly vested in them, the JOSEPHINE COUNTY BOARD OF COUNTY COMMISSIONERS have hereunto affixed their signatures this _____ day of APRIL, 1963.

JOSEPHINE COUNTY, OREGON
BOARD OF COUNTY COMMISSIONERS

_____
County Commissioner

_____
County Commissioner

_____
County Commissioner

REPORT ON THE
INDUCED POLARIZATION
AND
RESISTIVITY SURVEY
QUEEN OF BRONZE MINES, OREGON
FOR
ASSOCIATED GEOLOGISTS

McPHAR GEOPHYSICS LIMITED

NOTES ON THE THEORY OF INDUCED POLARIZATION AND THE METHOD OF FIELD OPERATION

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water. The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d.c. current is allowed to flow through

the rock; i. e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces to effectively stop all current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d. c. voltage used to create this d. c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the "metal factor" or "M. F." are a measure of the amount of polarization present in the rock mass being surveyed. This parameter has been found to be very successful in mapping areas of sulphide mineralization, even those in which all other geophysical methods have been unsuccessful. The induced polarization measurement is more sensitive to sulphide content than other electrical measurements

because it is much more dependent upon the sulphide content. As the sulphide content of a rock is increased, the "metal factor" of the rock increases much more rapidly than the resistivity decreases.

Because of this increased sensitivity, it is possible to locate and outline zones of less than 10% sulphides that can't be located by E. M. Methods. The method has been successful in locating the disseminated "porphyry copper" type mineralization in the Southwestern United States.

Measurements and experiments also indicate that it should be possible to locate most massive sulphide bodies at a greater depth with induced polarization than with E. M.

Since there is no I. P. effect from any conductor unless it is metallic, the method is useful in checking E. M. anomalies that are suspected of being due to water filled shear zones or other ionic conductors. There is also no effect from conductive overburden, which frequently confuses E. M. results. It would appear from scale model experiments and calculations that the apparent metal factors measured over a mineralized zone are larger if the material overlying the zone is of low resistivity.

Apropos of this, it should be stated that the induced polarization measurements indicate the total amount of metallic constituents in the rock. Thus all of the metallic minerals in the rock, such as pyrite, as well as the ore minerals chalcopyrite, chalcocite, galena, etc. are responsible for the induced polarization effect. Some

oxides such as magnetite, pyrolusite, chromite, and some forms of hematite also conduct by electrons and are metallic. All of the metallic minerals in the rock will contribute to the induced polarization effect measured on the surface.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points a distance (X) apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes. The distance between the nearest current and potential electrodes is an integer number (N) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (NX) between the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (N); i. e. (N) = 1, 2, 3, 4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (N) used.

In plotting the results, the values of the apparent resistivity and the apparent metal factor measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. The resistivity values are plotted above the line and the metal factor values below. The lateral displacement of a given value is determined by the location along the survey

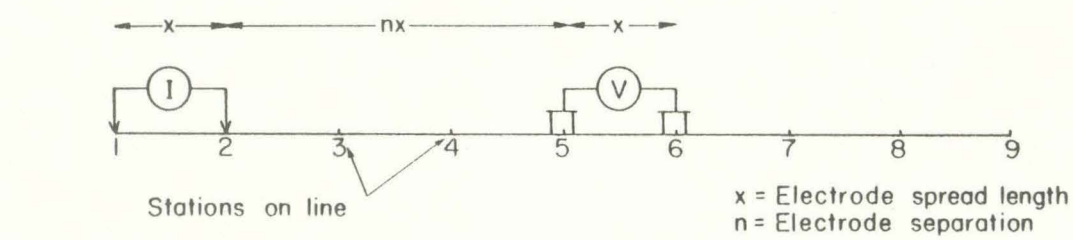
line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (NX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. These plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field, model and theoretical investigations. The position of the electrodes when anomalous values are measured must be used in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made. One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 100 feet to 1000 feet for (X). In each case, the decision as to the distance (X) and the values of (N) is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure 1 below demonstrates the method used in plotting the results. Each value of the apparent resistivity and the apparent "Metal factor" is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i. e. the depth of the measurement is increased.

METHOD USED IN PLOTTING DIPOLE-DIPOLE
INDUCED POLARIZATION AND RESISTIVITY RESULTS



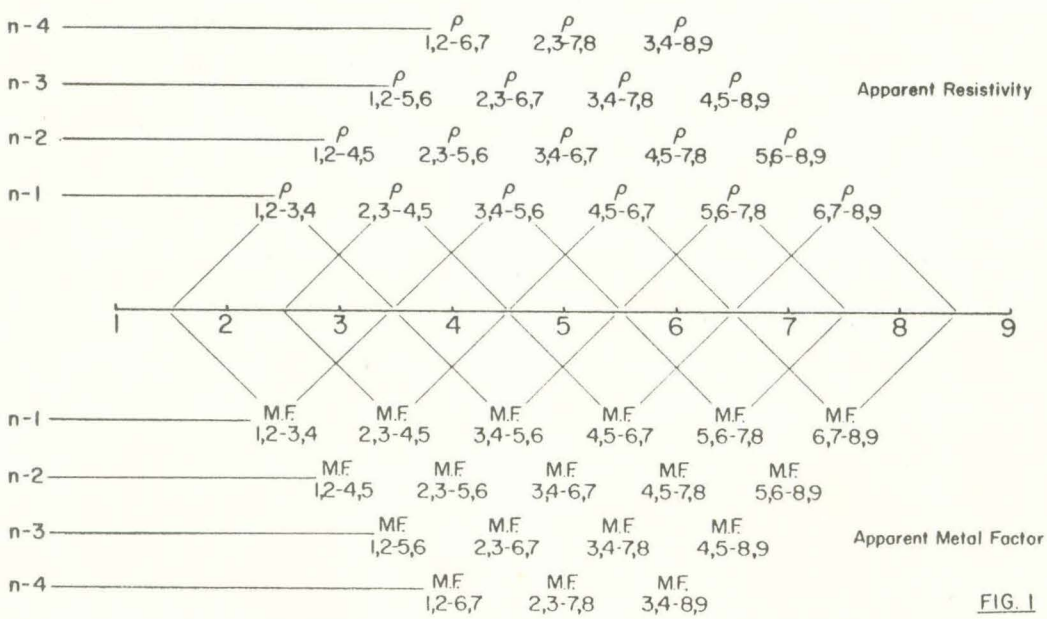


FIG. 1

McPHAR GEOPHYSICS LIMITED

REPORT ON THE

INDUCED POLARIZATION AND RESISTIVITY SURVEY

QUEEN OF BRONZE MINES, OREGON

FOR

ASSOCIATED GEOLOGISTS

1. INTRODUCTION

At the request of Mr. Lloyd E. Frizzell of Associated Geologists a combined induced pollarization resistivity survey has been carried out on the Queen of Bronze Mine property. The Queen of Bronze Mine is located in the Takilma Copper Belt, Josephine County, Oregon. It was the largest mine in the area and is reported to have produced 35, 000 tons of 5 to 16 percent copper ore. The mineral assemblage included pyrite, chalcopyrite, pyrrhotite, sphalerite and some secondary chalcocite. Like other metallic deposits in the area, the Queen of Bronze occurs in a greenstone roof pendant, near the contact with the large peridotite mass.

The purpose of the survey was to establish whether appreciable metallic material remained in the vicinity of the old workings and to delineate any extensions of the original mineralization.

The field work was completed in June 1963.

2. PRESENTATION OF RESULTS

The induced polarization and resistivity results are shown on the enclosed data plots in the manner outlined in the notes preceding this report. All of the surveying was carried out with the pole-dipole configuration with a 200 foot electrode separation.

Line 18E	Dwg. No. I.P. 2073-1
Line 19E	Dwg. No. I.P. 2073-2
Line 20E	Dwg. No. I.P. 2073-3
Line 21E	Dwg. No. I.P. 2073-4
Line 22E	Dwg. No. I.P. 2073-5
Line 23E	Dwg. No. I.P. 2073-6

Enclosed with this report is Dwg. Misc. 2072 a plan map of the property at a scale 1" = 200'. The definite and possible induced polarization anomalies are indicated by solid and broken bars respectively on this plan map as well as the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the induced polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the spread length i.e.. when using 200' spreads the position of a narrow sulphide body can only be determined to lie between two stations 200' apart. On order to locate sources at some depth, larger spreads must be used, with a corresponding increase in the

uncertainties of location. Therefore, while the center of the indicated anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

3. DISCUSSION OF RESULTS

Several weak responses were encountered on this property. In comparison with other results obtained in this area, these are of minor importance.

Line No. 18E

Weak induced polarization effects occur over most of this line, which suggests a broad area of low metallic content. A possible anomaly has been shown at 38N, over the strongest part of the induced polarization effects, because of its possible correlation with the results on Line No. 19E.

Line No. 19E

A weak shallow source is indicated in the vicinity of 38N on this line. The metal factor values on the larger separations suggest that the source broadens with depth.

The small metal factors on the first separation near 46N and 48N may be due to dump material from the Queen of Bronze mine.

Line No. 20E

The strongest response on the property occurs in the vicinity of 46N to 48N and coincides with the main part of the Queen of Bronze dump. The countour pattern is not simple but the source appears to be shallow and most of the effects could be due to the metallic content of the dump material.

Line No. 21E

This line passes over part of the Queen of Bronze dump and lies about 100 feet west of the glory hole of the mine. There is a slight increase in the metal factor values between 42N and 46N that has been shown as a possible anomalous zone. However, the induced polarization effects are very weak and could be almost entirely due to the dump material.

There are no significant effects in the vicinity of the South Queen of Bronze area, between 32N and 34N on this line.

Line No. 22E

Two possible anomalous zones have been shown on this line. Both have been interpreted from minimal induced polarization effects.

There appears to be a weak shallow source near 38N but there is no indication of the South Queen of Bronze which lies between 32N and 34N.

The weak effects between 46N and 50N may be due to the dump material located to the side of the line. They could also be due to a weakly mineralized zone.

Line No. 23E

There does not appear to be any significant induced polarization effects on this line.

