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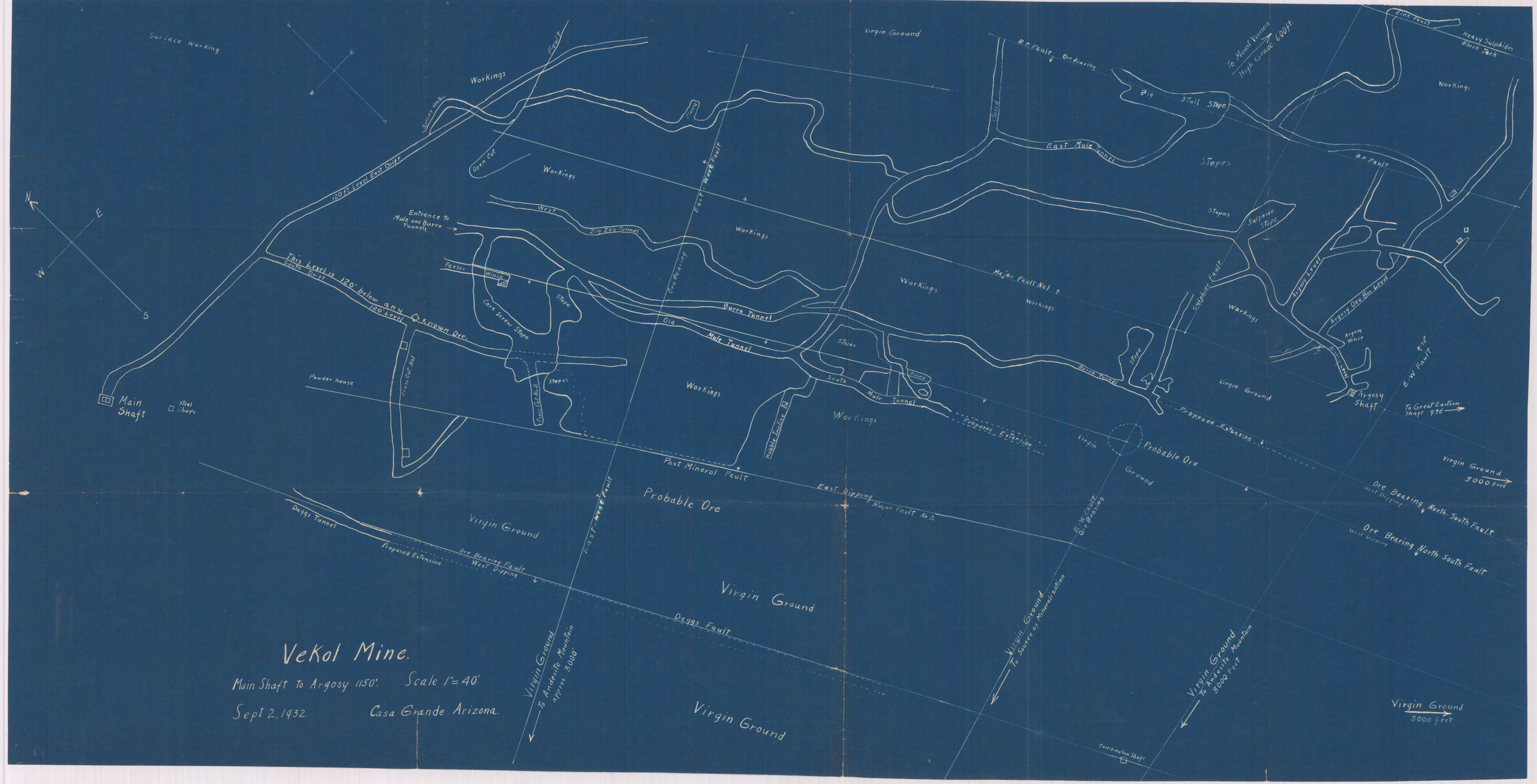
Vekol Mine.
Main Shaft To Argosy 1150'. Scale 1" = 40'.
Sept 2, 1932. Casa Grande. Arizona.
Surface Working
Workings
Virgin Ground
Fault
Open Cut
120 ft Level East Drift
Entrance to Mule and Burro Tunnels
West
Zig Zag Tunnel
East - West Fault
Ore Bearing
Parlor
Winze
Stope
Cork Screw Stope
This Level is 120' below any 120' Level
South Drift
Known Ore.
Powder house
Cross Cut No 1
Cross Cut No 2
Stopes
Main Shaft
Steel Shops
Burro Tunnel
Old
Mule Tunnel
South
Mule Tunnel
Hubble Incline
Post Mineral Fault
East Dipping
Major Fault No 2
Probable Ore
Daggs Tunnel
Proposed Extension
Ore Bearing Fault
West Dipping
Daggs Fault
Virgin Ground
To Andesite Mountain approx 3000'
Virgin Ground
To Source of Mineralization
Virgin Ground
To Andesite Mountain 3000 Feet
Combination Shaft
B.F. Fault
Ore Bearing
Big Stull Stope
East Mule Tunnel
Stopes
Major Fault No 1
Sulphide Fault
Sulphide Stope
Argosy Level
Argosy Ore Bin Level
Argosy Winze
Argosy Shaft
E-W Fault
To Great Eastern Shaft 930'
Proposed Extension
Virgin Ground
Probable Ore
Ground
Ore Bearing North-South Fault
West Dipping
Ore Bearing North-South Fault
West Dipping
Virgin Ground
3000 feet
Virgin Ground
3000 feet
To Mount Vernon High Grade 600 ft.
Zinc Fault
Heavy Sulphides Black Jack
Workings
B.F. Fault
N
E
S
W

NOTE:- Combination Shaft is not down as deep as the first dolomite bed. The 120' level was driven a long time ago, and is about 120' below the known ore zone. At that time it was thought the ore West of Major Fault No. 2 had dropped. However, later geologists have shown that there has been an upward displacement instead, which amounts to about 40'.

Vekol Mine

VEKOL MINE.

Casa Grande Mining District
Pinal County, Arizona.

Reconnaissance Report

by

J. S. Coupal, Mining Engineer.
Phoenix, Arizona. July 10,1946.

HEINRICHS GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

CONCLUSION. The Vekol mine has shown a large recorded production of high grade silver ore. A misconception of the realtion between the ore occurance and the step faulted limestone series resulted in a comparitively large area of virgin ground being left unexplored. The virgin area justifies intensive exploration and development and I do so recommend.

PROPERTY. The property consists of six patented mining claims ans should include a few of the adjoining unpatented claims. Title to the property was under litigation at one time but has since been cleared and is now, I believe, free from any and all incumbrance. Located in the Casa Grande Mining District, Pinal County, Arizona about 35 miles southwest from Casa Grande and in the Papago Indian Reservation. It is at an elevation of about 1600 to 1700 feet above sea level. The route from Casa Grande, the nearest rail point, is over practically level desert road, a good part of which is maintained by the gas line company. Ample water is available both for domestic and milling purposes from a deep well on the patented claims. Operating conditions are favorable for year around operations.

GEOLOGY. The geology is fully covered in a transcipt, from the " Economic Geological Reconnaissance of the Casa Grande Mining District, Pinal County, Arizona by J. B. Tenney" which is attached. Breifly it may be summarized as a mineralized replacement in an altered shale horizon in a block faulted limestone series. The ore bearing shale horizon is capped by hard gray limestone and underlain by an altered iron stained dolomitized lime.

DEVELOPMENT. The ore bodies have not been systematically mined but have been irregularly opened up and mined by several thousands of feet of drifts, raises, stopes, open cuts and shafts. The strike of the block faulting is not normal to the dip of the lime bedding in which the ore occurs and the major development has been roughly parallel to the strike of the block faulting so that the major working level is a gentle incline dipping from 5 to 8 degrees downward from the portal. This results in a high cost for removal of the mined ore. The workings are very irregular .

DEVELOPMENT. (cont)

Mr. Chas. A. Mitke, a mining engineer of high national standing, acquired a lease and option on the property and spent the greater part of his time from 1932 and 1933 in an intensive study and mapping of the property. He plotted the results of these studies on a sectional glass scaled model of the geology and the underground workings. This model shows the location and existence of several unexplored blocks of virgin area where the productive ore horizon is practically assured.

The earlier workings were all in oxidized ore. At the southeast end of the developed ore body the Argosy shaft was sunk to a depth of about 300 feet and exploration and development work from the bottom of this shaft opened up a sizable body of sulphide ores as well as connecting with the old workings for ventilation and for an easier and less costly way of removing the mined ore.

Due to the irregularity of the mine workings and the unsystematic method of development it is impossible for me to call any of the ore "blocked ore". From the habit of the ore occurance and from the observations made I believe it is safe to say that there is practically assured about 15,000 to 20,000 tons of sulphide ore near the Argosy shaft and from 3,000 to 5,000 tons which can be recovered from the oxidized ores when adequate means of removing that ore can be provided.

Stage 1 — as proven by tests

There is also a sizable tonnage of dump ore which, when the proper metallurgy is worked out, might show a substantial profit. This can only be determined by intensive sampling and by careful testing to outline the proper mill flow sheet required. In addition to this there is the possibility of being able to handle a large tonnage of outcrop by open cut shovel work. This also calls for careful sample work and flow sheet study.

RECORDED PRODUCTION. From partial records, a production of in excess of $1,000,000 in silver is reported by Mr. J. B. Tenney. It is known that these records were incomplete. From other authentic sources the recorded production is placed at between $3,000,000 and $7,000,000.

The records of the mine have been lost. Mr. Chas. A. Mitke had a complete set of records with him while in the Philippenes during the late war and they were all lost.

RECOMMENATIONS. The property justifies ~~xxxxxxxxxx~~ systematic and intensive development and exploration and it is so recommended by me.

The work should be done in stages. When the results obtained from the first stage are known a decision can be soudly made as to the following stage and in a similar manner as to the following stage.

NAYT

RECOMMENDATIONS. (cont)

Stage 1. Rehabilitation of camp and partial mine workings.
Survey, sample and plot sites for diamond drilling.
Equip and diamond drill for new ore.
Estimated cost of stage 1. $25,000.00

Stage 2. Open up newly exposed ore shown by drilling and prepare for the efficient mining of this ore.
Estimated cost of stage 2. $25,000.00

Stage 3. Erect and install adequate mill , 50 to 100 tons daily capacity, and provide working capital for production.
Estimated cost of stage 3. $100,000.00

Total committment. $150,000.00

CONCLUSIONS. I believe the project thus outlined to be sound and that the records and the history of the Vekol mine fully justify carrying out this program.

It is entirely possible and well within reasonable expectation that the work outlined under stage 1 may reveal the occurance of sufficient high grade ore, within a comparitively short time and expense to start production within the amount, $25,000 allocated for stage 1.

One of the major recommendations for the future of the property is the personal time and expense made by Mr. Mitke in his study and the results obtained by him. The low price of silver and the conditions at the time made it advisable for him to abandon the project.

The present price of silver, 90.5 ¢ an ounce, and the favorable postion of silver in the world markets make the project most attractive at this time.

I take pleasure in being able to recommend it highly.

Respectfully submitted

J. S. Coupal.

J. S. Coupal. Mining Engineer.
307 Arizona Title Building.
Phoenix, Arizona.

July 31,1946.

Report by
Gus A. Mitke

14 pages

HEINRICHS
GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

VEKOL MINE.

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LOCATION.

The VEKOL MINE is located approximately 41 miles in a southwesterly direction from CASA GRANDE, Arizona, the said town being a station on the main line of the Southern Pacific Railroad. The trip from the station to the mine is made in about 2½ hours, over a fairly good desert auto road. The capital of the State, (Phoenix), and the town of Tucson, are each about 100 miles distant from the mine. (See Fig. 1.)

SUMMARY.

The mine is a high grade silver-gold, discovered in 1880, known as a Bonanza producer until 1894, closed down owing to the death of the owners, and tied up in litigation from that time on for many years. It has a past production record of around $5,000,000.

The ore occurs as a replacement deposit in dolomitic limestone. This extensive limestone bed is cut into rectangular blocks by post-mineral faults. The early operators mined out the ore in one of these rectangular blocks until they reached the post-mineral faults to the East and West, and then carried their development work to the south. Since little was known regarding the geology of fault problems in the early days, no attempt was made to find the continuation of the ore on the other side of the faults.

Approximately 9 acres cover the extent of the early workings, however, the dolomitic bed, constituting the Vekol ore horizon, extends 600 feet to the East, and both West and South for several thousand feet, but these extensions have not as yet been prospected.

The ore of the Vekol Mine, during its fourteen years of operation, was of such high grade that the major part of the profits was derived from merely mining the ore by hand methods, and shipping direct to the smelters. The average shipping ore carried 250 ozs. silver per ton, with more or less gold.

MINING PROPERTY.

The Vekol property consists of 22 mining claims - 409 acres. Six of the claims are in process of being patented. (See Fig. 2.) The mine is on the Papago Indian Reservation, in the Casa Grande Mining District.

All the mine work prosecuted to date is contained within the boundaries of the six claims mentioned above, but only a small portion of this area has, as yet, been explored. Practically no work has been done on the unpatented claims.

IMPROVEMENTS.

As the original discovery outcropped at surface, the mine was opened up, and largely worked, through tunnels, but at a later date, three shafts were sunk - the "Main", "Argosy", and "Combination". Eight miles of underground workings have been opened up, and there are also numerous open cuts on surface, as well as shallow shafts and pits.

As many as 150 Indian and Mexican families are said to have resided at the mine at one time, and the nucleus of a town still remains. Of the original buildings, two houses and the store are in good condition, but the large boarding and rooming house, and other dwellings, require repairs. A six inch well, 675-feet deep, supplies the camp with good water for domestic and mill purposes, and a pipe line carries water from the well to the various buildings.

The foundations and framework of the original mill are intact. This contains a 10-stamp mill, used to treat the small amount of low-grade remaining after the high-grade shipping ore had been sorted out. Assay office, small warehouse, blacksmith shop, oil and gasoline storage house, and two powder magazines are in use at present. Hoist, compressor, and motors are on the ground ready for use.

As the dolomite and altered porphyry (talc) containing the ore are soft and easily mined, a large proportion of the prospecting can be done with hand steel. The workings stand well and require little or no timber.

HISTORY OF THE MINE.

The following information has been extracted from various mining engineers' reports, much of it being taken from original records.

"The mine was located in 1880 by the Walker Brothers. One of the Walkers is said to have been initiated into the Pima Tribe, and the ore discovery was disclosed to him by an Indian."

"The Vekol Mine was worked successfully by John D. Walker, and his brother, Lucian, from the year 1880 to about the year 1894, during which period the owners realized a magnificent fortune in net profits from their operations, the high grade being shipped to the smelters direct, while the low-grade went to their ten stamp

mill and pan-amalgamation plant, which handled an average of 466.8 tons of ore per month."

"According to the history of the mine, and the records we have on file, the Walkers derived their main profits from shipping ore found in bonanza bodies, at intervals, in practically hundreds of places, from one end of the mine to the other."

"We have on file the smelter returns from about 80 cars of ore, which the said operators shipped to the El Paso and Kansas City smelters, this ore averaging around 250 ozs. of silver per ton. ..... The mill heads over a 33 month period, from July 8th, 1885, to the end of February, 1888, (according to original mill records), averaged 32.09 ozs. silver per ton of ore treated. The mill heads of that period would have been considerably higher but for the fact that all high grade ore encountered was, as stated, carefully hand sorted and shipped, per data attached hereto. Also thousands of dollars worth of rich ore were annually stolen by the workmen. The mine is famous as one where every miner was a high grader. There are tales of rich ore shoots which were discovered and then covered with loose muck to await the convenience of the high grader. ....."

"The mill building and camp are located in a canyon which cuts the Vekol Range from East to West. The discovery of valuable minerals was made at a point on the south side of this canyon. The tunnel entrances to the mine are along the side of the gulch, or canyon. The mine workings are south from the gulch. The north side of the range has not been developed. To the south, the reef has been penetrated for a total linear distance of about 1050 feet. Near the extreme southern end of the workings the Argosy shaft has been sunk to a depth of 300 feet. The mine is dry and the ground stands well."

"Only one of the tunnels has been driven at a reasonably good tramming grade. The extreme irregular nature of the workings is due to the selective system of mining followed. Ore was trammed in wheelbarrows, or packed on men's backs, in rawhide bags, for hundreds of feet. Another method of transportation was to load the ore into light cars and pull it up tortuous inclines, over wooden tracks, with mule or burro power. In fact, the main tunnels of the mine are still known as the "Mule" and "Burro" tunnels. After the Argosy shaft was sunk, however, extraction of ore from the back-end stopes was simplified to a marked degree."

"Altogether, about eight miles of underground work was prosecuted during this period, mostly in the form of inclined workings, which are rectangular in shape, about 400' wide by 1050' long, and consist of a maze of tunnels, stopes, crosscuts, and irregular gougings. Continuing in a southeasterly direction, beyond the mined area, there are about 2000' of unexplored mineralized ground. Again, there are 700' of "back" above the old workings, and between the same and surface, that were never explored, while along the dip of the zone, little development work has been done. Hence, unquestionably, new bonanzas will be discovered again after the proper develop-

ment work is instituted." (E. B. Holt, for Vekol Mines Company, 1918)"

"John D. Walker and his brother, Lucian, died within a short time of each other, about 1894, and the mine was closed down and became involved in a multiplicity of law-suits. It lay idle until around 1907, although the mill was operated for a short period on dump ores, along about 1898."

"About 1912, under a lease and bond arrangement, a considerable amount of ill-advised work was done, which brought no results whatever to the lessees. North of the tunnel entrances, in the gulch, a second shaft (Main shaft) was sunk to a depth of 400 feet. From this shaft, at the 120' level, a drift and crosscut were driven. The crosscut is connected by a raise with some of the tunnel workings, about 500 feet from the shaft. The drift connects with the Corkscrew stopes, at a distance of about 300 feet from the shaft. The Main Shaft is below the Vekol ore horizon. Its bottom has penetrated another dolomite reef, but no development has been done on this, "

"In 1918, a group of Phoenix business men took an option on the property, and instituted a six months examination of the mine. They considered the results eminently satisfactory, as also the cyanidation and concentration tests made by their metallurgist, Mr. Walter E. Holt, and Mr. George Parson, Chief Chemist of the Ray Con. Copper Co. However, the slump in cotton at that time, in which the lessees were said to be heavily interested, and the rather severe terms of their agreement, involving monthly payments on the property, forced them to drop their option. Since then, practically nothing has been done with the property, although a later option was granted to another group, who, however, merely had sufficient funds to keep up the assessment work. The mine, therefore, remains in practically the same condition as when the death of the Walker Bros. closed it down."

GEOLOGY.

The strike of the Vekol Range, in which the mine is located, is approximately North-West, South-East, and it dips at an angle of between twenty and thirty degrees to the South-west. The ore deposit extends along the western slope of the range.

The country rock consists of a series of limestone beds, which overlay the older granitic rocks. These limestone beds consist principally of blue limestone, dolomite, and what is termed a "lime-shale". There is a bed of quartzite between the limestone series and the basal granite.

In the Vekol Range there are three known beds of dolomite, sandwiched between other beds of hard blue limestone. The topmost bed of the dolomitic series constitutes the Vekol ore horizon. This bed is about 100-feet in thickness. Development has been confined entirely to this upper bed, but the same geological conditions

apply to the two lower beds. Statements by the superintendent who supervised the sinking of the 400-foot Main shaft (now partially filled with water), are to the effect that at approximately 385 feet, the shaft entered dolomite, and ore showings made their appearance. Also, about 400 feet down the Eastern slope of the Range, silver sulphide nuggets have been dug out on surface, in what appears to be the second dolomite bed.

The Vekol mountains undoubtedly owe their origin to deep seated igneous intrusions, which caused the great uplift along the eastern side of the range. Subsequent to the uplift, there occurred subsidence on both the dip and strike of the mountain range. This resulted in the forming of at least two series of faults - the North-South and the East-West faults.

Fig 3 illustrates the position of the dolomite beds, and the manner in which the North-South faults have displaced the ore. It also shows the location of Andesite Mountain.

About half a mile to the west of the Vekol Range, in the sloping plain, is "Andesite Mountain", composed of porphyry (accompanied by an abundance of iron and silicious material), andesite, and later basaltic flows. Various intrusive flat tongues of porphyry originated from this mountain, and entered the dolomite series, especially along pre-mineral fault planes, as illustrated in Fig. 3. These intrusive porphyries deposited a large amount of iron and silica, in many cases replacing the dolomite. They also provided avenues for the thermal waters carrying the valuable metals in solution, which arrived as an end-phase of the intrusion, permeating the entire mountain. The solutions circulated most freely along lines of weakness, which were developed when the range was formed, and the values throughout the mine indicate general precipitation in the intrusive porphyries and between them and the dolomite, as well as along minor fault planes.

At the foot of Andesite Mountain, a small pit has been sunk on low-grade, copper-stained, silver ore, which occurs in a combination of talc (altered porphyry) and limestone. Geologists state ore stains have also been found at other points around the mountain slopes.

The same characteristics exist at Vekol as are found in Bisbee (Arizona). Andesite Mountain has performed the same functions for the Vekol deposit that Sacramento Hill did for the Copper Queen (Phelps Dodge) and Calumet & Arizona mines. Both are porphyritic mountains, which, being forced up through the limestone beds, sent large tongues of porphyry, with their ore accompaniement, into the more favorable beds. At Vekol, the ore-bearing solutions entered the dolomitic limestone beds, while in Bisbee, they penetrated the Martin limestone. The intrusive and extrusive porphyries in both cases contain large amounts of iron, silica, and breccia. At both mines, there are numerous cases of the ore being displaced by faults. At Bisbee, one of the principal methods of prospecting is working out fault problems, and following leads from mined-out stopes. The Vekol and Bisbee deposits are replacements in limestone, and the original discoveries, in both cases, were right on surface,

and about the same distance from their respective sources.

Another well-known camp in which the deposits were formed similarly to that of Vekol, is Leadville, Colorado. In that camp, the ore is found and mined in several limestone beds, over a very large area.

At Shafter, Texas, the American Metal Company has, in recent years, re-opened the Presidio Mine, an old producer, which is also a replacement in limestone, where the orebodies have been cut off through block-faulting. The fault problem was worked out, and a substantial extension of one of the former orebodies was found beyond the fault. Another new orebody was also found by driving in virgin territory beyond the fault lines.

VALUABLE MINERALS.

The values occur largely as silver chloride and sulphide (argentite), with more or less gold. The ore is found in a dolomite limestone, as a replacement, accompanied by silica, the oxides of iron and a very small amount of copper and lead. The copper stain is always an indication of ore of a good grade. The ore is generally found near the top of the dolomite. The altered andesite porphyry, or "talc" is always associated with the ore. At the contact of the talc and the dolomite is always found a reddish gossan deposit, which leads from one ore shoot to another, and is a most valuable guide in prospecting.

UNDERGROUND WORKINGS AND ORE EXPOSURES.

As previously mentioned, there are over eight miles of underground workings, consisting of tunnels and old stopes.

The ore outcropped at surface, and the early operators followed the dolomite bed Eastward until they struck the North-South post-mineral fault, and Westward, until they struck a similar fault, a total width of 400 feet. The ore was formed along the bedding plane, which has a strike of from North-West to South-East. The two post-mineral faults sheared the mineralized limestone bed, and gave it an upward thrust on the West, and a downward thrust on the East. It has been estimated that the displacement on the East is about 70 feet, and on the West, around 40 feet. (See Fig. 3). No attempt was ever made to go down or up on these well marked fault lines. Neither was any attempt even made to go through the intrusive porphyry (talc) above, to learn whether ore had been deposited at its contact with the dolomite, or limestone, on top, similar to the deposits found at its contact with the dolomite below.

The two main tunnels, the "Burro" and the "Mule", followed the ore to the South, for a length of about 1050 feet. The greatest height of the stoped area is about 100 feet. The mined-out section

therefore resembles a rectangular block of limestone, 400' wide by 1050' long and 100' thick.

At the time the Walkers died, the workings had progressed as far south as the Argosy shaft, which is in a faulted area, and litigation ensuing, the mine was closed down.

The large open stopes give evidence as to the tonnage extracted, while the ore left as a thin coating on the walls of drifts and stopes in numerous places, and as pillars throughout the mine, are an indication of the high values obtained.

Partial mill and smelter records available offer additional proof of these values.

Hundred pound sacks, averaging 50 to 70 ozs. of silver per ton, are obtained here and there throughout the mine, but no large tonnage of shipping or mill ore is blocked out at present.

Numerous leads and stringers exist, which, if followed, may connect with shipping ore, as they did when the mine was operated in former years. There are many stopes in which the ore has been followed right to a fault and then stopped. Naturally, raises and winzes should be driven from these stopes, along the fault, to explore the faulted portion of the orebed.

The Mt. Vernon may be quoted as an example of a promising ore lead. This consists of a 90' tunnel, driven into the range on the Eastern slope, on the Mt. Vernon claim. This tunnel, in general, is at right angles to the main workings, and its face is about 600' through the mountain from the Argosy shaft and the stopes where bonanza ore was mined. At the tunnel entrance, there is a very prominent outcrop of the altered porphyritic material, or talc, similar to that found throughout the mine. There is also plenty of red gossan, and several stringers of copper-stained, high-grade, silver-gold ore. The values were very low at surface, but 90 feet in the tunnel, assays as high as 3000 ozs. of silver and $22.00 in gold have been obtained. A small shipment to the Hayden smelter of the American Smelting & Refining Company ran 281 ozs. in silver, and $6.60 in gold. It is possible that one of these stringers will lead to the faulted segment of the orebody on the Eastern side, as in the past many such leads have connected up with large orebodies. (See Fig. 2)

The following assays of ore leavings in the mine, pillars, and sides of stopes and tunnels, taken by various engineers are, as mentioned above, indicative of the values stoped by the former operators:-

Assay No.	Width.	Ozs. Silver. Assay.	Remarks.
4	3'.0	98.96	Sulphide Stope (Galena).
12	7'.5	37.80	Ore bin level stopes.
16	7'.2	21.2	" " " "

Assay No.	Width.	Ozs. Silver. Assay.	Remarks.
24	4'.0	10.8	Argosy sub-level stopes.
29	0'.5	1018.9	Sulphide Stopes (specimen)
35	1'.0	142.0	Argosy stopes.
38	6'.0	10.7	Bottom of Argosy shaft.
40	0'.5	162.8	Argosy shaft bottom vicinity.
51	4'.0	17.0	Zig Zag Stopes.
52	2'.0	28.9	Big Stull Stope.
53	2'.0	111.6	" " "
56	4'.5	137.4	Zig Zag Stope.
58	6'.0	16.0	" " "
67	4'.0	70.9	Entrance to sulphide stopes.
68	5'.0	32.9	In Green Stope.

(B. W. McDougall, M.E. March 29th, 1920.)
(Certified correct.)

1	1'.3	31.8	Nearest	Survey	- No.	128
2	1'.0	39.5	"	"		"
3	2'.0	39.0	"	"		"
4	2'.0	20.5	"	"		"
5	5'.0	30.0	"	"		"
6	2'.0	36.7	"	"	No.	114.
7	3'.0	32.0	"	"	"	81
8	0'.5	258.0	"	"	"	82
9	2'.0	67.4	"	"	"	128
14	2'.0	62.0	"	"	"	82
15	1'.0	20.0	"	"	"	116
16	2'.0	73.0	"	"	"	117
17	2'.0	21.0	"	"	"	"
20	3'.0	21.0	"	"	"	82
22	1'.3	53.0	"	"	"	82
24	2'.0	38.0	"	"	"	82
25	2'.0	117.0	"	"	"	113
27	2'.0	36.0	"	"	"	82
28	1'.3	20.0	"	"	"	82
33	0'.5	24.5	"	"	"	113
35	1'.5	22.0	"	"	"	113
36	3'.0	85.5	"	"	"	113
37	3'.0	40.0	"	"	"	113
38	3'.0	31.5	"	"	"	113
40	0'.5	413.5	"	"	"	114
42	5'.0	22.0	"	"	"	114
44	0'.5	120.8	"	"	"	113
48	1'.0	75.0	"	"	"	106
49	2'.5	95.5	"	"	"	106
50	2'.0	86.5	"	"	"	106

(E. B. Holt, M.E. Oct. 20, 1919.)

1 - -

Assay No.	Width.	Ozs. Silver. Assay.	Remarks.
54	3'.0	39.5	Nearest Survey - No. 128
57	3'.0	80.0	" " 128
63	2'.0	64.5	" " 85
62	2'.0	61.6	" " 128
87	3'.0	136.0	Reynolds Raise.
89	2'.5	67.5	" "
93	0'.5	46.5	Sulphide Stope.
94	2'.0	141.5	" "
97	2'.0	147.0	" "
98	3'.5	17.5	Nearest Survey - No. 55½
99	3'.5	23.6	" " "
110	2'.5	23.5	Reynolds Raise.
111	3'.0	60.5	" "
112	6'.0	27.5	" "
114	3'.0	45.5	" "
207	2'.5	174.2	Hidden Stope.
214	3'.0	108.0	" "
219	3'.0	20.5	" "
225	1'.0	41.0	Nearest Survey - No. 120
227	2'.0	30.0	Reynolds Raise.
263	2'.0	180.5	Sulphide Stope.
284	2'.0	33.5	" "
308	1'.5	38.5	" "
330	2'.0	34.0	" "
409	3'.0	60.0	Green Stope.
411	2'.0	111.7	" "

(E. B. Holt, Feb. 1, 1919.)

Assay No.	Ozs. Gold.	Ozs. Silver.	% Copper.	% Lead.
1	.06	63.4	1.5	15.
2	.04	47.6	2.8	13.0
3	.06	10.8	3.4	3.6
4	.01	73.6	1.8	13.0
5	.01	51.0	2.1	14.0
6	.04	37.0	1.1	7.6

(P. R. Daggs, January 21st, 1932.)

(Above assays taken for patent purposes.)

ORE SHOWING ON MT. VERNON CLAIM.

Assay No.	Width.	Oz. Gold.	Oz. Silver.	% Lead.	% Copper.	Remarks.
59	3'.0	-	0.8	-	-	Mt. Vernon outcrop.
60	2'.0	-	2.0	-	-	" "
61	2'.0	-	1.9	-	-	" "
62	2'.0	-	0.3	-	-	" " (tunnel entrance.)

(B. W. McDougall, M.E. March 29th, 1920.)

1	--	0.3	1000.0	-	-	90' in tunnel.
2	--	-	70.0	-	-	Lower grade, after sorting out high grade.

(Diehl, Assayer, for Ed. Drake, Sept. 1931.)

6	0'.5	1.1	3178.9	-	-	90' in tunnel.

(Burlingame & Parker, assayers, Denver, Colo. June 7, 1932.)

Small shipment of Mt. Vernon ore, sorted out while driving tunnel, and sent to Hayden smelter of American Smelting & Refining Co. Oct. 16, 1931.

Silver	281.35 ozs. per ton.
Gold	.33 " "
Copper	1.61 %

RECOMMENDATIONS FOR FUTURE PROSPECTING.

No prospecting has been done in the southern extensions of the Argosy stopes, or in the Vekol ore horizon lying beyond the West post-mineral fault. This belt parallels the mine workings and extends south for a distance of around 3000 feet, and west to Andesite Mountain, the main source of mineralization. It is estimated that this belt has an upward displacement of about 40-feet.

The Corkscrew stopes, in which some of the richest ore was found in the early days, were carried down to the West post-mineral fault and then abruptly stopped. Several raises should be put up in the fault, a distance of about 40-feet, in order to pick up the continuation of the ore in the dolomite.

Likewise, a section of the Big Stull Stope, which was also very rich, has been faulted to the East. This should be followed.

Prospecting should also be carried on in the Argosy end of the mine, to locate the extensions of the ore in the Sulphide stopes.

Between the top of the mine workings and the surface, there is a large block of virgin ground. This back extends over the entire developed portion of the mine. The length is about 1000 feet, and the distance, measured along the pitch of the reef to the surface, varies from 500 to 700 feet. This large unexplored area can readily be prospected from the tunnel levels by following the numerous ore showings in the back of both tunnels and stopes.

There are also a number of very promising leads and stringers which should be followed, as for example, the Mt. Vernon high grade.

The reef north of the mill has not been developed. This is promising ground as some small patches of ore are to be seen in the outcroppings, and it has the same continuation of the limestone, and is the same distance from Andesite Mountain as the mine itself.

Casa Grande, Arizona.
August 30th, 1932.

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VEKOL MINE.

The following is an account of the results of a few shipments of some of the high grade ores of the Vekol Mine, which were taken promiscuously from great quantities of these papers:-

KANSAS CITY SMELTING AND REFINING CO.

DATE.			TONS.	GROSS PROCEEDS	NET RETURNS	CAR NO.
Sept.	20,	1884	12.75	$4,860.09	$4,672.31	At2770
Sept.	20,	1884	12.25	3,900.38	3,717.68	At8732
Aug.	27,	1884	36.75	10,542.47	9,982.04	At1656
May	14,	1884	13.00	3,638.30	3,434.29	At12944
June	27,	1884	38.00	11,233.43	10,686.11	At4458
Oct.	6,	1884	5.25	1,743.92	1,663.90	At10484
June	20,	1885	12.50	3,162.94	2,934.23	At1732
Feb.	9,	1885	24.50	4,389.85	4,205.81	At3107
Jan.	5,	1885	35.50	13,580.48	13,028.65	At4268
May	6,	1885	11.75	3,632.68	3,408.02	At7506
Apr.	18,	1885	12.50	3,607.69	3,278.28	At9238
July	24,	1885	12.50	3,432.67	3,006.84	At7400
Feb.	27,	1885	12.75	3,967.58	3,789.95	At1276
Apr.	11,	1885	11.00	3,872.84	3,643.54	At1276
June	17,	1885	12.50	4,217.68	3,992.65	At2436
Mar.	26,	1885	12.75	3,807.10	3,756.17	At1428
Aug.	5,	1885	14.25	4,000.21	3,756.17	At10758

EL PASO SMELTER.

Jan.	10,	1894	11.50	1,522.71	1,451.31	Sp6482
Apr.	1,	1891	11.50	1,082.70	1,011.39	Sp11050
Mar.	27,	1891	11.25	1,124.86	1,052.96	Sp7038
Feb.	21,	1891	11.26	1,360.60	1,290.32	Sp2530
July	23,	1891	12.75	1,690.53	1,634.33	Sp1184
Aug.	14,	1891	12.00	1,426.15	1,376.89	Sp3482
Aug.	31,	1891	12.00	1,231.53	1,182.73	Sp1920
Jan.	21,	1891	12.00	1,277.96	1,202.44	Sp2364
June	22,	1891	12.50	1,606.43	1,555.23	Sp2700
May	11,	1891	12.00	1,289.08	1,214.48	Sp1866
Apr.	20,	1891	12.00	1,502.67	1,429.22	Sp4704
Apr.	8,	1889	12.25	1,999.95	1,921.08	Sp2880
July	7,	1890	13.00	2,662.84	2,581.49	Sp1558
May	28,	1890	13.00	3,779.39	3,699.50	Sp3960
Apr.	22,	1890	12.25	1,732.14	1,656.01	Sp1640
June	6,	1890	12.00	3,498.95	3,422.93	Sp1661
July	25,	1890	12.75	2,629.50	2,549.30	Sp308
Sept.	18,	1890	10.00	2,641.09	2,541.09	Sp138
Nov.	13,	1890	12.00	3,130.04	3,055.59	Sp334
Oct.	23,	1890	11.25	2,082.65	2,010.77	Sp758
Dec.	23,	1890	12.00	1,466.02	1,389.64	Sp9358

EL PASO SMELTER - CONTINUED.

			TONS.	GROSS PROCEEDS	NET RETURNS	CAR NO.
Dec.	29,	1890	12.00	$1,932.25	$1,857.55	Sp614
July	20,	1890	12.50	1,494.42	1,441.67	Sp9328
Dec.	6,	1890	13.00	1,996.93	1,915.48	Sp2300
Dec.	5,	1890	13.00	2,199.91	2,123.56	Sp9358
Oct.	16,	1889	11.00	1,508.45	1,470.76	Sp2300
Oct.	16,	1889	11.00	1,569.42	1,470.76	Sp2726
Nov.	13,	1889	11.50	1,351.40	1,277.60	Sp8626
Nov.	4,	1889	13.00	2,066.52	1,988.22	Sp232
Apr.	24,	1889	10.75	1,447.23	1,378.33	Sp3096
Sept.	23,	1889	11.75	1,523.22	1,452.57	Sp8204
Aug.	31,	1889	11.00	2,378.41	2,305.78	Sp1249
Oct.	24,	1889	13.00	1,814.78	1,734.08	Sp9748
Dec.	14,	1889	14.00	1,997.05	1,734.08	Sp9748
Feb.	25,	1890	11.25	2,470.94	2,400.05	Sp4604
Jan.	31,	1890	11.25	1,804.38	1,730.58	Sp9540
Jan.	15,	1890	12.00	2,692.21	2,618.11	Sp8988
Feb.	26,	1890	12.50	2,484.82	2,466.16	Sp8280
May	9,	1890	12.50	2,545.24	2,466.16	Sp566
Mar.	30,	1890	13.00	1,796.48	1,716.71	Sp10750
Apr.	15,	1890	13.00	2,081.44	2,000.12	Sp7192
Aug.	1,	1891	No data	--------	1,429.22	Sp4704
Apr.	21,	1891	"		1,441.67	Sp9328
Nov.	21,	1892	"	--------	1,221,02	Sp9492
Oct.	22,	1891	"	--------	1,082.62	Sp1226
Dec.	22,	1892	"	1,724.88	1,662.55	Sp4874
Oct.	15,	1891	10.25	1,223.27	1,818.07	Sp4874
Oct.	21.	1891	12.00	1,130.02	1,082.62	Sp1226
Nov.	12,	1891	11.00	944.08	898.58	Sp1962
Jan.	26,	1892	11.00	1,522.18	1,475.54	Sp8879
July	6,	1892	12.00	867.00	817.18	Sp3636
Oct.	6,	1892	10.75	1,069.12	1,024.82	Sp7368
Nov.	19,	1892	10.50	1,283.02	1,221.02	Sp9492
Aug.	10,	1893	14.75	1,557.03	1,494.85	Sp8959
Oct.	7,	1891	-----	--------	1,181.07	Sp4878
Aug.	31,	1891	-----	--------	1,182.73	Sp1920
July	24,	1891	-----	--------	1,634.33	Sp1184
May	11,	1891	-----	--------	1,214.48	Sp1866
Aug.	18,	1891	-----	--------	1,376.89	Sp3582
Nov.	18,	1891	-----	--------	898.56	Sp1962
June	23,	1891	-----	--------	2,937.00	Sp2700

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VEKOL MINE - MILL RUN.

Record of operation of Vekol Mill for 33 months, dating from July 8th, 1885 to February, 1888. Copied from original mill records.

Date.	Tons Milled.	Heads Ozs. Ag.	Tails Ozs Ag.	Amt. Saved.	Percent Saved.	Fine Bullion Ozs. Silver recovered.
1885						
July	289.6	42.86	6.05	36.91	85.88	10,663.43
Aug.	468.5	49.26	3.90	45.36	92.08	21,251.65
Sept.	667.0	40.96	3.29	37.54	91.65	25,030.45
Oct.	646.0	39.65	4.13	35.52	89.58	22,996.97
Nov.	622.0	32.58	2.86	29.72	9.20	19,252.45
Dec.	645.0	36.85	3.12	33.72	91.53	23,051.37
1886						
Jan.	658.0	41.15	3.42	37.73	91.68	24,740.05
Feb.	586.0	38.71	2.74	35.97	92.92	21,087.81
Mar.	522.0	35.73	2.76	32.97	92.27	17,204.88
Apr.	555.0	39.15	3.17	35.98	91.90	20,003.57
May	446.0	38.70	3.17	35.53	91.00	15,874.23
June	305.3	44.17	2.60	41.57	94.11	12,692.01
July	358.7	41.71	2.98	38.62	92.83	13,857.38
Aug.	317.0	28.73	2.68	26.05	90.67	8,263.56
Sept.	329.2	36.06	3.84	32.22	89.35	10,609.18
Oct.	337.5	37.10	3.55	33.55	90.43	11,318.54
Nov.	373.0	37.36	3.71	33.65	90.00	12,571.64
Dec.	331.0	32.24	3.01	29.23	90.67	9,678.97
1887						
Jan.	324.0	33.68	4.07	29.59	87.90	9,585.68
Feb.	316.0	34.62	4.16	30.46	87.90	9,734.21
Mar.	297.7	32.58	3.82	28.70	88.00	8,541.22
Apr.	291.5	32.92	3.71	29.21	88.70	8,717.20
May	320.0	35.87	5.49	30.38	84.60	9,166.76
June	701.7	20.06	2.59	17.47	87.80	12,261.06
July	586.7	21.93	3.43	18.50	84.30	10,857.99
Aug.	712.0	19.36	3.02	16.54	84.50	11,776.57
Sept.	498.5	19.83	3.08	16.75	84.40	8,348.30
Oct.	623.7	32.67	4.53	28.14	85.10	17,557.91
Nov.	490.0	18.52	2.62	15.90	85.80	9,049.07
Dec.	527.5	16.75	2.00	14.75	88.00	7,781.17
1888						
Jan.	587.0	13.73	1.60	12.13	88.40	7,118.35
Feb.	721.0	12.43	1.52	10.91	87.70	8,235.62
	10,406.1	32.09	3.23	28.48	86.50	438,842.25

Average tons ore milled per month 466.80
Average fine ounces silver recovered per month 13,298.21

Process employed - Pan-Amalgamation.

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EXCERPT.

THE COPPER HANDBOOK - Vol. 9. 1909.

by H. J. Stevens.

Page 1387. Vol 9.

VEKOL MINING COMPANY.

OFFICE: Tucson, Arizona. Mine Office; Vekol, Pinal County, Arizona. Employs circa 50 men. Maj. E. S. Garnett, president: J. V. Neuhaud, vice-president: J. M. Cotton, treasurer: S. J. Garnett, secretary: Wm. Forbach, supt.

LANDS: 42 claims, said to have been bought for circa $200,000.00, in the Vekol Mountains, about 35 miles southwest of Casa Grande. Lands include 6 old properties, dating from 1881, with about 6 miles of workings, said to have produced in the past circa $3,000,000.00 in silver and lead, and the old ore dumps are said to contain 350,000 tons of second grade ore that probably can be treated at a profit. The old mines shipped some ore carrying up to 4,000 ounces silver per ton, with considerable lead and a small amount of copper, with strong indications of increased copper values in depth. The mine has a new 380 foot two-compartment shaft, said to show good ore.

EQUIPMENT includes steam power, air compressor and 3 hoists, one good for 1,000 foot depth. Buildings include a smithy shop, machine-shop, carpenter shop, office and laboratory. The mill is of 40 tons rated daily capacity. Property considered promising.

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VEKOL MINE.

News Clippings from the files of the Mining Journal.

Dec. 5, 1925.

A 25 year lease has been taken on the Vekol Mine by W. J. Forback of Casa Grande, Ariz. Much high-grade silver ore was produced by the Vekol when operated 30 years ago, and additional development work was started about 10 years ago by Wm McDemot, then of Tucson. Mr. Forback is to proceed at once with development.

July 25, 1926.

P. P. Dagges, the owner of the Vekol Mine, Casa Grande, Arizona has announced that the property has been leased to a Mexico Mining company and that they will start work at once with W. J. Forback as manager. The mill and other machinery are now at the mine.

Feb. 27, 1927.

The famous old Vekol silver mines in the desert near Casa Grande, Arizona, are again at work. The Vekol Mining and Milling Company, capitalized at $750,000 has been incorporated by F. E. Carrow, 616 First Ave., Phoenix, Arizona, M. J. Carrow and Walter F. Lee.

Oct. 15, 1927.

P. P. Daggs, president of the Vekol Mine, Casa Grande, Arizona, has returned to the mines from Claremont, California. Mr. Daggs expects to spend the winter at the mine. The group of Phoenix people who have a lease and bond on the property, expect to start operations.

Oct. 10, 1930.

P. P. Dagges, 75 year old mining man of Casa Grande, Arizona died on January 8th, 1930.

Sept. 19, 1931

The Vekol Mine, 50 miles southwest from Casa Grande is now under lease to Drake and Harrison of Casa Grande. This mine was formerly owned by P. P. Daggs, who passed away early this year. Tom G. Young and associates of Los Angeles are continuing work at the Great Eastern property, adjoining the Vekol.

Apr. 9, 1932.

Charles A. Mitke, the well known mining engineer, who has recently been doing much work on mining methods for the Mt. Isa properties in Australia, is spending sometime in the southwest. He has the old Vekol mine, south of Casa Grande, under lease and bond and has been

taking out some high grade silver-lead ore. The Vekol is an old time silver-lead producer with a good production record, but it has been in litigation many years which prohibited operation.

Nov. 2,1932.

Mark Clardy has joined the engineering staff of Chas. A. Mitke at the Vekol mine, Casa Grande. Clardy holds degress of Bachelor of Science in egineering and Master of Science in Metallurgy from the University of Arizona.

Feb. 11,1933.

Percy G. Dobson, mining engineer and geologist of Vancouver, British Columbia has just completed an examination of the Vekol Mine.

June 20,1934.

An extensive study of the geology of the Vekol Mine, near Casa Grande, is being made by J. B. Tenney, geologist, of Tucson, Arizona. He is also directing the assessment work which is being performed by a small crew of men. The Vekol is under option to Chas. A. Mitke, who has been in Washington, D.C., the past year, directing the fight being made by claim owners of Southern Arizona against the order of the Secretary of the Interior, withdrawing all Papago reservation lands from mineral location. Mr. Mitke is expected back in Arizona at an early date, at which time he will direct further work to be done at the Vekol and at the Davis mine, which he also has under option.

Journal office note. June 26,1934.

Wire from Mitke requests we withhold publication of this item. Letter gives further reason that battle on claims on Indian Reservation not won and he wishes to attract as little attention as possible to mineral deposits.

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Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
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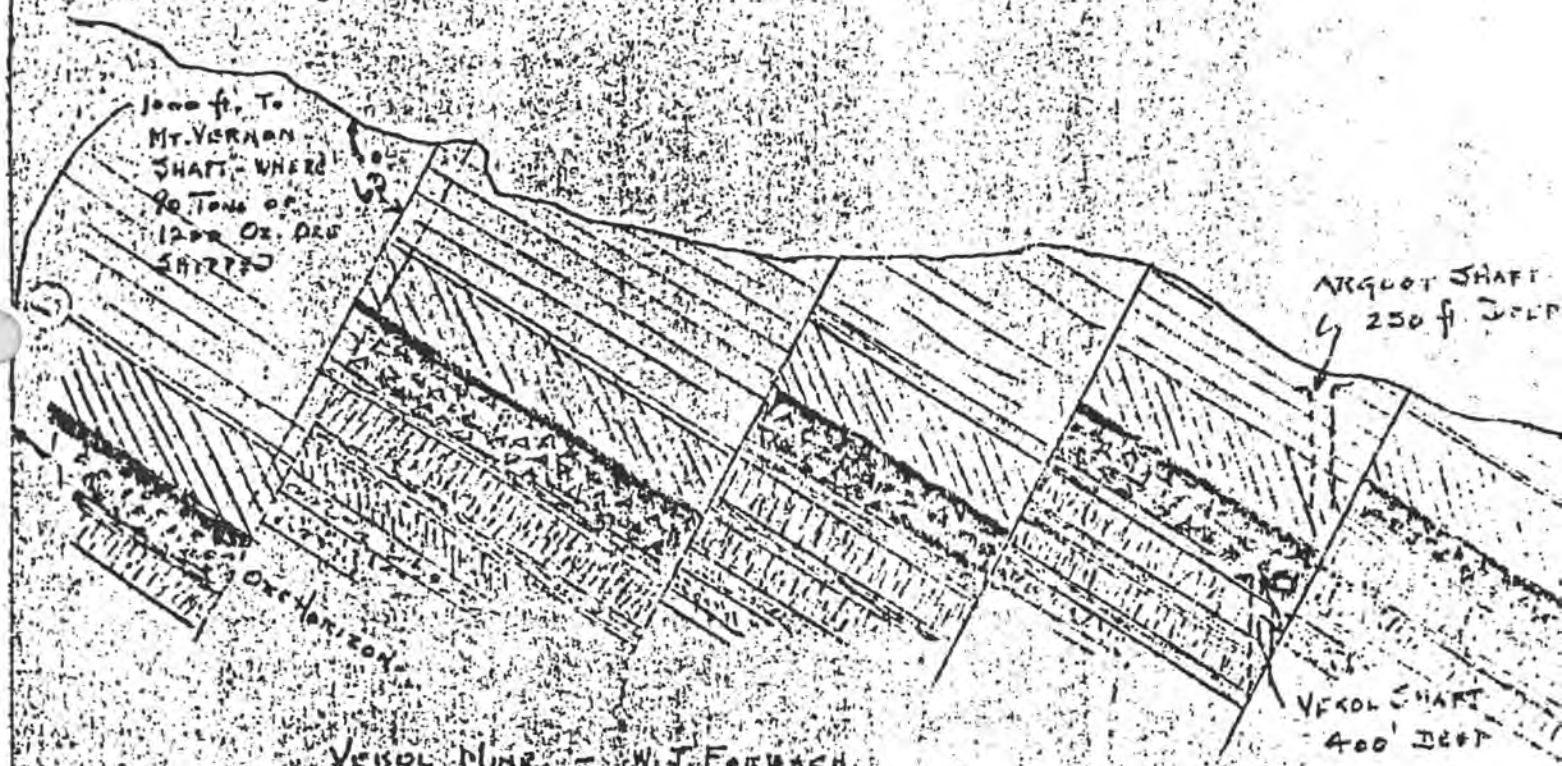


Vesol Mine — W. J. Forbach

Illustrative E-W Geological Section:

This sketch shows the ore occurrence in a well defined limestone strata. Approximately 10% of the mineralized limestone strata has been explored, developed & mined. This development work consists of some 10 miles of tunnels & drifts, 13 shafts & 12 surface cuts. The workings extend some 1400' on the strike.

*

cost to present cost $690,000

PROPOSED PROGRAM AND CAPITAL COSTS

October, 1984

1) PLANT EXPANSION AND IMPROVEMENTS	
CRUSHING EQUIPMENT crushing to 1/8" instead of 3/8"	$ 180,000
EQUIPMENT UPGRADE	15,000
1 DUMP TRUCK	7,000
1 PICKUP TRUCK	8,000
2 PLASTIC POOLS WITH PIPING	2,000
1 ZINC PRECIPITATOR	6,000
LABORATORY, INCL. AA-UNIT IN TRAILER	25,000
SUB-TOTAL	$ 243,000
2) DRILLING PROGRAM I = First Part Open Pittable areas 1-3 2,780 FT of core @ 50 ft/day = 56 days	$ 164,500 per RBL
LEACHING TESTS	3,000
SUB-TOTAL	$ 167,500
3) ACQUISITION OF MINING EQUIPMENT	
FOR OPEN PIT MINING	$ 350,000
SUB-TOTAL	$ 350,000
4) DRILLING PROGRAM II surface drilling outside of pit area PDP 1-5	$ 147,000 per RBL
LEACHING TESTS	1,500
SUB-TOTAL	$ 148,500
GRAND-TOTAL	$ 909,000
plus Contingency approx 10% →	$ 1,000,000

does not include underground drilling PDP-6 THRU PDP-12

PROFORMA WEEKLY OPERATING STATEMENT

÷ 200 TPD = 200 days
6.6 MONTHS
96 lb/cu ft
20.8 cu ft/TON

MATERIAL: DUMPS (ESTIMATED AT 40,000 TONS) ÷ VOLUME of DUMP REQUIRED 2
OPERATION: 5-DAY WEEK OR 7-DAY WEEK 5 DAY CYCLE = 100 TONS/WEEK 23
PRODUCTION RATE: 225 TPD AVERAGE
RECOVERY: 1 OZ/TON (INCL. GOLD RECOVERY EQUIVALENT)

OPERATING COSTS	5-DAY WEEK	7-DAY WEEK
MILLING AND RECOVERY	$ 7,450	$ 9,590
REVENUE		
SILVER PRICE $ 9.00/OZ		
1,050 OUNCES	$ 9,450	
1,575 OUNCES		$ 14,175
ROYALTIES	1,418	2,126
OPERATING COSTS	7,450	9,590
CASH FLOW	$ 582	2,459
SILVER PRICE $ 12.00/OZ		
CASH FLOW	$ 3,260	$ 6,475
SILVER PRICE $ 18.00/OZ		
CASH FLOW	$ 8,615	$ 14,507

PROFORMA WEEKLY OPERATING STATEMENT

MATERIAL: ORE - OPEN PIT MINING maximum available 351,000 TONS @ 250 TPD = 1404 DAYS

OPERATION: 7-DAY WEEK - 2 5-DAY CREWS

PRODUCTION RATE: 225/250 TPD - AVERAGE 1575 TPW

RECOVERY: 3.5 OZS/TON (INCL. GOLD RECOVERY EQUIVALENT)

at 50% RECOVERY NEED 7 oz/TON ORE

at 33% RECOVERY NEED 10.5 oz/TON ORE

OPERATING COSTS

	per Week	$2.86 per
MINING blasting + moving	$ 4.500	4 5
PROCESSING = Milling + Recovery	9.590	10.43
	$ 14.090 $8.94	14.93

REVENUE

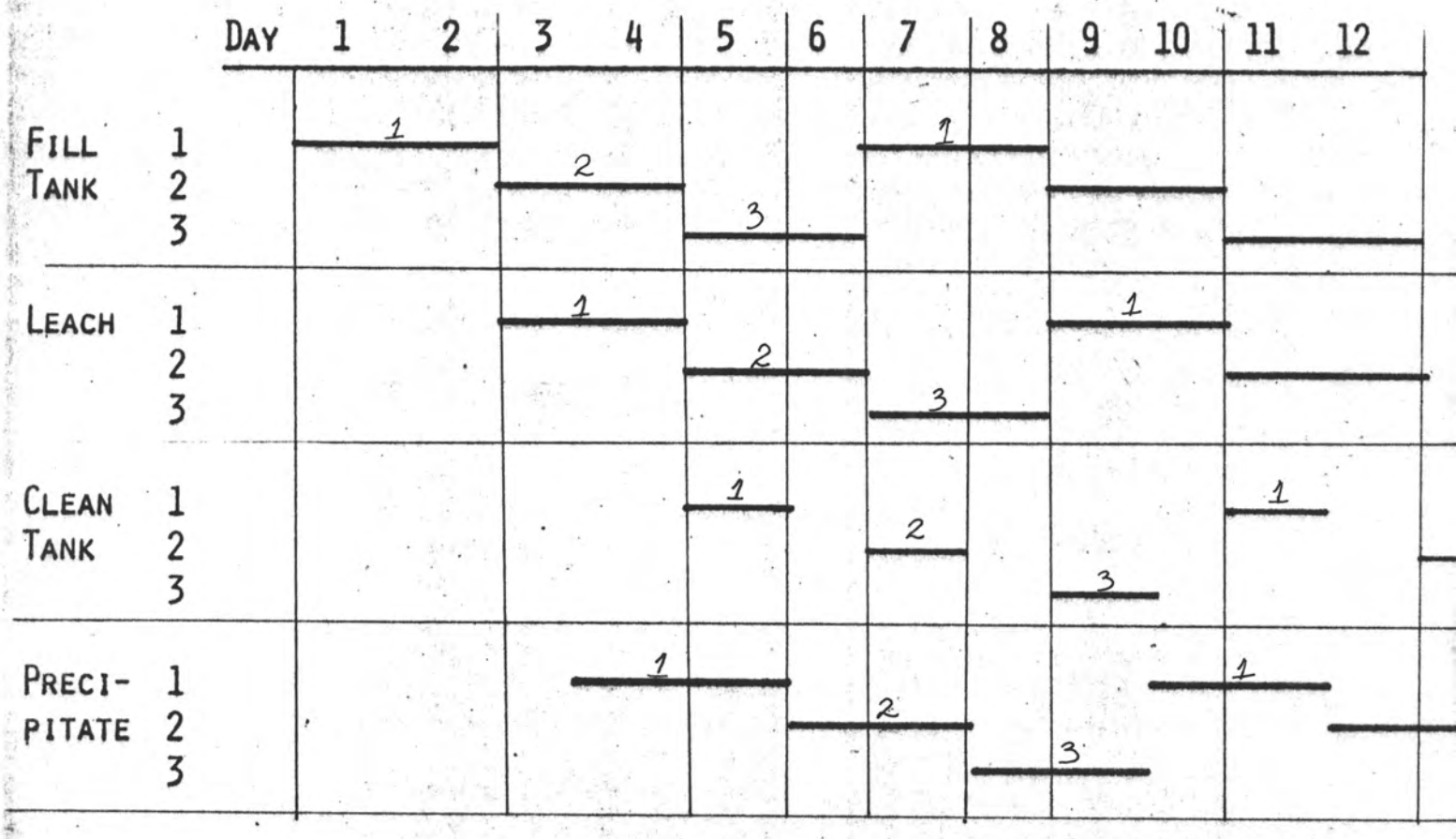
SILVER PRICE PER OUNCE	$ 9.00	$ 12.00	$ 18.00	7.00
5500 OUNCES for 1571 TPW	$ 49.500	$ 66.000	$ 99.000	38,500
ROYALTY	7.425	9.900	14.850	5775
OPERATING COSTS	14.090	14.090	14.090	14.090
CASH FLOW	$ 27.985	$ 42.010	$ 70.060	18,635
CASH FLOW PER TON	$ 17.77	$ 26.67	$ 44.48	$11.83

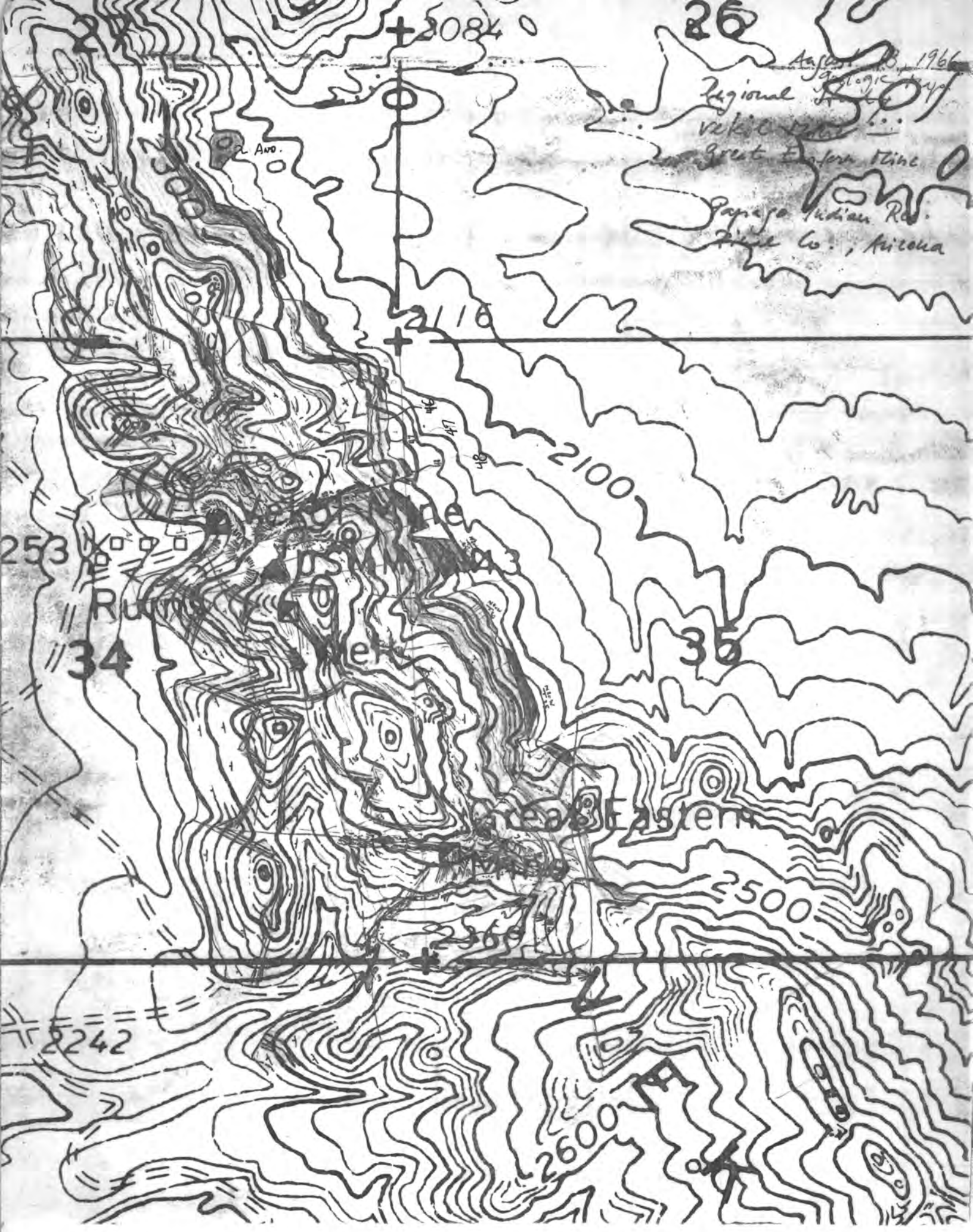
WEEKLY OPERATING COSTS

	5-DAY WEEK	7-DAY WEEK	
WAGES (5) (10) MEN	5 men (64$/day) $ 1,600	10 men $ 2,240	
PLANT SUPERVISOR	500	500	x 7/5 = 700
LAB TECHNICIAN	400	400	x 7/5 = 560
PAYROLL EXPENSES	800	1,000	
MANAGAMENT	900	900	x 7/5 = 1260
FUEL	1,050	1,500	
CHEMICALS	1,200	1,800	
MAINTENANCE	400	600	
TRANSPORTATION	100	150	
INSURANCE	150	150	
OFFICE, RADIO	300	300	
FOOD	50	50	x 7/5 = 70
TOTAL	$ 7,450	$ 9,590	= 10.430 +

OPERATING SCHEDULE

5 DAY CYCLE





26
2084
2116
2100
253
34
35
Great Eastern
2500
2242
2600

HEINRICHS
GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

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GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

Geologic & Feasibility Overview

of the

VEKOL MINE

Pinal County, Arizona

By: Keith C. Crandall
Consulting Geologist
Mesa, Arizona

November 8, 1978

27 pages

INTRODUCTION:

The purpose of this study of the Vekol Mine is to determine the feasibility of mining the old mine workings and/or discovery of new ore bodies of high grade silver.

To determine this, extensive research into the literature as well as field work was employed. A large sampling program has been involved in conjunction with geologic mapping of the area. Many

BY GUNNEX

laboratory experiments and pilot plant test runs were conducted in flow sheet design. By A.H. Ross + Assoc for Gunnex

SUMMARY & CONCLUSIONS:

The Vekol Mine has been an excellent producer of silver in the past and is a current producer. The early miners high-graded parts of the ore body but left much ore that with modern machinery and technology can be treated economically. There are significant quantities of high-grade sulfide ore such as argentite, tetrahedrite (friebergite) and high silver content galena and sphalerite to make a successful high-grade operation. This is ore 'in sight'. The early miners knew nothing about floatation of sulfides or did not have the proper equipment. They high-graded the oxide zone but when they got to the heavy sulfides were unable to treat the ore properly. They were after native and horn silver primarily.

After extensive research and field work on the property I believe that there has been post-mineralization block faulting of the ore body and that there are several blocks of ore yet untouched. This can only be confirmed however, by core drilling. There is also much evidence to support the theory of a large porphory copper deposit under the present mine workings where there are more favorable replacement beds.

GENERAL INFORMATION:

PROPERTY- There are six patented claims surrounded by the Papago Indian Reservation. They are recorded in Book 52 (deeds) page 138, Pinal County Court House, Florence, Arizona, BLM survey #4143.

CLIMATE- The climate is semi-arid with generally mild temperatures. The mine can be worked year-round without concern of weather. The temperature varies between the low of approx. 25 degrees F in the winter to a high of approx. 110 degrees F in the summer. The average rainfall is 10-15 inches per year. Most of the precipitation occurs during late summer and mid-winter.

WATER- There is presently a 380 ft. producing well on the property.* It produces approx. 15000 gallons/day. The water table east of the Vekol Hills by Bitter Wells is approx. 20 ft. deep while on the west side it drops to over 300 ft.

POWER- There is no electric power lines with at least 20 miles of the property. A 40 KW diesel generator is currently in use.

* A second well has since been drilled. It produces approximately 23800 gallons/day.

ACCESSIBILITY- There are three passable roads to the mine site. The route currently used is the El Paso Natural Gas road which is south of Stanfield approx. 10 miles. Another route is to go south on the Vekol Wash from I-8 freeway. An alternate route is to go south from Stanfield to Kohatk and through Bitter Wells to the mine site. There is also a landing strip for light airplanes on the property.

PRODUCTION

PAST- Most of the silver and gold was produced from 1882 to 1916. Very little has been done since then. An estimated 1,000,000 oz. of silver were taken out during this time.

JAN 17, 1978 TO SEPT 19, 1980

PRESENT- There is a heap leaching operation in production BY SUNBURST MINING CO OF SECURITY METALS INC AND O'BARR ELECTRIC CO MESA, ARIZ at this time. There are approx. 60,000 tons of mine dump material available. About 15,000 tons are currently on the leaching pad but only a fraction of which is presently being leached. This pad produces at least 850 oz. of silver per week. They are leaching the lowest grade dumps and only recover 20-25% of the silver, which is about average for a heap leach. Even with the low grade material and low recovery the system is very economical.

GEOLOGY AND ORE OCCURANCE:

The rock types at the Vekol Mine and vicinity comprise one of the most complete stratigraphic columns in the Basin & Range province of Arizona. At the base of the column is the pre-Cambrian Pinal Schist which is intruded by granite of questionable age. The Apache group rests unconformable on the schist basement. It is comprised of shales, conglomerates, quartzite, and limestone. It is estimated to be in excess of 1500 ft. thick. The Troy quartzite, of doubtful age unconformably overlies the Apache group. The Santa Catalina formation and the Southern Belle quartzite lie above the lower Troy. All of these are believed to be Cambrian in age. These are succeeded by the Upper Cambrian Abrigo formations, which is followed by the Upper Devonian section composed of the Martin limestone and the Lower Ouray formation. The Lower Mississippian Escabrosa limestone follows, and is seperated from the Lower Pennsylvanian Naco limestone by a distinct shale bed. (CONTACT SHALE) This can easily be seen near the main audit (MAIN PORTAL) of the Vekol Mine.

The entire Paleozoic section at the Vekol Mine and vicinity is approximately 1700 ft. thick. Although the entire section is essentially conformable in dip and strike, there are at least five disconformities (IN THE PALEOZOIC SECTION). Red beds, Quartzites and conglomerates (PHONODOREE FORMATION CRETACEOUS)

RED, BRICK-RED, LIGHT-BROWN MUDSTONE

RED FELDSPATHIC SS.

WHITE TO GRAY QUARTZITE

WHITE, GRAY AND ORANGISH-BROWN PEBBLE CONGLOMERATE

were deposited on the eroded Naco limestone and are visable south of the Vekol Mine. These were probably Cretaceous in age. The Dacite porphry, sills, flows and dikes are thought to be mid-tertiary and possibly Laramide in age.

At the Vekol Mine the Naco limestone and the underlying Escabrosa limestone for a northwesterly trending ridge which strikes generally N 30 W and dips about 25 degrees to the south-west. Two sets of pre-mineral faults cut these formations with apparently small displacement. The N 10-20 W set shows dips from 70 degrees east to 70 degrees west, and are commonly multiple structure of fractured or brecciated rock and comprise some very extensive fault zones. The N 70-80 E set dip about 80 degrees North and are usually straight and well defined. The largest of this second set cuts the north end of the old workings and is intruded in places by small andesite dikes which can be seen in the main shaft. The faults of both types may have been channels of mineralizing hydrothermal fluids. This calc-alkaline rock type is commonly associated with porphry copper deposits in the Southwest U.S.

According to old reports and from field observations it is apparent that the ore extracted from the old workings consisted of small nodules of horn silver, argentite, and silver bearing tetrahedrite (friebergite). During most of the production period

The ore was concentrated by hand sorting. This was mined from small pockets and lenses in the dolomitized upper horizon of the Escabrosa limestone within a few tens of feet of the basal shale bed of the overlying Naco Formation. Associated copper, lead, and zinc carbonates and sulfides can be found on the dumps and throughout the old workings.

The values of the high-grade material run about 1200 oz. Ag/ton. This is comprised mainly of argentite and friebergite. The wall rock varies in value from approx. 2.0 oz. Ag/ton to 12 oz. Ag/ton, with the average of 9 to 10 oz. It is interesting to note that there is little native or horn silver to be found on the dumps or in the old workings yet there is substantial amounts of sulfides still present.

ENVIRONMENTAL IMPLICATIONS:

Newmont Mining Co. has plans to start a large open-pit operation 3-5 miles east of the Vekol Mine. Their Vekol Hills project includes the Christmas Gift and Reward Mines. They have prepared a lengthly and in-depth study which has already been approved. This study is available from the U.S. Dept. of Interior, Bureau of Indian Affairs, Phoenix, Arizona.

The general conclusion was that an open-pit operation in this locality would be much more beneficial than detrimental. Since

the Vekol Mine is on patented property no environmental impact statement is needed. However, if extensive work outside the patented claims is done then an updated statement might be necessary.

RECOMMENDATIONS:

I would recommend a systematic program of geologic mapping, sampling, and drilling to confirm the presence and value of untapped ore bodies as well as the remaining value of ore bodies that have been partially exploited. While this exploration program is in progress I would also recommend a small scale high-grade operation which will not only prove financially beneficial but will also help in mapping and provide the material for a pilot mill to test the ore benefication techniques. Special care should be taken in working the old mine because of safety conditions. There are places which may need to be timbered.

I would strongly recommend development of the property, both as a high-grade and open-pit operation. I believe it would yield a high return on the investment.

Keith C. Crandall

Keith C. Crandall
Consulting Geologist
645 E. Bates
Mesa, Ariz. 85203

D. W. LITCHFIELD & ASSOCIATES, INC.
MINING AND LAND PLANNING CONSULTANTS

October 12, 1978

Mr. Joe O'Barr
Security Metals Inc.
438 South Drew
Mesa, Arizona 85202

Dear Sir:

On September 28, 1978, I accompanied your man, Tom Brice, and Mr. Carr Krueger on an inspection and evaluation of the Vekol mine and the adjoining properties.

Considerable time was spent in the underground workings and surface observations were made. The size and type of structures were observed, and from the data contained in those reports previously written by various authors, which reports I studied in detail prior to undertaking an on-site verification and evaluation, I surmised that a considerable quantity of commercial ore is available in the old workings.

It is obvious that the highgrade stringers were chlorided by the old timers and that the bulk of the ore of good mill grade is left in the stopes. The "gopher hole" type of mining has precluded the development of the mine in the past, but with some new and proven technology, using air conveyors and other modern underground mining equipment, the ore can be very economically mined and transported to a benification plant.

A thorough mapping and sampling should be accomplished, or perhaps the one done by the late John Walker of Gunnex may be purchased from the Gunnex interests. In either case, it should be quite simple to establish the best zones in which to begin mining within a very short time, and then the intricate mapping could be continued while the operations proceed.

In addition to the significant quantities of ore available in the present workings, a series of vein structures exist on the claims which should be trenched and drilled to establish the ???

220 South 2nd East, Suite 300
Salt Lake City, Utah 84111
P. O. Box 421
Lovelock, Nevada 89419
1755 East Plumb No.265A
Reno, Nevada 89504
P. O. Box 41
Gold Creek, Montana 59733

reserves contained therein. Some deep drilling is also indicated to establish the existence and magnitude of the inferred porphritic ore body believed to underly these claims.

I believe that the subject claims have excellent potential to become a large producer of silver and other precious metals and do not hesitate to recommend that a program of development, production and exploration be started as soon as possible.

Respectfully submitted,

D.W. Litchfield
Mining Consultant and Engineer

EXCERPT.

THE COPPER HANDBOOK - Vol. 9. ~~1909.~~ 1909

by H. J. Stevens.

Page 1387. Vol 9.

" VEKOL MINING COMPANY.

OFFICE: Tucson, Arizona. Mine Office; Vekol, Pinal County, Arizona. Employs circa 50 men. Maj. E. S. Garnett, president: J. V. Neuhaud, vice-president: J. M. Cotton, treasurer: S. J. Garnett, secretary: Wm. Forbach, supt.

LANDS: 42 claims, said to have been bought for circa $200,000.00, in the Vekol Mountains, about 35 miles southwest of Casa Grande. Lands include 6 old properties, dating from 1881, with about 6 miles of workings, said to have produced in the past circa $3,000,000.00 in silver and lead, and the old orre dunps are said to contain 350,000 tons of second grade ore that probably can be treated at a profit. The old mines shipped some ore carrying up to 4,000 ounces silver per ton, with considerable lead and a small amount of copper, with strong indications of increased copper values in depth. The mine has a new 380 foot two-compartment shaft, said to show good ore.

EQUIPMENT includes steam power, air compressor and 3 hoists, one good for 1,000 foot depth. Buildings include a smithy shop, machine-shop, carpenter shop, office and laboratory. The mill is of 40 tons rated daily capacity. Property considered promising. "

HEINRICHS GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

*

VEKOL MINE.

News Clippings from the files of the Mining Journal.

Dec. 5, 1925.

A 25 year lease has been taken on the Vekol Mine by W. J. Forback of Casa Grande, Ariz. Much high-grade silver ore was produced by the Vekol when operated 30 years ago, and additional development work was started about 10 years ago by Wm McDemot, then of Tucson. Mr. Forback is to proceed at once with development.

July 25, 1926.

P. P. Dagges, the owner of the Vekol Mine, Casa Grande, Arizona has announced that the property has been leased to a Mexico Mining company and that they will start work at once with W. J. Forback as manager. The mill and other machinery are now at the mine.

Feb. 27, 1927.

The famous old Vekol silver mines in the desert near Casa Grande, Arizona, are again at work. The Vekol Mining and Milling Company, capitalized at $750,000 has been incorporated by F. E. Carrow, 616 First Ave., Phoenix, Arizona, M. J. Carrow and Walter F. Lee.

Oct. 15, 1927.

P. P. Daggs, president of the Vekol Mine, Casa Grande, Arizona, has returned to the mines from Claremont, California. Mr. Daggs expects to spend the winter at the mine. The group of Phoenix people who have a lease and bond on the property, expect to start operations.

Oct. 10, 1930.

P. P. Dagges, 75 year old mining man of Casa Grande, Arizona died on January 8th, 1930.

Sept. 19, 1931

The Vekol Mine, 50 miles southwest from Casa Grande is now under lease to Drake and Harrison of Casa Grande. This mine was formerly owned by P. P. Daggs, who passed away early this year. Tom G. Young and associates of Los Angeles are continuing work at the Great Eastern property, adjoining the Vekol.

Apr. 9, 1932.

Charles A. Mitke, the well known mining engineer, who has recently been doing much work on mining methods for the Mt. Isa properties in Australia, is spending sometime in the southwest. He has the old Vekol mine, south of Casa Grande, under lease and bond and has been

taking out some high grade silver-lead ore. The Vekol is an old time silver-lead producer with a good production record, but it has been in litigation many years which prohibited operation.

Nov. 2,1932.

Mark Clardy has joined the engineering staff of Chas. A. Mitke at the Vekol mine, Casa Grande. Clardy holds degress of Bachelor of Science in egineering and Master of Science in Metallurgy from the University of Arizona.

Feb. 11,1933.

Percy G. Dobson, mining engineer and geologist of Vancouver, British Columbia has just completed an examination of the Vekol Mine.

June 20,1934.