4. SUMMARY AND RECOMMENDATIONS

Several weak anomalies were encountered in the survey of the property. Most of these occur in the vicinity of the Queen of Bronze mine and the dump material from the old workings. The sources of these anomalies appear to be shallow and some if not all of the responses could

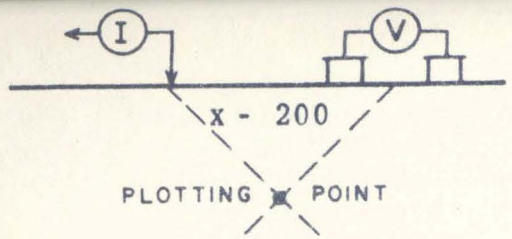
be due to the metallic content of the dumps.

In comparison with other responses obtained in this area, the anomalous effects on the Queen of Bronze property are considered to be of minor importance. Consequently no further work is recommended on this property at present.

McPHAR GEOPHYSICS LIMITED

D. B. Sutherland,
Geophysicist.

DBS:gg



n - 3

n - 2

n - 1

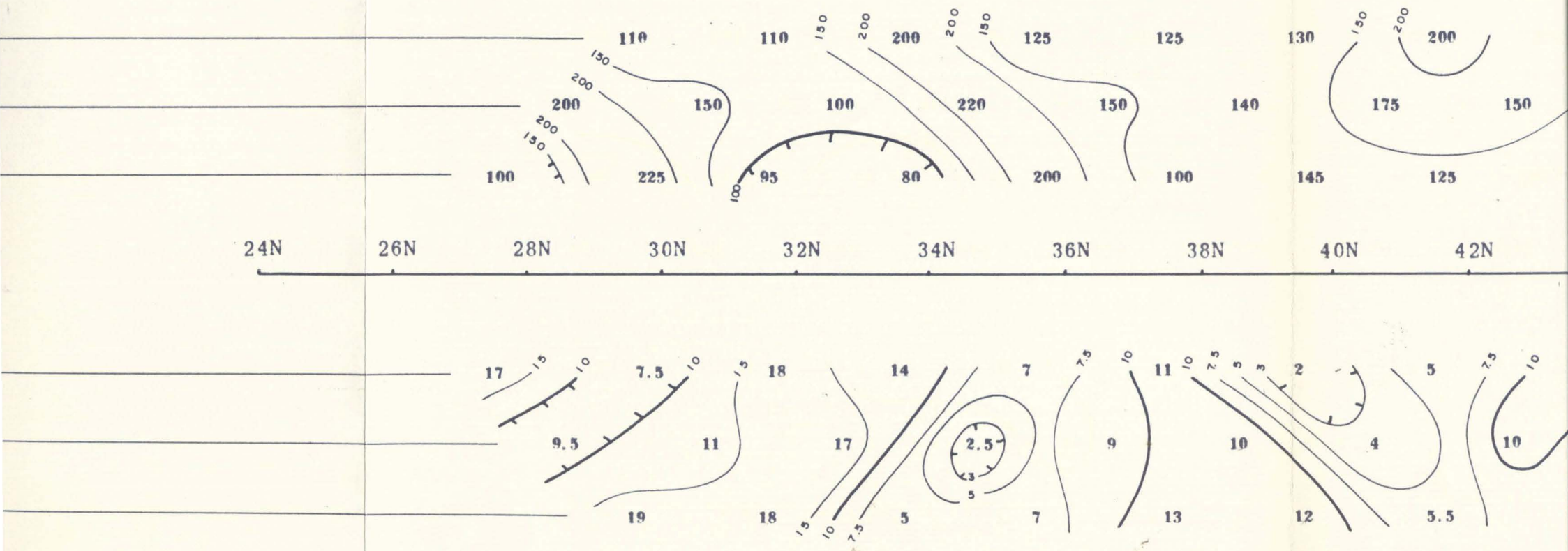
n - 1

n - 2

n - 3

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



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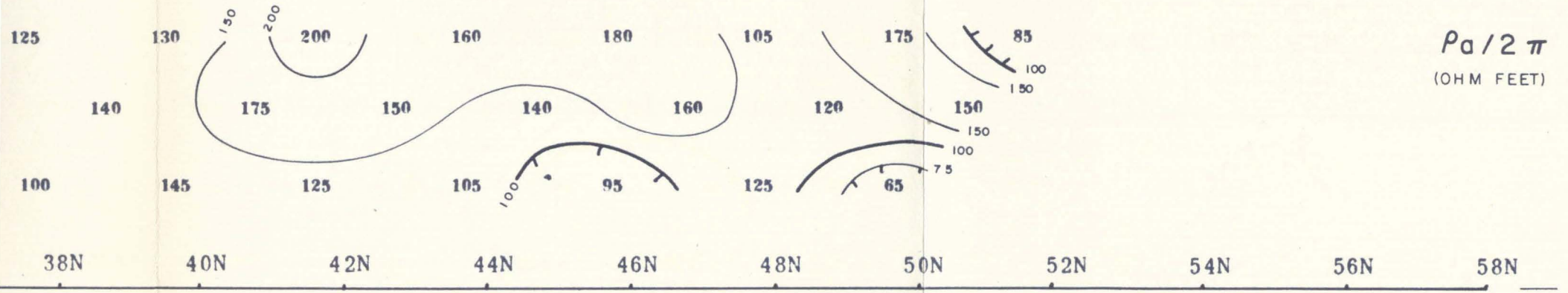

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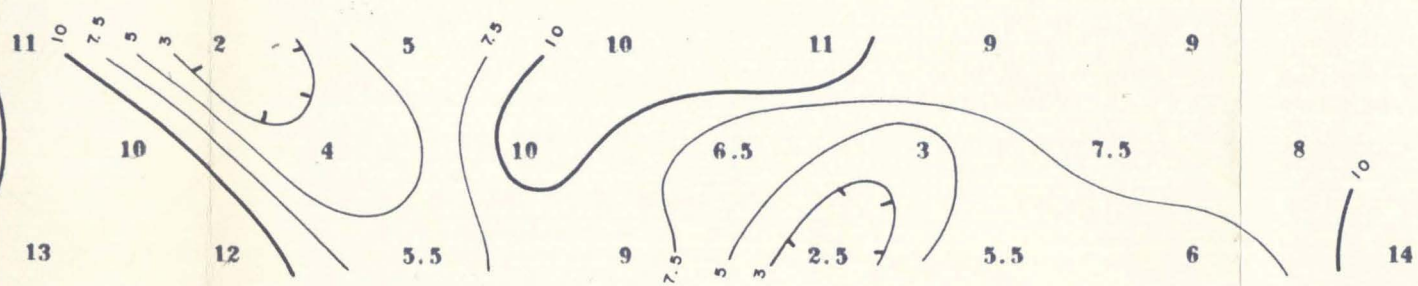

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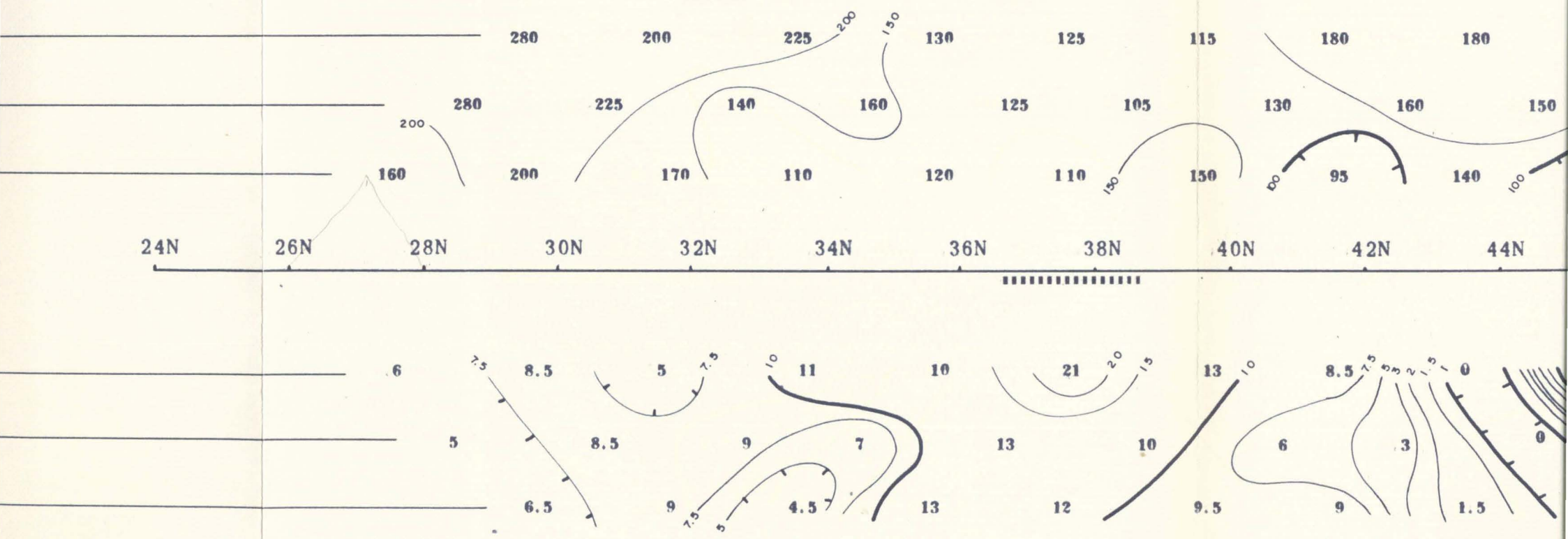
LINE NO.-23E.