An extensive study of the geology of the Vekol Mine, near Casa Grande, is being made by J. B. Tenney, geologist, of Tucson, Arizona. He is also directing the assessment work which is being performed by a small crew of men. The Vekol is under option to Chas. A. Mitke, who has been in Washington, D.C., the past year, directing the fight being made by claim owners of Southern Arizona against the order of the Secretary of the Interior, withdrawing all Papago reservation lands from mineral location. Mr. Mitke is expected back in Arizona at an early date, at which time he will direct further work to be done at the Vekol and at the Davis mine, which he also has under option.

Journal office note. June 26,1934.

Wire from Mitke requests we withhold publication of this item. Letter gives further reason that battle on claims on Indian Reservation not won and he wishes to attract as little attention as possible to mineral deposits.

*

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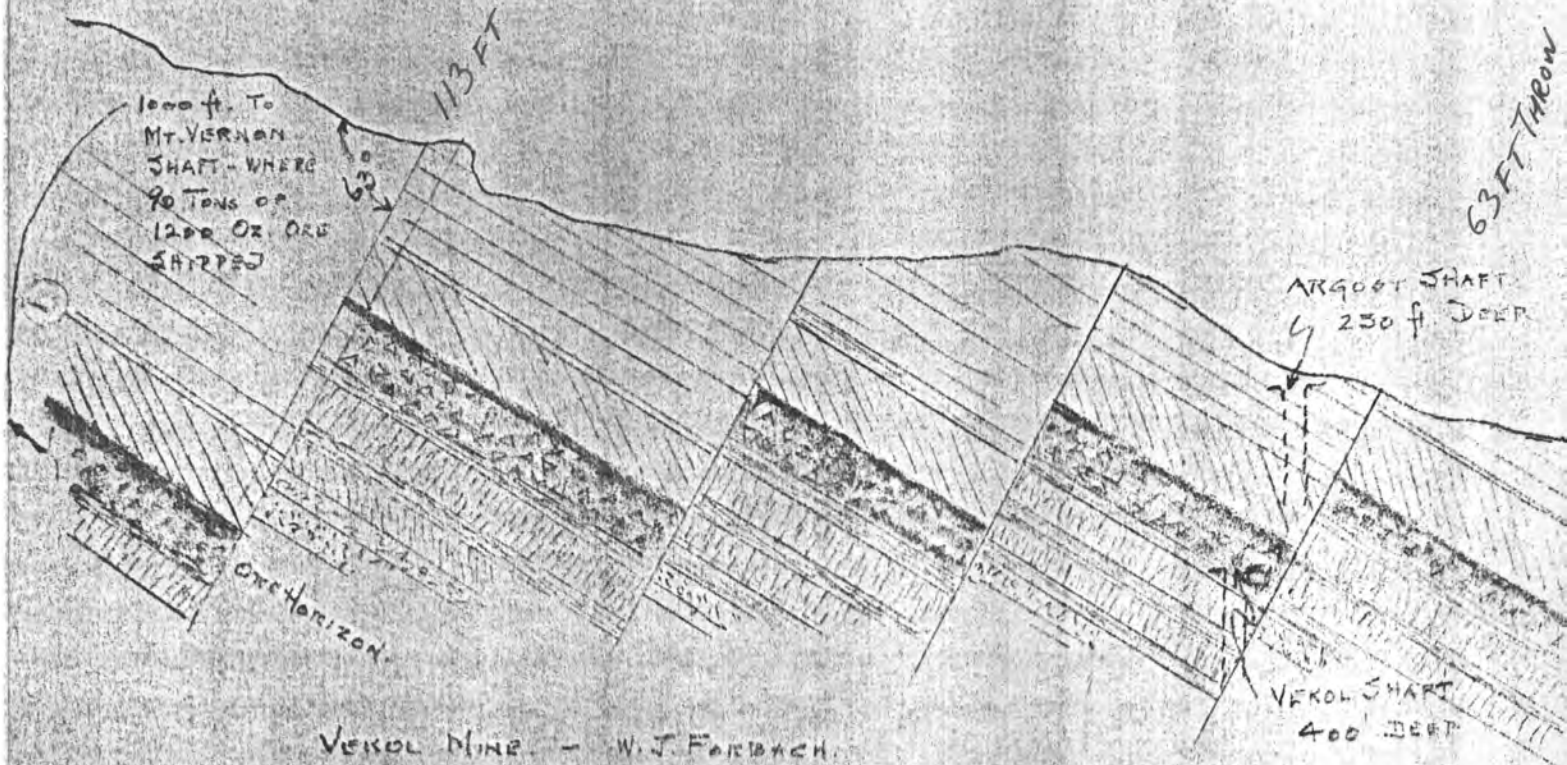

VEROL MINE. - W. J. FORBACH.
ILLUSTRATIVE E-W GEOLOGICAL SECTION.

THIS SKETCH SHOWS THE ORE OCCURRENCE IN A WELL DEFINED LIMESTONE SERIES. APPROXIMATELY 10% OF THE MINERALIZED LIMESTONE STRATA HAS BEEN EXPLORED, DEVELOPED & MINED. THIS DEVELOPMENT WORK CONSISTS OF SOME 10 MILES OF TUNNELS & DRIFTS, 13 SHAFTS & 12 SURFACE CUTS. THE WORKINGS EXTEND SOME 1400' ON THE STRIKE.

*

ORIGINAL BY FORBACH ?

HEINRICHS
GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

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GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

A COMPILATION OF REPORTS ON THE VEKOL SILVER.

36 pages

by

Hamilton A. Higbie, Registered Geologist
Scottsdale, Arizona

January 12,1969

REPORT on the VEKOL MINE
by
W.J. PORBACH, Mine Superintendent, 1907-1908

Superior, Arizona
July 12, 1946

To Dr. H.A. Moore,
Arizona Club,
Phoenix, Arizona

Dear Sir:

Referring to the Vekol Mine, this property was discovered by Papago Indians and samples taken to the J.D. Walker ranch on the Gila River, where samples were sent out for assaying, the results of which showed high values in silver; whereupon J.D. Walker, P.R. Brady and Lucien Walker located the property in 1880 and jointly began the operation as a co-partnership. For some reason or other, Brady and the Walkers failed to agree on the manner of operating the property, and the net result was the sale of Brady's one-third interest for $60,000.00 to the Walker Brothers, who jointly operated the property from 1880 to 1892. During this period, several million dollars worth of ore was shipped to various smelters, and the lower grade ores were milled in a 10-stamp mill followed by pan amalgamation.

In 1892 J.D. Walker became ill and died a short time later. Following the death of Mr. Walker, the property was involved in a series of legal entanglements which extended over a period of ten years, and following this period of litigation, I secured a lease and option for the sum of $200,000.00, and interested some southern gentlemen to take it over. At that time I had recommended a campaign of diamond drilling to determine the exact displacement of the ore-bearing series which occur between the highly altered shale beds and a dolomitized limestone which had been faulted by post-mineral east dipping faults, displacing the ore-bodies which follow the bedding planes, which dip approximately 32° to the west-south-west.

The Walkers, in operating the property, followed in along the strike for a distance of some 1400 feet from the discovery point, and in the extreme southern workings of the mine the ore-bodies became much more base -- the lead and zine increasing -- thus rendering their method of milling inadequate for the treatment of the sulphide ores. The displacement of the ore-bearing blocks increased from a throw of 63 feet from the western

extremity of the ore-blocks to a distance of 113 feet on the last fault to the east. These are the two faults, in my estimation, that make the Vekol a very interesting mining venture, as there is a large block of ground, lying to the south and east, of virgin territory which is exposed on the brow of the hill, where it is said that two carloads were shipped from this outcrop which averaged 1200 ounces silver per ton. MOUNT VERNON PROSPECT

= 24 TONS
= 28,800 OZ
NO-
TRY 281.35 oz Ag 0.33 oz Au 1.61% Cu

$PbCO_3$ is 83% Pb

To the west of the Argosy shaft there is a very strong probability that the Vekol ore bodies can be picked up in comparatively short diamond drill holes and that was the reason why I became interested in the mine in 1907, besides the fact that the records then in the office safe, which were not complete by any means, but which, showed by smelter settlement sheets, accounted for a million, six hundred thousand dollars, the average value in silver being 312 ounces and 12% lead. The mill book then in the safe, showed some $388,000.00 odd dollars as return from bullion indicating an average of 39 ounces of silver per ton. I had also been told by the bookkeeper, Mr. Mitchell, that the total production of the Vekol, at the time of Mr. Walker's death, was approximately seven million dollars.

I had proposed to the people interested that we initiate a diamond drilling campaign prior to attempting constructive development, but unfortunately I was over-ruled by the president of the company, and was instructed to sink a two-compartment working shaft adjacent toa 680 - foot water well which had been drilled to supply water for the mill and camp. The reason for the insistence of the president on sinking the two-compartment working shaft at this point was based on a drunken well-driller's story that in drilling the water-well, they had passed through 29 feet of 30 ounce silver ore. However, when the shaft reached the depth of 120 feet. We enclountered an east-dipping post-mineral fault which made it clear to me that the collar of the shaft had been started at a point where the ore-bearing series had long since been eroded, and was below the ore-bearing strata, there being a canyon extending from a pass in the mountains downward, forming a V-valley at the place where the shaft was sunk. I stopped the work at the 120 foot level, and advised the president of the company of the true conditions. They ignored the advice so furnished and instructed me to continue the shaft to a depth of 400 feet. No ore-bodies were encountered, proving the deductions previously given were correct.

?

This shaft, however, will be worth a good deal of money in the future operations in entering into the extension of the ore-bodies to be determined by future drilling, there being a long cross-cut.

January 12, 1969

Vekol Mine

Pinal County, Ariz.

General Information.

by

Hamilton A. Higbie, Registered Geologist.
Scottsdale, Ariz.

---Six patented claims, surrounded by the Papago Indian Reservation.

---Approximately 25 miles southwest of Casa Grande, Ariz. by airline, and approximately 29 miles south and west of Stanfield by graded gravel road. Railhead to the smelter at ElPaso, Texas would be Casa Grande.

---Mining commenced in 1879-80 with shipment of hand-sorted high grade ore. Total, through 1916, estimated at over $1,000,000. Only mined intermittently since then.

---Recent assays (with silver currently around $2.00 per oz.) show an average of 25 oz/Ton. One recent assay from the Argosy shaft yielded 141 oz/ton of silver.

--Firmly shown that an average of about $50/ton shipping ore is present.

---An I.P. recently run by Geo-Ex (of Tucson) indicates an anomolie at some 650' depth, indicating the possiblility of a large low-grade copper deposit below the silver.

---Gunnex Limited of Canada sampled dumps (100,000tons est.) which averaged $5.00/Ton (see report attached).

---Silver would be mined by underground methods, and the country rock is such that no timbering would be necessary.

---If copper deposit present below silver, additional property would have to be arranged through and with the Papago Tribal Council. They appear willing to negotiate.

---There is a FIRST well with good water on it near the main shaft. It is reportedly drilled to a total depth of ~~650~~ feet. 680 FT
NEW WELL PUMP AT 470 490

---Present owner is Harry Westling of Casa Grande. Owns 27% of the mine and has the remainder under lease from two other partners.

---Deposit is one of secondary enrichment, a replacement deposit in dolomitized lime strata.

---Orebody completely underlies all 6 claims, varying in THICKNESS ~~depth~~ from 20 feet to 80 feet. ~~OR MORE~~ FAVORABLE HORIZON

---Dumps include values in lead, copper, and zinc, as do the underground workings.

---Pb-Ag grade better at 8 mesh, but coarser material seems to favor Zn-Cu.

---Originally consisted of 22 claims, of which only the six mentioned were patented, others were allowed to revert to the Papago Reservation.

---There are approximately 8 miles of workings (tunnels,etc.) on the property.

---The orebodies seem to be controlled by a series of closely parallel faults of small throw.

---Claims are recorded as Mineral Survey #4143, April 2, 1933, Book 52 (deeds) page 138, Pinal County court house, Florence Arizona.

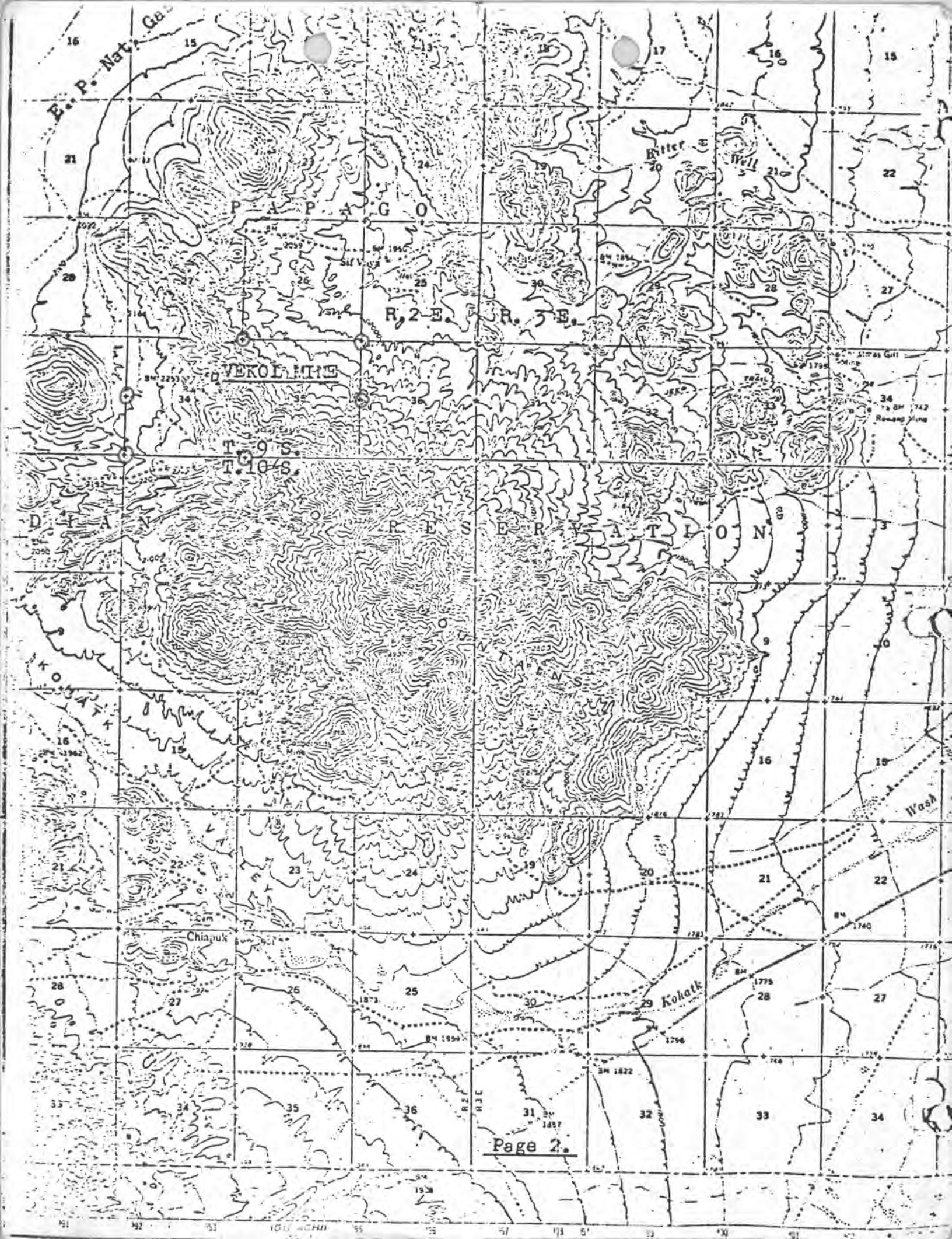
---Approximately ¼ mile of road would have to be bulldozed from the present road to open access to the Argosy shaft and dumps. If any drilling and shooting were necessary it would be minimal. The present road from the property to the El Paso Natural Gasline road could also be bladed with a minimum of time and expense to make it more accessible to truck traffic.

---The dumps can be worked immediately offering the quickest returns for investment. This could then used to open up the existing underground workings to shipping grade ore.

---Further drilling is necessary to delineate any possible deep-seated low-grade copper deposit.

Contents.

		Page
	Vicinity Map	1.
	Topographic Map (U.S.G.S.)	2.
	General Information	3.
I.	Results of Chemical and Geological Investigation BY DON STOUT. 1968	5.
II.	Preliminary Report (Blucher) 1968	9.
III.	Estimate of Exploration Costs (Johnson)	18.
MISSING	Explanatory Letter to Gunnex (A. H. Ross)	23.
	Memorandum by A. H. Ross & Assoc. to Gunnex	24.
	Flow Sheet (A. H. Ross & Assoc.)	27.
	Excerpt from Geological Reconnaisance (J. B. Tenney)	30.-34
	Brief History of Vekol (Murbarger)	35.
MISSING	Claim Map	36.
	Surface Geology (Duval Corporation, Eplor. Dept) BEFORE 1968	37.
	Preliminary Geologic Map	38. missing
	Aerial Magnetic Composite (Heinricks Geoex. for Duval Corp. - 1966)	39.
	Photos	40.


E. P. Nat. Gas
PAPAGO
R. 2 E.
R. 3 E.
VEKOL MINE
T. 9 S.
T. 10 S.
DIAN RESERVATION
MOUNTAINS
Bitter Well
Chiapuk
Kohatk
Wash
Page 2.

I.

VEKOL SILVER MINE.

Pinal County,

Arizona.

Results of chemical and geological investigation for Rare Metal Products Company of Phoenix, Arizona.

June 1968

by
Don Stout.

"The purpose of this investigation has been to evaluate the Vekol Silver Mine to determine what possibilities, if any, exist for the discovery of unmined high-grade silver ores in the near surface. This has involved attempts to outline the major structural controls of mineralization, the nature of mineralization, and its possible source. Aside from field

mapping, the principal method I have employed is a fairly intensive sampling program. Heavey emphasis was placed on emmission spectrographic analysis to determine what elements were present, and their approximate concentration. This work was performed by me in the laboratory of Research Chemicals, Phoenix, Arizona. Silver assays performed by Arizona Testing Laboratories, Phoenix, Arizona were used as a cross check on the spectrographic work, and pulp from these used for secondary spectrographic standards.

Major structural controls consist of faults and probable joint fractures, with a possibility of some shearing at the extreme south end of the old workings. The faults, for the most part, show no measureable ~~deflection~~ THROW although strong dip-slip slickensides are common in the tunnels. To further complicate the picture, the large E-W ARGOSY FAULT fault at the south end of the property is strongly reflected in the underlying Escabrosa Dolomite, but shows only minor silicification of the zone along its strike OUTCROP in the overlying Naoo Limestone. It appears that all of the mineralized zones in the main workings are poorly reflected in the upper limestone, if at all. The E-W fault ANDESITE DIKE FAULT at the north end of the workings, however, appears to have cut the limestone with substantial strike-slip displacement. This is the only fault with notable displacement, and is concluded to be younger ? than the other features, and probably post-mineral ? The great majority of the faulting is pre-mineral

and indeed probably existed as faults and/or joint fractures before the unconformable deposition of the Naco Limestone. No. Later hydrothermal action was undoubtedly responsible for the mineralization, and intersections of faults and/or fractures together with the ~~base~~ TOP of the much more chemically reactive ESCABROSA DOLOMITE limestone were the loci for higher grade ores. The mineralized fault zones delineated by the old workings trend N. 10 to 15 degrees W., but a strong case can be built for the existence of an intersecting set of fractures showing a trend of N. 80 to 85 degrees W., which are also mineralized. CRANDALL GIVES N 70-80 E

Mineralization consists for the most part of a very low-grade, highly calcareous fracture filling whose metallic constituents are iron, zinc, lead, manganese, silver, antimony, DO GEOCHEM and copper, in order of concentration. The lead and silver, and to some extent the zinc, will concentrate by gravity. I feel that all the metallics are present as carbonates and oxides, with the possible exception of some silver present as the chloride. This is the nature of the great bulk of the material in the fractures, which are metal-bearing along the entire length of the workings. In the small pockets of higher grade ore, probably all formed in the intersection of fractures, ??? lead, copper, and silver combine in a complex sulfide probably best described as bournonite. Silver-bearing carbonates of zinc and lead are accessory minerals. One sample of this ore from the Argosy dump assayed 241 oz. of silver per ton. Spec-

TETRAHEDRITE - Cu_3SbS_3

trographic analysis showed this to be antimonial, with a trace of mercury, and lead higher than copper. Underground investigation and chemical analysis indicated that this probably came from the extreme south end of the workings under the Argosy Claim. On the Mount Vernon Claim 150 feet south of the E-W fault which crosses the south end of the property, a pocket of sulfides was mined which showed copper higher than lead, with silver down to 75 oz. per ton, and antimony replaced by arsenic. This, together with the presence of antimony in the western workings, and its absence in the eastern workings in stopes further north, would indicate that the source of the mineralization either is closer to the surface on the east side of the property, or may actually lie east of the claims. The chemical makeup of the mineralization would indicate, from my experience in Arizona, an andesitic source.

ARGOSY FAULT

Future exploration for unmined higher grade silver ore should be directed along the strike of the southernmost E-W ARGOSY fault, but the expense is apt to be prohibitive unless geochemical methods are employed as a guide to promising areas along the fault. Also, the temperature zoning of the property seems to point to higher grade silver ores to the west of the main workings where this fault is presumed to extend. The 25 degree westerly dip of the beds puts the base of the NACO limestone at a rapidly increasing depth to the west. This could conceivably force explorations into highly speculative underground drifting, but it also could easily be worth the risk."

Don Stout.

II.

PREIIMINARY REPORT
VEKOL MINE AREA.

BY

Arthur G. Blucher

"Mr. Harry Westling, Mgr.,
Vekol Mining and Exploration Co.,
1198 E. Rodeo Road,
Casa Grande, Arizona 85222

February 27, 1968

Dear Mr. Westling:

Following is my report on the preliminary study of the old Vekol Mine Area. The engineering aspects of the report or study were handled by Mr. Albert S. Johnson, an engineering consultant with offices at 5215 North Oracle Road, Tucson, Arizona. His discussion of the drilling methods to be recommended here, and his cost and time estimates, are included as an appendix to this report. In addition to data gathered

during this examination, information was drawn from previous work by Tenney, Mitke, Carpinter, and geologists of the Duval Corporation.

Introduction and Conclusions

The old Vekol Mine is located on the western flank of the northern Vekol Mountains about 30 miles S. 55 W. of Casa Grande, Arizona. It can be reached by about 30 miles of fair dirt road turning south off U.S. Highway 80 at Stanfield, Arizona.

Discovered in 1879, it had a reported production of about one million ounces of silver between 1882 and 1916. There has been little exploration or production since that date.

The property consists of six patented mining claims (Mineral Survey 4143). The surrounding ground is part of the Papago Indian Reservation, and is controlled by the Tribal Council.

Present geologic and mineralogic information is sufficient to show that this prospect warrants drilling -- either as a A prospect of shallow and small high-grade silver orebodies, or B as a prospect of a large volume of base metal-silver ore from deeper stratigraphic horizons. The exact location and number of drill holes will depend on the results of recommended detailed geologic studies.

Summary

Mineraliztion at the old Vekol Mine consisted of lenses and pods of silver minerals enriched from a low grade deposit

of primary Cu-Pb-Zn-Ag minerals in dolomitized and fractured Escabrosa Limestone near the base of the overlying Naco Limestone. These secondary orebodies, though rich in silver, were quite small in physical dimensions.

Zn > Pb > Cu > Ag

Primary ore controls appear to have been N-S to N 30 W striking faults, N 75 E striking faults with attendant andesite porphyry dikes, and the lower surface of the Naco Limestone. Secondary enrichment producing high grade silver orebodies may have been controlled by the coincidence of these geologic features with an ancient water-table. ?? TRY "WITH A PRESENT WATER TABLE"

There are two exploration possibilities here: (A) The search for near surface, high grade, secondarily enriched silver deposits in areas not explored by the old workings; and, (B) A test of deeper and more favorable replacement horizons in the underlying formations. POOR!

Either or both of these proposals offer a clear possibility of success. It should be pointed out that proposal A will require a large expenditure in the search of targets of modest total potential worth, while proposal B will require a modest expenditure in search of a target of great potential worth. ?

Regional Setting

This is a desert region of small mountain ranges separated by broad valleys. Although the maximum relief of the mountain ranges is not great, they are commonly quite rugged in detail. Premineral bedrock outcrops are almost entirely confined to the

mountains, and a large part of the region is covered by valley fill or post-mineral volcanic rocks.

Although the geologic history of the region is quite complex when considered in detail, it may be simplified as follows:

At the beginning of late PreCambrian time the land surface was fairly even and consisted of Early PreCambrian schist and granite.

Upon this surface there was discontinuous deposition of sediments from Late PreCambrian until the end of Mesozoic time. There was little deformation or faulting during this period.

Active crustal movement beginning in Mesozoic time continued well into Tertiary and was accompanied by the intrusion of various igneous rocks. With some of these intrusives there was associated mineralization.

Uplift and erosion during Middle Tertiary was followed by the deposition of post-mineral detrital deposits and the extrusion of a considerable thickness of volcanic rocks. During the period of uplift and erosion some of the above mentioned mineral deposits were exposed to oxidation and leaching, and the consequent redistribution of mineral values between the surface and the water table. This process resulted in the enrichment of the very large chalcocite-copper deposits of the southwestern U.S. as well as some of the small but high grade silver deposits.

Geology and Mineralization

At the base of the straigraphic column for the Vekol Mountains is the much contorted Early PreCambrian Pinal schist, intruded in places by Early PreCambrian granite. Unconformably overlying these rocks is the Apache Group -- a thick (1500 feet plus) sequence of shale, quartzite, and conglomerate, with one thin bed of limestone. At the top of this sequence is the Troy Quartzite, which may be either Late PreCambrian or Cambrian in age, depending on the authority quoted. Conformably overlying the Troy is the Cambrian Abrigo Formation, the Martin Formation of Devonian Age, and the Mississippian Escabrosa Limestone. Overlying the Escabrosa with an apparent slight disconformity is the Naco Limestone of Lower Pennsylvanian Age.

At the Vekol Mine the Naco Limestone and the underlying Escabrosa Limestone form a northwesterly trending ridge rising several hundred feet above the valley floor. These beds strike generally N 30 W and dip about 25 degrees to the southwest. Two sets of pre-mineral faults cut these formations with small (10 to 100 feet) apparent displacement. The N 10-20 W set show dips from 70 degrees east (NORMAL) to 70 degrees west (ANTITHETIC), and are commonly multiple structures of fractured and brecciated rock. The N 70-80 E set dip about 80 degrees N and are commonly straight and clearly defined. The largest of this second set (ANDESITE DIKE FAULT) cuts the north end of the old workings and is intruded in places by small andesite dikes. The faults of both types may have been channels of

No!

ARGOSY FAULT
SULFIDE FAULT
JONES FAULT
ULYSSES FAULT

mineralizinghydrothermal solutions, and the ~~porphyry~~ ANDESITE is of a type commonly associated with mineral deposits of southern Arizona.

According to reports the ore extracted from the old workings consisted of small nodules of horn silver, argentite, and silver-bearing tetrahedrite (Cu_3SbS_3), which during most of the period of production was handsorted to a grade of several hundred ounces of silver per ton. This was mined from small pockets and lenses in the dolomtized upper horizon of the Escabrosa Limestone within a few tens of feet of the basal shale bed of the overlying Naco Formation. There was associated copper, lead, and zinc -- and carbonates and sulfates of these elements can be found on the dump and in the walls of the old workings. Assays of samples taken during an extensive examination by Duval Corporation averaged 0.02% Cu, 0.27% Pb, and 0.51% Zn. Zn > Pb > Cu > Ag

SMELTER RETURNS AVERAGE 12% Pb = Ag 312g

GIVES Ag = 7 oz/ton

Two samples taken during this examination from typical zones of what appeared to be remnants of strong mineralization left in the walls of old cuts and stopes assayed only 5.7 oz. Ag and 2.1 oz. Ag, with about 0.01 oz. Au. A large sample taken from the barren looking material immediately adjacent to these assayed only 0.2 oz. Ag and trace Au. A large (100 lb.) composite sample taken from holes dug in four places on the dump was rolled and split down to a small sample. This assayed 6.3 oz. Ag and 0.02 oz. Au. The results of Duval's sampling tend to confirm these values.

$\frac{Au}{Ag} = 1/315$

From the above sample results, the reported past production, and the size of the old stopes, it would appear that the high-grade ore was closely confined to small pods and had little or no low grade fringe. The overall area explored by the old workings amounts to about 300,000sq. ft. The area of the old stopes shown on C.A. Mitke's 1932 map is about 6000 sq. ft. or about 2% of the total area explored.

It is clear then that the search for new orebodies in the Escabrosa - Naco contact horizon will require detailed geologic studies and close-spaced drilling. !!!

A second observation that can be made is that this mineralization, though spotty, occurs over a wide area, in a stratigraphic horizon ~~several hundred feet~~ 400 20-100. FT THICK TOP ESCABROSA MASSIVE GRAY 200 FT THICK MIDDLE & LOWER 200 FT THICK above the more favorable replacement horizons IE. DEVONIAN MARTIN of the region, and is related to faults and intrusives which surely cut the deeper beds. ?? This may reflect base metal COPPER deposits in the deeper formations. Newmont Mining Corporation has discovered such a deposit about five miles east of the Vekol Mine which is reportedto contain about 75 million tons of low-grade copper ore.

Proposal A.

Geologic mapping should be done on a scale of 1 inch BASE MAP equals 100 feet to determine the location and attitude of faults and the subsurface level of the Naco-Escabrosa contact. Present geologic knowledge suggests that areas I, II, and III on the attached map might be favorable. This mapping might take one geologist about three weeks 3 MONTHS depending on the amount of geologic complexity encountered. For the purpose of Mr. Johnson's OK.

MAP ?

drilling estimate, an arbitrary figure of 60 drill-holes averaging fifty feet in depth was chosen. IS THIS OPEN-PITTABLE AREAS 1-3

Propsal B.

For proposal B a second geologic map with two cross-sections should be prepared on a scale of one inch equals 500 feet. Some work will have to be done on outcrops outside of the immediate Vekol Mine area in order to determine the thickness of the older formations beneath the Naco and Escabrosa limestones on Vekol Ridge. SEE CARPENTER FOR THICKNESS

FORGET IT !!

The target horizons here are the lower Martin Limestone, the Abrigo Formation, and the upper Apache Group. Present knowledge indicates depths to these beds FROM the upper Vekol workings of ROUGHLY about 600 feet, 700 feet, and 1000 feet, respectively. 579

MAP ?

On the attached geologic map are shown five proposed drill-hole locations. I, II, and III are a minimal test of Proposal B. The drilling of holes at sites IV and V is contingent on the geologic studies, the results encountered by the first three drill-holes, and the acquisition of adjacent property. (PAPAGO RESERVATION)

Recommendations.

Prior to further work on the Vekol Prospect a property study should be made including an accurate survey of the six patented claims, a check of public records, and an inquiry as to the possibility of acquiring adjacent ground on the PAPAGO Indian Reservation. ??

Following this the geologic studies described under Proposal A and Proposal B should be completed. The results of this work will determine the amount of drilling necessary as a mineral test of the property -- either as proposal A, or Proposal B, or a combination of both.

Very truly yours,

Arthur G. Blucher

III.

Vekol Mine.

Estimate of Exploration Costs.

by

Albert S. Johnson
Consulting Engineer
Tucson, Arizona.

"Mr. Harry Westling:

The following is a report in which an estimate is made of the costs of exploring your claim group known as the Vekol Mine in Pinal County, Ariaona. This estimate is based upon the exploration program outlined by Mr. Arthur G. Blucher, and is an attachement to Mr. Blucher's report.

Introduction.

The drilling and coring procedures recommended in this report are designed to produce the best quality geologic information possible at the lowest cost possible consistent

with the objective. The nature of the area and the type of rock to be penetrated dictate the methods to be used.

The estimate also includes anticipated costs of road building, assaying of drill cuttings and cores, engineering and geologic supervision, and the miscellaneous labor required in handling and splitting samples, cores, etc.

Summary.

The program as outlined by Mr. Blucher consists of five holes to be drilled to an average depth of 1,000 feet, No plus the 60 holes drilled to a depth of 50 feet. The deeper holes are for the purpose of exploring for a deep-seated orebody. The shallow holes will explore for additional pockets and veins of high-grade silver not mined out in the early life of the mine. UNDERGROUND

OPEN-PITTABLE AREA ?

The cost of this program is estimated as follows:

1. Roads and drill sites	$6,000.00
2. Drilling and coring	$52,750.00 TRY 8000 FT X $25 = $200,000
3. Supervision and miscellaneous labor	$15,000.00
4. Assays and miscellaneous services	$4,050.00
	$77,800.00

Discussion.

A. Drilling problems and costs.

The most outstanding characteristic of the rock in the Vekol mine area in regard to drillability is its hardness. Two general rock types will be encountered: (a) a massive

limestone with probable quartz veinging, and (b) a quartzite. NO! Every hole will be spudded in limestone.

There is a possibility of loss of mud circulation. The holes in the area are in a zone of faulting, and it can be assumed that fracturing of the rock has occurred in conjunction with movement along the faults. This fracture system could create a loss of circulation problem. Old records of the area indicate that water will be encountered at a depth of 300 feet.

Taking the above conditions into account, the following drilling procedure is recommended:

1. Drill to water-table (300') with air using a downhole hammer.
2. Set 4" O.D. casing at 300'.
3. Core from 300' -- total depth (1000') with 3.25" x NX diamond core bit using low solids mud as circulating fluid. Wow!

The drilling costs for such a program are estimated as follows:

1. 5 holes to average depth of 1,000'	$42,250.00	NO!
2. 60 holes to average depth of 50'	$10,500.00	OK
Total	$52,750.00	

B. Roads and drill sites.

A system of old existing roads is present in the mine area. Where possible these roads will be reconditioned and put to use. New roads will have to be built in areas which have not been explored in the past. These roads will be built in massive limestone and will require sidehill cuts. A hydraulic ripper

will be used where possible, but parts of the area will have to be drilled and blasted. The estimated cost of road and drill site preparation is $6,000.00.

C. Supervision and miscellaneous labor.

Into this category fall three types of personnel:

1. Geology.-- Drill cuttings and cores will be logged, and as information accumulates, successive steps in the exploration program will be conducted based on the accumulated information. Detailed geologic mapping will proceed in conjunction with the drilling.

2. Engineering.-- General planning and supervision of construction and drilling will be an engineering responsibility.

3. Miscellaneous labor.-- Miscellaneous labor costs will arise from the work involved in handling and splitting drill cuttings and cores and in assisting in field mapping.

Supervision and miscellaneous labor costs are estimated at $15,000.00.

D. Assays.

The primary target for the shallow holes is silver. A silver assay will be made on each five-foot section of hole drilled. In addition two samples on each hole will be assayed for lead, gold, copper, and zinc.

On deep holes assays will be run on 10 foot samples taken in the interval from 500' to total depth. Samples will

be assayed for lead, zinc, copper, and silver.

The estimated cost for assay work is $4,050.00.

E. Total cost.

The total cost for the project is estimated at $77,800.00.

Respectfully submitted,

Albert S. Johnson"

Registered Professional Engineer
(Petroleum) Ariz. #6777

VEKOL MINE.

EXCERPT from

Economic Geological Reconnaissance
Casa Grande Mining District
Pinal County, Arizona by
J. B. Tenney.

VEKOL MOUNTAINS.

This range has been the most extensively mineralized of any in the district and has furnished the greatest bulk of the ore produced in the past. The principal mines are the Vekol, Reward, Copperosity, Great Eastern, Christmas Gift, Republic and Spondulix.

HISTORY AND PRODUCTION.

The outcrop is said to have been shown to the original locator by a Papago Indian about 1879, about three years after the completion of the Southern Pacific Railroad from Yuma to Casa Grande which, until 1880, was the eastern terminus of the road. The locations were acquired in 1880 by Judge John D. Walker who started development at the mine by a series of open cuts and tunnels. The ore extracted was carefully sorted to a grade of 200 ounces up to several thousand ounces in silver and was shipped to the Selby Smelter in San Francisco, to the El Paso smelter, and to smelters in Colorado. Operations were gradually expanded as the devlopment proceeded, and in 1884, Judge Walker enlisted the financial aid of his brother Luciah to further expand the scale of operations by building a mill to obviate the expense of sorting, and to beneficiate the accumulation of rejects from past sorting.

The mill was completed in 1885 and consisted of ten stamps followed by pan-amalgamation. It was moved from a former site in Queen Creek near the Silver King mine in 1884, but litigation with the former owners prevented its use until 1885. Water for milling was developed at the mine by drilling a 350 foot well. The stamps commenced dropping July 3,1885 and the mill was run until April 1889 at an average of rate of 470 tons per month. It was finally closed due to the lowering of the mill heads below the economic limit. Shipments of sorted high grade ore were resumed which were made to the El Paso smelter until the death of John D. Walker in 1894 followed shortly by the death of his brother. Litigation then ensued between the heirs of the brothers, and the mine was closed except at intermittent intervals.

It was not reopened until 1908 when it was bonded to a New Orleans and Texas company. This company confined itself almost entirely to prospecting. A four hundred foot shaft was sunk and several hundred feet of deep-level prospecting was done with negative results. The mine was closed after four years of work during which time but little production was made. It was reopened in 1918 by a group of Phoenix men. The mill was reconditioned and concentrating tables were added to treat the large accumulation of mine dump as a low grade ore, but the attempt was a failure. A few shipments of concentrate were made. VEKOL SHAFT

The property is now owned by Paul R. Daggs of Upland, California. The production figures for the mine have been derived from the U. S. Mint

Reports, partly from the yearly production figures published each year by the Tucson Star, in large part from smelter settlement sheets in the possession of the owners of the ore shipped and a partial milling record, and in part from the yearly reports of the United States Geological Survey on mine production. After allowing for ore stolen and unrecorded production a figure very close to $1,000,000 was arrived at, almost entirely in silver. A summary is shown in the following table:-

VEKOL MINE PRODUCTION.

Period	Price of Silver.	How treated	Ounces Silver Produced.	Value in $.	Source of Information.
1882	$1.14	Sorted & Shipped	19745	$22,509.	Aria Star.
1883	1.11	" "	75676	84,000.	" "
1884	1.11	" "	79279	88,000.	" "
1885	1.07	" "	47121	51,171.	Company records
1885 to 1889	0.98	Milled and bullion shipped	525030	523,752.	Company rec. to march 1888 Estimated to Apr. 1889.
1889 to 1893.	0.93	Sorted & Shipped	209345	207,664.	Company records plus estimated unrecorded shipm'ts.
1908	0.53	Sorted & Shipped	3961	2,256.	U.S.G.S. Min. Res. A little Pb credit.
1909	0.52	" "	5329	3,000.	(same as above)
1915	0.51	Concentrated.	30000	16,620.	" " "
1916	0.66	"	8000	5,816.	" " "
GRAND TOTAL.			1,003,485 oz.	$1,004,788.	

LOCATION AND MINING PROPERTY.

The mine is situated on the western side of the Vekol mountains about midway of the length of the range. There are twenty-two mining claims owned, of which six are patented. They lie in T 9 S R 2 E Section 33 and in T 10 S R 2 E Section 4 (Gila and Salt River Meridian). The mine is twenty-nine miles southwest of Casa Grande to which it is connected by a forty-three mile fair road, twnety-nine miles of which is partly graded and the remaining twelve miles of which is a fair desert road passable except in wet weather. The camp, consisting of frame and adobe buildings, four of which are in good repair, has been built in a west-flowing arroya heading in a low pass in the westermost ridge of the mountains.

MINE DEVELOPMENT.

The major workings of the mine have been driven from a series of tunnels starting from the southern side of the arroya. Most of these tunnels were driven at a down grade of from one to ten degrees in a south ten to thirty degree east direction. They are inter-connected by irregular stopes, raises, and inclines, the whole forming an extremely intricate network of workings, which extend a total distance of about 1070 feet to the southeast of the outcrop with a width of about 320 feet. At the south-east end, the workings are connected to the Argosy shaft, an

untimbered nearly vertical shaft 300 feet deep. In the arroya northwest of the tunnel entrances, the main shaft, a vertical two-compartment timbered shaft, has been sunk to a depth of 400 feet, the bottom 100 feet of which is now under water. At the 250-foot level two drifts have been driven under the upper workings to which they are connected by raises. Very little timbering was necessary and little of the work has been filled. About eight miles was done, the greater part of which is accessible. TRY 120

GEOLOGY AND ORE OCCURRENCE.

The ore occurs as irregular replacements of Pennsylvania Limestone within a horizon varying in thickness from a few feet up to ten feet, locally known as the "shale" horizon. It is capped by hard fractured limestone, and underlain by compact dolomitized limestone. All of the ore was either highly oxidized or enriched. The only primary ore or "protore" (as the primary ore is not commercial) was found at the southeastern end of the occurrence in the underlying dolomitized beds near the Argosy shaft. The ore bodies were controlled by a series of closely parallel faults of small throw, striking from north-south to north 30 degrees west, with dips varying from 50 degrees to the east to an equal inclination to the west. The width of this zone of faulting is about 400 feet. The dip of the limestone beds varies from ten to thirty degrees about south seventy degrees west, nearly at right angles to the strike of the fault system. The ore horizon in this zone also dips with the limestone beds so that the high part is at the eastern edge and the lower part at the western edge. The surface expression of the fault zone is a partial replacement of limestone beds, especially those with abundant chert, by limonite. No lateral work was done outside of the fault zone in the search for other possible zones. A second equally strong or stronger belt of limonite stained limestone occurs about 400 feet to the west of the prospected zone, under which no work has been done. ?

At the northwest end of the ore zone, outcropping in the arroyo, is a steeply dipping dike classified in the field as diorite porphyry, 20 to forty feet thick, striking northeast. It is little altered and contacts with the limestone are generally barren except at the intersection with the northwest faults. About 3000 feet west of the outcropping ore is an outcrop about 3000 feet in diameter of andesite lava, tuffs and breccias, dipping to the southwest at about the same inclination as the limestone. It is separated from the limestone by about 2500 feet of recent detritus. ANDESITE DIKE

At the southeast end of the workings occur a series of north 60 to 75 degrees east faults, apparently limiting the northwest series or forming fault blocks with them. The limonite stained outcrops of the known ore zone also end at this northeast series of faults. ??

The ore, judging by the very sparce remaining seams on the edges of the stopes, was almost entirely oxidized. It consisted of small nodules, locally termed nuggets, of horn silver, argentite, and silver-bearing tetrahedrite (freibergite?) in a gangue of iron-stained slightly copper stained kaolinized limestone with abundant secondary calcite veins. Very little silification exists except at the southeast end of the mine where mineralization was stronger. ?

There were two bodies found and mined: the Corkscrew, which outcropped in the arroyo, and was followed into the hill to the southeast, and the Argosy to the southeast of the Corkscrew, associated with a continuation of the same series of faults and separated from it by about 170 feet of kaolinized limonite-stained limestone with lean silver values. The Argosy ore body at its southeast end is capped by over 300 feet of limestone. The ore here is said to be less oxidized. Extraction drifts in the underlying dolomite cut a few beds replaced with galena, zinc blend and pyrite with a little attendant silver.

The occurrence of a bedded deposit nearly horizontal on the strike and inclined at a small angle across the strike, consisting of highly enriched silver ore well above the present water table, cannot be explained by the usual processes of vein enrichment. The only satisfactory explanation is that the enrichment was effected by the leaching of values out of a series of closely spaced nearly vertical veinlets and their redeposition at an old watertable. The fact that the ore horizon is now inclined with the dip of the limestone and overlying lavas shows that this old water table was established before the tilting of the beds to their present attitude. The limestone below the old table was altered to dolomite, and all that remained fixed in the old leached area above the water table was the iron, oxidized to the stable form of limonite. The occurrence in this respect closely parallels those of Magma[1] and Miami[2] where mineralization and enrichment took place before the development of the Basin Range structure, of tilted faults blocks.

[1] Short N.M. and Ettlinger, I.A. Ore Deposition and Enrichment at the Magma Mine, Superior, Arizona. Trans. Am. Inst. Min. and Met. Eng. Vol LXXIV, 1926, pp 194, 195.
[2] Ransome, F.L. The Copper Deposits of Ray and Miami, Arizona. U.S. Geol. Surv. Prof. Paper No. 115, 1919, pp 148-149.

FUTURE POSSIBILITIES.

The ore bodies already exploited have been almost completely denuded of commercial ore. The favorable horizon at the ancient water table has been so well prospected in the one fault zone prospected that the possibility of the existence of hidden sizeable ore bodies in this zone is remote.

As previously mentioned, there exists on the property a second parallel strongly mineralized northwest belt of limonite-stained limestone to the southwest of the prospected zone. No work has been done at the old water table horizon under this belt. It is quite possible that high grade enriched silver ore underlies this belt at the same horizon as that of the known ore bodies.

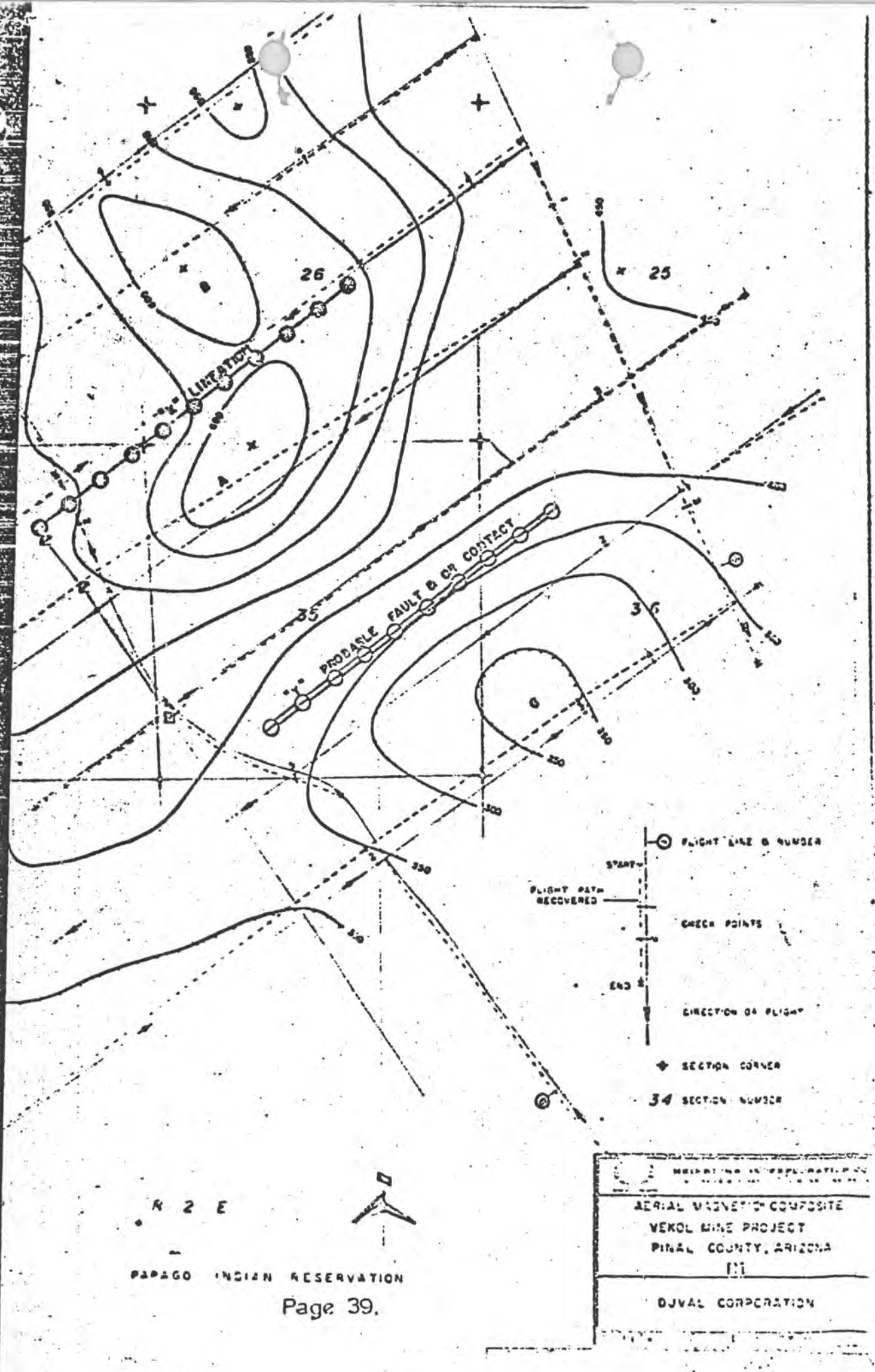
There is also a possibility of an ore zone at the old water table horizon at the zone of north east faults to the south of the Argosy ore body. Evidence to strengthen this possibility is that at the Great Eastern property about 2000 feet to the south of the Argosy shaft, the ore is associated with an east-west system of faults at the old water table horizon. Additional evidence strengthening this hypothesis is the occurrence of a small outcrop at the same horizon on the eastern slope of the ridge, known

No! as the Mount Vernon, 900 feet distant, closely associated with the same series of northeast faults that limits the Argosy ore. A zone such as this one would be an inclined one, and therefore more difficult to prospect and mine.

By Tenney

Ghosts of the Adobe Walls N.ell Murbarger - 1964
Westernlore press Los Angeles 1964

[redacted]


26
25
LINEATION
PROBABLE FAULT & OR CONTACT
35
36
FLIGHT LINE & NUMBER
START
FLIGHT PATH RECOVERED
CHECK POINTS
END
DIRECTION OF FLIGHT
SECTION CORNER
34 SECTION NUMBER
R 2 E
PAPAGO INDIAN RESERVATION
AERIAL MAGNETIC COMPOSITE
VEKOL MINE PROJECT
PINAL COUNTY, ARIZONA
DUVAL CORPORATION

DAT 445 PAGE 567

STATE OF ARIZONA
County of Pinal, } ss.

I hereby certify that the within instrument was filed and recorded APR 4 1966, 19__, at 2 P.M. in Book 445 Page 567 at the request of TRANSAMERICA TITLE INSURANCE COMPANY

Fee No. 318647

Indexed:

Compared:

Fee: $ 1.75

I.R.S.: $ 2.20

When recorded mail to:
Federal Mines Company, Inc.
P. O. Box 519
Casa Grande, Arizona

RECORDER ARIZONA

Witness my hand and official seal.

SOPHIE M. SMITH, County Recorder

By Sophie M. Smith
County Recorder

Warranty Deed

For the consideration of Ten Dollars, and other valuable considerations, I or we, ~~[illegible]~~ C.D.D. ~~and~~ CHARLES D. DAGGS, dealing with his sole and separate property, do hereby convey to FEDERAL MINES COMPANY, INC., an Arizona corporation the following property situated in Pinal County, Arizona:

VESUL MINING CLAIM, MOUNT VERNON MINING CLAIM, ARGOSY MINING CLAIM, GRAND FATHER MINING CLAIM, LOOKOUT MINING CLAIM and FLAT IRON MINING CLAIM, lode mining claims, in Sections Thirty-four (34) and Thirty-five (35), Township Nine (9) South, Range Two (2) East of the Gila and Salt River Base and Meridian, being shown on Mineral Survey #4143, on file in the office of the Bureau of Land Management, as granted by Patent recorded April 20, 1933, in Book 52 of Deeds, page 138, records of Pinal County, Arizona.

SUBJECT TO: Reservations contained in the Patent from the United States of America, reading as follows: "SUBJECT to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States." If any rights of a proprietor of a vein or lode to extract and remove his ore from said land, should the same be found to intersect or penetrate the premises, as provided by law; rules of the State of Arizona for working the mineral claims or premises involving easements, drainage and other necessary means of improvement, as set out in United States Patent for said premises.

And I or we do warrant the title against all persons whomsoever, subject to the matters above set forth.

Dated this 16th day of January, 1964

~~Paul R. Daggs~~ C.D.D. Charles D. Daggs
Charles D. Daggs

STATE OF ARIZONA
County of } ss.

This instrument was acknowledged before me this _____ day of _____, 19__, by ~~Paul R. Daggs~~ C.D.D. ~~and~~ Charles D. Daggs

My Commission expires _____

Notary Public

STATE OF California

This instrument was acknowledged before me this

BK 445 PG 557

STATE OF ARIZONA
County of Pinal } ss.

I hereby certify that the within instrument was filed and recorded at ___ o'clock ___ M., APR 4 ___, in Book ___ of ___, Page ___, Records of Pinal County, Arizona.

Fee No. 318517

Indexed:

Compared:

Fee: $1.75

Exd.: $2.20

Witness my hand and official seal.

SOPHIE M. SMITH, County Recorder

By ___ Deputy Recorder

Federal Mines Company
P. O. Box 919

Warranty Deed

For the consideration of ten dollars and other valuable considerations, I or we, C. D. D. ___ husband and wife as community property, do hereby convey to FEDERAL MINES COMPANY, INC., an Arizona corporation

the following property situated in Pinal County, Arizona:

VENUS MINING CLAIM, MERRY VENUS MINING CLAIM, ARGONT MINING CLAIM, GRAND PRIZE MINING CLAIM, LOCKOUT MINING CLAIM and FLAT IRON MINING CLAIM, lode mining claims, in Sections Thirty-four (34) and Thirty-five (35), Township Nine (9) South, Range Two (2) East of the Gila and Salt River Base and Meridian, being shown on Mineral Survey #4143, on file in the office of the Bureau of Land Management, as granted by Patent recorded April 20, 1923, in Book 52 of Deeds, page 138, records of Pinal County, Arizona.

Subject to the reservations contained in the Patent from the United States of America, reading as follows: "SUBJECT to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts; and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States." Any rights of a proprietor of a vein or lode to extract and remove his ore from said land, should the same be found to intersect or penetrate the premises, as provided by law; rules of the State of Arizona for working the mineral claims or premises involving easements, drainage and other necessary means of improvement, as set out in United States Patent for said premises.

And I or we do warrant the title against all persons whomsoever, subject to the matters above set forth.

Dated this 16th day of January, 1961

C. D. D.

Charles D. Daggs

Charles D. Daggs

STATE OF ARIZONA
County of } ss.

This instrument was acknowledged before me this ___ day of ___, 19___, by Charles D. Daggs

My Commission Expires ___

Notary Public

STATE OF California

This instrument was acknowledged before me ___

REPORT on the VEKOL MINE
by
W. J. FORBACH, Mine Superintendent, 1907-1908.

Superior, Arizona.
July 12, 1946

To Dr. H. A. Moore,
Arizona Club,
Phoenix, Arizona.

Dear Sir:

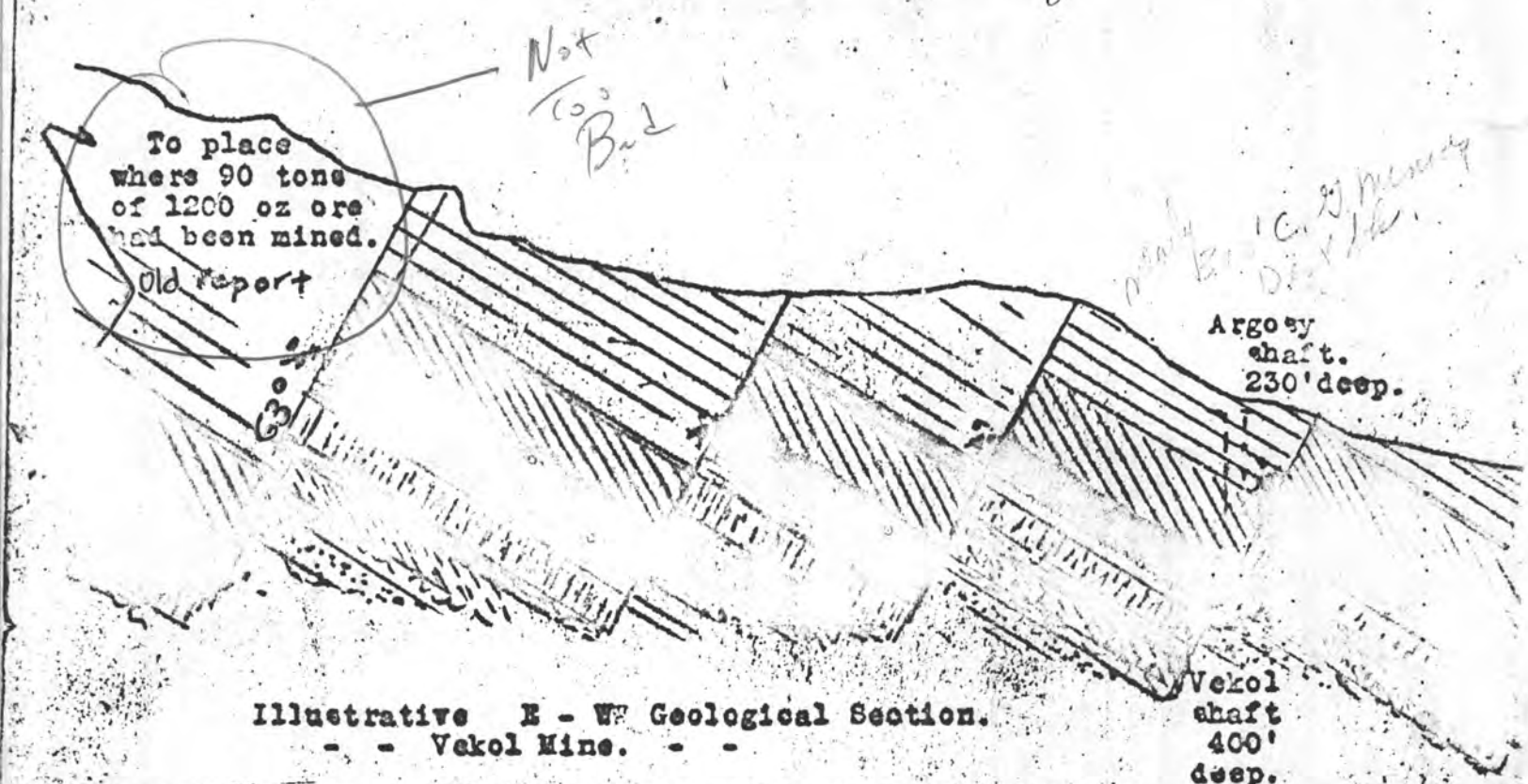
Referring to the Vekol Mine, this property was discovered by Papago Indians and samples taken to the J. D. Walker Ranch on the Gila River, where samples were sent out for assaying, the results of which showed high values in silver; whereupon J. D. Walker, P. R. Brady and Lucien Walker located the property in 1880 and jointly began the operation as a co-partnership. For some reason or other, the Walkers and Brady failed to agree on the manner of operating the property, and the net result was the sale of Brady's one-third interest for $80,000.00 to the Walker Brothers, who jointly operated the property from 1880 to 1892. During this period, several million dollars worth of ore was shipped to various smelters, and the lower grade ores were milled in a 10-stamp mill followed by pan amalgamation.

In 1892 J. D. Walker became ill and died a short time later. Following the death of Mr. Walker, the property was involved in a series of legal entanglements which extended over a period of ten years, and following this period of litigation I secured a lease and option for the sum of $200,000.00, and interested some southern gentlemen to take it over. At that time I had recommended a campaign of diamond drilling to determine the exact displacement of the ore-bearing series which occur between the highly altered shale beds and a dolomitized limestone which had been faulted by post-mineral east-dipping faults, displacing the ore-bodies which follow the bedding planes, which dip approximately 32° to the west-south-west.

The Walkers, in operating the property, followed in along the strike for a distance of some 1000 feet from the discovery point, and in the extreme southern workings of the mine the ore-bodies became much more base -- the lead and zinc increasing -- thus rendering their method of milling inadequate for the treatment of the sulphide ores. The displacement of the ore-bearing blocks increased from a throw of 65 feet from the western extremity of the ore-blocks to a distance of 113 feet on the last fault to the east. These are the two faults, in my estimation, that make the Vekol a very interesting mining venture, as there is a large block of ground, lying to the south and east, of virgin territory which is exposed on the brow of the hill, where it is said that two carloads were shipped from this outcrop which averaged 1200 ounces silver per ton.

To the west of the Argosy shaft there is a very strong probability that the Vekol ore-bodies can be picked up in comparatively short diamond drill holes and that was the reason why I became interested in the mine in 1907, besides the fact that the records then in the office safe,

June 18, 1946



Illustrative E - W Geological Section.
- - Vekol Mine. - -

This sketch shows the ore occurrence in a well defined limestone bed. Approximately 10% of this mineralized limestone strata has been explored, developed and mined. The development consisted of some 10 miles of tunnels and drifts, 13 shafts and 16 surface cuts. The workings extend some 1400' on the strike.

Vekol

Map of [illegible] 1932

DEVELOPMENT. (cont)

Mr. Chas. A. Mitke, a mining engineer of high national standing, acquired a lease and option on the property and spent the greater part of his time from 1932 and 1933 in an intensive study and mapping of the property. He plotted the results of these studies on a sectional glass scaled model of the geology and the underground workings. This model shows the location and existence of several unexplored blocks of virgin area where the productive ore horizon is practically assured.

The earlier workings were all in oxidized ore. At the southeast end of the developed ore body the Argosy shaft was sunk to a depth of about 300 feet and exploration and development work from the bottom of this shaft opened up a sizable body of sulphide ores as well as connecting with the old workings for ventilation and for an easier and less costly way of removing the mined ore.

Due to the irregularity of the mine workings and the unsystematic method of development it is impossible for me to call any of the ore "blocked ore". From the habit of the ore occurance and from the observations made I believe it is safe to say that there is practically assured about 15,000 to 20,000 tons of sulphide ore near the Argosy shaft and from 3,000 to 5,000 tons which can be recovered from the oxidized ores when adequate means of removing that ore can be provided.

Stage 1 — as proven by tests

There is also a sizable tonnage of dump ore which, when the proper metallurgy is worked out, might show a substantial profit. This can only be determined by intensive sampling and by careful testing to outline the proper mill flow sheet required. In addition to this there is the possibility of being able to handle a large tonnage of outcrop by open cut shovel work. This also calls for careful sample work and flow sheet study.

RECORDED PRODUCTION. From partial records, a production of in excess of $1,000,000 in silver is reported by Mr. J. B. Tenney. It is known that these records were incomplete. From other authentic sources the recorded production is placed at between $3,000,000 and $7,000,000.

The records of the mine have been lost. Mr. Chas. A. Mitke had a complete set of records with him while in the Philippenes during the late war and they were all lost.

RECOMMENATIONS. The property justifies ~~systematic~~ systematic and intensive development and exploration and it is so recommended by me.

The work should be done in stages. When the results obtained from the first stage are known a decision can be soudly made as to the following stage and in a similar manner as to the next following stage.

BY BLUCHER

Ag and trace Au. A large (100 lb.) composite sample taken from holes dug in four places on the dump was rolled and split down to a small sample. This assayed 6.3 oz. Ag and 0.02 oz. Au. The results of Duval's sampling tend to confirm these values.

From the above sample results, the reported past production, and the size ofthe old stopes, it would appear that the high grade ore was closely confined to small pods and had little or no low grade fringe. The overall area explored by the old workings amounts to about 300,000 sq. ft. The area of the old stopes shown on Mitke's map is about 6000 sq. ft. or about 2% of the total area explored.

It is clear then that the search for new orebodies in the Escabrosa-Naco contact horizon will require detailed geologic studies and close spaced drilling.

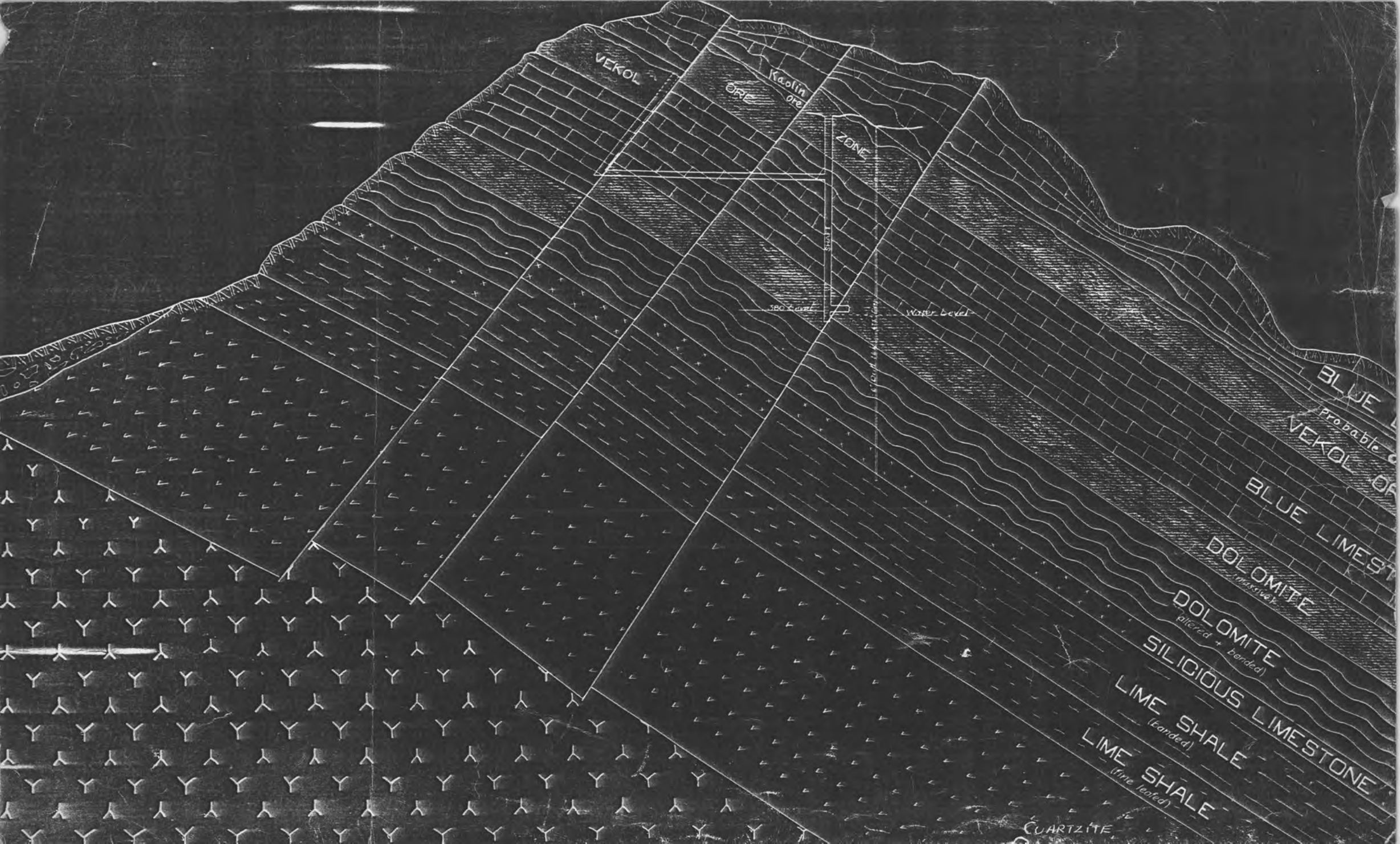
A second observation that can be made is that this mineralization, though spotty, occurs over a wide area, in a stratigraphic horizón several hundred feet above the more favorable replacement horizons of the region, and is related to faults and intrusives which surely cut the deeper beds. This may reflect base metal deposits in the deeper formations. Newmont Mining Corporation has discovered such a deposit about five miles east of the Vekol mine which is reported to contain about 75 million tons of low grade copper ore.

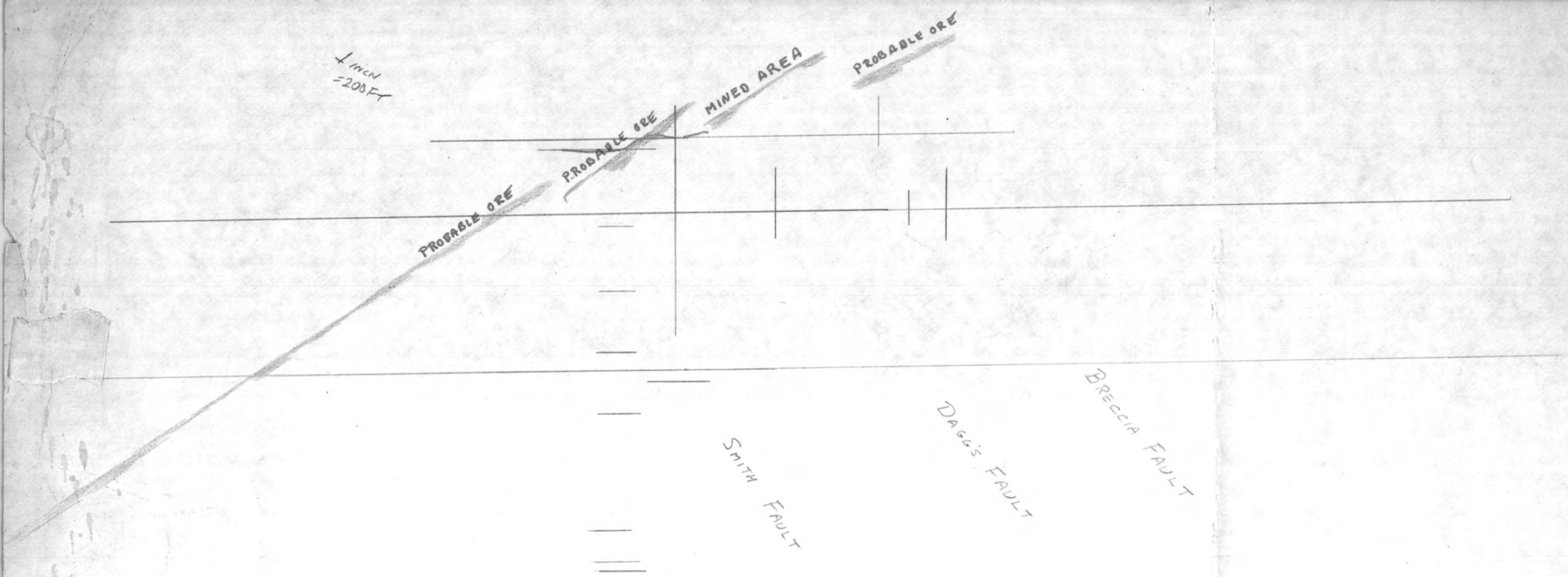
PROPOSAL A

Geologic mapping should be done on a scale of 1 inch equals 100 feet to determine the location and attitude of faults and the subsurface level of the Naco-Escabrosa contact. Present geologic knowledge suggests that areas I, II, and III on the attached map might be favorable. This mapping might take one geologist about three weeks depending on the amount of geologic comolexity encountered. For the purpose of Mr. Johnson's drilling estimate, an arbitrary figure of 60 drillholes averaging fifty feet in depth was chosen.

PROPOSAL B

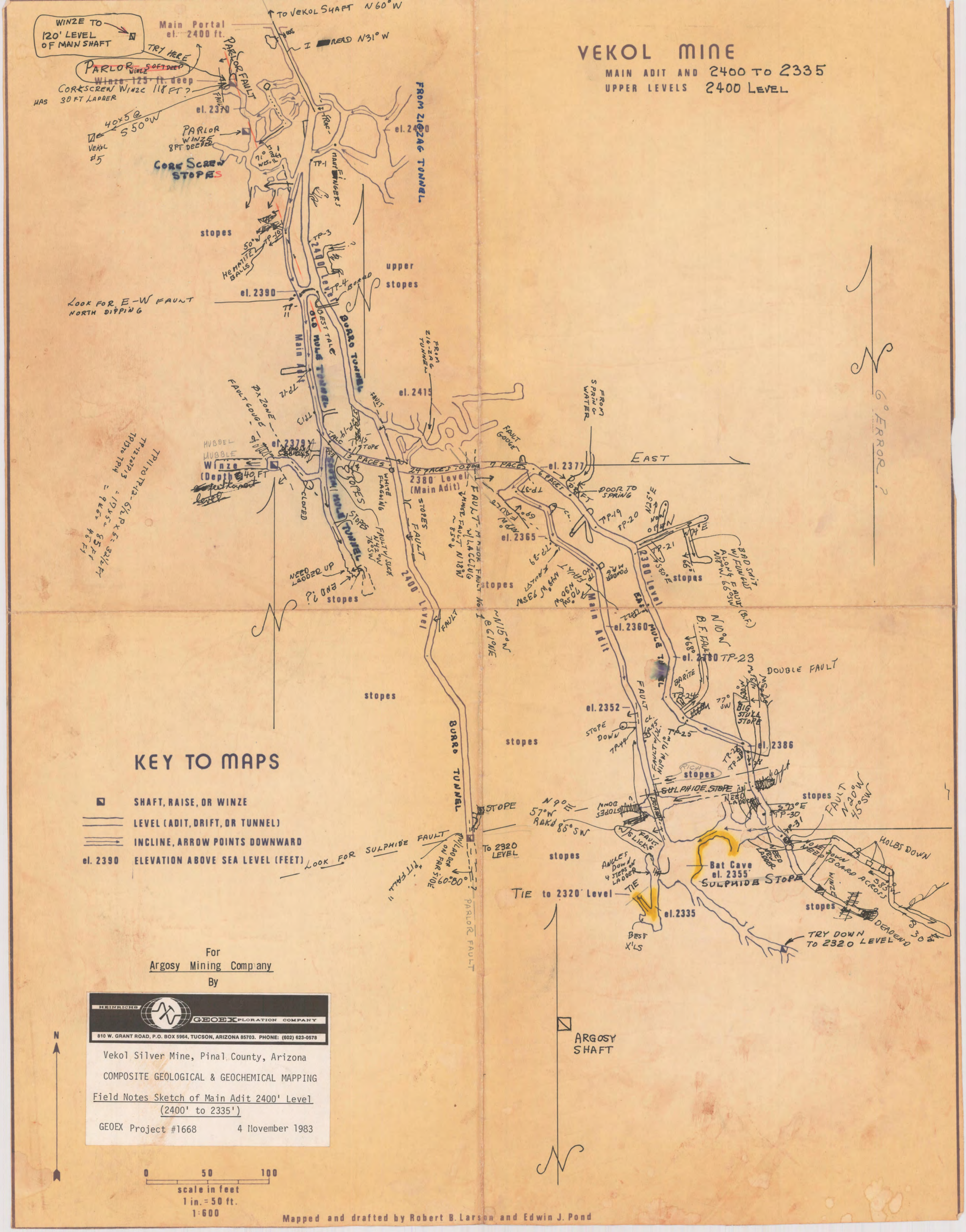
For Proposal B a second geologic map with two crosssections should be prepared on a scale of one inch equals 500 feet. Some work will have to be done on outcrops outside of the immediate Vekol area in order to determine the thicknesses of the older formations beneath the Naco and Escabrosa limestones on Vekol Ridge.