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



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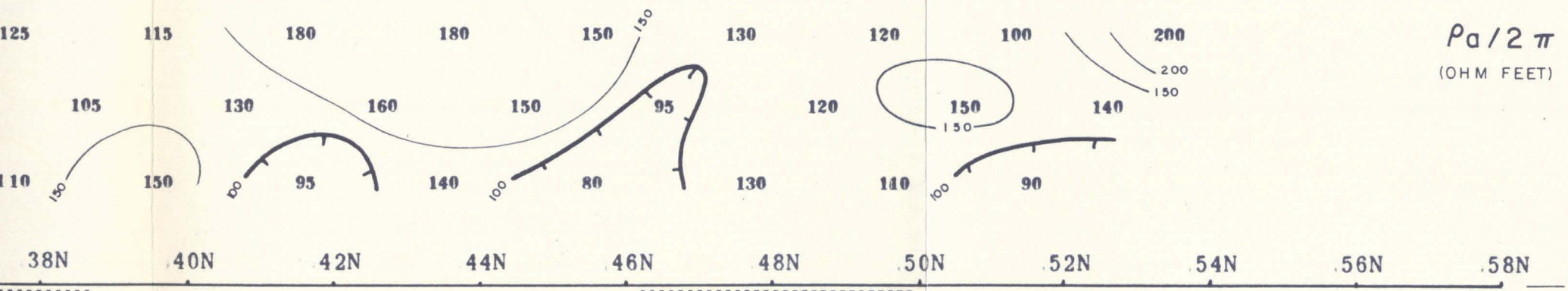

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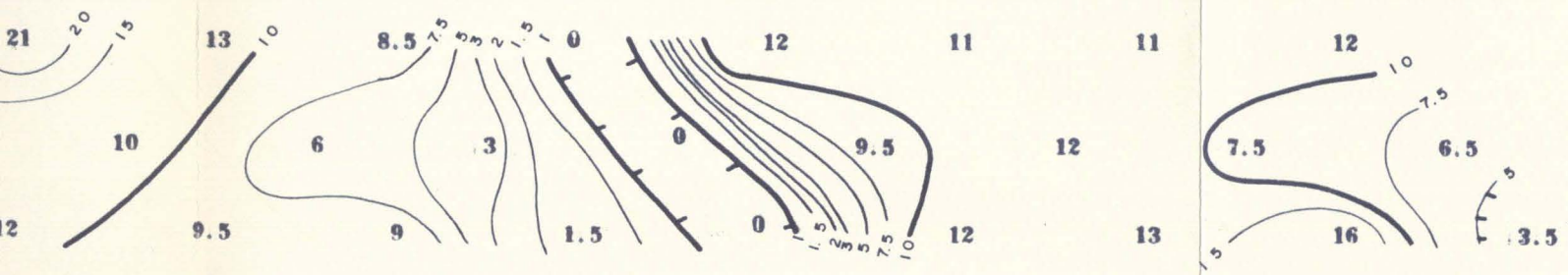

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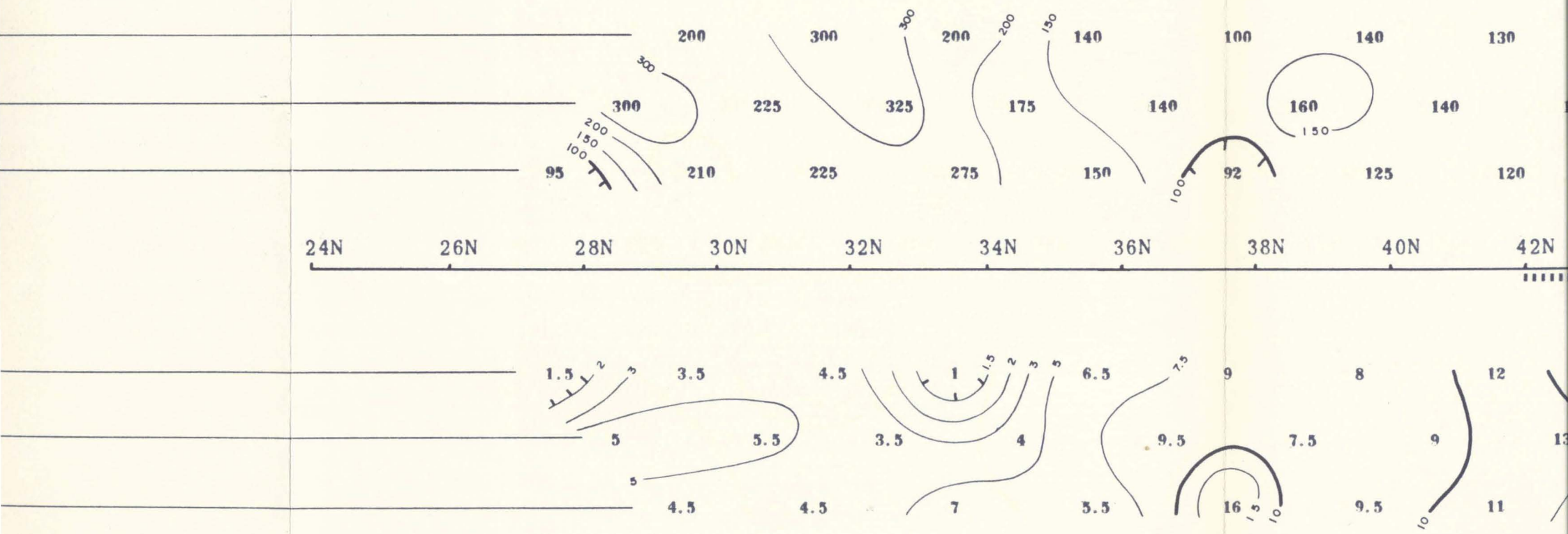
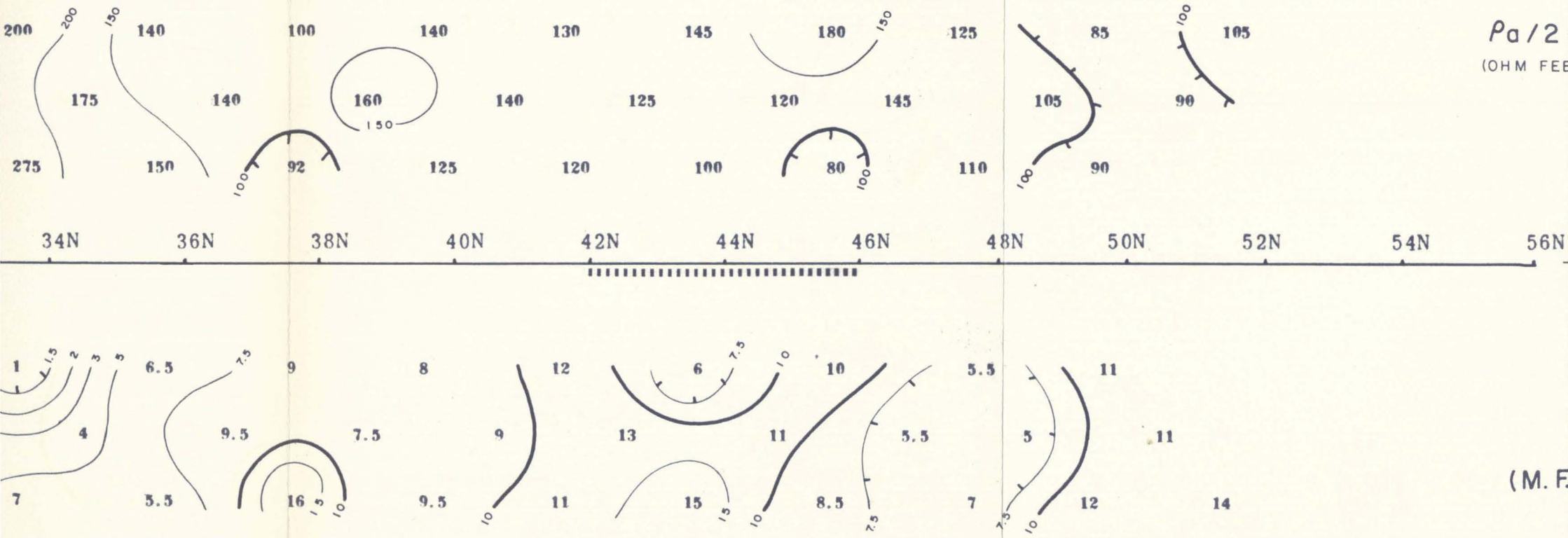
LINE NO.-22E.

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY





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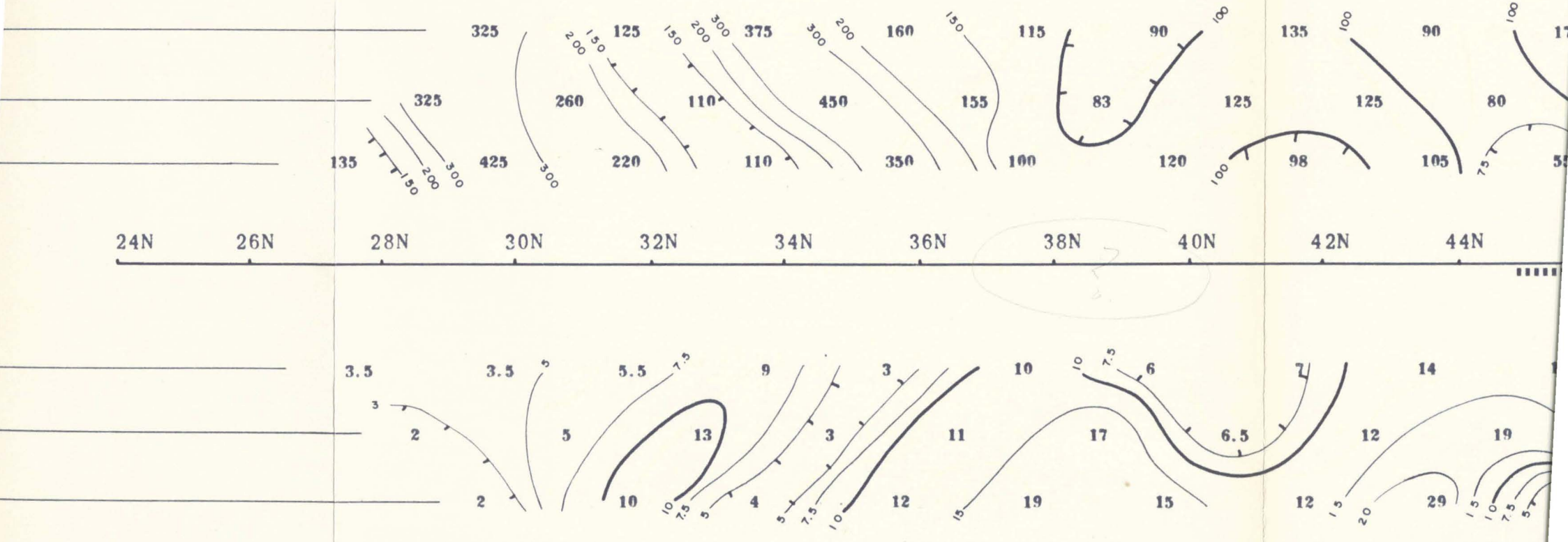
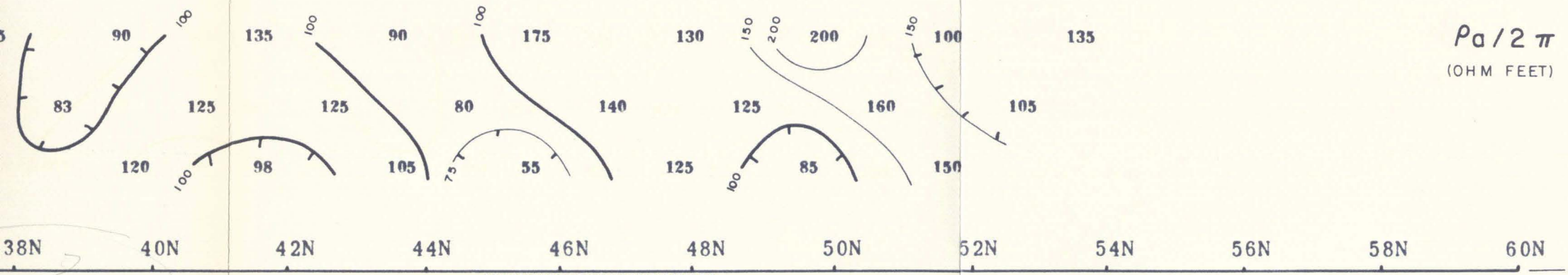
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY





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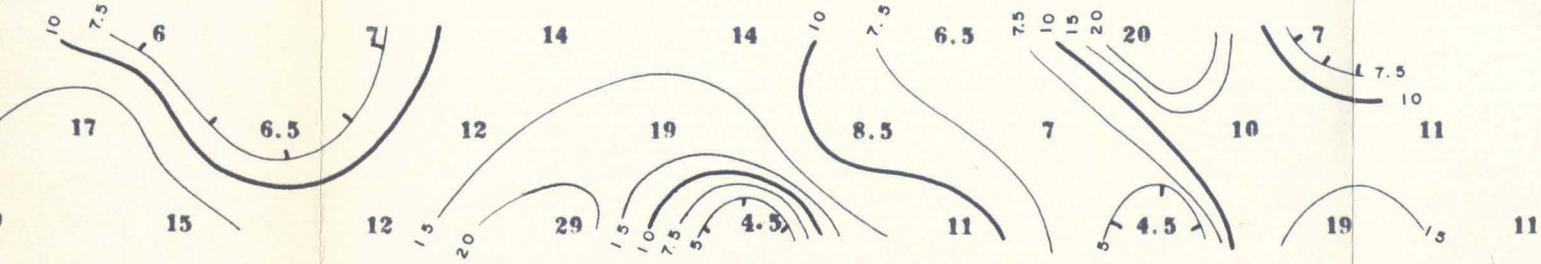

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McPHAR GEOPHYSICS LIMITED

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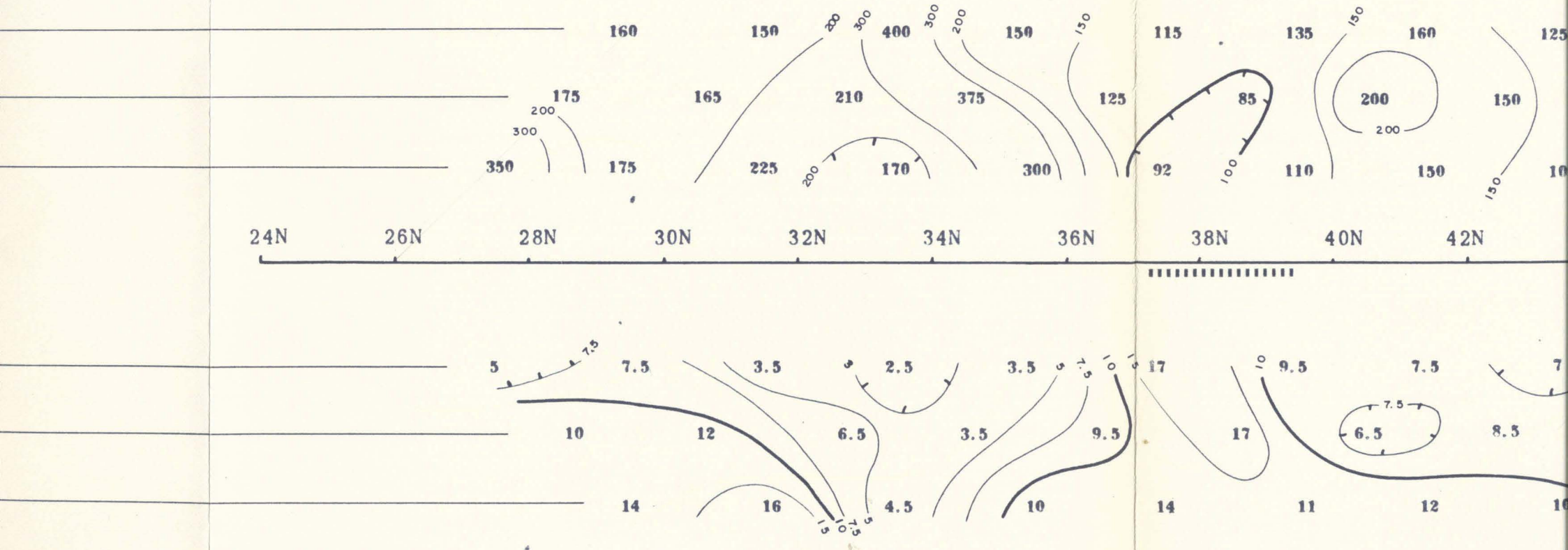

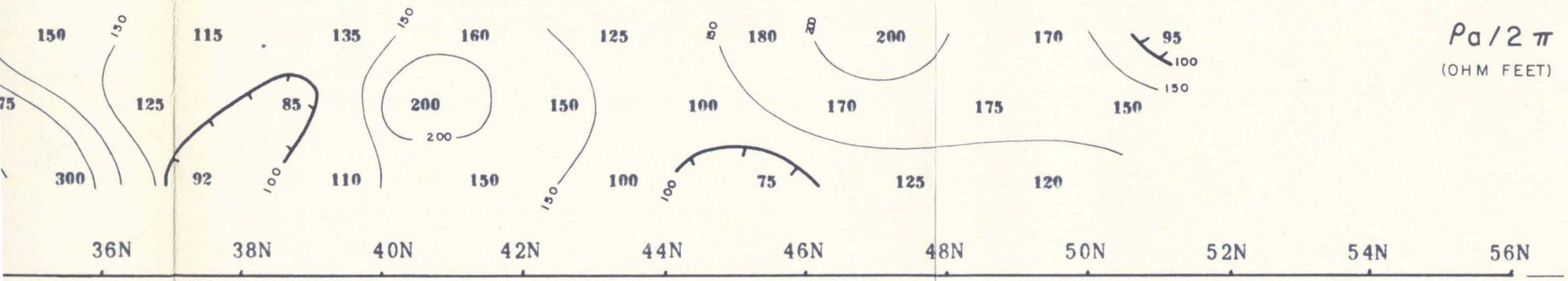

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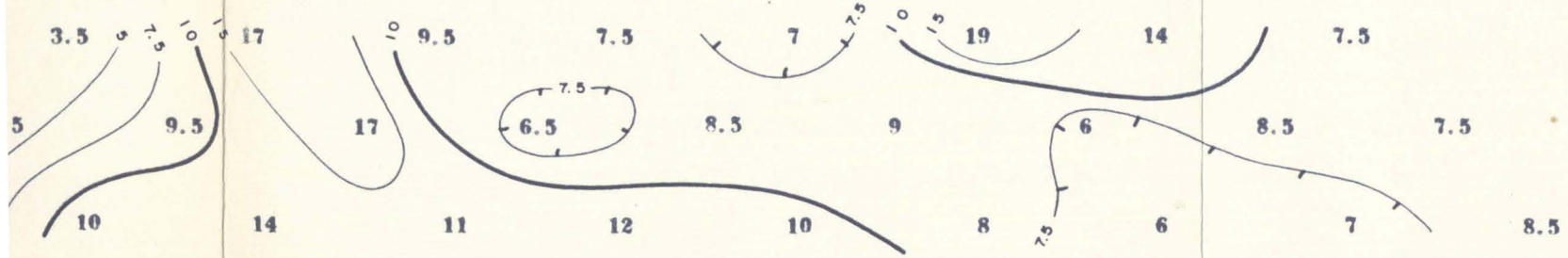