VEKOL
ORE
Kaolin ore
ZONE
SHAFT
380 Level
Water level
BLUE
Probable
VEKOL
BLUE LIMEST
DOLOMITE
(massive)
DOLOMITE
(altered + banded)
SILICIOUS LIMESTONE
LIME SHALE
(banded)
LIME SHALE
(fine leaved)
QUARTZITE


1 inch
=200 Ft
PROBABLE ORE
PROBABLE ORE
MINED AREA
PROBABLE ORE
SMITH FAULT
DAGGS FAULT
BRECCIA FAULT

VEKOL MINE

MAIN ADIT AND 2400 TO 2335
UPPER LEVELS 2400 LEVEL



KEY TO MAPS

- SHAFT, RAISE, OR WINZE
- LEVEL (ADIT, DRIFT, OR TUNNEL)
- INCLINE, ARROW POINTS DOWNWARD
- el. 2390 ELEVATION ABOVE SEA LEVEL (FEET)

For
Argosy Mining Company
By

HEINRICHS GEOEXPLORATION COMPANY
810 W. GRANT ROAD, P.O. BOX 5964, TUCSON, ARIZONA 85703. PHONE: (602) 623-0578

Vekol Silver Mine, Pinal County, Arizona

COMPOSITE GEOLOGICAL & GEOCHEMICAL MAPPING

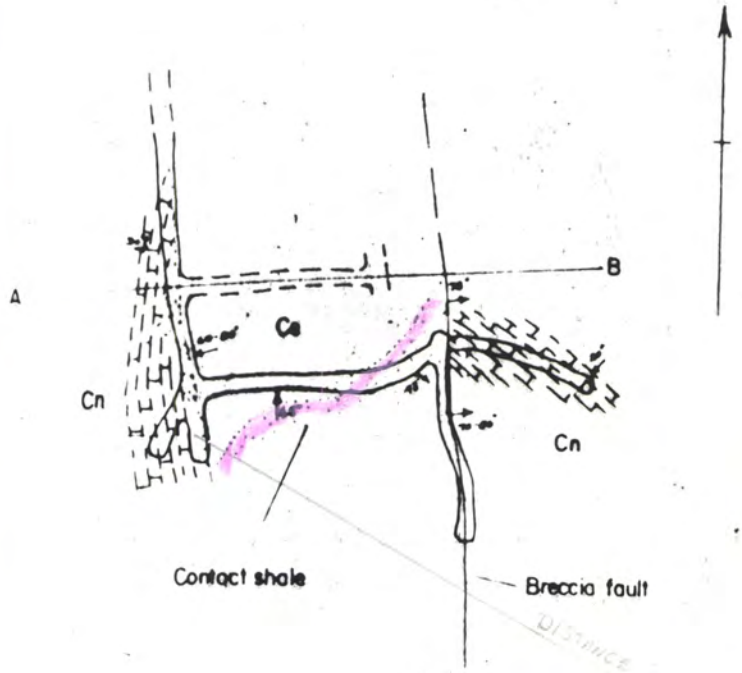
Field Notes Sketch of Main Adit 2400' Level
(2400' to 2335')

GEOEX Project #1668 4 November 1983

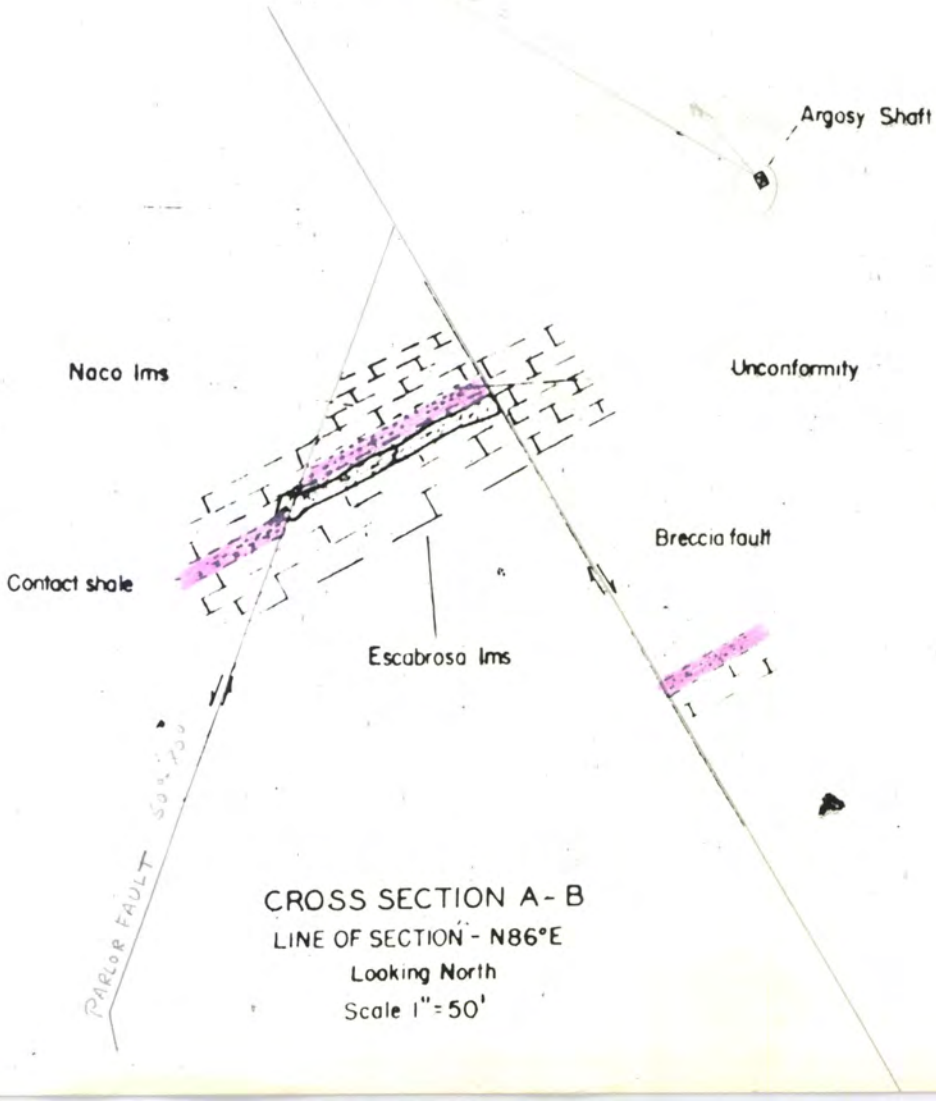
N

0 50 100
scale in feet
1 in. = 50 ft.
1:600

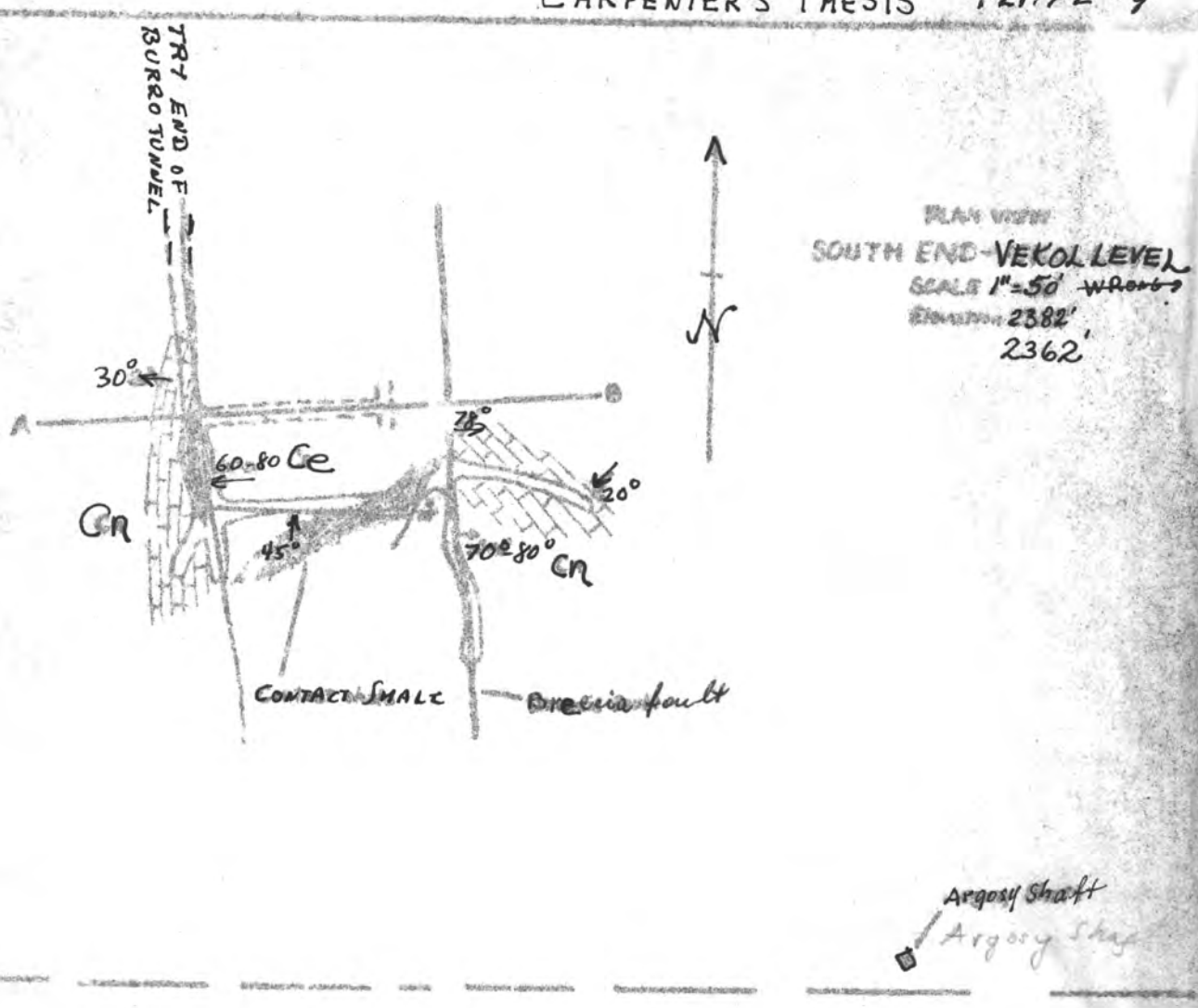
Mapped and drafted by Robert B. Larson and Edwin J. Pond

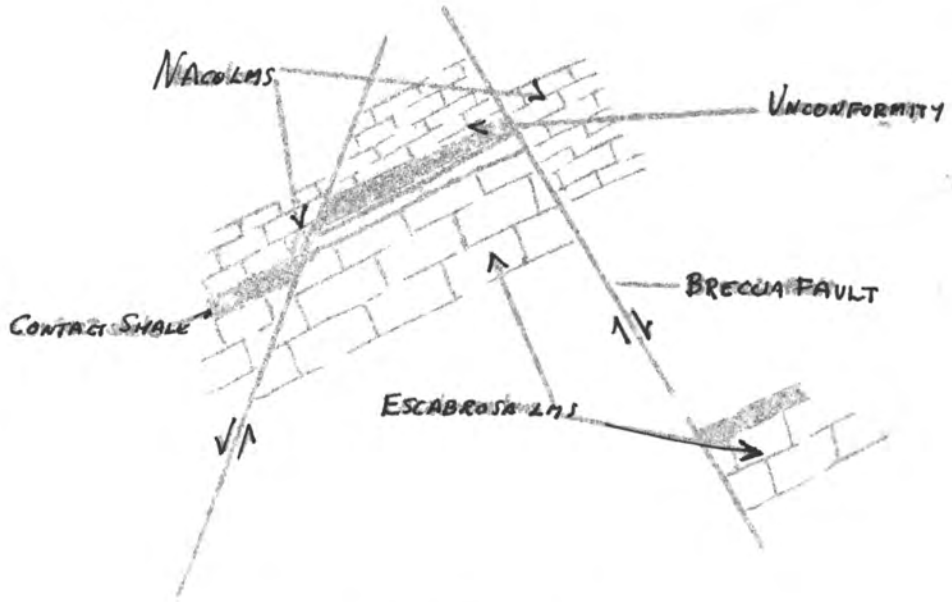


PLAN VIEW
SOUTH END-VEKOL LEVEL
SCALE 1" = 50'
Elevation 2362'



CROSS SECTION A-B
LINE OF SECTION - N86°E
Looking North
Scale 1" = 50'





CROSS SECTION A-B
LINE OF SECTION N83°E
Looking North
Scale 1"=50'

VEKOL MINE - MILL RUN.

Record of operation of Vekol Mill for 33 months, dating from July 8th, 1885 to February, 1888. Copied from original mill records.

Date.	Tons Milled.	Heads Ozs. Ag.	Tails Ozs Ag.	Amt. Saved.	Percent Saved.	Fine Bullion Ozs. Silver recovered.
1885						
July	289.6	42.86	6.05	36.91	85.88	10,663.43
Aug.	468.5	49.26	3.90	45.36	92.08	21,251.65
Sept.	667.0	40.96	3.29	37.54	91.65	25,030.45
Oct.	646.0	39.65	4.13	35.52	89.58	22,996.97
Nov.	622.0	32.58	2.86	29.72	9.20	19,252.45
Dec.	645.0	36.85	3.12	33.72	91.53	23,051.37
1886	3338.1					
Jan.	658.0	41.15	3.42	37.73	91.68	24,740.05
Feb.	586.0	38.71	2.74	35.97	92.92	21,087.81
Mar.	522.0	35.73	2.76	32.97	92.27	17,204.88
Apr.	555.0	39.15	3.17	35.98	91.90	20,003.57
May	446.0	38.70	3.17	35.53	91.00	15,874.23
June	305.3	44.17	2.60	41.57	94.11	12,692.01
July	358.7	41.71	2.98	38.62	92.83	13,857.38
Aug.	317.0	28.73	2.68	26.05	90.67	8,263.56
Sept.	329.2	36.06	3.84	32.22	89.35	10,609.18
Oct.	337.5	37.10	3.55	33.55	90.43	11,318.54
Nov.	373.0	37.36	3.71	33.65	90.00	12,571.64
Dec.	331.0	32.24	3.01	29.23	90.67	9,678.97
1887	5118.5					
Jan.	324.0	33.68	4.07	29.59	87.90	9,585.68
Feb.	316.0	34.62	4.16	30.46	87.90	9,734.21
Mar.	297.7	32.58	3.82	28.70	88.00	8,541.22
Apr.	291.5	32.92	3.71	29.21	88.70	8,717.20
May	320.0	35.87	5.49	30.38	84.60	9,166.76
June	701.7	20.06	2.59	17.47	87.80	12,261.06
July	586.7	21.93	3.43	18.50	84.30	10,857.99
Aug.	712.0	19.36	3.02	16.54	84.50	11,776.57
Sept.	498.5	19.83	3.08	16.75	84.40	8,348.30
Oct.	623.7	32.67	4.53	28.14	85.10	17,557.91
Nov.	490.0	18.52	2.62	15.90	85.80	9,049.07
Dec.	527.5	16.75	2.00	14.75	88.00	7,781.17
1888	5689.3					
Jan.	587.0	13.73	1.60	12.13	88.40	7,118.35
Feb.	721.0	12.43	1.52	10.91	87.70	8,235.62
32 MONTHS	10,406.1	32.09	3.23	28.48	86.50	438,842.25
	15,453.9					

Average tons ore milled per month 466.80

Average fine ounces silver recovered per month 13,298.21

Process employed - Pan-Amalgamation.

HEINRICHS GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

LEAD

EL PASO SMELTER - CONTINUED.

			TONS.	GROSS PROCEEDS	NET RETURNS	CAR NO.
Apr.	8,	1889	12.25	1,999.95	1,921.08	Sp2880
Oct.	16,	1889	11.00	1,508.45	1,470.76	Sp2300
Oct.	16,	1889	11.00	1,569.42	1,470.76	Sp2726
Nov.	13,	1889	11.50	1,351.40	1,277.60	Sp8626
Nov.	4,	1889	13.00	2,066.52	1,988.22	Sp232
Apr.	24,	1889	10.75	1,447.23	1,378.33	Sp3096
Sept.	23,	1889	11.75	1,523.22	1,452.57	Sp8204
Aug.	31,	1889	11.00	2,378.41	2,305.78	Sp1249
Oct.	24,	1889	13.00	1,814.78	1,734.08	Sp9748
Dec.	14,	1889	14.00	1,997.05	1,734.08	Sp9748
Feb.	25,	1890	11.25	2,470.94	2,400.05	Sp4604
Jan.	31,	1890	11.25	1,804.38	1,730.58	Sp9540
Jan.	15,	1890	12.00	2,692.21	2,618.11	Sp8988
Feb.	26,	1890	12.50	2,484.82	2,466.16	Sp8280
May	9,	1890	12.50	2,545.24	2,466.16	Sp566
Mar.	30,	1890	13.00	1,796.48	1,716.71	Sp10750
Apr.	15,	1890	13.00	2,081.44	2,000.12	Sp7192
July	7,	1890	13.00	2,662.84	2,581.49	Sp1558
May	28,	1890	13.00	3,779.39	3,699.50	Sp3960
Apr.	22,	1890	12.25	1,732.14	1,656.01	Sp1640
June	6,	1890	12.00	3,498.95	3,422.93	Sp1661
July	25,	1890	12.75	2,629.50	2,549.30	Sp308
Sept.	18,	1890	10.00	2,641.09	2,541.09	Sp138
Nov.	13,	1890	12.00	3,130.04	3,055.59	Sp334
Oct.	23,	1890	11.25	2,082.65	2,010.77	Sp758
Dec.	23,	1890	12.00	1,466.02	1,389.64	Sp9358
Dec.	29,	1890	12.00	$1,932.25	$1,857.55	Sp614
July	20,	1890	12.50	1,494.42	1,441.67	Sp9328
Dec.	6,	1890	13.00	1,996.93	1,915.48	Sp2300
Dec.	5,	1890	13.00	2,199.91	2,123.56	Sp9358
Apr.	1,	1891	11.50	1,082.70	1,011.39	Sp11050
Mar.	27,	1891	11.25	1,124.86	1,052.96	Sp7038
Feb.	21,	1891	11.25	1,360.60	1,290.32	Sp2530
July	23,	1891	12.75	1,690.53	1,634.33	Sp1184
Aug.	14,	1891	12.00	1,426.15	1,376.89	Sp3482
Aug.	31,	1891	12.00	1,231.53	1,182.73	Sp1920
Jan.	21,	1891	12.00	1,277.96	1,202.44	Sp2364
June	22,	1891	12.50	1,606.43	1,555.23	Sp2700
May	11,	1891	12.00	1,289.08	1,214.48	Sp1866
Apr.	20,	1891	12.00	1,502.67	1,429.22	Sp4704
Aug.	1,	1891	No data	--------	1,429.22	Sp4704
Apr.	21,	1891	"		1,441.67	Sp9328
Oct.	7,	1891	-----	--------	1,181.07	Sp4878
Aug.	31,	1891	-----	--------	1,182.73	Sp1920
July	24,	1891	-----	--------	1,634.33	Sp1184
May	11,	1891	-----	--------	1,214.48	Sp1866
Aug.	18,	1891	-----	--------	1,376.89	Sp3582
Nov.	18,	1891	-----	--------	898.56	Sp1962
June	23,	1891	-----	--------	2,937.00	Sp2700
Oct.	15,	1891	10.25	1,223.27	1,818.07	Sp4874
Oct.	21.	1891	12.00	1,130.02	1,082.62	Sp1226
Nov.	12,	1891	11.00	944.08	898.58	Sp1962
Oct.	22.	1891	"	--------	1,082.62	Sp1226
Jan.	26,	1892	11.00	1,522.18	1,475.54	Sp8879
July	6,	1892	12.00	867.00	817.18	Sp3636
Oct.	6,	1892	10.75	1,069.12	1,024.82	Sp7368
Nov.	19,	1892	10.50	1,283.02	1,221.02	Sp9492 ?
Nov.	21,	1892	"	--------	1,221.02	Sp9492
Dec.	22.	1892	"	1,724.88	1,662.55	Sp4874
Aug.	10,	1893	14.75	1,557.03	1,494.85	Sp8959
Jan.	10,	1894	11.50	1,522.71	1,451.31	Sp6482

UNITED STATES
DEPARTMENT OF THE INTERIOR.

Bureau of Mines.
June 18,1946

Western Region
Economics and Statistics Division.

340 Federal Bldg.
Salt Lake City, Utah.

Dear Sir:-

The production of the Vekol Mine from 1901 to the present time is as follows:-

Year	Ore (tons)	Concentrates (tons)	Gold. (oz)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc. (lb)
1903	100	----	----	3,000	1,000	2,500	----
1904	200	5	----	4,000	----	3,334	----
1905	200	----	----	4,000	----	3,500	----
1908	11	----	----	1,500	316	3,635	----
1909	416	----	----	3,988	338	6,343	----
1914	3	----	6.09	16	26	----	----
1915	1,690	27	----	4,050	----	6,480	----
1916	610	61	3.00	6,032	392	26,476	----
1917	73	----	1.00	188	7,039	----	----
1921	56	----	3.00	1,229	41	13,928	----
1922	12	----	----	1,498	328	1,713	----
1931	1	----	----	165	18	----	----

Where the year is omitted there was no production.

With best regards, I am,

Very truly yours,

s/s Paul Luff
Statistician
Salt Lake Section.

*

HEINRICHS GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

VEKOL MINE.

The following is an account of the results of a few shipments of some of the high grade ores of the Vekol Mine, which were taken promiscuously from great quantities of these papers:-

KANSAS CITY SMELTING AND REFINING CO.

1884 - 118.00 35,918.59 = $304.39/TON = 274.23 oz/TON

DATE.			TONS.	GROSS PROCEEDS.	NET RETURNS		CAR NO.
Sept.	20,	1884	12.75	$4,860.09	$4,672.31	96%	At2770
Sept.	20,	1884	12.25	3,900.38	3,717.68		At8732
Aug.	27,	1884	36.75	10,542.47	9,982.04		At1656
May	14,	1884	13.00	3,638.30	3,434.29		At12944
June	27,	1884	38.00	11,233.43	10,686.11		At4458
Oct.	6,	1884	5.25	1,743.92	1,663.90	95.4%	At10484
6 June	20,	1885	12.50	3,162.94	2,934.23		At1732
2 Feb.	9,	1885	24.50	4,389.85	4,205.81		At3107
1 Jan.	5,	1885	35.50	13,580.48	13,028.65		At4268
5 May	6,	1885	11.75	3,632.68	3,408.02		At7506
4 Apr.	18,	1885	12.50	3,607.69	3,278.28		At9238
7 July	24,	1885	12.50	3,432.67	3,006.84		At7400
2 Feb.	27,	1885	12.75	3,967.58	3,789.95		At1276
4 Apr.	11,	1885	11.00	3,872.84	3,643.54		At1276
6 June	17,	1885	12.50	4,217.68	3,992.65		At2436
3 Mar.	26,	1885	12.75	3,807.10	3,756.17		At1428
8 Aug.	5,	1885	14.25	4,000.21	3,756.17		At10758
			172.50	51,671.72	$299.58/TON		279.96 oz/TON

118 TONS
GROSS 35918.59
32359.02
274.2302/TON

13 CARS IN 1885

Reports, partly from the yearly production figures published each year by the Tucson Star, in large part from smelter settlement sheets in the possession of the owners of the ore shipped and a partial milling record, and in part from the yearly reports of the United States Geological Survey on mine production. After allowing for ore stolen and unrecorded production a figure very close to $1,000,000 was arrived at, almost entirely in silver. A summary is shown in the following table:-

VEKOL MINE PRODUCTION.

Period	Price of Silver.	How treated	Ounces Silver Produced.	Value in $.	Source of Information.
1882	$1.14	Sorted & Shipped	19745	$22,509.	Aria Star.
1883	1.11	" "	75676	84,000.	" "
1884	1.11	" "	79279	88,000.	" "
1885	1.07	" "	47121	51,171.	Company records
1885 to 1889	0.98	Milled and bullion shipped	525030	523,752.	Company rec. to march 1888 Estimated to Apr. 1889.
1889 to 1893.	0.93	Sorted & Shipped	209345	207,664.	Company records plus estimated unrecorded shipm'ts.
1908	0.53	Sorted & Shipped	3961	2,256.	U.S.G.S. Min. Res. A little Pb credit.
1909	0.52	" "	5329	3,000.	(same as above)
1915	0.51	Concentrated.	30000	16,620.	" " "
1916	0.66	"	8000	5,816.	" " "
GRAND TOTAL.			1,003,485 oz.	$1,004,788.	

LOCATION AND MINING PROPERTY.

The mine is situated on the western side of the Vekol mountains about midway of the length of the range. There are twenty-two mining claims owned, of which six are patented. They lie in T 9 S R 2 E Section 33 and in T 10 S R 2 E Section 4 (Gila and Salt River Meridian). The mine is twenty-nine miles southwest of Casa Grande to which it is connected by a forty-three mile fair road, twnety-nine miles of which is partly graded and the remaining twelve miles of which is a fair desert road passable except in wet weather. The camp, consisting of frame and adobe buildings, four of which are in good repair, has been built in a west-flowing arroya heading in a low pass in the westernmost ridge of the mountains.

MINE DEVELOPMENT.

The major workings of the mine have been driven from a series of tunnels starting from the southern side of the arroya. Most of these tunnels were driven at a down grade of from one to ten degrees in a south ten to thirty degree east direction. They are inter-connected by irregular stopes, raises, and inclines, the whole forming an extremely intricate network of workings, which extend a total distance of about 1070 feet to the southeast of the outcrop with a width of about 300 feet. At the south-east end, the workings are connected to the largest shaft, an

Argosy - Vekol 5/8/84

Leaching:

pH 9-11? cost to maintain?
how much acid or base material consumed? & what kind?

Max size of leached ore

Amount &/or cost of cyanide consumption per ton or yard of ore processed &/or oz of silver produced?

The second point has to do with the subsequent payments that must be made by the limited partners. I have provided that a limited partner who defaults on subsequent payments will forfeit all or a portion of his limited partnership interest as a result thereof, and will no longer be given the right to make future payments. Other limited partners and the general partner may make up the defaulting limited partner's contribution, however. Also, I have provided that the limited partners must assign their interest in the limited partnership to the general partner to be held as collateral for their subsequent payment obligations.

6. The Adit-Knaebel Joint Venture agreement requires that, before Adit can assign an interest in the joint venture to any other entity, it must obtain Knaebel's written permission. I mentioned that to you some time ago and you said that you would obtain that permission.

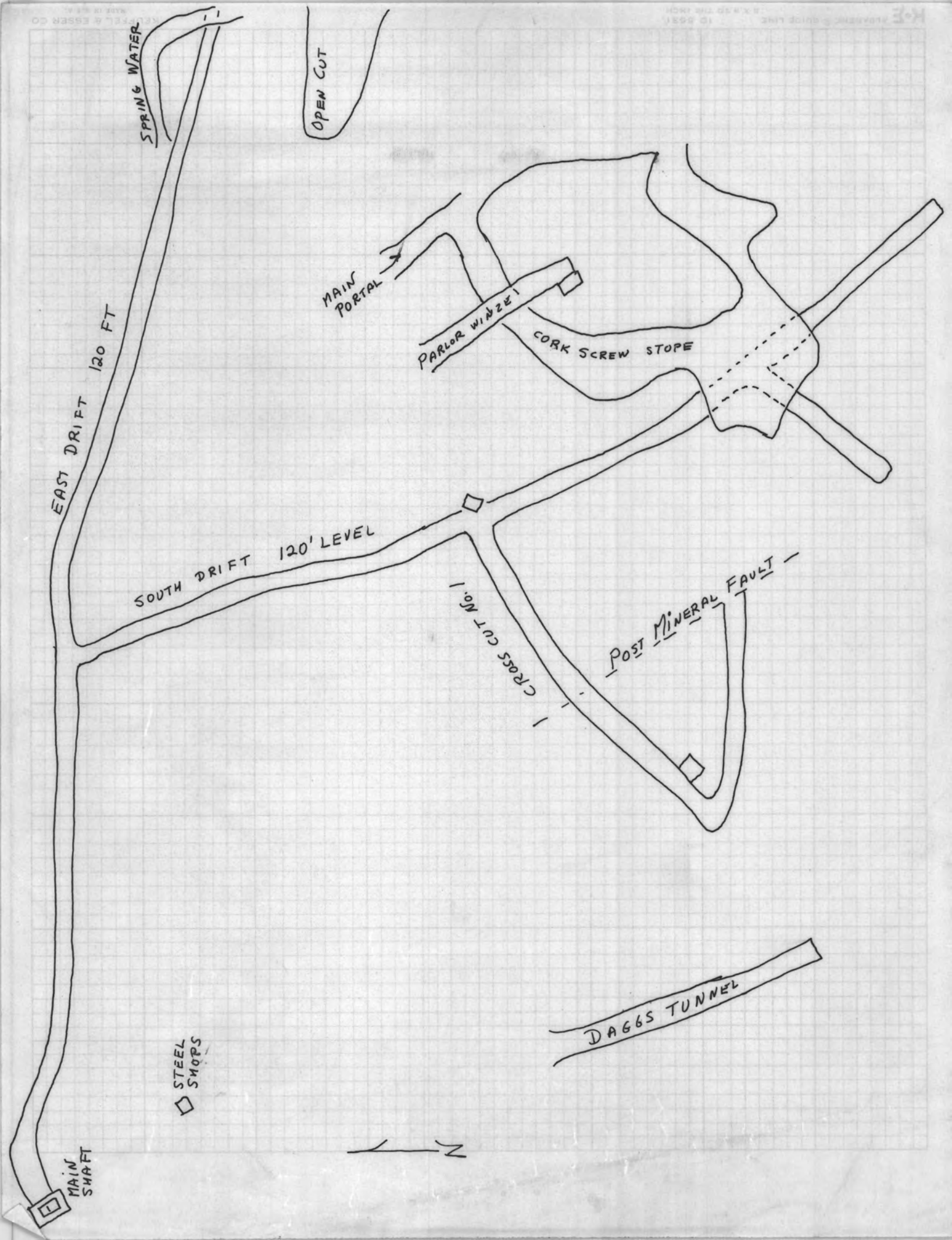
7. As we know, there are significant permitting requirements at both the state and federal level that must be accomplished before a mining company may undertake exploration operations on mining claims. Please supply us with any documentation regarding permitting accomplished.

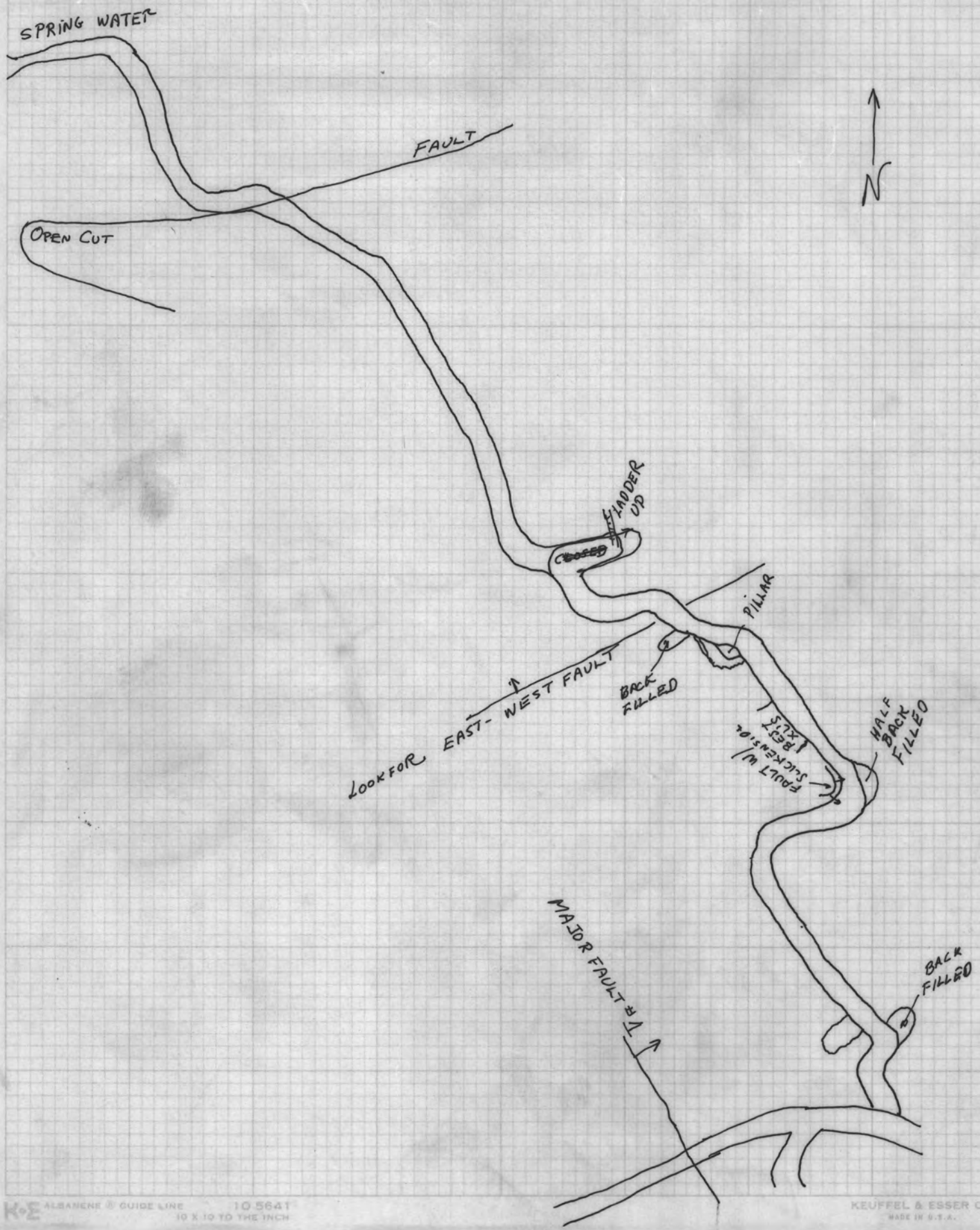
None to date

8. I took the discussion of the general partner, Adit Resources Corporation, from the old private placement memorandum. This should be updated to the extent necessary with the appropriate due diligence being done

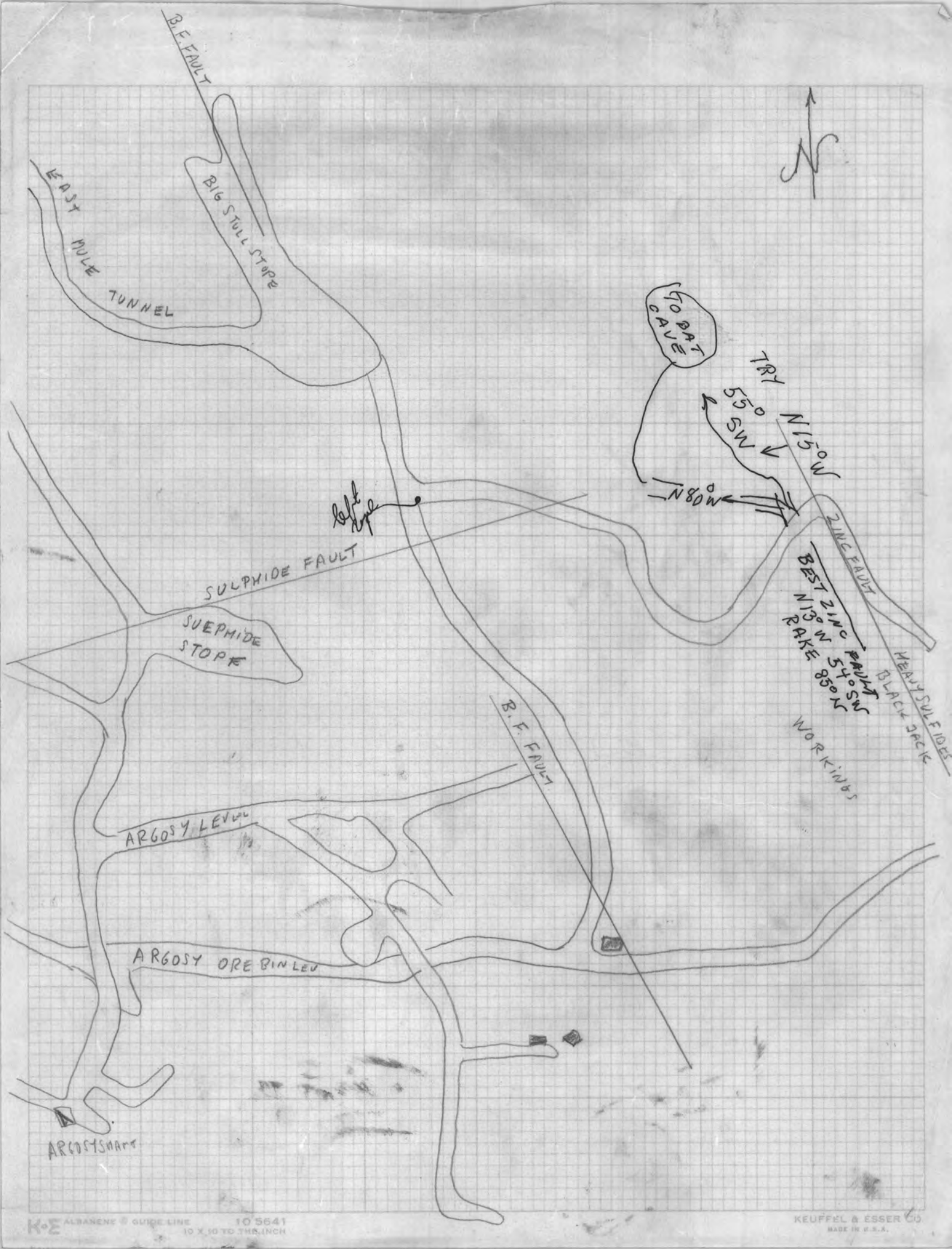
9. As previously indicated, Rule 146 requires audited financials for offerings in excess of $1,500,000.

10. Please review carefully the discussion of the Adit-Knaebel Joint Venture agreement from the previous offering

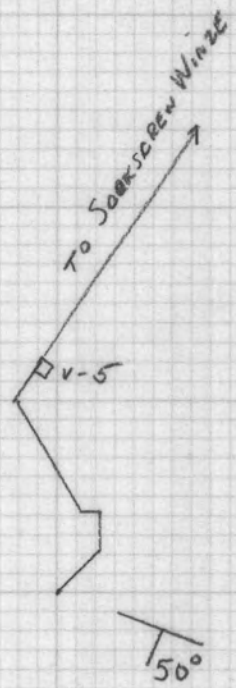

SPRING WATER
OPEN CUT
MAIN PORTAL
PARLOR WINZE
CORK SCREW STOPE
EAST DRIFT 120 FT
SOUTH DRIFT 120' LEVEL
CROSS CUT No. 1
POST MINERAL FAULT
DAGGS TUNNEL
STEEL SHOPS
MAIN SHAFT
N



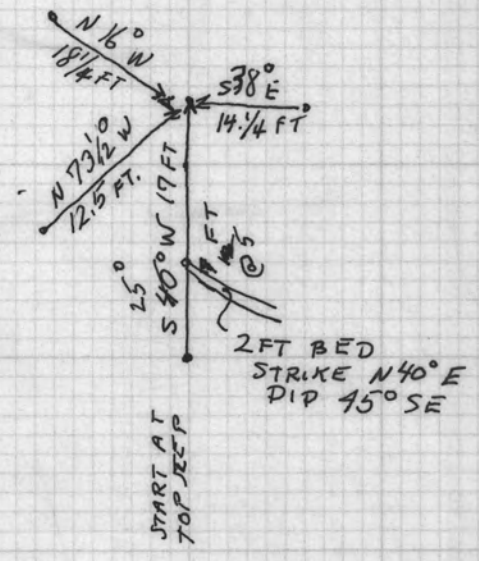
K+E ALBANENE ® GUIDE LINE 10 5641
10 X 10 TO THE INCH
KEUFFEL & ESSER CO.
MADE IN U.S.A.