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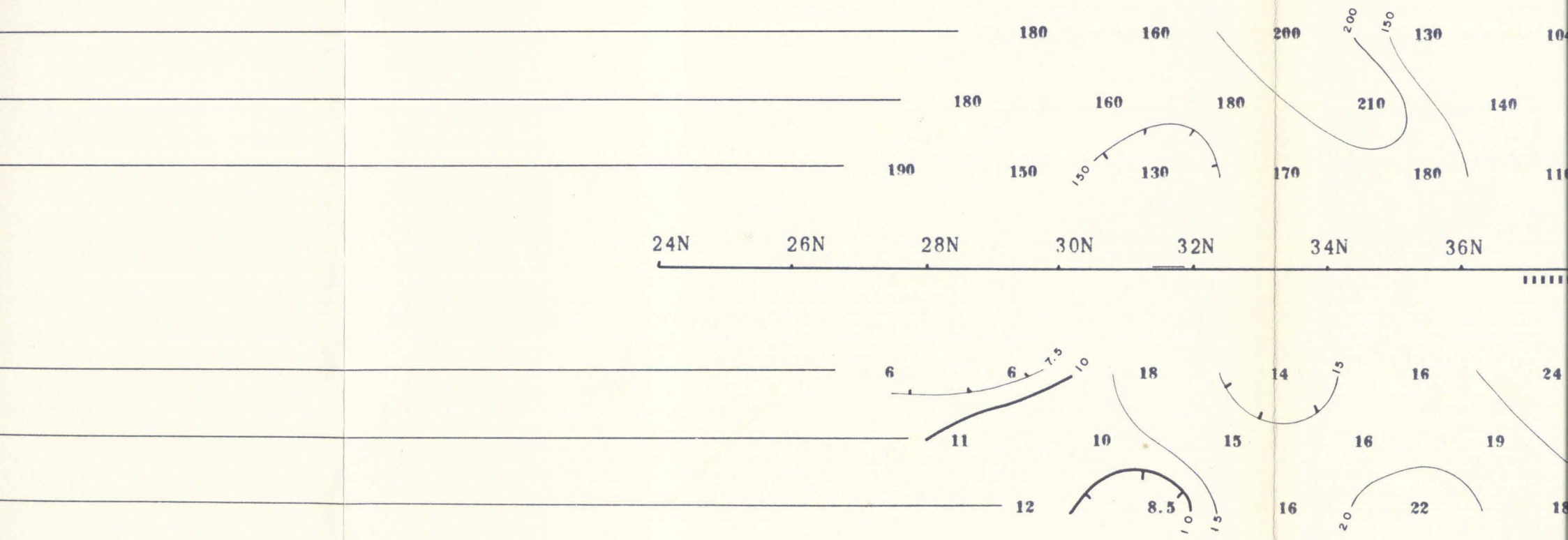
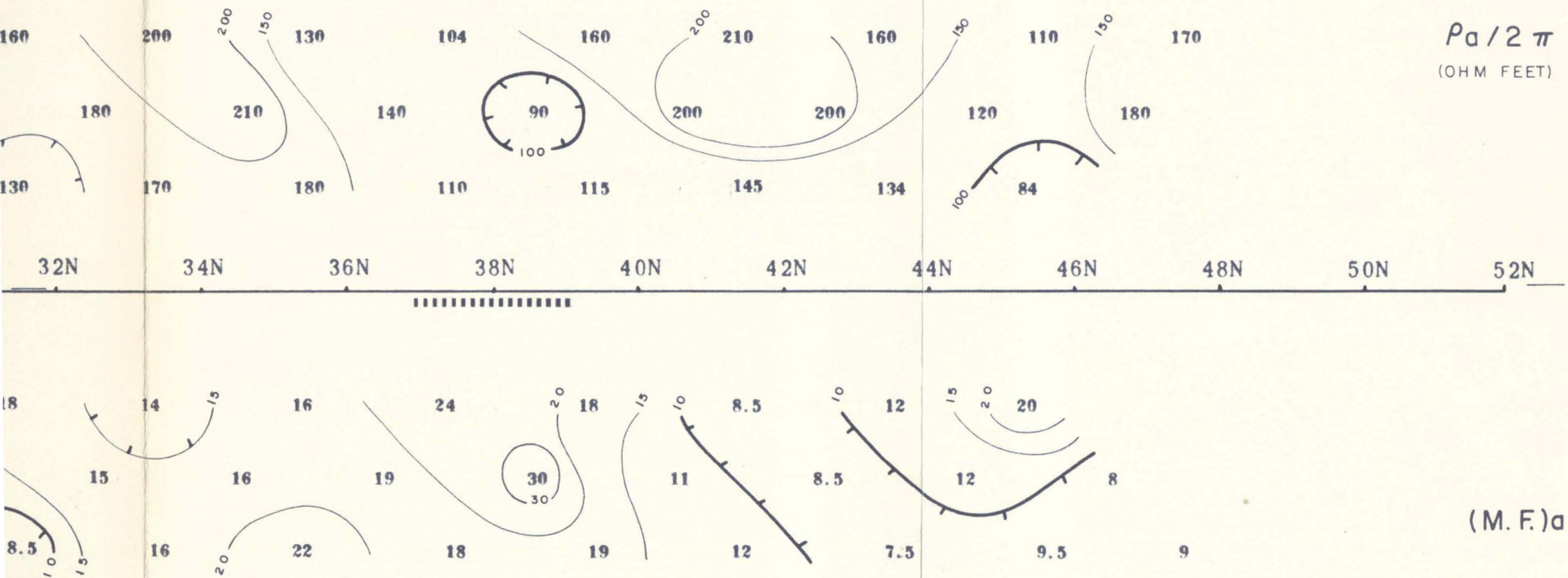
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY





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(M.F.)a

LINE NO.-18E.

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 1, Oregon
Telephone: Columbia 2161, Ext. 488

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OREGON MINERAL PRODUCTION IN 1951*

Oregon's 1951 mineral production as just reported by the U.S. Bureau of Mines totals nearly $28½ millions, and is the largest in dollar value ever attained despite low returns in value of metallic minerals. By far the greatest returns are in construction materials such as sand, gravel, stone, and cement. The breakdown of production of the different materials is as follows:

Mineral	Quantity	Value
Antimony ore and concentrate - short tons, gross weight	-	-
Carbon dioxide, natural (estimated) - thousand cubic feet	1/	1/
Chromite - short tons, gross weight	754	$ 63,000
Clays (except for cement) - thousand short tons	95	105,000
Coal - thousand short tons	-	-
Copper (recoverable content of ores, etc.) - short tons	11	5,000
Gold (recoverable content of ores, etc.) - troy ounces	7,927	277,000
Lead (recoverable content of ores, etc.) - short tons	2	1,000
Mercury - 76-pound flasks	1,177	247,000
Perlite (crude) - short tons	1/	1/
Pumice and pumicite - short tons	47,026	137,000
Sand and gravel - thousand short tons	10,504	9,117,000
Silver (recoverable content of ores, etc.) - thousand troy ounces	6	6,000
Stone (except limestone for cement and lime) - thousand short tons	8,722	10,831,000
Tungsten concentrate - short tons, 60-percent WO_3 basis	1	3,000
Zinc (recoverable content of ores, etc.) - short tons	3	1,000
Undistributed: Asbestos (1949-1951), cement, diatomite, gem stones, lime (1950-1951), quartz, stone (dimension granite, 1949; dimension and crushed granite, 1950), and minerals whose value must be concealed for particular years (indicated in appropriate column by footnote reference 1/)	-	7,608,000
Total Oregon	-	$28,401,000
Clays sold or used for cement - thousand short tons	57	$ 57,000

1/ Value included with "Undistributed."

*Graph showing Oregon Mineral Production 1850-1951 on following page.

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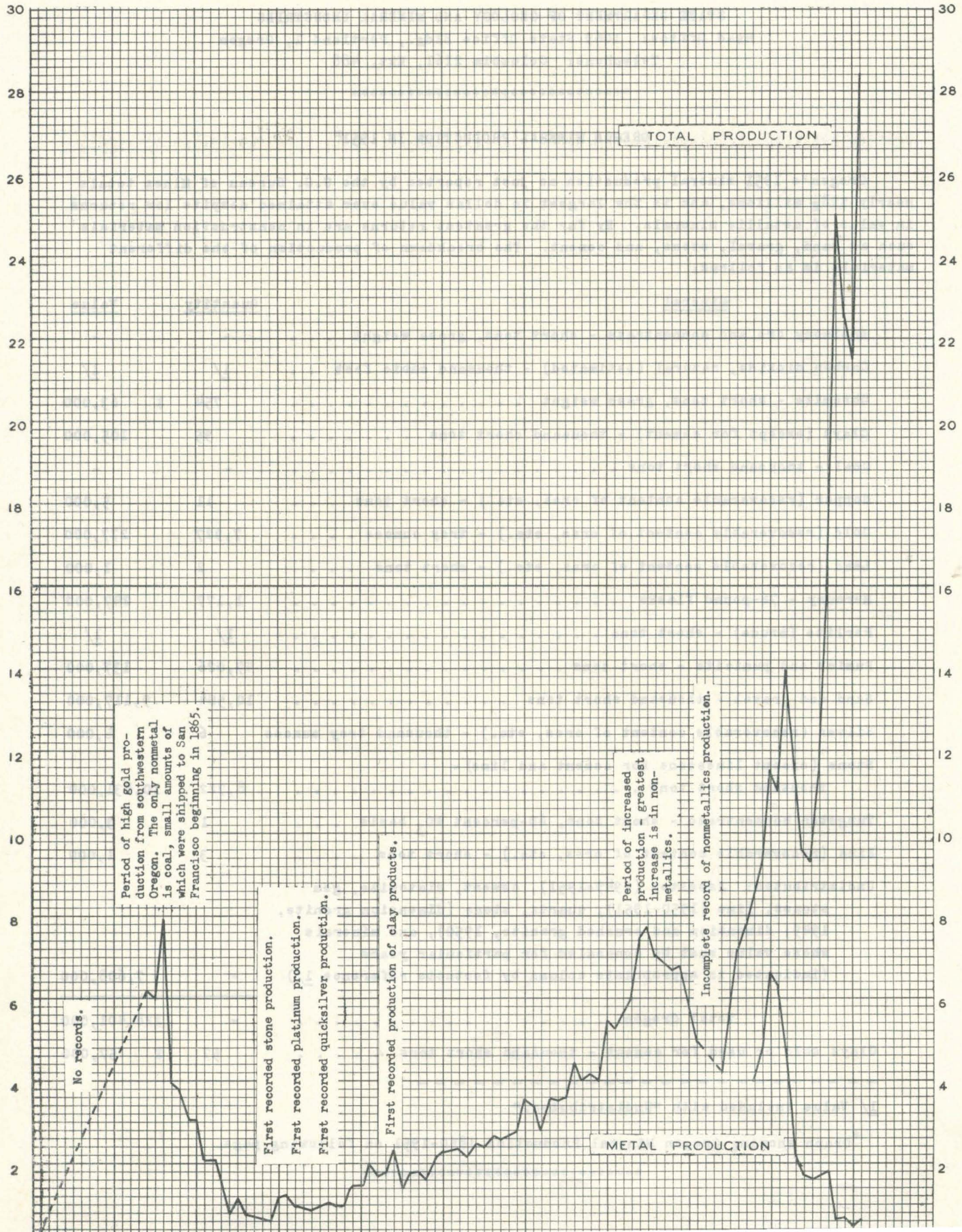
OREGON MINERAL PRODUCTION

(IN MILLIONS OF DOLLARS)



EASTERN OREGON MINING NEWS

Mr. Anthony Brandenthaler, Baker, Oregon, has announced the start of construction of a lime burning plant in Baker. The first kiln of a contemplated battery of three is now being prepared for shipment to Baker from California. Road building to the quarry site on Marble Creek about 8 miles west of Baker will begin about October 1. The limestone deposit on Marble Creek was diamond drilled several years ago and results showed exceptionally pure stone. It is planned to convert wood waste from sawmill operations into gas for burning limestone.