K+E ALBANENE GUIDE LINE 10 5641 10 X 10 TO THE INCH
KEUFFEL & ESSER CO. MADE IN U.S.A.



K+E ALBANENE® GUIDE LINE 10 5641
10 X 10 TO THE INCH
KEUFFEL & ESSER CO.
MADE IN U.S.A.



K+E ALBANENE ® GUIDE LINE 10 5641
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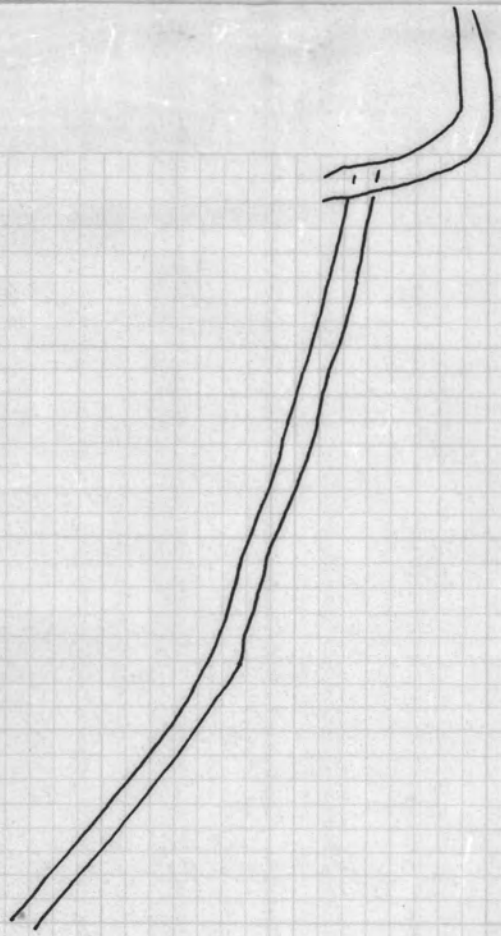


SUSAN BEEBE - DRAFTSMAN
2854½ NORTH EUCLID
TUCSON AZ 85719

OUR NUMBER
8101
DATE
11-6-83
CUSTOMER'S ORDER
SALESMAN
TERMS
F. O. B.

Sold To HEINRICHS GEOEXPLORATION
810 WEST GRANT ROAD

RECEIVED NOV - 7 1983 BOX 5964 TUCSON, AZ 85703

Shipped To

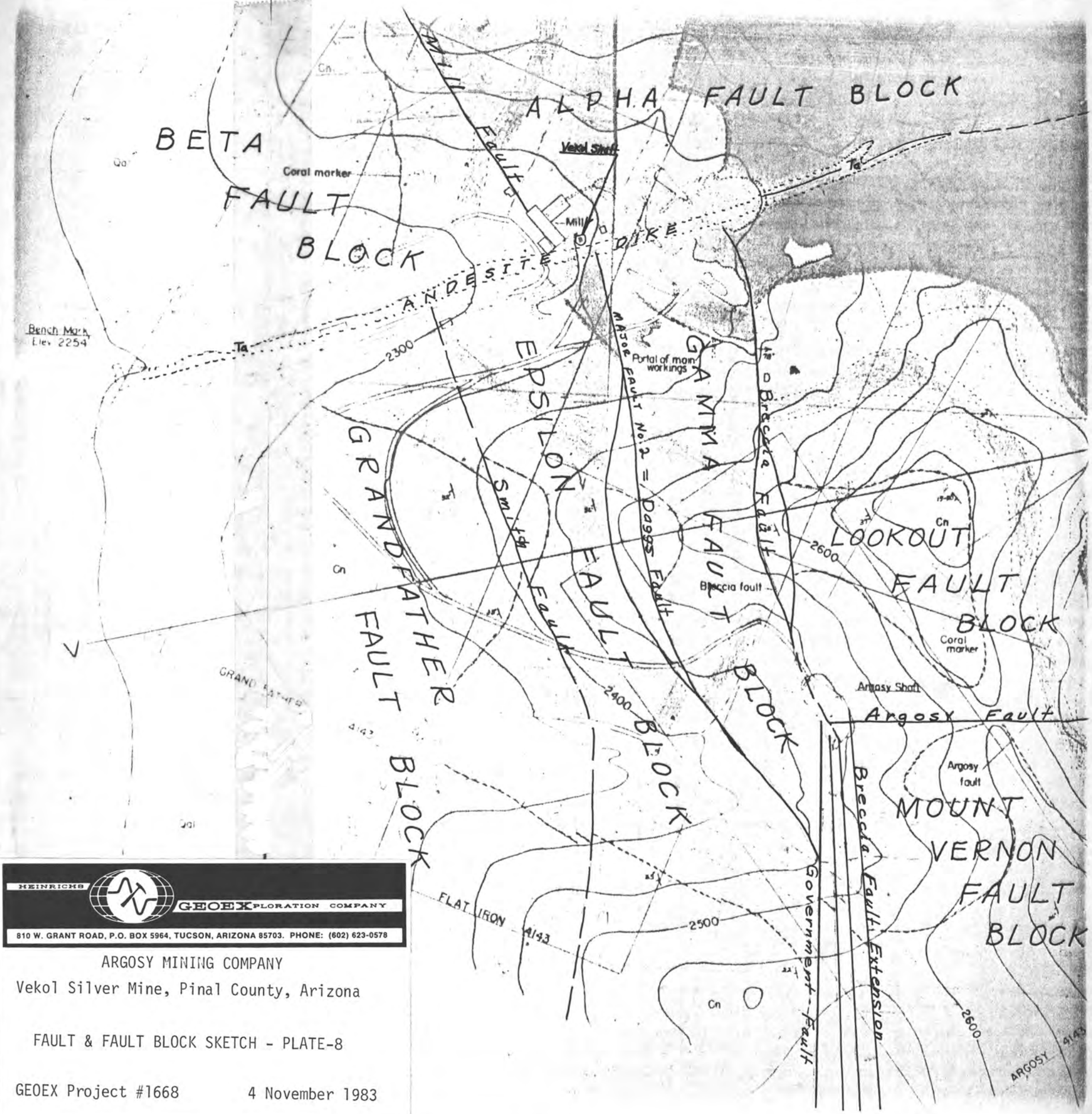
Address Via

RECEIVED NOV - 7 1983 BOX 5964 TUCSON, AZ 85703

INVOICE

	CONTRACT DRAFTING - VEKOL JOB			
	10/21/83 — 11/4/83			
	ADDITIONS, REVISIONS ON BASE MAP, AND			
	4 SECTIONS : 56¼ HRS. @ 8		450	00
	TRAVEL TIME, MILEAGE & MEETING E R. LEISURE		42	00
	5¼ HRS. @ 8			
	SUPPLIES : 4 FEET GRID MYLAR		4	82
	BLUE LINES : REPRODUCTIONS, INC INV. # 4887		6	53
	SUB TOTAL →		503	35
	INVOICE # 2863 10/13/83 VEKOL JOB		141	62
	TOTAL DUE		644	97

Rediform 7H 725



HEINRICHS GEOEXPLORATION COMPANY

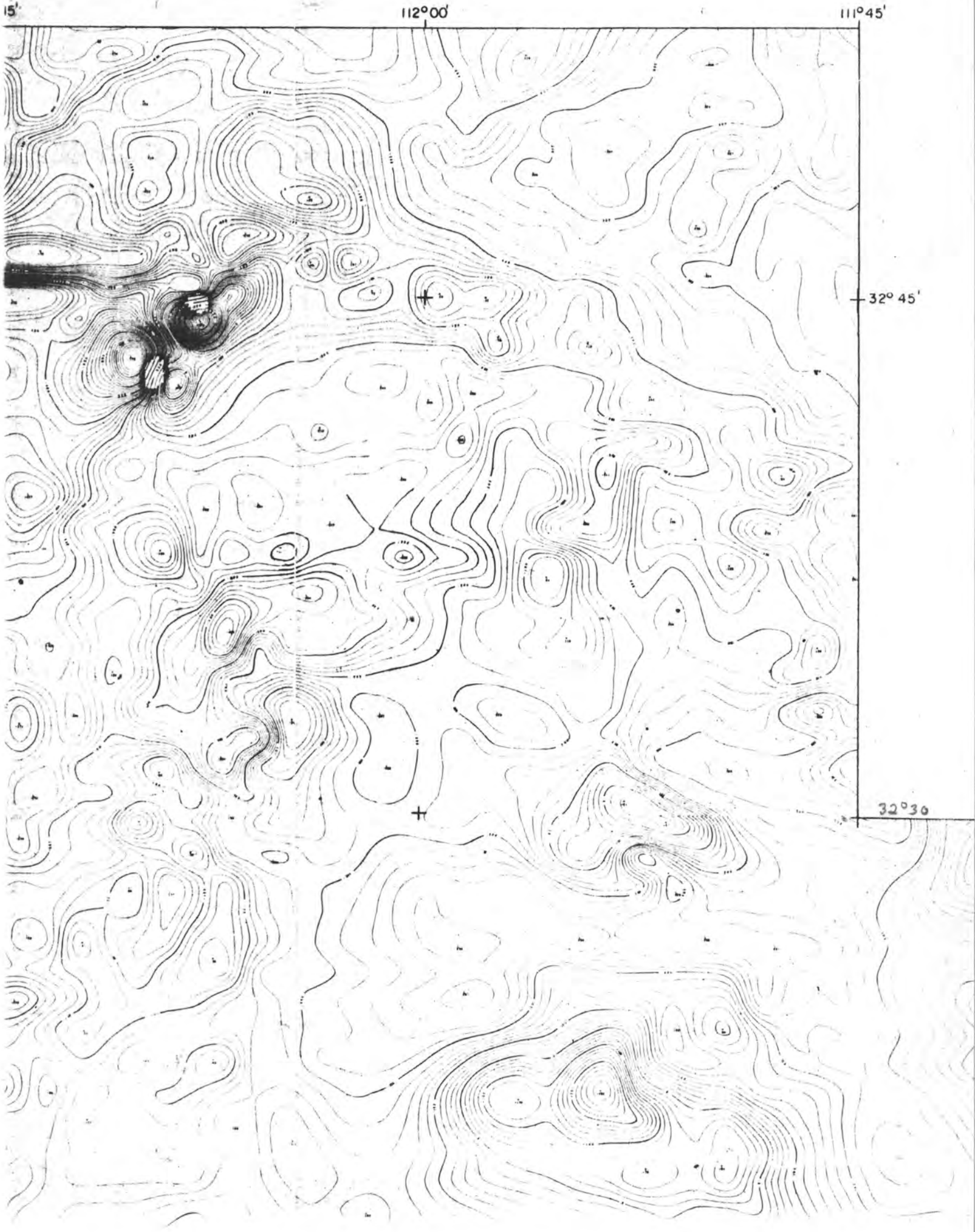
810 W. GRANT ROAD, P.O. BOX 5964, TUCSON, ARIZONA 85703. PHONE: (602) 623-0578

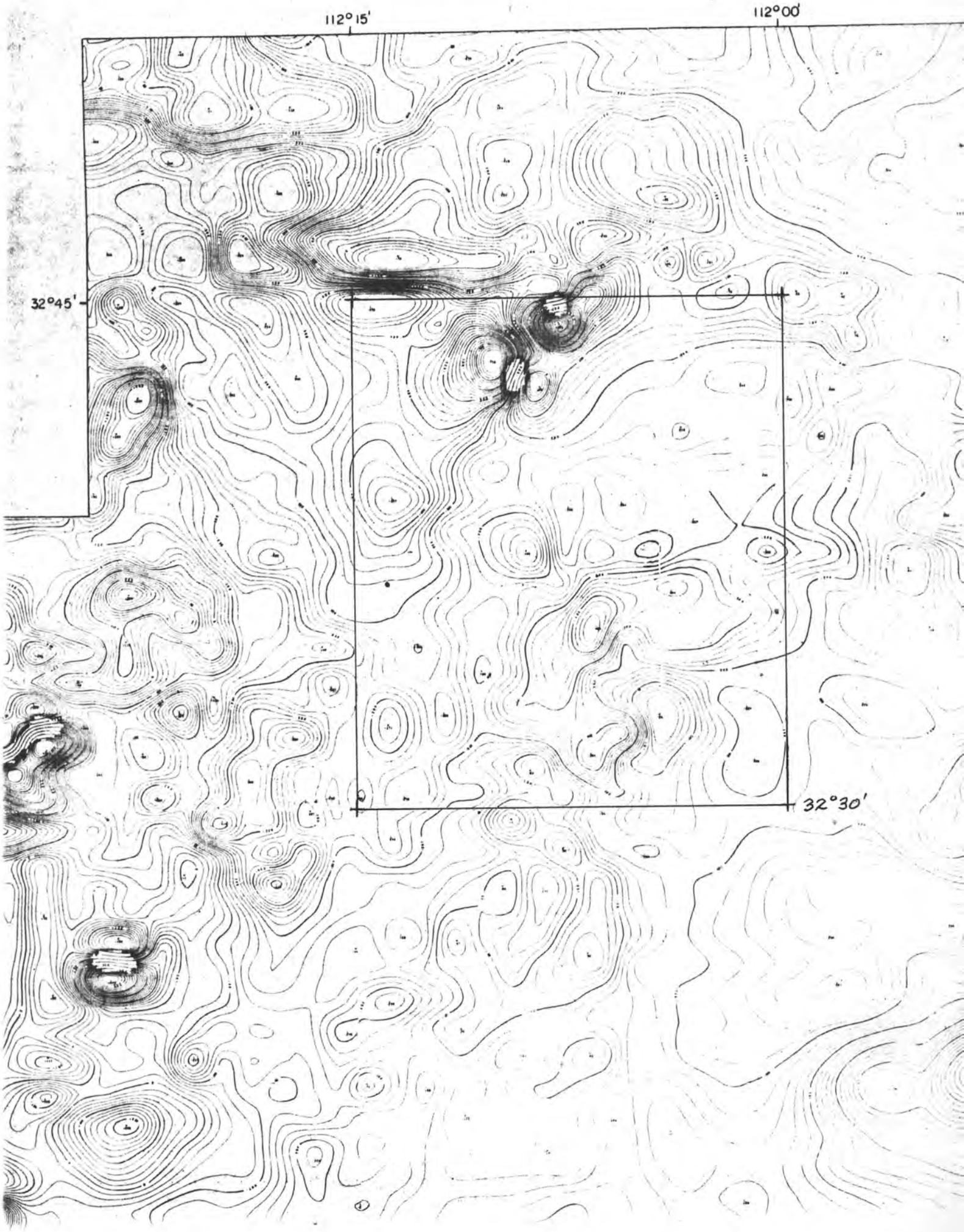
ARGOSY MINING COMPANY

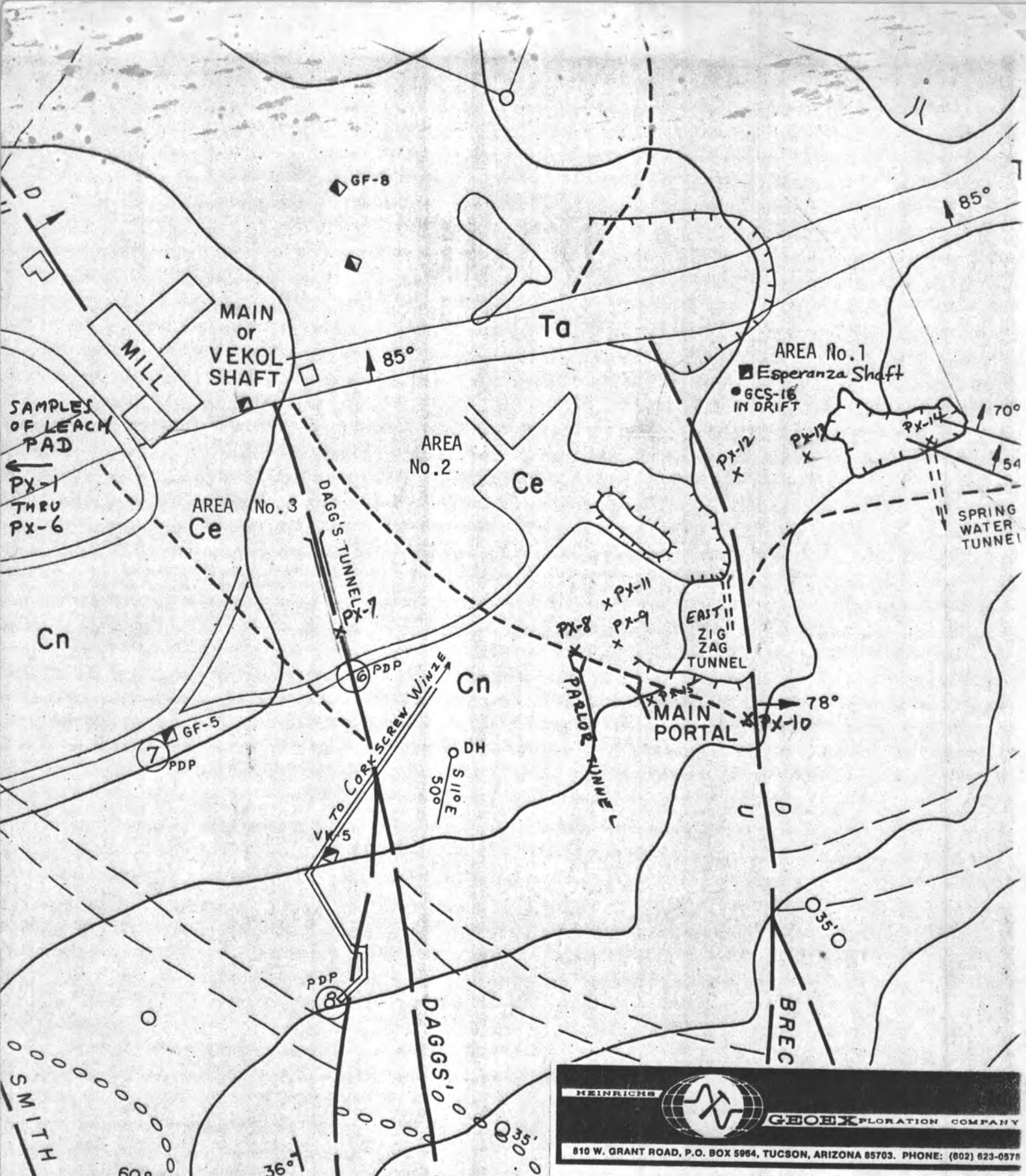
Vekol Silver Mine, Pinal County, Arizona

FAULT & FAULT BLOCK SKETCH - PLATE-8

GEOEX Project #1668 4 November 1983


15'
112°00'
111°45'
32° 45'
32°30


112°15'
112°00'
32°45'
32°30'



HEINRICHS GEOEXPLORATION COMPANY

810 W. GRANT ROAD, P.O. BOX 5964, TUCSON, ARIZONA 85703. PHONE: (602) 623-0578

ARGOSY MINING COMPANY

Vekol Silver Mine, Pinal County, Arizona

OPEN PITTABLE AREAS

Plate - 7

GEOEX ~~#1668~~ 1729

4 November 198

SAMPLE SUBMITTAL FORM

COPPER STATE ANALYTICAL LAB., INC.

P.O. Box 7517 – 710 E. Evans Blvd.
Tucson, Arizona 85725
(602) 884-5811 – 884-5812

Send Report To:	Copy Of Report To:	Send Statement To:
ARTHUR BUSHYEAGER	R.B. LEISURE	ARTHUR BUSHYEAGER
POINT DEVELOPING INC	7010 CALLE ORION	CLARION PA 16214
P.O. BOX 148	TUCSON AZ 85710	
CLARION, PA. 16214	PHONE 747-3793	

TYPE OF SAMPLES: ROCK CHIP ✓ CORE ____ SOIL ____ STREAM SEDIMENT ____
VEGETATION ____ WATER ____ OTHER ____

METHOD OF ANALYSIS: GEOCHEM ____ QUANTITATIVE ASSAY – A.A. ____ WET ____
FIRE ASSAY ____ OTHER ____

LIST SAMPLE NOS.	ELEMENT TO BE ANALYZED	~~LIST SAMPLE NOS.~~	~~ELEMENT TO BE ANALYZED~~	LIST SAMPLE NOS.	ELEMENT TO BE ANALYZED
PX-1	Cu, Pb, Ag	2 SACKS	TO BE COMBINED	110" VERTICAL CHANNEL	
PX-2	Cu Pb Ag	2 SACKS	✓ ✓ ✓	PILE FROM SAME PIT	
PX-3	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	110" VERTICAL CHANNEL	
PX-4	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	PILE FROM SAME PIT	
PX-5	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	90" VERTICAL CHANNEL	
PX-6	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	PILE FROM SAME PIT	
PX-7	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	MOUTH OF DAGGS TUNNEL 72" VERT	
PX-8	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	MOUTH OF PARLOR TUNNEL 40" VERT	
PX-9	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	OUTSIDE MAIN PORTAL	
PX-10	Cu, Pb, Ag	2 SACKS	✓ ✓ ✓	MOUTH OF WEST ZIGZAG TUNNEL	
PX-11	Cu, Pb, Ag	4 SACKS	✓ ✓ ✓	OUTSIDE MAIN PORTAL 19 FT HORIZ	

Special Instructions:
RESULTS → TRY FEB 5, TUESDAY

Shipment No.: ____
Date Shipped: ____
Shipped Via: ____
No. of Cartons: ____
No. of Samples: ____

INDICATE DISPOSITION OF SAMPLES AFTER ANALYSIS	BULK REJECTS	PULP
Return at Client's Expense VIA:		
Store Temporarily Pending Instructions		
Discard Immediately		

Unless other arrangements are made, pulps and rejects are discarded after three months. Drill core rejects and pulps never discarded without permission of client. A storage charge will be levied after three months.

Authorized Signature: ____

MAIL ORIGINAL

008

PAGE 2

SAMPLE SUBMITTAL FORM

COPPER STATE ANALYTICAL LAB., INC.

P.O. Box 7517 – 710 E. Evans Blvd.
Tucson, Arizona 85725
(602) 884-5811 – 884-5812

Send Report To: ARTHUR BUSHYEAGER

Copy Of Report To: RICHARD LEISURE

Send Statement To: ARTHUR BUSHYEAGER

TYPE OF SAMPLES: ROCK CHIP ✓ CORE ____ SOIL ____ STREAM SEDIMENT ____
VEGETATION ____ WATER ____ OTHER ____

METHOD OF ANALYSIS: GEOCHEM ____ QUANTITATIVE ASSAY – A.A. ____ WET ____
FIRE ASSAY ____ OTHER ____

LIST SAMPLE NOS.	ELEMENT TO BE ANALYZED	~~LIST SAMPLE NOS.~~	~~ELEMENT TO BE ANALYZED~~	LIST SAMPLE NOS.	ELEMENT TO BE ANALYZED
PX-12	Cu, Pb, Ag	2 SACKS	TO BE COMBINED	65" VERTICAL	
PX-13	Cu, Pb, Ag	2 SACKS	✓ ✓	END OF R.R. SLOT 110" VERT	
PX-14	Cu, Pb, Ag	2 SACKS	✓ ✓	MOUTH OF SPRING WATER TUNNEL 110" Horz	
PX-15	Cu, Pb, Ag	2 SACKS	✓ ✓	INSIDE MAIN PORTAL 3' VERTICAL	

Special Instructions:
IF Ag IS OVER 30 PPM PLEASE RUN Ag + Au BY FIRE ASSAY

SAMPLES ALSO CONTAIN HIGH Zn + Mn

Shipment No.: ____
Date Shipped: ____
Shipped Via: ____
No. of Cartons: ____
No. of Samples: ____

INDICATE DISPOSITION OF SAMPLES AFTER ANALYSIS	BULK REJECTS	PULP
Return at Client's Expense VIA:		
Store Temporarily Pending Instructions		
Discard Immediately		

Unless other arrangements are made, pulps and rejects are discarded after three months. Drill core rejects and pulps never discarded without permission of client. A storage charge will be levied after three months.

Authorized Signature: ____

MAIL ORIGINAL

HEINRICHS GEOEXPLORATION COMPANY

P.O. BOX 5964, TUCSON, ARIZONA 85703. 806 WEST GRANT ROAD. PHONE: (602) 623-0578

November 29, 1983

Argosy Mining Company
5244 N. 25th Street
Phoenix, AZ 85016

Attn: Mr. Arthur Hindrichs

Re: Vekol Silver Mine, Pinal County Arizona. Proposed drilling supervision and related geological services.
GEOEX #1675
~~Supplemental Letter #1~~

Dear Arthur:

This letter is in response to your request for a proposal to lay out and supervise an initial drilling program at the Vekol property as a logical follow-up effort toward the ultimate purpose of our initial work on the property which was covered in our report of 4 November 1983. This report titled"Composite Geological and Geochemical Mapping, was hand delivered to you on 7 November 1983. In addition to a proposal for drilling, this letter will also briefly review again a few things mentioned or covered in the 4 November report.

Objective of the initial mapping project was intended to determine if and how best additional reserves, preferably open pittable, might be quickly and least expensively identified and developed. Three such areas were identified as depicted on Plate 7 of the 4 November report. A copy of that plate also accompanies this letter.

Referring to Plate 7, several factors pertinent toward maximizing the chances for additional reserve development are apparent. These are:

1. Drilling control and related more detailed geologic mapping should be done at a scale of 1" = 20'. This should include designating and establishing some close at hand semi-permanent elevation bench mark, say perhaps at or near the Main Portal Adit floor. Eventually and definitely before any heavy equipment work is done, this elevation bench mark should be tied to a closed traverse over the surface then through the old workings to establish the exact point on the present surface which represents a vertical projection from the upper end of the underground Corkscrew Winze workings immediately below said point. The reason for this is to avoid possible adverse accidental encounters of heavy equipment and old workings.

2. Daggs Tunnel should be cleaned out for 1" = 20' geologic mapping access. This is important because it represents the east limiting line

for Open Pittable Area 3 and perhaps also access to the westward limit of Open Pittable Area 2. This should be done before drilling. Incidently, the triangular sliver of Naco limestone lying between Areas 2 and 3 may represent an area of thin cover over some additional tonnage of the favorable horizon which dips underneath to the west from Area 2.

3. The immediate areas of the Main Portal, Zig Zag and Spring Water tunnels should be detail geologically mapped at 1" = 20'. The importance of this is that the data may have considerable significance when projected on to the open pittable areas, or vice versa in connection with the interpretation of the economic geologic potential of the three areas.

4. The large boulders at Area No. 1 will have to be removed before any detailed geologic mapping and subsequent drilling can be effectively done and also the drilling access in the Zig Zag Tunnel vicinity improved by dozing if feasible.

5. All three areas should be mapped at a scale of 1" = 20' as part of the ultimate process of picking and laying out of the initial proposed drill sites.

6. Tentatively, to initiate the drilling we visualize an initial minimum preliminary - reconnaissance program of four holes, located as a square on approximately 100' centers, programmed to be drilled to 70 feet deep on Area 1, 50 feet deep on Area 2 and 30 feet deep on Area 3. These lengths represent a geologically anticipated favorable horizon thickness of 60 feet, 40 feet and 20 feet respectively and the extra 10 feet in each case is simply a programmed factor of safety. Then the drilling program would continue on a 50 foot spacing to begin to determine any tonnage and grade within the favorable horizon.

7. Underground geologic mapping of the Esperanza Shafts and its two 100 ft. long workings at a scale of 1" = 20' should also be done before any drilling.

Based on our standard rates as charged before, for such a program of mapping and laying out of drill sites, etc., we estimate seven professional man days in the field and seven professional man days in the office at a cost of $4,200.00 not including outside drafting expenses for one 1" = 20' plan master and one cross section, estimated at $400.00. An advance of $2,300.00 would be required and at least one week of notice prior to proceeding.

Actual drilling supervision, geologic logging of core or cuttings and sample preparation and logging would be charged at $35.00 per hour or $300.00 per day which ever were smaller, plus expenses at 115% of invoiced costs and vehicles charged as before. We do not anticipate the drilling to become at all routine at this initial stage and it will require careful and experienced supervision to get everything available and needed out of the drilling data.

Before any drilling or detailed geologic mapping commences, we recommend that Steve and one helper run a closed circuit of leveling from the nearest Government Bench Mark to permanent elevation points at the Vekol Shaft, Esperanza Shaft, Daggs Tunnel and the Main Portal. Someday it may become desirable to also tie this net to the H pads, tool shed floor, both water well collars and the Great Eastern Extension shaft collar. Thus, when ever any new mapping is done or new data acquired, everything would be tied together so that proper plan maps and cross sections could be prepared when ever needed or desired.

If desired, with sufficient notice and when ever mutually convenient, either Richard, myself or both, could spend one field day with you and/or your associates in the field going over this proposal together with the various PDP's (proposed drill pads)(as indicated on Plate 1 and discussed in our 4 November report) on the ground.

Meanwhile, we welcome your questions and comments.

Faithfully,
Heinrichs GEOEXploration Co., Inc.

Walter E. Heinrichs, Jr. President

WEH/jh

Encl: Plate 7

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.

PHONE 254-6181 817 WEST MADISON ST. P. O. BOX 1888 PHOENIX 85001

Chemist . . . Engineers

For Mineral Harvesters
Post Office Box 606
Standfield, Arizona 85272

Date June 10, 1966

Sample of Ore

Received: 6-10-66

Submitted by: Same

ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce

Silver figured at $ 1.29 per ounce

LAB. NO.	IDENTIFICATION	GOLD		SILVER		PERCENTAGES	
		OZ. PER TON	VALUE	OZ. PER TON	VALUE	LEAD	
A-691	TAKEN OF BELT #1 [illegible]			5.20	$6.71	2.10 %	
	#2 [illegible] TAKEN			4.80	6.19	1.30	
[illegible] Rocks	#3 white [illegible]			9.80	12.64	1.95	
?	#4 gray end of [illegible]			0.20	0.26	0.10	

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.

PHONE 254-6181 817 WEST MADISON ST. P. O. BOX 1888 PHOENIX 85001

Chemist . . . Engineers

For Mineral Harvester Corporation
Post Office Box 606
Stanfield, Arizona

Date June 1, 1966

Sample of Ore

Received: 5-28-66

Submitted by: Same

ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce

Silver figured at $ 1.29 per ounce

LAB. NO.	IDENTIFICATION	GOLD		SILVER		PERCENTAGES		
		OZ. PER TON	VALUE	OZ. PER TON	VALUE	COPPER	LEAD	ZINC
A-664	No Mark MIDDLE DUMP SCREEN BY TROMMEL TO 1/4 -			4.40	$5.62	0.20%	3.35%	4.90%

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean, Jr.

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.

PHONE 254-6181 817 WEST MADISON ST. P. O. BOX 1888 PHOENIX 85001

Chemist . . . Engineers

For Mineral Harvesters, Inc.
Box 606
Stanfield, Arizona

Date June 8, 1966

Sample of Ore

Received:

Submitted by: Don Coombes

ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce

Silver figured at $ 1.29 per ounce

LAB. NO.	IDENTIFICATION	GOLD		SILVER		PERCENTAGES	
		OZ. PER TON	VALUE	OZ. PER TON	VALUE	LEAD	ZINC
684	A-1			3.20	$ 4.13	1.05%	2.40%
	A-2			10.40	13.42		
	A-3			6.40	8.26	1.40%	2.55%

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean

ARIZONA TESTING LABORATORIES

A DIVISION OF CLAUDE E. McLEAN & SON LABORATORIES, INC.

PHONE 254-6181 817 WEST MADISON ST. P. O. BOX 1888 PHOENIX 85001

Chemist . . . Engineers

For Mineral Harvesters, Inc.
Box 606
Stanfield, Arizona

Date June 8, 1966

Sample of Ore

Received:

Submitted by: Don Coombes

ASSAY CERTIFICATE

Gold figured at $ 35.00 per ounce

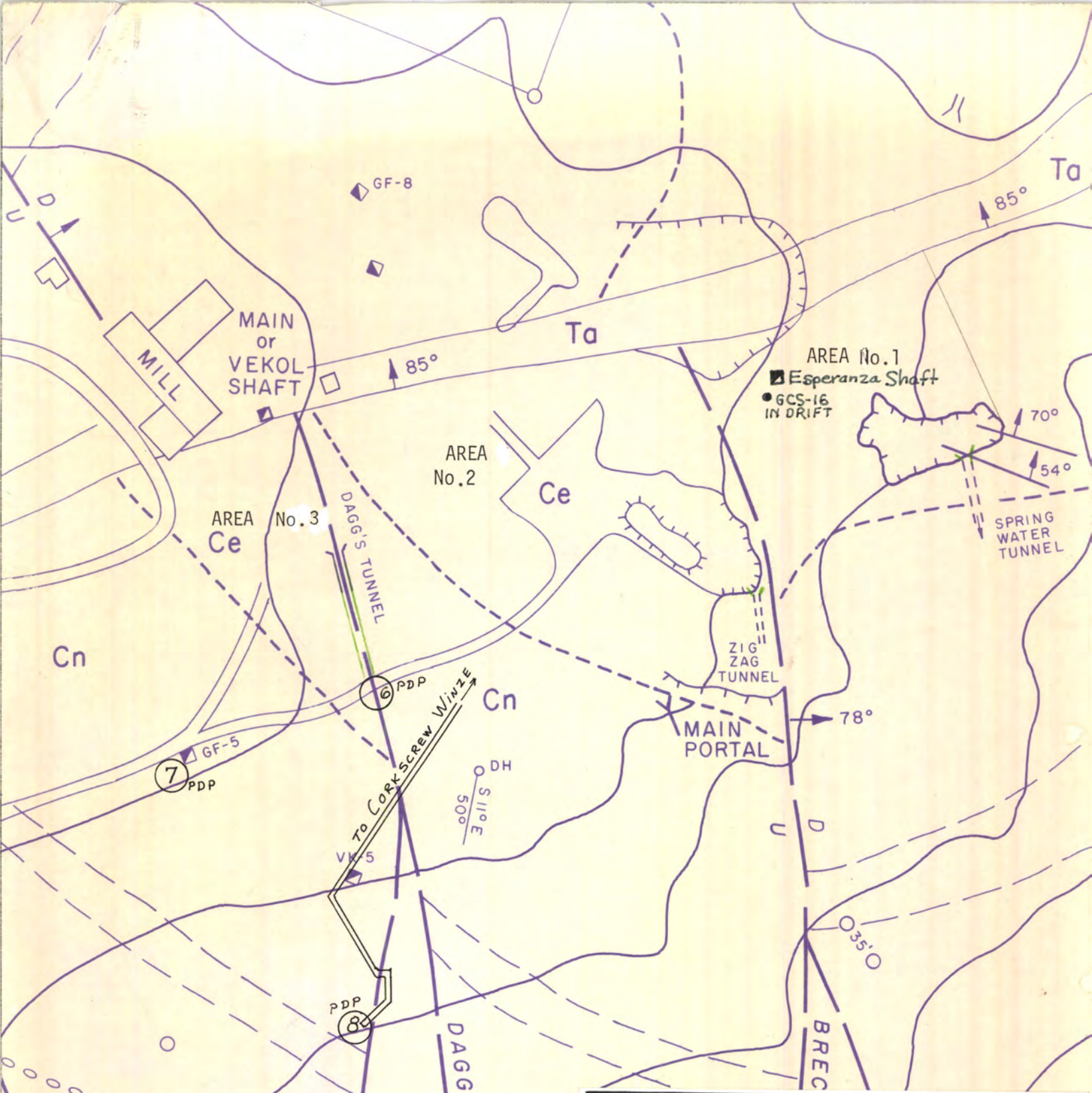
Silver figured at $ 1.29 per ounce

LAB. NO.	IDENTIFICATION	GOLD		SILVER		PERCENTAGES	
		OZ. PER TON	VALUE	OZ. PER TON	VALUE	LEAD	ZINC
684	A-1 middle dump			3.20	$ 4.13	1.05%	2.40%
	A-2 Upper [illegible] dump			10.40	13.42		
	A-3 Lower [illegible]			6.40	8.26	1.40%	2.55%

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Claude E. McLean



HEINRICHS GEOEXPLORATION COMPANY

810 W. GRANT ROAD, P.O. BOX 5964, TUCSON, ARIZONA 85703. PHONE: (602) 623-0578

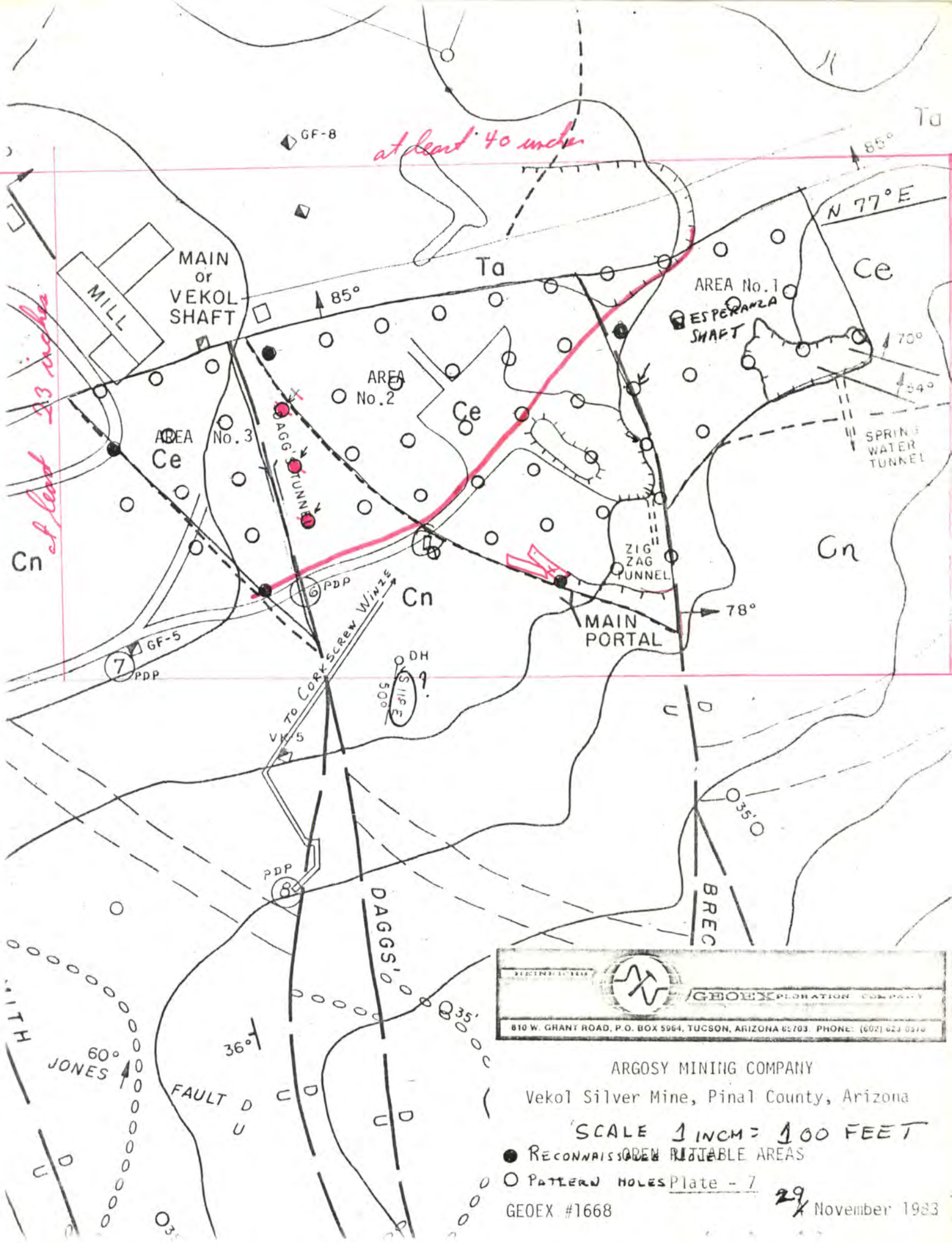
ARGOSY MINING COMPANY

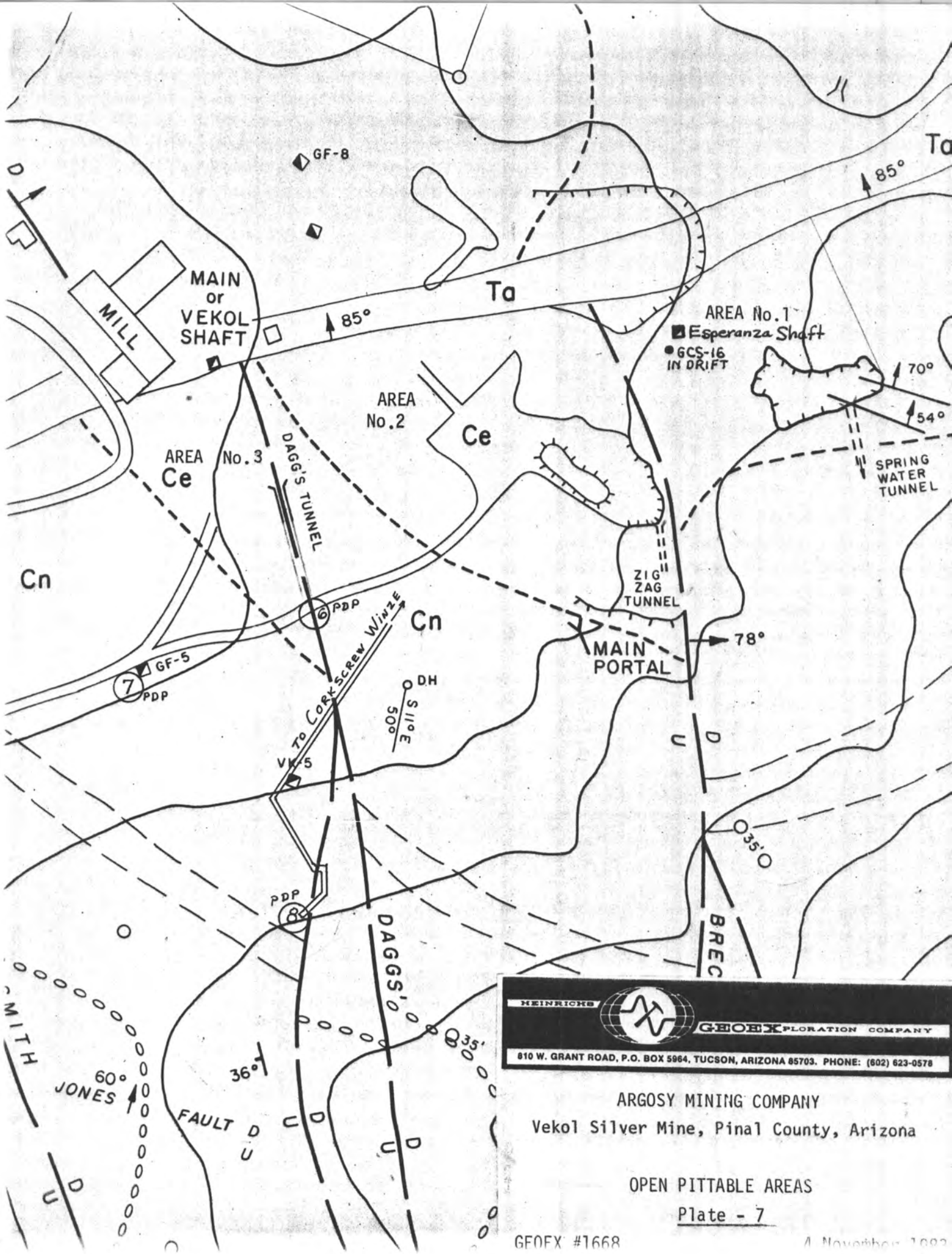
Vekol Silver Mine, Pinal County, Arizona

OPEN PITTABLE AREAS

Plate - 7

GEOEX #1668 4 November 1983


at least 40 inches
at least 23 inches
GF-8
MAIN or VEKOL SHAFT
MILL
Ta
85°
N 77°E
Ce
AREA No.1
ESPERANZA SHAFT
70°
54°
AREA No.2
AREA No.3
DAGG'S TUNNEL
SPRING WATER TUNNEL
Cn
ZIG ZAG TUNNEL
MAIN PORTAL
78°
PDP
GF-5
TO CORKSCREW WINZE
DH
VK-5
35'
DAGGS'
BREC
60°
JONES
36°
FAULT
GEOEX
810 W. GRANT ROAD, P.O. BOX 5964, TUCSON, ARIZONA 85703 PHONE: (602) 623-0578
ARGOSY MINING COMPANY
Vekol Silver Mine, Pinal County, Arizona
SCALE 1 INCH = 100 FEET
RECONNAISSANCE HOLES
PATTERN HOLES
OPEN PITTABLE AREAS
Plate - 7
GEOEX #1668
29 November 1983



ARGOSY MINING COMPANY

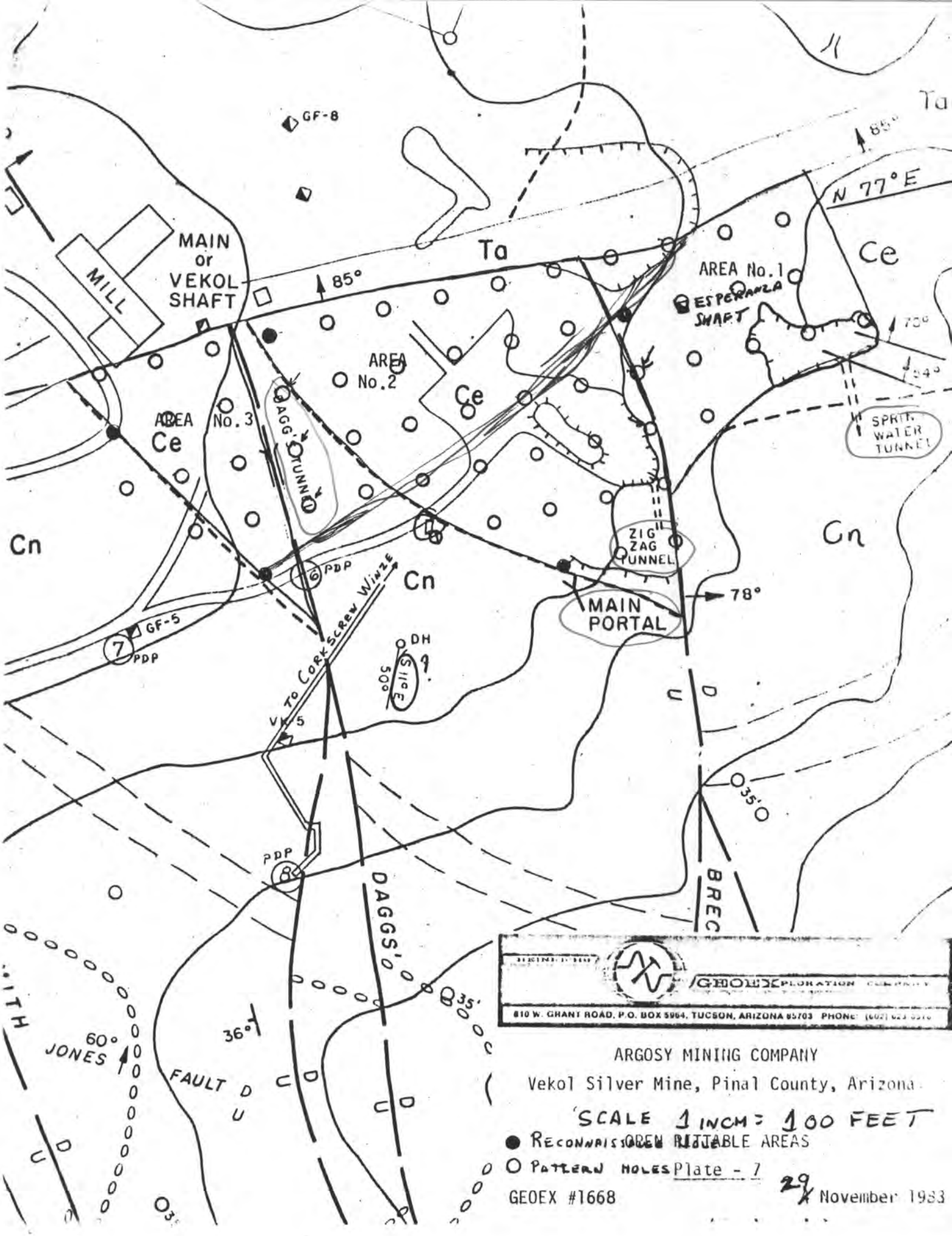
Vekol Silver Mine, Pinal County, Arizona

OPEN PITTABLE AREAS

Plate - 7

GEOEX #1668

4 November 1982



ARGOSY MINING COMPANY

Vekol Silver Mine, Pinal County, Arizona

SCALE 1 INCH = 100 FEET

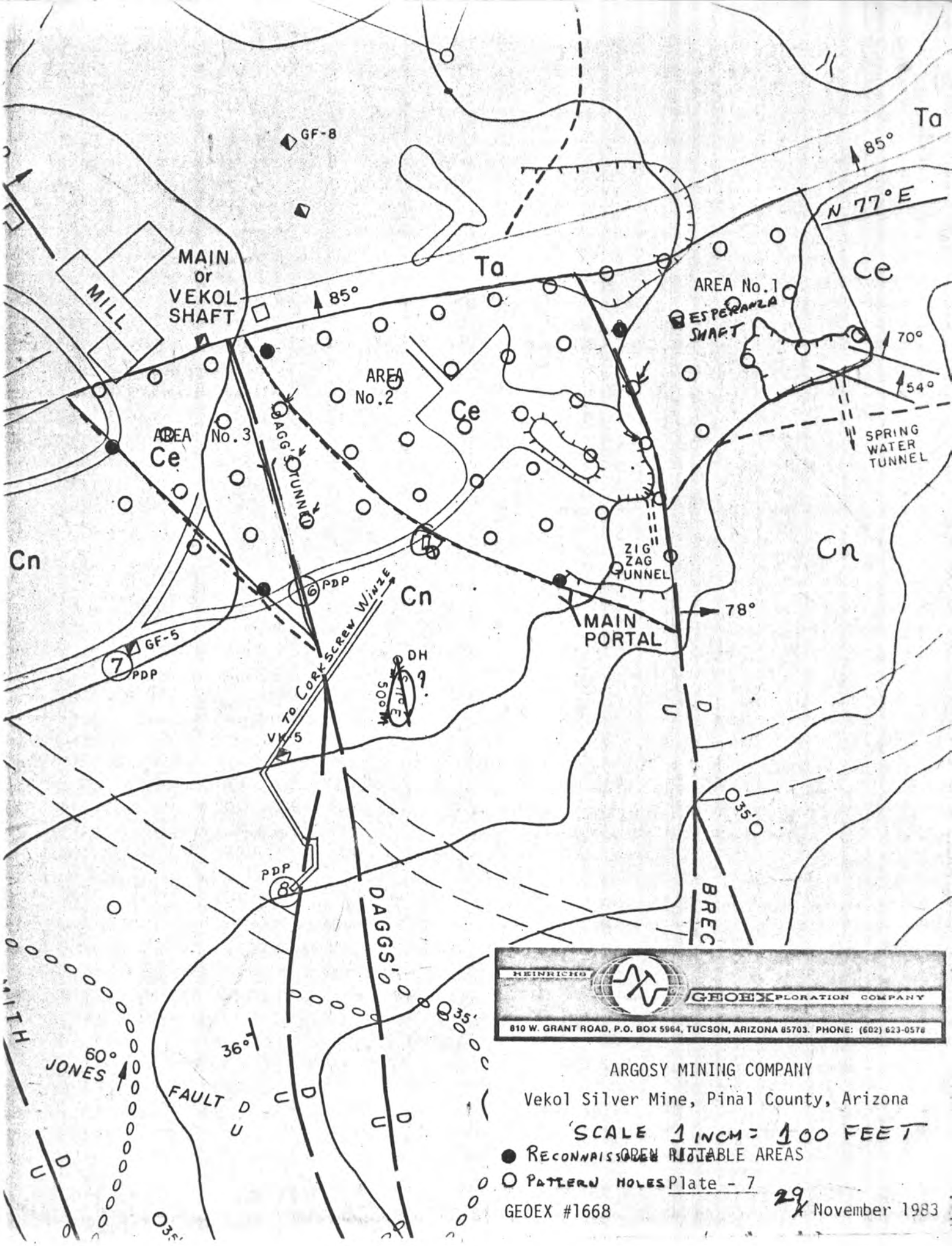
● RECONNAISSANCE MINEABLE AREAS

○ PATTERN HOLES

Plate - 7

GEOEX #1668

29 November 1983



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810 W. GRANT ROAD, P.O. BOX 5964, TUCSON, ARIZONA 85703. PHONE: (602) 623-0578

ARGOSY MINING COMPANY

Vekol Silver Mine, Pinal County, Arizona

SCALE 1 INCH = 100 FEET

● RECONNAISSANCE HOLES

○ PATTERN HOLES

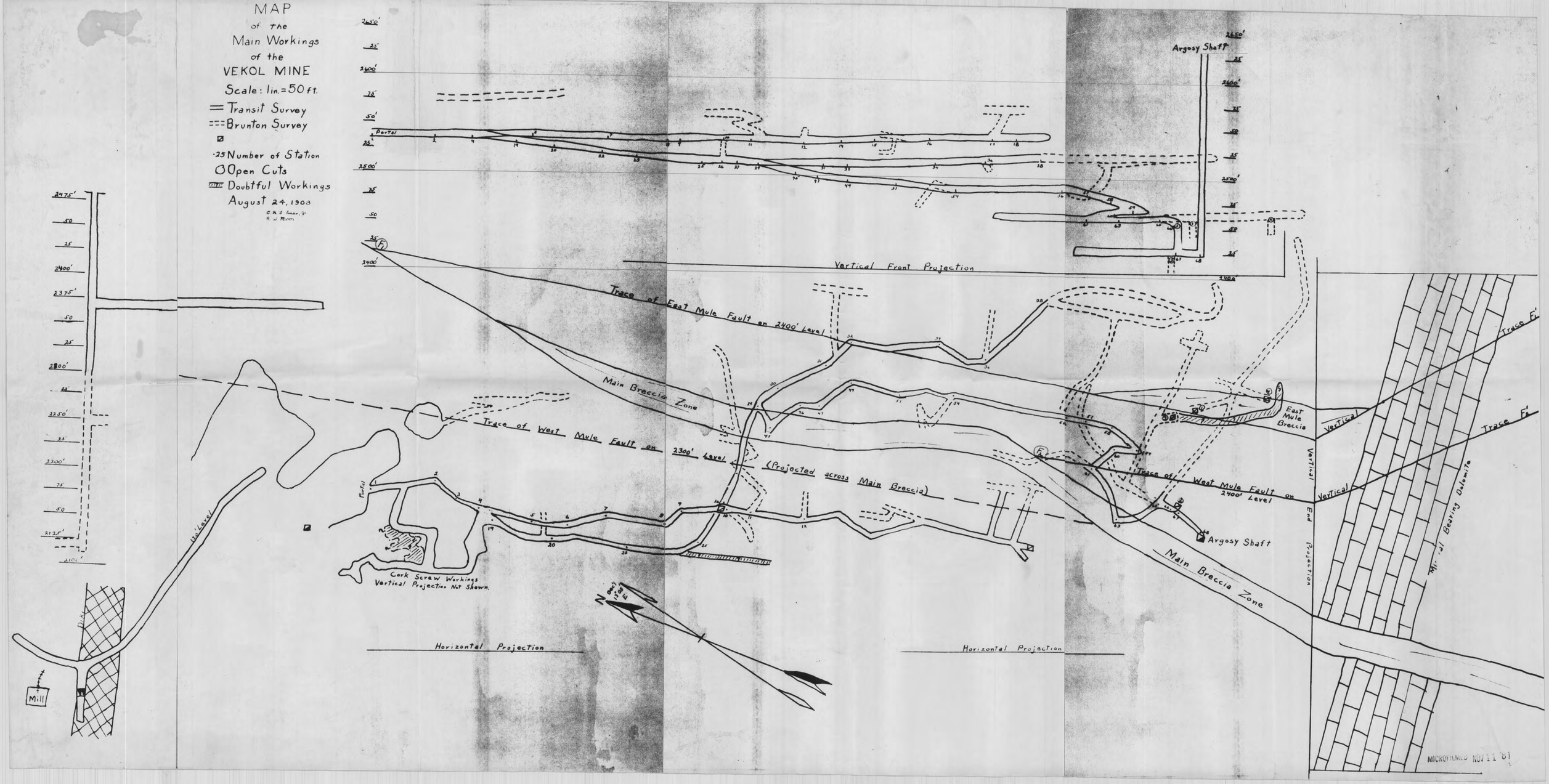
OPEN PITTABLE AREAS

Plate - 7

GEOEX #1668

29 November 1983

CASE 2 DRAWER 6
RAISE UP TO ORE BODY ?
LOOK FOR FAULT
East Cross Cut
West Zig Zag
South Drift
LOOK FOR FAULT
LOOK FOR FAULT
Burro Tunnel
Mule Tunnel
East Mule
West Mule
Big Bull Stope
Sulphide Stope
Stope
850 FT
360.87 FT
9.50 IN = 37.98 FT/IN
8.77 IN = 41.15
23°45'
26°
24°46' 35.1"
1160.56 FT
30.54 IN
MAP OF
PRINCIPAL
UNDERGROUND WORKINGS
OF THE
VEKOL MINE
CASA GRANDE DIST. PINAL COUNTY, ARZ.
SCALE 1 INCH = 20 FT.
WJB + GCL


MAP
of the
Main Workings
of the
VEKOL MINE
Scale: 1in.=50 ft.
Transit Survey
Brunton Survey
·25 Number of Station
Open Cuts
Doubtful Workings
August 24, 1908
Argosy Shaft
Portal
Vertical Front Projection
Trace of East Mule Fault on 2400' Level
Main Breccia Zone
Trace of West Mule Fault on 2300' Level
(Projected across Main Breccia)
East Mule Breccia
Vertical
Trace of West Mule Fault on 2400' Level
Vertical End Projection
Trace F'
Mineral Bearing Dolomite
Argosy Shaft
Main Breccia Zone
Cork Screw Workings
Vertical Projection Not Shown.
Horizontal Projection
Horizontal Projection
Mill
MICROFILMED NOV 11 '81

Drills Probe Ore In Pinal County

By VINCE TAYLOR
Pinal County Bureau

CHUICHU — Papago tribesmen are observing with traditional stoicism what may prove to be a major copper mining development on their land.

For more than a year, Newmont Development Co. has been punching exploratory holes in a 3-square-mile area east of Vekol Mountain. The location is 32 miles south and west of Casa Grande.

WORKING 16 hours a day, crews have completed 18 test holes from 300 to 800 feet deep, providing engineers with as yet unannounced data on the extent of ore bodies hidden below this verdant, saguaro-studded desert area.

If the deposits are ever developed, observers are quick to point out, it would be a shot in the arm for the Papagos, who comprise one of Arizona's poorest Indian tribes.

Just across the mountains to the west is the fabulous Vekol Mine, which produced countless thousands of tons of silver, lead and zinc ore at the turn of the century. To the east is the abandoned shaft of the old Jackrabbit Mine, also a high producer in early days.

Little data on the current Newmont explorations has been made public.

DAVE OSBORN, engineer in charge, said he was working 30 to 35 men in two shifts, six days a week. When the operation started, only one drilling rig was used. Now, Osborn supervises seven rigs, four rotary drills and three diamond-core drills.

He said water was his biggest problem.

"We encountered water at 285 feet in one hole, but an adjoining hole 800 feet away was dry," he recounted.

The Newmont engineer said whenever water is struck in a rotary hole, he has to move in with a core drill to complete the test.

Runoff from the surrounding hills also has caused major headaches and delays, he said.

TO PROVIDE access to the area, Morrison-Knudsen Contruction Co. crews were brought in to build dikes and construct 15 miles of all-weather roadway.

The road, significantly, would stand the pounding of heavy ore trucks should they be called into use.

The Newmont exploration is part of a continuous development program by mining companies in the Pinal County area.

...l Tops, Futures

Announcements

angements pend-
sons Mortuary.

78. 1101 N. 10th
Robert Kenney,
Tex., brother of
ts, Athens, Ohio,
ey, San Diego,
er of Sheila &
Corpus Christi,
y Sunday. Serv-
by Masonic Fu-
2:00 p.m. today
memories. A. L.
Cremation.

P. Surviving wife,
n-law Mrs. Della
sdale. Daughters,
Dwight Gummig,
t. Mrs. Vernon
ph, Missouri, Sis-
y Schwien, St. Jo-
Mrs. C. F. Buch-
Village, Calif. 1
Monica K. Gum-
Calif. 2 nephews.
ering, Messinger
sdale.

C. Survived by son
ottsdale, Daughter,
n McGirr, Denver,
ndchildren, 1 great-
vices will be con-
Robert E. Templin
n. Messinger Mor-
cottsdale. Interment
metery.

Christian Science
be conducted at
Phoenix Chapel
m., by Marvin
terment East Rest-
Walter E. Bloom
Directors.

J. (Charley). Sur-
ter Mrs. Dorothy
Valley, Calif.; a
yrtle Aber, Okla-
ahoma. He will be
Calif. for services
ends may call this
evening. Larry J.
ry, Mesa.

rene. 2020 W. San
James; father of
; brother of Mrs.
Robert M. O'Con-
O'Connor & Rev.
r. O.F.M. Requiem
Wednesday in SS
Church. Graveside
ay 10 a.m. in St.
ery. Friends may
5 p.m. Wednesday
Murphy Funeral

el E. Services 3
radise Chapel and
Private cremation.
Director.

m E. Father of
Budd, Chandler.
on. Services 2 p.m.
Bauer Mortuary.
A. Kendall offici-
at East Rest-

er W. Services and
sy. 2 p.m., Center-
ola, M. L. Gibbons

ie Wesley. 310 N.
es. 10 a.m. today.
The Rev. Canon
Dugan of Trinity
thedral officiating.
enwood Memorial

e J. Mass today
oachim Catholic
ty. Ludberg's Gold-
L. Youngtown.

Mass of the An-
oday Sacred Heart
nsen-Kings Funeral

et Jane. Service
day Palms Chapel
Mortuary. Dr. Ray

10-Lost

TURTLE "land." Vicinity 9th Avenue, Stapley Drive, Mesa. Christmas time. 969-3974.

PEKINGESE white male, northwest Phoenix, 1964 Pinal tag on harness. Needs medicine. 944-3279, 934-2986.

PEKINGESE, male, red with black mask, "Toi". Vicinity 800 North 24th Street. Reward. 252-4475.

RING, pearl. Reward. 277-0431.

CAT, black, four years old, spayed female. Family pet. Vicinity 25th-27th Avenue, Thomas-Osborn. February 3rd. Reward. 252-1256, evenings only.

PUP, English Shepherd, female. Black, brown, grey, white. White clipped tail. Vicinity Palmcraft Drive AL 4-2595.

BOSTON Terrier, black and white male, 6 years old, No tags. Vicinity Oak-82nd Street, Scottsdale. 273-3686, 964-1161.

BILLFOLD, at airport Sunday evening. Reward. Opal Schuler, 955-3509.

DOG, Black, 10 month old Hungarian Puli. Long, shaggy hair sheep dog, white star on chest. Long tail. Leather collar, no tags. Vicinity Thomas, between Granite Reef and Hayden Rd. Reward. 254-6421 days or 947-0512.

LAPEL pin, in shape of dog's head—peeking out of doghouse. $50 reward. AL 2-4465.

POODLE, apricot, miniature, male, 2½ years. Small reward. 275-4994.

KEY ring, with St. Christopher medal clip. At Fairway Coffee Shop, Marivale golf course, 59th Avenue-Indian School Road. 937-0756, 937-1220.

SIAMESE, male. Red collar. Vicinity Westown. 942-5862.

CALICO cat, vicinity 35th Avenue-Northern. Name "Patches." 939-1963.

11-Found

CAT, young Siamese. Cudia Estate. 959-1936 after 4 p.m.

13-Auctions

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Heindl—MESOZOIC FORMATIONS IN THE VEKOL MOUNTAINS, PAPAGO INDIAN RESERVATION, ARIZONA—Geological Survey Bulletin 1194-G

Mesozoic Formations in the Vekol Mountains Papago Indian Reservation Arizona

Dist

Pima & Pinal Co.

By L. A. HEINDL

CONTRIBUTIONS TO STRATIGRAPHY

GEOLOGICAL SURVEY BULLETIN 1194-G

Prepared in cooperation with the Bureau of Indian Affairs

HEINRICHS GEOEXPLORATION COMPANY
808 W. Grant Road • P. O. Box 5671
Tucson, Arizona 85703
Phone: (Area 602) 623-0578

UNITED STATES DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

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Contributions to stratigraphy.
Prepared in cooperation with the Bureau of Indian Affairs.
Bibliography: p. 9.

1. Geology—Arizona—Papago Indian Reservation. 2. Geology, Stratigraphic—Mesozoic. I. U.S. Bureau of Indian Affairs. II. Title. III. Title: Vekol Mountains. (Series)

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CONTENTS

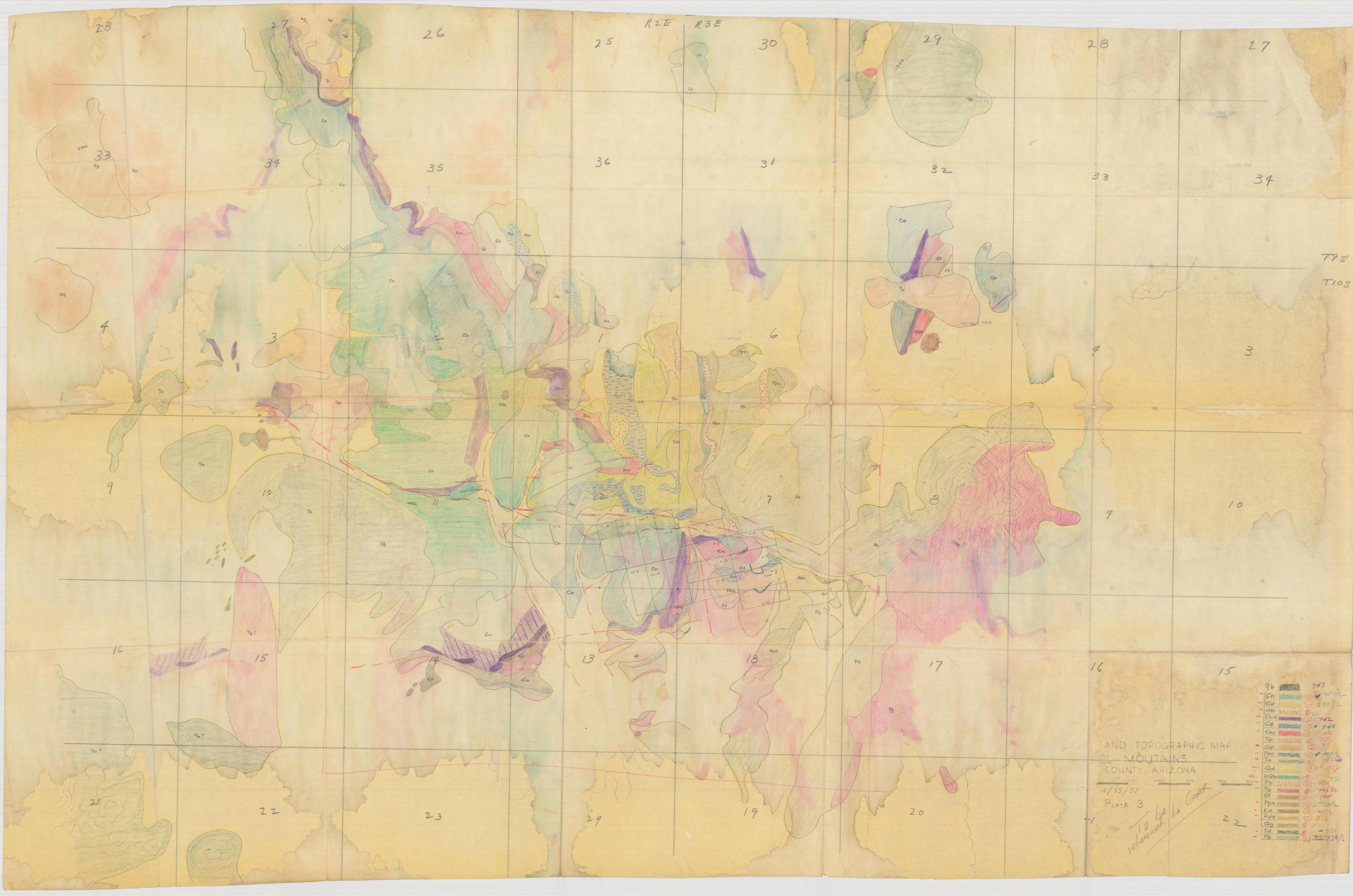
	Page
Abstract	G1
Introduction	1
Phonodoree Formation	3
Vekol Formation	5
Chiapuk Rhyolite	8
References cited	9

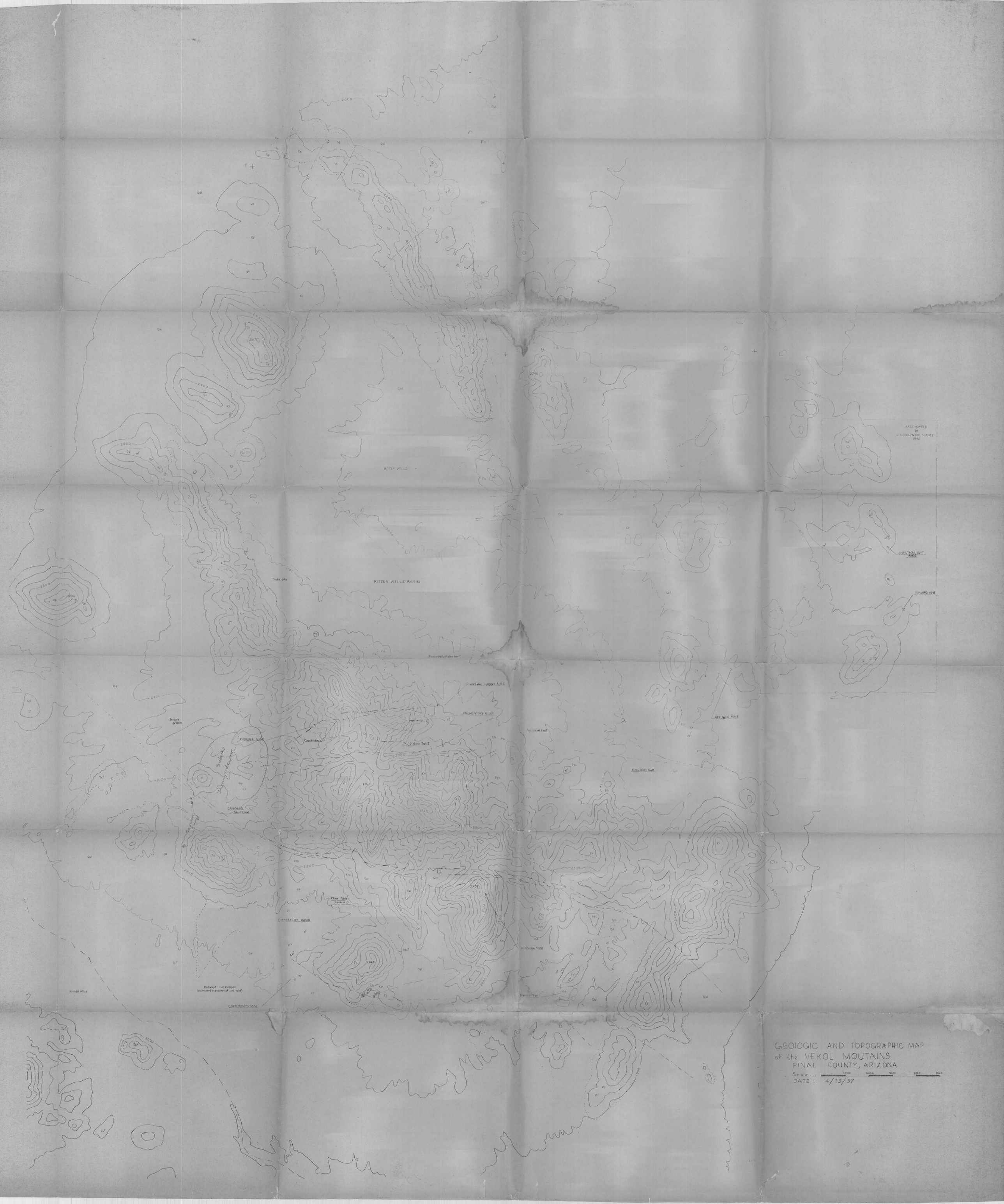
ILLUSTRATION

	Page
FIGURE 1. Geologic map showing Mesozoic formations in Vekol Mountains	G2

746-645—64

U. S. GOVERNMENT PRINTING OFFICE: 1965


R2E
R3E
T9S
T10S
AND TOPOGRAPHIC MAP
MOUTAINS
COUNTY, ARIZONA
4/15/57
PLATE 3
To be returned to Geol
Qb 747
Cn 740½
Ed 738½
Ab
DLo 742
Ce 740
Esc
Tp
Qp
Pm 740½
Ta 742
Qal Top
KRb 751
Pb 750
Tg 743½
Et 750
Pps 737½
Ea 745½
Pds 756
Qg
Td 738
Ps 734½


GEOLOGIC AND TOPOGRAPHIC MAP
of the VEKOL MOUTAINS
PINAL COUNTY, ARIZONA
Scale ...
DATE : 4/15/57
AREA MAPPED BY U.S. GEOLOGICAL SURVEY 1940
BITTER WELLS BASIN
BITTER WELLS
Vekol dike
Promontory Ridge fault
Plane Table Traverses A, B, C
PROMONTORY RIDGE
Plane Table Traverse E
Transverse fault
Bitter Wells fault
REPUBLIC MINE
CHRISTMAS GIFT MINE
REWARD MINE
POMONA MINE
Pomona fault
Copperosity fault zone
Plane Table Traverse D
COPPEROSITY BASIN
COPPEROSITY MINE
HINSHAW MINE
Terrace gravels
Pediment - not mapped (occasional exposures of bed rock)
Kohatk Wash
Qal
Qp
Ta
Ts
Tg
Ps
Pb
Pds
Ce
Cn
Ed
Ev
Krb
Krs
Dm
2917
2804
2346
2250
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
1900

SUMMARY OF DRILLING PROGRAM

Regarding all of the above mentioned drill holes the choice of which type of drilling to be performed; core drilling vs. the various types of rotary drilling must be considered from an engineering view point. This includes cost per foot, desired reliability of assay data, desired detail of geological information, availability of drills and crews and the decision to purchase or contract equipment and crews.

The three parts of the drilling program have been presented by their desirability, ease and cost as 1st, 2nd and 3rd. The open pittable areas are numbered by most importance and desirability 1 through 3, the proposed surface drill pads are not numbered by importance but rather from north to south. Therefore their importance and desirability listed in decreasing order of priority is PDP's 5, 4, 1, 2, 3. The proposed underground drill pads will be the most difficult and expensive and are listed in approximate order of importance.