* * * * *

The Morrison-Knudsen Company, Boise, Idaho, is carrying on exploration work on a deposit of limestone west of Durkee, Baker County, Oregon. Bulldozing and road building has been under way for the past two months and now diamond drilling will be done.

* * * * *

William Wendt, Baker, Oregon, is installing a 5-ton mill to test a free milling ore showing at the Sanger mine east of Baker in Baker County. The Sanger is one of the famous early-day gold producers of eastern Oregon. The vein which will be tested was discovered several years ago and has been under development for the past two summers. A length in excess of 300 feet along the vein has been indicated.

* * * * *

Burt Hayes, who shipped the first chrome concentrates from the John Day area to the Grants Pass purchasing depot in 1952, is building a small concentrating mill on Dog Creek about 7 miles southeast of John Day, Grant County, Oregon. Hayes has leased the property from Ray Summers, John Day.

* * * * *

The United Mining and Metals Corporation, Cottage Grove, Oregon, is installing a new pipeline on the High Bar Placer above Pine Creek in Baker County. Water will be pumped to a reservoir from Burnt River and thence pumped to giants at the pit. Operations are in charge of Mr. H. L. Bruneau.

* * * * *

According to The Stockpile, the Buffalo mine in eastern Grant County, Oregon, is active and is being operated by Jim Jackson and Bill Coxe who have leased the property from the Boaz Mining Company, Seattle. The Buffalo has a long record of production of both high-grade shipping ore and milling ore. Concentrates are shipped to the Tacoma Smelter.

****

ZIRCONIUM AND HAFNIUM

The U.S. Bureau of Mines has announced that production of zirconium at the Northwest Electrodevelopment Laboratory, Albany, Oregon, is currently maintained at an average rate of about 22,000 pounds per month. The entire output is consigned to the Atomic Energy Commission. July production of hafnium amounted to 896 pounds, also sent to the Atomic Energy Commission.

Zirconium and hafnium are associated in the mineral zircon, zirconium silicate.

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CHROMITE IN JUNE 1953

Domestic chromite production in June 1953 amounted to 2,825 short tons, an increase of 73 percent compared to production in May, according to the U.S. Bureau of Mines Chromite Report No. 41. All of the production originated in California and Oregon and was received at the Grants Pass ore purchasing depot at Grants Pass, Oregon. Shipments for the first six months of 1953 amounted to 9,780 short tons. This amount was 120 percent greater than shipments during the first six months of 1952.

Total consumption of all grades of chromite in the United States during the first half of 1953 was 17 percent greater than the previous half year high which was attained in the second half of 1951.

Consumption of chromite for chemical purposes during June was less than 1 percent below the monthly average during the peak year of 1951, increasing 9 percent over May 1953. Refractory use gained 5 percent during June 1953 but metallurgical use dropped 9 percent, reversing the recent upward trend in total consumption of all grades of chromite with the total falling 3 percent below the May record high. Imports during June 1953 totalled 189,132 short tons. For the first six months of 1953 imports amounted to 1,071,128 short tons of which metallurgical grade totalled 562,068 long tons, refractory grade 307,065 long tons, and chemical grade 87,231 long tons. This compares with total imports of 1,700,209 for the whole of 1952. Imports are reported in long tons; other statistics in short tons.

Countries from which metallurgical grade chromite was imported during the first six months of 1953 in order of importance were: Turkey (208,786 tons), Southern Rhodesia (133,247 tons), Union of South Africa (94,357 tons), New Caledonia (36,815 tons), Philippines (34,659 tons), Yugoslavia (22,455 tons), Cuba (16,300 tons), India (6,056 tons), Sierra Leone (6,000 tons), Pakistan (3,060 tons), Greece (335 tons), Afghanistan (42 tons).

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MOUAT CHROME MINE GOES INTO PRODUCTION

According to the August Commodity Report of the U.S. Bureau of Mines, the American Chrome Company which has reactivated the Mouat chromite project in Stillwater County, Montana, has gone into production at a current rate of about 500 tons of ore daily. Plans are to double this output. The American Chrome Company has a contract to supply the government with 900,000 tons of chromite concentrates over a period of 8 years. The property was developed and a concentrating mill erected at the mine in World War II under the management of Anaconda Copper Mining Company. After the war the property remained inactive until taken over by the American Chrome Company.

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QUEEN OF BRONZE, JAPAN MAKE COPPER AGREEMENT

As reported by Mining World, August 1953, the Queen of Bronze Mining and Smelting Company of Grants Pass, Oregon, has agreed to export between 19,000 and 28,000 tons (copper content) of copper concentrate over a year's time to the Tokyo Boeki Shokai, a Japanese trading company, for use in Japanese smelters.

The initial shipment, which is expected to reach Japan by September, will be about 1,000 tons. The Queen of Bronze mine in Josephine County, Oregon, is said to have a stock of about 4,000 tons of copper concentrate. The mine had been closed since the end of World War II.

The copper will be divided among six leading Japanese copper smelters and will be used to reduce smelting costs and also to meet the shortage of scrap copper.

DMEA ACTIVITIES IN OREGON
(July 15 to August 15, 1953)

The status and location of Defense Minerals Exploration Administration contracts approved and accepted to date in Oregon is indicated in the tabulation below.

Operator	Location (County)	Commodity	Amount	Status
Paul W. Wise	Malheur	Mercury	$34,727	Terminated
Waite Minerals	Josephine	Copper	30,000	Terminated
Owen Pigmon	Crook	Mercury	20,460	Terminated
Bonanza Oil and Mine Corporation	Douglas	Mercury	50,056	Active
Roba and Westfall	Grant	Mercury	20,140	Active
Strickland Butte Mines (Page and Page)	Crook	Mercury	5,600	Active

Summary of Active Projects

Bonanza Oil and Mine Corporation

Drifting is in progress on the 830 level and the 1050 level of the Bonanza mine.

Strickland Butte Mines

Bulldozer trenching at the Strickland Butte prospect was completed during the first part of August.

Roba and Westfall

Preparatory work is in progress. It is anticipated that shaft sinking will be commenced in the near future.

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CEMENT COMPANY EXPANDS ACTIVITIES

According to Commerce, published by the Portland Chamber of Commerce, the Oregon Portland Cement Company, Frank E. McCaslin, President, has announced a $1,000,000 expansion program at the plant of the Oregon Portland Cement Company at Lime, Baker County, Oregon. The project now in progress will increase conveying and crushing capacity and will modernize the kiln firing system in order to boost production. The announcement states that capacity of the plant will be increased sufficiently to provide cement needed for Snake River dam construction. It is expected that the expansion initially planned will be completed by the end of 1953. The O.P.C. quarry is near the present plant site and in addition the company has large deposits of limestone on Fox Creek in Baker County on the Snake River side of the divide a few miles from the Lime plant.

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MINERAL PRODUCTION IN CONTINENTAL UNITED STATES

According to the U.S. Bureau of Mines, value of mineral production in continental United States in 1951 was $13,524,000,000 compared to $11,855,000,000 in 1950. Texas led all the states in 1951 with production valued at $3,268,555,000 (because of the huge production of oil and gas). Pennsylvania was second with $1,289,226,000 (principally because of the large coal production). California was third with a production of $1,208,920,000 (mainly because of large oil and gas production).

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QUICKSILVER

E&MJ Metal and Mineral Markets, issue of September 10, reports that the market for quicksilver was inactive and prices unsettled. Market quotations for the metal ranged from $186 to $189 per flask which showed a drop of about $2 per flask under the level of the previous week. The United States Government is apparently not in the market, and under this condition lower quotations may be expected. Reportedly high market price stimulated Mexican production. The chlorine program which required large supplies of mercury for mercury cells seems to be coming to an end.

The U.S. Bureau of Mines reports that the mercury industry in the second quarter of 1953 was featured by a decline in receipts of the metal from abroad. Imports in the second quarter amounted to 6,431 flasks. This compares with 24,265 flasks for the first quarter of 1953 and 68,686 flasks for the full 1952 period. Domestic production for the first six months of 1953 amounted to 7,320 flasks. Total 1952 production amounted to 12,547 flasks. This domestic output showed a continued upward trend but was small compared to the long-time history of domestic mercury mining. The eight leading domestic producers which accounted for 93 percent of the total production were Abbott (Lake County), New Idria, including San Carlos (San Bernito County), Culver-Baer, Cloverdale, and Mt. Jackson, including Great Eastern (Sonoma County), California; Hermes (Valley County), Idaho; Cordero (Humboldt County) Nevada; and Bonanza (Douglas County) Oregon. In addition twenty-one other properties were productive during the second quarter of 1953. Imports in order of importance during the first quarter of 1953 came from: Spain (12,417 flasks), Italy (7,264 flasks), Mexico (2,854 flasks), Yugoslavia (1,652 flasks), Miscellaneous (78 flasks). Imports during the second quarter in order of importance were: Mexico (3,469 flasks), Italy (1,179 flasks), Yugoslavia (1,131 flasks), Spain (624 flasks), miscellaneous (28 flasks).

****

ATKINSON DREDGE LEASE IS TAKEN BY VERNER ALLEN

Dredging lease in Hells Canyon area of Snake River which forms the Idaho-Oregon boundary line, has been taken over from S. K. Atkinson of Boise by Verner Allen of San Francisco. Transfer of the lease was approved by both the Idaho and Oregon land boards.

The Atkinson lease was approved more than a year ago after a public hearing at which Mr. Atkinson estimated that a dredging operation in Hells Canyon gorge could recover about $171,000,000 worth of gold, monazite, and other metals.

(From Mining and Industrial News, p. 14, August 1953.)

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STAINLESS STEEL OUTPUT IS RISING AT 16 PERCENT YEARLY RATE

The production of stainless steel ingots increased an average of 16 percent a year from 1940 to 1951, according to statistics by American Iron and Steel Institute. At the same time the total physical output of the country increased an average of 5 percent a year, according to the Department of Commerce. Stainless ingots are converted by the steel industry to nearly all the forms in which other steel is sold, such as bars, sheets, pipe, etc.

Since 1935, when the official statistics on stainless steel were first compiled, the ingot output of this metal has increased more than 12 times to a total of approximately 930,000 net tons in 1952, compared with the record high of nearly 934,000 tons in 1951. The combined output of two light metals, including primary and secondary or reclaimed metal, set a record in 1952 of over 1.3 million tons, nearly 12 times the 1935 production.

(From Steel Facts, June 1953.)

PUBLICATIONS*

Oregon Department of Geology and Mineral Industries
1069 State Office Building, Portland 1, Oregon

BULLETINS**	Price postpaid
1. Mining laws of Oregon, 3d rev., 1951, contains Federal placer mining regulations	$ 0.40
2. Progress report on Coos Bay coal field, 1938: F. W. Libbey	0.10
3. Geology of part of the Wallowa Mountains, 1938: C. P. Ross	0.50
14. Oregon metal mines handbooks: by the staff	
C. Vol. II, Section 1, Josephine County, 1952 (2d Ed.)	1.25
D. Northwestern Oregon, 1951	1.25
16. Field identification of minerals for Oregon prospectors and collectors, 5th printing, 1953: Compiled by Ray C. Treasher	(in preparation)
21. Second biennial report of the Department, 1939-40	Free
23. Inv. of reported occurrence of tin at Juniper Ridge, Oregon, 1942: Harrison and Allen	0.40
24. Origin of the black sands of the coast of southwestern Oregon, 1943: W. H. Twenhofel	0.30
26. Soil: Its origin, destruction, and preservation, 1944: W. H. Twenhofel	0.45
27. Geology and coal resources of Coos Bay quadrangle, 1944: J. E. Allen and E. M. Baldwin	1.00
28. Fourth biennial report of the Department, 1943-44	Free
29. Ferruginous bauxite in NW Oregon, 1945: F. W. Libbey, W. D. Lowry, and R. S. Mason	1.00
31. Geology of the St. Helens quadrangle, 1946: W. D. Wilkinson, W. D. Lowry, and E. M. Baldwin	0.45
33. Bibliography (supplement) of the geology and mineral resources of Oregon, 1947: J. E. Allen	1.00
34. Mines and prospects of the Mt. Reuben mining district, Josephine County, Oregon, 1947: E.A. Youngberg	0.50
35. Geology of the Dallas and Valsetz quadrangles, Oregon, 1947: E. M. Baldwin	0.75
36. (1st vol.) Five papers on foraminifera from the Tertiary of Western Oregon, 1947: J. A. Cushman, R. E. Stewart, and K. C. Stewart	1.00
(2d vol.) Two papers on foraminifera from the Tertiary of Western Oregon and Western Washington, 1949: Cushman, Stewart, & Stewart; and one paper on mollusca and microfauna of Wildcat coast section, Humboldt County, California, 1949: Stewart & Stewart	1.25
37. Geology of the Albany quadrangle, Oregon, 1953: Ira S. Allison	0.75
39. Geology and mineralization of the Morning mine and adjacent region, Grant County, Oregon, 1948: Rhesa M. Allen, Jr.	(withdrawn pending revision)
40. Preliminary description of the geology of the Kerby quadrangle, Oregon, 1949: Wells, Hotz, & Cater	0.85
41. Ground-water studies in Umatilla and Morrow counties, 1949: Norman S. Wagner	1.25
42. Seventh biennial report of the Department, 1948-1950	Free
43. Eighth biennial report of the Department, 1950-52	Free
44. Bibliography (2d supplement) of the geology and mineral resources of Oregon, 1953: M. L. Steere	1.00
SHORT PAPERS	
2. Industrial aluminum - a brief survey, 1940: Leslie L. Motz	0.10
4. Flotation of Oregon limestone, 1940: J. B. Clemmer and B. H. Clemmons	0.10
7. Geologic history of the Portland area, 1942: Ray C. Treasher	0.25
9. Some manganese deposits in the southern Oregon coastal region, 1942: Randall E. Brown	0.10
13. Antimony in Oregon, 1944: Norman S. Wagner	0.15
14. Notes on building-block materials of eastern Oregon, 1946: Norman S. Wagner	0.10
15. Reconnaissance geology of limestone deposits in the Willamette Valley, Oregon, 1946: J. E. Allen	0.15
16. Perlite deposits near the Deschutes River, southern Wasco County, Oregon, 1946: J. E. Allen	0.15
17. Sodium salts of Lake County, Oregon, 1947: Ira S. Allison and Ralph S. Mason	0.15
18. Radioactive minerals the prospectors should know, rev. ed., 1953:	0.20
19. Brick and tile industry in Oregon, 1949: J. E. Allen and R. S. Mason	0.20
20. Glazes from Oregon volcanic glass, 1950: Charles W. F. Jacobs	0.20
21. Lightweight aggregate industry in Oregon, 1951: Ralph S. Mason	0.25
22. Preliminary report on tungsten in Oregon, 1951: Harold D. Wolfe and David J. White	0.35
GEOLOGIC MAPS	
Geologic map of the central portion of the Wallowa Mts., Oregon, 1938: W. D. Smith and others	0.20
Geologic map of the Medford quadrangle, Oregon, 1939: F. G. Wells and others	0.40
Geologic map and geology of the Round Mountain quad., 1940: W. D. Wilkinson and others	0.25
Geologic map of the Butte Falls quadrangle, 1941: W. D. Wilkinson and others	0.45
Geologic map and geology of the Grants Pass quadrangle, 1940: F. G. Wells and others	0.30
Preliminary geologic map of the Sumpter quadrangle, 1941: J. T. Pardee and others	0.40
Geologic map of the Portland area, 1942: Ray C. Treasher	0.25
Geologic map of the Coos Bay quadrangle, 1944: J. E. Allen and E. M. Baldwin (sold with Bull. 27)	----
Geologic map of the St. Helens quadrangle, 1945: Wilkinson, Lowry, and Baldwin (also in Bull. 31)	0.35
Geologic map of the Dallas quadrangle, Oregon, 1947: E. M. Baldwin (also in Bull. 35)	0.25
Geologic map of the Valsetz quadrangle, Oregon, 1947: E. M. Baldwin (also in Bull. 35)	0.25
Prelim. geologic map of the Kerby quadrangle, Oregon, 1948: Wells, Hotz, & Cater (also in Bull. 40)	0.80
Geologic map of the Albany quadrangle, Oregon, 1953: Ira S. Allison (also in Bull. 37)	0.50
MISCELLANEOUS PAPERS	
1. A description of some Oregon rocks and minerals, 1950: Hollis M. Dole	0.40
2. Key to Oregon mineral deposits map, 1951: Ralph S. Mason	0.15
3. Facts about fossils, 1953: (Reprints)	0.35
MISCELLANEOUS PUBLICATIONS	
The Ore.-Bin - Issued monthly by the staff as medium for news about the Department, mines, and minerals. (Available back issues 5 cents each.) Subscription price per year	0.40
Oregon mineral deposits map (22 x 34 inches) 1951	0.30
Oregon quicksilver localities map (22 x 34 inches) 1946	0.25
Landforms of Oregon: a physiographic sketch (17 x 22 inches) 1941	0.15
Index to topographic mapping in Oregon, 1952	Free
Index to published geologic mapping in Oregon, 1952	Free
Bibliography of the geology and mineral resources of Oregon, to 1936: State Planning Board	1.50

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER TRAVERSE
LINE 1370E

DATE OF TRAVERSE: 11/23/80 AND 12/10/80
TRAVERSED BY: J. Wiscarson, R. Engle
LOCATION OF DIURNAL BASE STATION: 1370E, 1800N

DBS observation at 11:30 AM/PM: 53072 gammas } 11/23/80 STA 1475-1800
DBS observation at 14:30 AM/PM: 53074 gammas }
DBS observation at 1:35 AM/PM: 53067 gammas } 12/10/80 STA 1825-2600 AND 0500-1450
DBS observation at 15:25 53073

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
500N	2460	4	52902	15:13	Station amid old rusty cans.
525N			53460	15:11	
550N			53277	15:09	
575N			53335	15:07	
600N	2470	2	52982	15:05	Station over serpentine.
625N			52669	15:04	
650N			52639	15:02	
675N			52536	~~14~~15:00	
700N	2470	4 52516	?52516	14:58	
725N			52676	14:56	
750N			53014	14:54	
775N			52929	14:52	
800N	2450	3	52207	14:50	
825N			52842	14:48	
850N			52789	14:46	
875N			52458	14:45	
900N	2460	3	52526	14:44	At south edge of "glory hole".
925N			52130	14:42	In Glory Hole
950N			52286	14:41	In Glory Hole
975N			52462	14:38	Edge of Glory Hole
1000N	2450	3	52561	14:37	At north edge of "glory hole".
1025N					
1050N					
1075N					
1100N	2450	2	52689	14:35	
1125N					
1150N					

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1175 N					
1200 N	2440	7	52674	14:33	In bottom of gully.
1225 N					
1250 N					
1275 N					
1300 N	2470	3	52710	14:29	In road cut.
1325 N			52718	14:27	
1350 N			52784 ? 52784	14:26	
1375 N			52925	14:24	
1400 N	2450	3	52871	14:22	In middle of road.
1425 N			53016	14:21	
1450 N			53070	14:20	
1475 N			52768	13:35	
1500 N	2470	4	53336	13:37	
1525 N			52768	13:39	
1550 N			52733	13:41	
1575 N			52896	13:43	
1600 N	2480	4	52794	13:45	
1625 N			53214	13:47	
1650 N			52928	13:49	
1675 N			52628	13:51	
1700 N	2490	3	52652	13:53	
1725 N			52599	13:54	
1750 N			52767	13:56	
1775 N			52990	13:58	
1800 N	2500	4	53074	14:00	In middle of road.
1825 N			52961	13:45	
1850 N			52917	13:47	
1875 N			52863	13:49	
1900 N	2550	4	52821	13:50	
1925 N					
1950 N					

Taken on 11/23/80

DENISON MINES (U.S.) INCORPORATED
QUEEN OF BRONZE PROJECT
JOSEPHINE COUNTY, OREGON

MAGNETOMETER TRAVERSE
LINE 1370 E

Station	Elevation	Topographic character	TFM (gammas)	Time	Remarks
1975 N					
2000 N	2565	4	52784	13:51	Station directly below road cut.
2025 N					
2050 N					
2075 N					
2100 N	2580	2	52846	13:53	On inner edge of road cut.
2125 N					
2150 N					
2175 N					
2200 N	2560	4	52892	13:55	On outer edge of road cut.
2225 N					
2250 N					
2275 N					
2300 N	2520	5	52853	13:57	
2325 N					
2350 N					
2375 N					
2400 N	2470	4	52915	13:59	
2425 N					
2450 N					
2475 N					
2500 N	2450	4	52860	14:01	
2525 N					
2550 N					
2575 N					
2600 N	2410	4	52869	14:03	

Dec. 10, 1980

INVENTORY OF QUEEN OF BRONZE AREA MAPS

OBTAINED FROM U.S. BUREAU OF MINES

No.	Map title	Scale	Date
1	Geologic map of Takilma-Waldo Copper Belt (Fig. 2 of USBM RI 5187, at original scale)	1" = 1,320'	1951
2	Topography, geology, and assays of Cowboy mine	1" = 40'	1951
3	Cowboy mine (geologic map of mine workings)	1" = 40'	1951
4	Plan of surface, Cowboy mine (Fig. 15 of USBM RI 5187, at original scale)	1" = 40'	1951
5	Plan of surface, Queen of Bronze mine (Fig. 5 of USBM RI 5187, at original scale)	1" = 40'	1951
6	South workings, Queen of Bronze mine (plan view)	1" = 20'	?
7	Lyttle mine (plan and profile)	1" = 40'	1929
8	Lyttle mine (profiles of projected tunnels)	1" = 100', 40'	1902
9	Lyttle mine (plan and profile)	1" = 20'	1902
10	Plan of surface, Lyttle mine (Fig. 14 of USBM RI 5187, at original scale)	1" = 40'	1951
11	North workings, Queen of Bronze mine (plan view)	1" = 20'	1916
12	Waldo Copper Mine (plan and profile)	1" = 200', 10'	1901

Illinois Valley News--10/13/49

SMELTER HAS BEEN ORDERED FOR TAKILMA

C. H. Mace, of the Mace Smelter company, Denver with the order in his pocket to build and construct a smelter for the Waite Minerals, Inc., at Takilma, to be erected on the site of the old smelter that was in operation there years ago.

Major Waite expects to have the smelter in operation by the 15th of January, weather conditions permitting.

W. A. Richelsen, consulting engineer, well known throughout the United States, has just spent several days at the Queen of Bronze and Cowboy mine and left Saturday by plane for Seattle, his home. Mr. Richelsen has been retained as consulting engineer for the Waite Minerals, Inc.

The operations at this group of mines will become a thriving enterprise by the first of the year, and new jobs for some 30 men will be made available, when the smelter is put in operation.

Both Mr. Richelsen and Mr. Mace have made extensive examinations of the copper group and are both enthusiastic on the prospects of extensive development of the copper deposits in this Valley and nearby points.

The use of the smelter will be made available to other miners who can produce copper ore in quantities, and it is a well known fact, that in this territory, enough gold comes in the copper ore to nearly pay the expenses of production, so the outlook for greater production was never brighter.

end were mined from stopes known as the Johnson, McCauley, East, Stevens, Messenger, Cameron, Twohy, Hampshire, Staisy, and Erwin stopes. The McCauley stope, the largest, was followed for a vertical distance of about 70 feet and at its greatest horizontal extent measured approximately 40 by 50 feet. The open cut has an outline measuring roughly 80 by 150 feet. The south-end workings are less extensive and include about 800 feet of crosscuts on two levels, in addition to an open cut, stopes, and a shaft 109 feet deep. None of these workings are now accessible.

"The larger ore bodies are mined by square-setting and partial filling. The smaller stopes are supported by stulls, and at least one ore body was mined by shrinkage stoping. The square-set method allows rough sorting underground and is better adapted to mining the large irregular-shaped ore bodies and for supporting the slickensided rocks near them. After rough sorting underground the ore is trammed to outside bins and from them drawn to sorting tables, where the low-grade material is discarded and the ore of shipping grade is dropped to loading bins.

"Geology: The ore at the Queen of Bronze mine occurs as disconnected bodies, irregular in outline, and ranging in size from mere stringers to deposits containing as much as 10,000 tons. The ore minerals do not form a solid body within the limits of the deposits but are interspersed with bands and irregular areas of altered wall rock, much after the manner of a mineralized shear zone. The more persistent bodies strike approximately east, some trending a little north of east and some a little south of east. Dips vary greatly, but the rake of the deposits, with exception of the Hampshire ore body, is to the south. The Hampshire ore body rakes to the west. The deposits everywhere show effects of intense postmineral faulting. Slickensided surfaces and brecciated rock are conspicuous within the ore bodies and in the enclosing rocks, but are much less evident away from the mineralized areas. Drag effects and crushing are pronounced near faults in some of the more tubular deposits.

"The ore is enclosed in greenstone, including both metabasalt and metagabbro, and is found near the contacts with serpentine but was not observed within serpentine. Next to the ore the original characteristics of the greenstones are usually obliterated by processes which have changed the rocks to a mass of chlorite, quartz, and calcite containing disseminated sulphides. Very little sericite was observed in thin sections.

"Oxidation extends as much as 100 feet below the surface, but sulphide minerals prevail below 50 feet. Surface processes have produced high-grade oxidized ore near the surface, and sulphide enrichment undoubtedly was an important process at shallow depths, though it has not contributed greatly to the copper content below a depth of 100 feet.

"Before sorting, the ore in some of the stopes, as indicated by samples taken by C. E. Stowell, mining engineer, has a metal content of 4 to 7 percent of copper and 0.04 to 0.1 ounce of gold to the ton. The average copper content of the oxidized ores near the surface was considerably higher and according to Kay was over 10 percent. A sample taken by Mr. Stowell across 5 feet of the ore in the East stope assayed 4.8 percent of copper and 0.04 ounce of gold to the ton. Another sample from the same stope taken across 7.8 feet assayed 4.0 percent of copper and 0.10 ounce of gold to the ton. A sample across 6 feet in the top of the east end of the same stope assayed 4.7 percent of copper and 0.08 ounce of gold, and a sample across 7.5 feet on the sill floor directly below assayed 7.0 percent of copper and 0.06 ounce of gold. A sample across 12 feet of ore in the south drift of the 50 level assayed 5.4 percent of copper and 0.06 ounce of gold. A "bunch" of ore 3 feet wide from the top of the stope above the 70 level assayed 6.4 percent of copper. If these assays represent the average metal content of the ore in place, it follows that considerable waste is readily eliminated by sorting, as the shipping ore in the past has averaged about 8.3 percent of copper and about 0.13 ounce of gold and 0.16 ounce of silver to the ton.

"Mineralogy: The mineralogy of the ore is comparatively simple. The hypogene sulphide

minerals include pyrite, chalcopyrite, and in much smaller amounts, pyrrhotite and sphalerite. The proportion of each varies considerably from place to place, and as a result rough sorting is practiced underground to eliminate the material high in pyrite and low in chalcopyrite. Textural relations indicate that two generations of pyrite are present. Older massive pyrite is cut by well-defined fractures containing chalcopyrite, whereas the younger pyrite occurs as disseminations or as grains in more or less parallel arrangement along irregular fractures in chalcopyrite. Supergene chalcocite is present near the surface, where it replaces hypogene sulphides. The supergene replacement has been selective, chalcopyrite being replaced to a much greater extent than pyrite. The abundant oxidation products include malachite, azurite, cuprite, iron oxides, and chrysocolla; tenorite and native copper have also been reported. The sulphides follow fractures in the quartz, whereas the calcite cuts both quartz and sulphides and, in places, is abundant enough to deplete the grade of the ore seriously.

"Economic considerations: The largest ore shoot had a vertical extent of about 70 feet, but most of the stopes are less than 50 feet high. The horizontal outlines of the ore bodies are irregular and vary greatly at different altitudes. Projections of the ore bodies as a basis for tonnage estimates of ore in place are therefore hazardous and not reliable.

"Many faults cut and displace the ore bodies, and it seems likely that the numerous disconnected shoots represent segments of larger and more continuous deposits. Gouge-filled faults and stringers containing quartz, calcite, and sulphides become increasingly numerous toward the larger ore bodies and if used in conjunction with wallrock alteration should serve as a guide toward mineralized areas.

"Ore bodies probably exist in some of the unexplored areas. Recent prospecting has proved the presence of good-sized deposits as deep as the D (lower) level, and the type of mineralization does not indicate that other ore bodies are not present, even below this level. Winchell states that 'the apparent relation of the ore bodies to the present erosion surface suggests that they owe their final position to the work of downward percolating surface waters.' This is interpreted to assume that the present position of the ore bodies is largely due to sulphide enrichment. Sulphide enrichment has undoubtedly been an important process near the surface, but evidence of it is lacking in the deposits below a depth of 100 feet. The wallrock alteration, the presence of pyrite, chalcopyrite, and pyrrhotite as the principal ore minerals, and the absence of chalcocite or other supergene (secondary) copper minerals in the deeper ore bodies confirm the hypogene origin of these deposits. Therefore little change in the mineral composition or metal content of the ore can be expected for at least several hundred feet below the zone of enrichment."

The Continental and Mable mines, now parts of the Queen of Bronze holdings, have been reported on by Parks and Swartley (16:72 and 146) as follows:

"The Continental Mine, property of the Copper Mountain Mining Company, is located one mile southeast of Takilma in the SE¼ sec. 35, T. 40 S., R. 8 W. The workings comprise three adits, one with 180 feet of drift following a very slightly mineralized fissure zone. Some distance north of this is another adit with about 100 feet of work. Some ore observed here was chiefly pyrrhotite with some chalcopyrite. West of this working and at about 100 feet lower elevation a crosscut was being driven to intersect the mineralized zone at greater depth. This was 100 feet long when examined. It is said that some good ore has been hauled to Grants Pass from this property.

"The Mable mine, or Copper King, is located on Page Creek south of the NE corner of sec. 11, T. 41 S., R. 8 W., 2½ miles southeast of Takilma. It is controlled by the Tutt estate, Colorado Springs, Colorado. At present it is under option to John Hampshire, Grants Pass, and the Twohy Bros., Portland. This mine is similar to the Queen of Bronze in the character of its ores, their modes of occurrence and associations,