Before selected parts of the drilling program are initiated the three open-pittable areas and the various proposed drill pads would have to be cleaned by dozer and/or manual labor ideally to allow for detailed geological mapping on the scale of 1 inch = 20 ft. This mapping is required to best allow for the final determination of the drill hole bearings, angles of inclination and total lengths.

Steven Hindricks has been given a separate map showing where fifteen triangulation points are to be set up with metal pipe and flagging, and two triangulation points have already been established. These points will greatly help determine location of geological features in the field, and later on for aerial photographic and other important engineering control factors.

The above recommendations are based on the geologic possibility that undiscovered oxide mineral bodies exist outside the area of the previous mine workings.

~~GENERAL~~ GEOLOGY

~~The general geology~~ of the geology is of the Vekol Silver ~~Mine area was initially covered in our Phase 1 a report of 19 August 1983 (GEOEX #1650, appended)~~ The major expression ~~consists of~~ a north-west trending ridge of Paleozoic limestones, dolomites, shales and quartzites. This 1,600 ft. thick series of sedimentary rock has been cut at two places by much younger Tertiary andesite dikes. One igneous andesite dike cuts east-west through the Vekol Silver Mine area at the main Vekol Shaft and another east-west dike cuts through the Great Eastern Mine 1,300 ft. south of the Vekol property. ~~Whether this geometric association is coincidental or related to possible origin of the sulfide ore bearing solutions has not been determined.~~

The entire sedimentary rock section strikes northwest parallel to the ridge and dips about 33° to the southwest, going under alluvial gravel cover just west of the Vekol property.

The uppermost limestone unit is called the Naco Formation. The Naco Formation also contains various beds of shale, two of which are mapped on Plate 1. One is an upper bed of shale 40 ft. thick known as the Brick-Red shale member. The second and most important is a 10 ft. thick red shale known as the Contact Shale which defines the base of the Naco Formation.

Just below the Contact Shale is the Escabrosa Limestone whose 20 to 80 ft. uppermost part is the host rock for the manto type silver-bearing lead and zinc sulfide bodies known to date.

This 20 to 80 ft. uppermost part is known as the Favorable Horizon because it has been mineralized by small pods and stringers of lead the zinc sulfide, extensively altered to an iron rich dolomite and intensly fractured and faulted.

The Contact Shale apparently acted as an impervious barrier to the upward moving sulfide solutions causing them to move horizontally

along the bottom of the Contact Shale and precipitate the sulfide minerals in the uppermost part of the Escabrosa Limestone.

The subsequent oxidation of these sulfide minerals by downward moving surface-water along prominent faults, produced the rich pockets of silver oxide ore which were extensively mined in the past. The best silver oxide ore was reportedly found at the intersection of the most prominent northwest trending faults which continue to the surface, and with the strongest sulfide mineralization localized in the favorable horizon.

The silver oxide minerals have not migrated far from their point of sulfide origin and are thus also found within the favorable horizon.

The Escabrosa Limestone and its uppermost favorable horizon underlies all of the Vekol property to the west of the outcrop of the Contact Shale, or approximately 90% of the patented claim area.

Since detailed geologic mapping on the surface and underground has found more faults than previously indicated, the potential for unexplored and undiscovered intersections of faults and the favorable horizon has greatly increased. And, it is these zones that we have recommended be explored.

In the past, successful mining was limited to rich pods and pockets of high grade silver ore having 70 to 300 ounces per ton but limited to "washtub to room-sized bodies".

More recently leasees have tried to develop underground tonnage for bulk mining of remaining wall rock and pillars within the mined areas, which seem to average as low as 2 to 6 ounces per ton, however, these efforts did not result in the mining of any significant ore.

Geochemical Assay Results

Nineteen samples as listed in the appendix were taken by GEOEX. An interpretation of the results was used in the location of the proposed

Property of Chas. A. Kunke

VEKOL MINE

GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

Report by
C. A. Mike

HEINRICHS
GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

VEKOL MINE.

.....

LOCATION.

The VEKOL MINE is located approximately 41 miles in a southwesterly direction from CASA GRANDE, Arizona, the said town being a station on the main line of the Southern Pacific Railroad. The trip from the station to the mine is made in about 2½ hours, over a fairly good desert auto road. The capital of the State, (Phoenix), and the town of Tucson, are each about 100 miles distant from the mine. (See Fig. 1.)

SUMMARY.

The mine is a high grade silver-gold, discovered in 1880, known as a Bonanza producer until 1894, closed down owing to the death of the owners, and tied up in litigation from that time on for many years. It has a past production record of around $5,000,000.

The ore occurs as a replacement deposit in dolomitic limestone. This extensive limestone bed is cut into rectangular blocks by post-mineral faults. The early operators mined out the ore in one of these rectangular blocks until they reached the post-mineral faults to the East and West, and then carried their development work to the south. Since little was known regarding the geology of fault problems in the early days, no attempt was made to find the continuation of the ore on the other side of the faults.

Approximately 9 acres cover the extent of the early workings, however, the dolomitic bed, constituting the Vekol ore horizon, extends 600 feet to the East, and both West and South for several thousand feet, but these extensions have not as yet been prospected.

The ore of the Vekol Mine, during its fourteen years of operation, was of such high grade that the major part of the profits was derived from merely mining the ore by hand methods, and shipping direct to the smelters. The average shipping ore carried 250 ozs. silver per ton, with more or less gold.

MINING PROPERTY.

The Vekol property consists of 22 mining claims - 409 acres. Six of the claims are in process of being patented. (See Fig. 2.) The mine is on the Papago Indian Reservation, in the Casa Grande Mining District.

All the mine work prosecuted to date is contained within the boundaries of the six claims mentioned above, but only a small portion of this area has, as yet, been explored. Practically no work has been done on the unpatented claims.

IMPROVEMENTS.

As the original discovery outcropped at surface, the mine was opened up, and largely worked, through tunnels, but at a later date, three shafts were sunk - the "Main", "Argosy", and "Combination". Eight miles of underground workings have been opened up, and there are also numerous open cuts on surface, as well as shallow shafts and pits.

As many as 150 Indian and Mexican families are said to have resided at the mine at one time, and the nucleus of a town still remains. Of the original buildings, two houses and the store are in good condition, but the large boarding and rooming house, and other dwellings, require repairs. A six inch well, 675-feet deep, supplies the camp with good water for domestic and mill purposes, and a pipe line carries water from the well to the various buildings.

The foundations and framework of the original mill are intact. This contains a 10-stamp mill, used to treat the small amount of low-grade remaining after the high-grade shipping ore had been sorted out. Assay office, small warehouse, blacksmith shop, oil and gasoline storage house, and two powder magazines are in use at present. Hoist, compressor, and motors are on the ground ready for use.

As the dolomite and altered porphyry (talc) containing the ore are soft and easily mined, a large proportion of the prospecting can be done with hand steel. The workings stand well and require little or no timber.

HISTORY OF THE MINE.

The following information has been extracted from various mining engineers' reports, much of it being taken from original records.

"The mine was located in 1880 by the Walker Brothers. One of the Walkers is said to have been initiated into the Pima Tribe, and the ore discovery was disclosed to him by an Indian."

"The Vekol Mine was worked successfully by John D. Walker, and his brother, Lucian, from the year 1880 to about the year 1894, during which period the owners realized a magnificent fortune in net profits from their operations, the high grade being shipped to the smelters direct, while the low-grade went to their ten stamp

mill and pan-amalgamation plant, which handled an average of 466.8 tons of ore per month."

"According to the history of the mine, and the records we have on file, the Walkers derived their main profits from shipping ore found in bonanza bodies, at intervals, in practically hundreds of places, from one end of the mine to the other."

"We have on file the smelter returns from about 80 cars of ore, which the said operators shipped to the El Paso and Kansas City smelters, this ore averaging around 250 ozs. of silver per ton. ..... The mill heads over a 33 month period, from July 8th, 1885, to the end of February, 1888, (according to original mill records), averaged 32.09 ozs. silver per ton of ore treated. The mill heads of that period would have been considerably higher but for the fact that all high grade ore encountered was, as stated, carefully hand sorted and shipped, per data attached hereto. Also thousands of dollars worth of rich ore were annually stolen by the workmen. The mine is famous as one where every miner was a high grader. There are tales of rich ore shoots which were discovered and then covered with loose muck to await the convenience of the high grader. ....."

"The mill building and camp are located in a canyon which cuts the Vekol Range from East to West. The discovery of valuable minerals was made at a point on the south side of this canyon. The tunnel entrances to the mine are along the side of the gulch, or canyon. The mine workings are south from the gulch. The north side of the range has not been developed. To the south, the reef has been penetrated for a total linear distance of about 1050 feet. Near the extreme southern end of the workings the Argosy shaft has been sunk to a depth of 300 feet. The mine is dry and the ground stands well."

"Only one of the tunnels has been driven at a reasonably good tramming grade. The extreme irregular nature of the workings is due to the selective system of mining followed. Ore was trammed in wheelbarrows, or packed on men's backs, in rawhide bags, for hundreds of feet. Another method of transportation was to load the ore into light cars and pull it up tortuous inclines, over wooden tracks, with mule or burro power. In fact, the main tunnels of the mine are still known as the "Mule" and "Burro" tunnels. After the Argosy shaft was sunk, however, extraction of ore from the back-end stopes was simplified to a marked degree."

"Altogether, about eight miles of underground work was prosecuted during this period, mostly in the form of inclined workings, which are rectangular in shape, about 400' wide by 1050' long, and consist of a maze of tunnels, stopes, crosscuts, and irregular gougings. Continuing in a southeasterly direction, beyond the mined area, there are about 2000' of unexplored mineralized ground. Again, there are 700' of "back" above the old workings, and between the same and surface, that were never explored, while along the dip of the zone, little development work has been done. Hence, unquestionably, new bonanzas will be discovered again after the proper develop-

ment work is instituted." (E. B. Holt, for Vekol Mines Company, 1918)"

"John D. Walker and his brother, Lucian, died within a short time of each other, about 1894, and the mine was closed down and became involved in a multiplicity of law-suits. It lay idle until around 1907, although the mill was operated for a short period on dump ores, along about 1898."

"About 1908- 1912, under a lease and bond arrangement, a considerable amount of ill-advised work was done, which brought no results whatever to the lessees. North of the tunnel entrances, in the gulch, a second shaft (Main shaft) was sunk to a depth of 400 feet. From this shaft, at the 120' level, a drift and crosscut were driven. The crosscut is connected by a raise with some of the tunnel workings, about 500 feet from the shaft. The drift connects with the Corkscrew stopes, at a distance of about 300 feet from the shaft. The Main Shaft is below the Vekol ore horizon. Its bottom has penetrated another dolomite reef, but no development has been done on this, "

"In 1918, a group of Phoenix business men took an option on the property, and instituted a six months examination of the mine. They considered the results eminently satisfactory, as also the cyanidation and concentration tests made by their metallurgist, Mr. Walter E. Holt, and Mr. George Parson, Chief Chemist of the Ray Con. Copper Co. However, the slump in cotton at that time, in which the lessees were said to be heavily interested, and the rather severe terms of their agreement, involving monthly payments on the property, forced them to drop their option. Since then, practically nothing has been done with the property, although a later option was granted to another group, who, however, merely had sufficient funds to keep up the assessment work. The mine, therefore, remains in practically the same condition as when the death of the Walker Bros. closed it down."

GEOLOGY.

The strike of the Vekol Range, in which the mine is located, is approximately North-West, South-East, and it dips at an angle of between twenty and thirty degrees to the South-west. The ore deposit extends along the western slope of the range.

The country rock consists of a series of limestone beds, which overlay the older granitic rocks. These limestone beds consist principally of blue limestone, dolomite, and what is termed a "lime-shale". There is a bed of quartzite between the limestone series and the basal granite.

In the Vekol Range there are three known beds of dolomite, sandwiched between other beds of hard blue limestone. The topmost bed of the dolomitic series constitutes the Vekol ore horizon. This bed is about 100-feet in thickness. Development has been confined entirely to this upper bed, but the same geological conditions

apply to the two lower beds. Statements by the superintendent who supervised the sinking of the 400-foot Main shaft (now partially filled with water), are to the effect that at approximately 385 feet, the shaft entered dolomite, and ore showings made their appearance. Also, about 400 feet down the Eastern slope of the Range, silver sulphide nuggets have been dug out on surface, in what appears to be the second dolomite bed.

The Vekol mountains undoubtedly owe their origin to deep seated igneous intrusions, which caused the great uplift along the eastern side of the range. Subsequent to the uplift, there occurred subsidence on both the dip and strike of the mountain range. This resulted in the forming of at least two series of faults - the North-South and the East-West faults.

Fig 3 illustrates the position of the dolomite beds, and the manner in which the North-South faults have displaced the ore. It also shows the location of Andesite Mountain.

About half a mile to the west of the Vekol Range, in the sloping plain, is "Andesite Mountain", composed of porphyry (accompanied by an abundance of iron and silicious material), andesite, and later basaltic flows. Various intrusive flat tongues of porphyry originated from this mountain, and entered the dolomite series, especially along pre-mineral fault planes, as illustrated in Fig. 3. These intrusive porphyries deposited a large amount of iron and silica, in many cases replacing the dolomite. They also provided avenues for the thermal waters carrying the valuable metals in solution, which arrived as an end-phase of the intrusion, permeating the entire mountain. The solutions circulated most freely along lines of weakness, which were developed when the range was formed, and the values throughout the mine indicate general precipitation in the intrusive porphyries and between them and the dolomite, as well as along minor fault planes.

At the foot of Andesite Mountain, a small pit has been sunk on low-grade, copper-stained, silver ore, which occurs in a combination of talc (altered porphyry) and limestone. Geologists state ore stains have also been found at other points around the mountain slopes.

The same characteristics exist at Vekol as are found in Bisbee (Arizona). Andesite Mountain has performed the same functions for the Vekol deposit that Sacramento Hill did for the Copper Queen (Phelps Dodge) and Calumet & Arizona mines. Both are porphyritic mountains, which, being forced up through the limestone beds, sent large tongues of porphyry, with their ore accompaniement, into the more favorable beds. At Vekol, the ore-bearing solutions entered the dolomitic limestone beds, while in Bisbee, they penetrated the Martin limestone. The intrusive and extrusive porphyries in both cases contain large amounts of iron, silica, and breccia. At both mines, there are numerous cases of the ore being displaced by faults. At Bisbee, one of the principal methods of prospecting is working out fault problems, and following leads from mined-out stopes. The Vekol and Bisbee deposits are replacements in limestone, and the original discoveries, in both cases, were right on surface,

and about the same distance from their respective sources.

Another well-known camp in which the deposits were formed similarly to that of Vekol, is Leadville, Colorado. In that camp, the ore is found and mined in several limestone beds, over a very large area.

At Shafter, Texas, the American Metal Company has, in recent years, re-opened the Presidio Mine, an old producer, which is also a replacement in limestone, where the orebodies have been cut off through block-faulting. The fault problem was worked out, and a substantial extension of one of the former orebodies was found beyond the fault. Another new orebody was also found by driving in virgin territory beyond the fault lines.

VALUABLE MINERALS.

The values occur largely as silver chloride and sulphide (argentite), with more or less gold. The ore is found in a dolomite limestone, as a replacement, accompanied by silica, the oxides of iron and a very small amount of copper and lead. The copper stain is always an indication of ore of a good grade. The ore is generally found near the top of the dolomite. The altered andesite porphyry, or "talc" is always associated with the ore. At the contact of the talc and the dolomite is always found a reddish gossan deposit, which leads from one ore shoot to another, and is a most valuable guide in prospecting.

UNDERGROUND WORKINGS AND ORE EXPOSURES.

As previously mentioned, there are over eight miles of underground workings, consisting of tunnels and old stopes.

The ore outcropped at surface, and the early operators followed the dolomite bed Eastward until they struck the North-South post-mineral fault, and Westward, until they struck a similar fault, a total width of 400 feet. The ore was formed along the bedding plane, which has a strike of from North-West to South-East. The two post-mineral faults sheared the mineralized limestone bed, and gave it an upward thrust on the West, and a downward thrust on the East. It has been estimated that the displacement on the East is about 70 feet, and on the West, around 40 feet. (See Fig. 3). No attempt was ever made to go down or up on these well marked fault lines. Neither was any attempt even made to go through the intrusive porphyry (talc) above, to learn whether ore had been deposited at its contact with the dolomite, or limestone, on top, similar to the deposits found at its contact with the dolomite below.

The two main tunnels, the "Burro" and the "Mule", followed the ore to the South, for a length of about 1050 feet. The greatest height of the stoped area is about 100 feet. The mined-out section

therefore resembles a rectangular block of limestone, 400' wide by 1050' long and 100' thick.

At the time the Walkers died, the workings had progressed as far south as the Argosy shaft, which is in a faulted area, and litigation ensuing, the mine was closed down.

The large open stopes give evidence as to the tonnage extracted, while the ore left as a thin coating on the walls of drifts and stopes in numerous places, and as pillars throughout the mine, are an indication of the high values obtained.

Partial mill and smelter records available offer additional proof of these values.

Hundred pound sacks, averaging 50 to 70 ozs. of silver per ton, are obtained here and there throughout the mine, but no large tonnage of shipping or mill ore is blocked out at present.

Numerous leads and stringers exist, which, if followed, may connect with shipping ore, as they did when the mine was operated in former years. There are many stopes in which the ore has been followed right to a fault and then stopped. Naturally, raises and winzes should be driven from these stopes, along the fault, to explore the faulted portion of the orebed.

The Mt. Vernon may be quoted as an example of a promising ore lead. This consists of a 90' tunnel, driven into the range on the Eastern slope, on the Mt. Vernon claim. This tunnel, in general, is at right angles to the main workings, and its face is about 600' through the mountain from the Argosy shaft and the stopes where bonanza ore was mined. At the tunnel entrance, there is a very prominent outcrop of the altered porphyritic material, or talc, similar to that found throughout the mine. There is also plenty of red gossan, and several stringers of copper-stained, high-grade, silver-gold ore. The values were very low at surface, but 90 feet in the tunnel, assays as high as 3000 ozs. of silver and $22.00 in gold have been obtained. A small shipment to the Hayden smelter of the American Smelting & Refining Company ran 281 ozs. in silver, and $6.60 in gold. It is possible that one of these stringers will lead to the faulted segment of the orebody on the Eastern side, as in the past many such leads have connected up with large orebodies. (See Fig. 2)

The following assays of ore leavings in the mine, pillars, and sides of stopes and tunnels, taken by various engineers are, as mentioned above, indicative of the values stoped by the former operators:-

Assay No.	Width.	Ozs. Silver. Assay.	Remarks.
4	3'.0	98.96	Sulphide Stope (Galena).
12	7'.5	37.80	Ore bin level stopes.
16	7'.2	21.2	" " " "

Assay No.	Width.	Ozs. Silver. Assay.	Remarks.
24	4'.0	10.8	Argosy sub-level stopes.
29	0'.5	1018.9	Sulphide Stopes (specimen)
35	1'.0	142.0	Argosy stopes.
38	6'.0	10.7	Bottom of Argosy shaft.
40	0'.5	162.8	Argosy shaft bottom vicinity.
51	4'.0	17.0	Zig Zag Stopes.
52	2'.0	28.9	Big Stull Stope.
53	2'.0	111.6	" " "
56	4'.5	137.4	Zig Zag Stope.
58	6'.0	16.0	" " "
67	4'.0	70.9	Entrance to sulphide stopes.
68	5'.0	32.9	In Green Stope.

(B. W. McDougall, M.E. March 29th, 1920.)
(Certified correct.)

1	1'.3	31.8	Nearest	Survey -	No. 128
2	1'.0	39.5	"	"	"
3	2'.0	39.0	"	"	"
4	2'.0	20.5	"	"	"
5	5'.0	30.0	"	"	"
6	2'.0	36.7	"	"	No. 114.
7	3'.0	32.0	"	"	" 81
8	0'.5	258.0	"	"	" 82
9	2'.0	67.4	"	"	" 128
14	2'.0	62.0	"	"	" 82
15	1'.0	20.0	"	"	" 116
16	2'.0	73.0	"	"	" 117
17	2'.0	21.0	"	"	" "
20	3'.0	21.0	"	"	" 82
22	1'.3	53.0	"	"	" 82
24	2'.0	38.0	"	"	" 82
25	2'.0	117.0	"	"	" 113
27	2'.0	36.0	"	"	" 82
28	1'.3	20.0	"	"	" 82
33	0'.5	24.5	"	"	" 113
35	1'.5	22.0	"	"	" 113
36	3'.0	85.5	"	"	" 113
37	3'.0	40.0	"	"	" 113
38	3'.0	31.5	"	"	" 113
40	0'.5	413.5	"	"	" 114
42	5'.0	22.0	"	"	" 114
44	0'.5	120.8	"	"	" 113
48	1'.0	75.0	"	"	" 106
49	2'.5	95.5	"	"	" 106
50	2'.0	86.5	"	"	" 106

(E. B. Holt, M.E. Oct. 20, 1919.)

1 - -

Assay No.	Width.	Ozs. Silver. Assay.	Remarks.
54	3'.0	39.5	Nearest Survey - No. 128
57	3'.0	80.0	" " 128
63	2'.0	64.5	" " 85
64	2'.0	61.6	" " 128
87	3'.0	136.0	Reynolds Raise.
89	2'.5	67.5	" "
93	0'.5	46.5	Sulphide Stope.
94	2'.0	141.5	" "
97	2'.0	147.0	" "
98	3'.5	17.5	Nearest Survey - No. 55½
99	3'.5	23.6	" " "
110	2'.5	23.5	Reynolds Raise.
111	3'.0	60.5	" "
112	6'.0	27.5	" "
114	3'.0	45.5	" "
207	2'.5	174.2	Hidden Stope.
214	3'.0	108.0	" "
219	3'.0	20.5	" "
225	1'.0	41.0	Nearest Survey - No. 120
227	2'.0	30.0	Reynolds Raise.
263	2'.0	180.5	Sulphide Stope.
284	2'.0	33.5	" "
308	1'.5	38.5	" "
330	2'.0	34.0	" "
409	3'.0	60.0	Green Stope.
411	2'.0	111.7	" "

(E. B. Holt, Feb. 1, 1919.)

Assay No.	Ozs. Gold.	Ozs. Silver.	% Copper.	% Lead.
1	.06	63.4	1.5	15.
2	.04	47.6	2.8	13.0
3	.06	10.8	3.4	3.6
4	.01	73.6	1.8	13.0
5	.01	51.0	2.1	14.0
6	.04	37.0	1.1	7.6

(P. R. Daggs, January 21st, 1932.)

(Above assays taken for patent purposes.)

ORE SHOWING ON MT. VERNON CLAIM.

Assay No.	Width.	Oz. Gold.	Oz. Silver.	% Lead.	% Copper.	Remarks.
59	3'.0	-	0.8	-	-	Mt. Vernon outcrop.
60	2'.0	-	2.0	-	-	" "
61	2'.0	-	1.9	-	-	" "
62	2'.0	-	0.3	-	-	" " (tunnel entrance.)

(B. W. McDougall, M.E. March 29th, 1920.)

1	--	0.3	1000.0	-	-	90' in tunnel.
2	--	-	70.0	-	-	Lower grade, after sorting out high grade.

(Diehl, Assayer, for Ed. Drake, Sept. 1931.)

6	0'.5	1.1	3178.9	-	-	90' in tunnel.

(Burlingame & Parker, assayers, Denver, Colo. June 7, 1932.)

Small shipment of Mt. Vernon ore, sorted out while driving tunnel, and sent to Hayden smelter of American Smelting & Refining Co. Oct. 16, 1931.

Silver	281.35 ozs. per ton.
Gold	.33 " "
Copper	1.61 %

RECOMMENDATIONS FOR FUTURE PROSPECTING.

No prospecting has been done in the southern extensions of the Argosy stopes, or in the Vekol ore horizon lying beyond the West post-mineral fault. This belt parallels the mine workings and extends south for a distance of around 3000 feet, and west to Andesite Mountain, the main source of mineralization. It is estimated that this belt has an upward displacement of about 40-feet.

The Corkscrew stopes, in which some of the richest ore was found in the early days, were carried down to the West post-mineral fault and then abruptly stopped. Several raises should be put up in the fault, a distance of about 40-feet, in order to pick up the continuation of the ore in the dolomite.

Likewise, a section of the Big Stull Stope, which was also very rich, has been faulted to the East. This should be followed.

Prospecting should also be carried on in the Argosy end of the mine, to locate the extensions of the ore in the Sulphide stopes.

Between the top of the mine workings and the surface, there is a large block of virgin ground. This back extends over the entire developed portion of the mine. The length is about 1000 feet, and the distance, measured along the pitch of the reef to the surface, varies from 500 to 700 feet. This large unexplored area can readily be prospected from the tunnel levels by following the numerous ore showings in the back of both tunnels and stopes.

There are also a number of very promising leads and stringers which should be followed, as for example, the Mt. Vernon high grade.

The reef north of the mill has not been developed. This is promising ground as some small patches of ore are to be seen in the outcroppings, and it has the same continuation of the limestone, and is the same distance from Andesite Mountain as the mine itself.

Casa Grande, Arizona.
August 30th, 1932.

HEINRICHS
GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

VEKOL MINE.

The following is an account of the results of a few shipments of some of the high grade ores of the Vekol Mine, which were taken promiscuously from great quantities of these papers:-

KANSAS CITY SMELTING AND REFINING CO.

DATE.			TONS.	GROSS PROCEEDS	NET RETURNS	CAR NO.
Sept.	20,	1884	12.75	$4,860.09	$4,672.31	At2770
Sept.	20,	1884	12.25	3,900.38	3,717.68	At8732
Aug.	27,	1884	36.75	10,542.47	9,982.04	At1656
May	14,	1884	13.00	3,638.30	3,434.29	At12944
June	27,	1884	38.00	11,233.43	10,686.11	At4458
Oct.	6,	1884	5.25	1,743.92	1,663.90	At10484
June	20,	1885	12.50	3,162.94	2,934.23	At1732
Feb.	9,	1885	24.50	4,389.85	4,205.81	At3107
Jan.	5,	1885	35.50	13,580.48	13,028.65	At4268
May	6,	1885	11.75	3,632.68	3,408.02	At7506
Apr.	18,	1885	12.50	3,507.69	3,278.28	At9238
July	24,	1885	12.50	3,432.67	3,006.84	At7400
Feb.	27,	1885	12.75	3,967.58	3,789.95	At1276
Apr.	11,	1885	11.00	3,872.84	3,643.54	At1276
June	17,	1885	12.50	4,217.68	3,992.65	At2436
Mar.	26,	1885	12.75	3,807.10	3,756.17	At1428
Aug.	5,	1885	14.25	4,000.21	3,756.17	At10758

EL PASO SMELTER.

Jan.	10,	1894	11.50	1,522.71	1,451.31	Sp6482
Apr.	1,	1891	11.50	1,082.70	1,011.39	Sp11050
Mar.	27,	1891	11.25	1,124.86	1,052.96	Sp7038
Feb.	21,	1891	11.25	1,360.60	1,290.32	Sp2530
July	23,	1891	12.75	1,690.53	1,634.33	Sp1184
Aug.	14,	1891	12.00	1,426.15	1,376.89	Sp3482
Aug.	31,	1891	12.00	1,231.53	1,182.73	Sp1920
Jan.	21,	1891	12.00	1,277.96	1,202.44	Sp2364
June	22,	1891	12.50	1,606.43	1,555.23	Sp2700
May	11,	1891	12.00	1,289.08	1,214.48	Sp1866
Apr.	20,	1891	12.00	1,502.67	1,429.22	Sp4704
Apr.	8,	1889	12.25	1,999.95	1,921.08	Sp2880
July	7,	1890	13.00	2,662.84	2,581.49	Sp1558
May	28,	1890	13.00	3,779.39	3,699.50	Sp3960
Apr.	22,	1890	12.25	1,732.14	1,656.01	Sp1640
June	6,	1890	12.00	3,498.95	3,422.93	Sp1661
July	25,	1890	12.75	2,629.50	2,549.30	Sp308
Sept.	18,	1890	10.00	2,641.09	2,541.09	Sp138
Nov.	13,	1890	12.00	3,130.04	3,055.59	Sp334
Oct.	23,	1890	11.25	2,082.65	2,010.77	Sp758
Dec.	23,	1890	12.00	1,466.02	1,389.64	Sp9358

EL PASO SMELTER - CONTINUED.

			TONS.	GROSS PROCEEDS	NET RETURNS	CAR NO.
Dec.	29,	1890	12.00	$1,932.25	$1,857.55	Sp614
July	20,	1890	12.50	1,494.42	1,441.67	Sp9328
Dec.	6,	1890	13.00	1,996.93	1,915.48	Sp2300
Dec.	5,	1890	13.00	2,199.91	2,123.56	Sp9358
Oct.	16,	1889	11.00	1,508.45	1,470.76	Sp2300
Oct.	16,	1889	11.00	1,569.42	1,470.76	Sp2726
Nov.	13,	1889	11.50	1,351.40	1,277.60	Sp8626
Nov.	4,	1889	13.00	2,066.52	1,988.22	Sp232
Apr.	24,	1889	10.75	1,447.23	1,378.33	Sp3096
Sept.	23,	1889	11.75	1,523.22	1,452.57	Sp8204
Aug.	31,	1889	11.00	2,378.41	2,305.78	Sp1249
Oct.	24,	1889	13.00	1,814.78	1,734.08	Sp9748
Dec.	14,	1889	14.00	1,997.05	1,734.08	Sp9748
Feb.	25,	1890	11.25	2,470.94	2,400.05	Sp4604
Jan.	31,	1890	11.25	1,804.38	1,730.58	Sp9540
Jan.	15,	1890	12.00	2,692.21	2,618.11	Sp8988
Feb.	26,	1890	12.50	2,484.82	2,466.16	Sp8280
May	9,	1890	12.50	2,545.24	2,466.16	Sp566
Mar.	30,	1890	13.00	1,796.48	1,716.71	Sp10750
Apr.	15,	1890	13.00	2,081.44	2,000.12	Sp7192
Aug.	1,	1891	No data	--------	1,429.22	Sp4704
Apr.	21,	1891	"		1,441.67	Sp9328
Nov.	21,	1892	"	--------	1,221,02	Sp9492
Oct.	22,	1891	"	--------	1,082.62	Sp1226
Dec.	22,	1892	"	1,724.88	1,662.55	Sp4874
Oct.	15,	1891	10.25	1,223.27	1,818.07	Sp4874
Oct.	21.	1891	12.00	1,130.02	1,082.62	Sp1226
Nov.	12,	1891	11.00	944.08	898.58	Sp1962
Jan.	26,	1892	11.00	1,522.18	1,475.54	Sp8879
July	6,	1892	12.00	867.00	817.18	Sp3636
Oct.	6,	1892	10.75	1,069.12	1,024.82	Sp7368
Nov.	19,	1892	10.50	1,283.02	1,221.02	Sp9492
Aug.	10,	1893	14.75	1,557.03	1,494.85	Sp8959
Oct.	7,	1891	-----	--------	1,181.07	Sp4878
Aug.	31,	1891	-----	--------	1,182.73	Sp1920
July	24,	1891	-----	--------	1,634.33	Sp1184
May	11,	1891	-----	--------	1,214.48	Sp1866
Aug.	18,	1891	-----	--------	1,376.89	Sp3582
Nov.	18,	1891	-----	--------	898.56	Sp1962
June	23,	1891	-----	--------	2,937.00	Sp2700

HEINRICHS
GEOEXPLORATION CO.
Box 5364 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX

VEKOL MINE - MILL RUN.

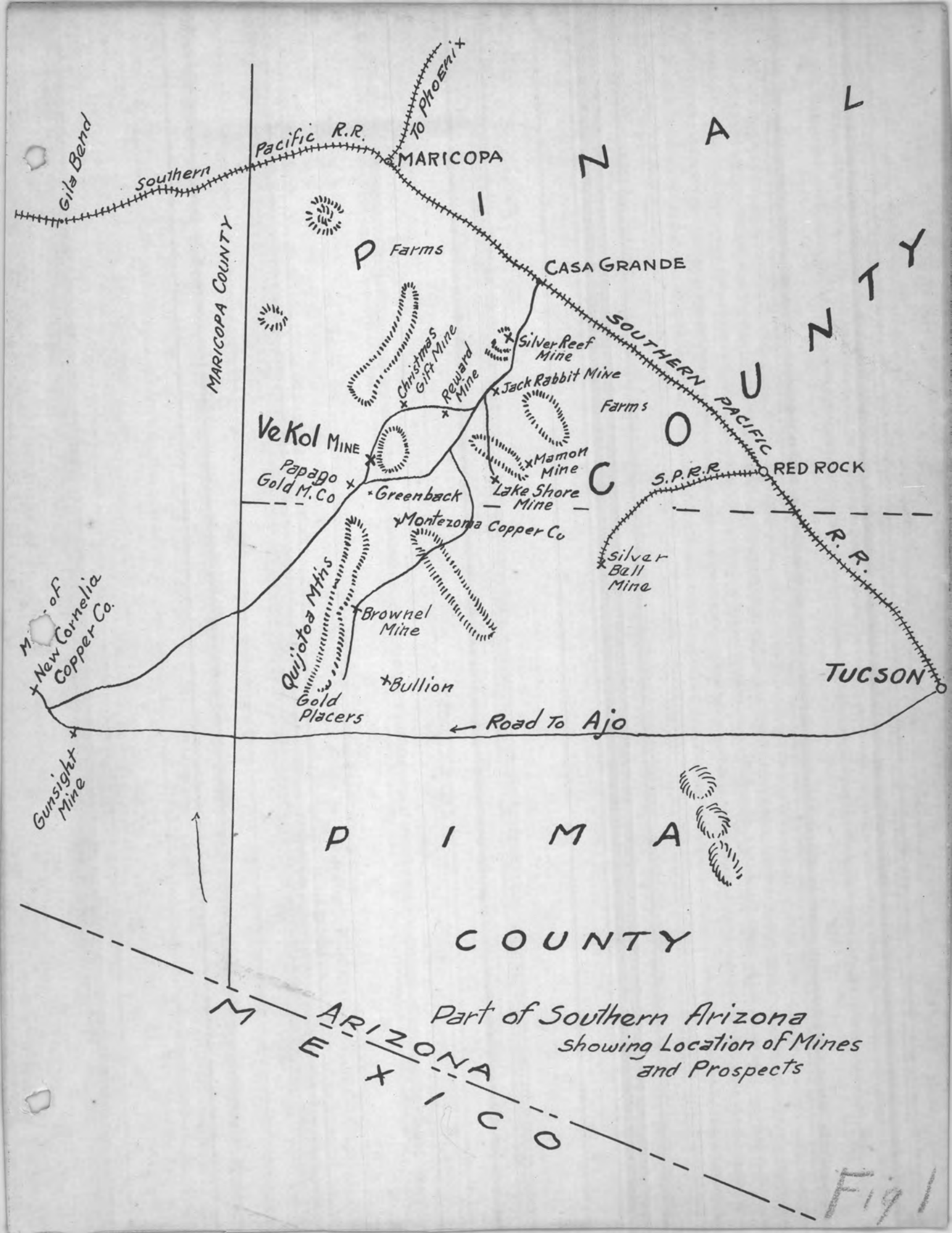
Record of operation of Vekol Mill for 33 months, dating from July 8th, 1885 to February, 1888. Copied from original mill records.

Date.	Tons Milled.	Heads Ozs. Ag.	Tails Ozs Ag.	Amt. Saved.	Percent Saved.	Fine Bullion Ozs. Silver recovered.
1885						
July	289.6	42.86	6.05	36.91	85.88	10,663.43
Aug.	468.5	49.26	3.90	45.36	92.08	21,251.65
Sept.	667.0	40.96	3.29	37.54	91.65	25,030.45
Oct.	646.0	39.65	4.13	35.52	89.58	22,996.97
Nov.	622.0	32.58	2.86	29.72	9.20	19,252.45
Dec.	645.0	36.85	3.12	33.72	91.53	23,051.37
1886						
Jan.	658.0	41.15	3.42	37.73	91.68	24,740.05
Feb.	586.0	38.71	2.74	35.97	92.92	21,087.81
Mar.	522.0	35.73	2.76	32.97	92.27	17,204.88
Apr.	555.0	39.15	3.17	35.98	91.90	20,003.57
May	446.0	38.70	3.17	35.53	91.00	15,874.23
June	305.3	44.17	2.60	41.57	94.11	12,692.01
July	358.7	41.71	2.98	38.62	92.83	13,857.38
Aug.	317.0	28.73	2.68	26.05	90.67	8,263.56
Sept.	329.2	36.06	3.84	32.22	89.35	10,609.18
Oct.	337.5	37.10	3.55	33.55	90.43	11,318.54
Nov.	373.0	37.36	3.71	33.65	90.00	12,571.64
Dec.	331.0	32.24	3.01	29.23	90.67	9,678.97
1887						
Jan.	324.0	33.68	4.07	29.59	87.90	9,585.68
Feb.	316.0	34.62	4.16	30.46	87.90	9,734.21
Mar.	297.7	32.58	3.82	28.70	88.00	8,541.22
Apr.	291.5	32.92	3.71	29.21	88.70	8,717.20
May	320.0	35.87	5.49	30.38	84.60	9,166.76
June	701.7	20.06	2.59	17.47	87.80	12,261.06
July	586.7	21.93	3.43	18.50	84.30	10,857.99
Aug.	712.0	19.36	3.02	16.54	84.50	11,776.57
Sept.	498.5	19.83	3.08	16.75	84.40	8,348.30
Oct.	623.7	32.67	4.53	28.14	85.10	17,557.91
Nov.	490.0	18.52	2.62	15.90	85.80	9,049.07
Dec.	527.5	16.75	2.00	14.75	88.00	7,781.17
1888						
Jan.	587.0	13.73	1.60	12.13	88.40	7,118.35
Feb.	721.0	12.43	1.52	10.91	87.70	8,235.62
	10,406.1	32.09	3.23	28.48	86.50	438,842.25

Average tons ore milled per month 466.80
Average fine ounces silver recovered per month 13,298.21

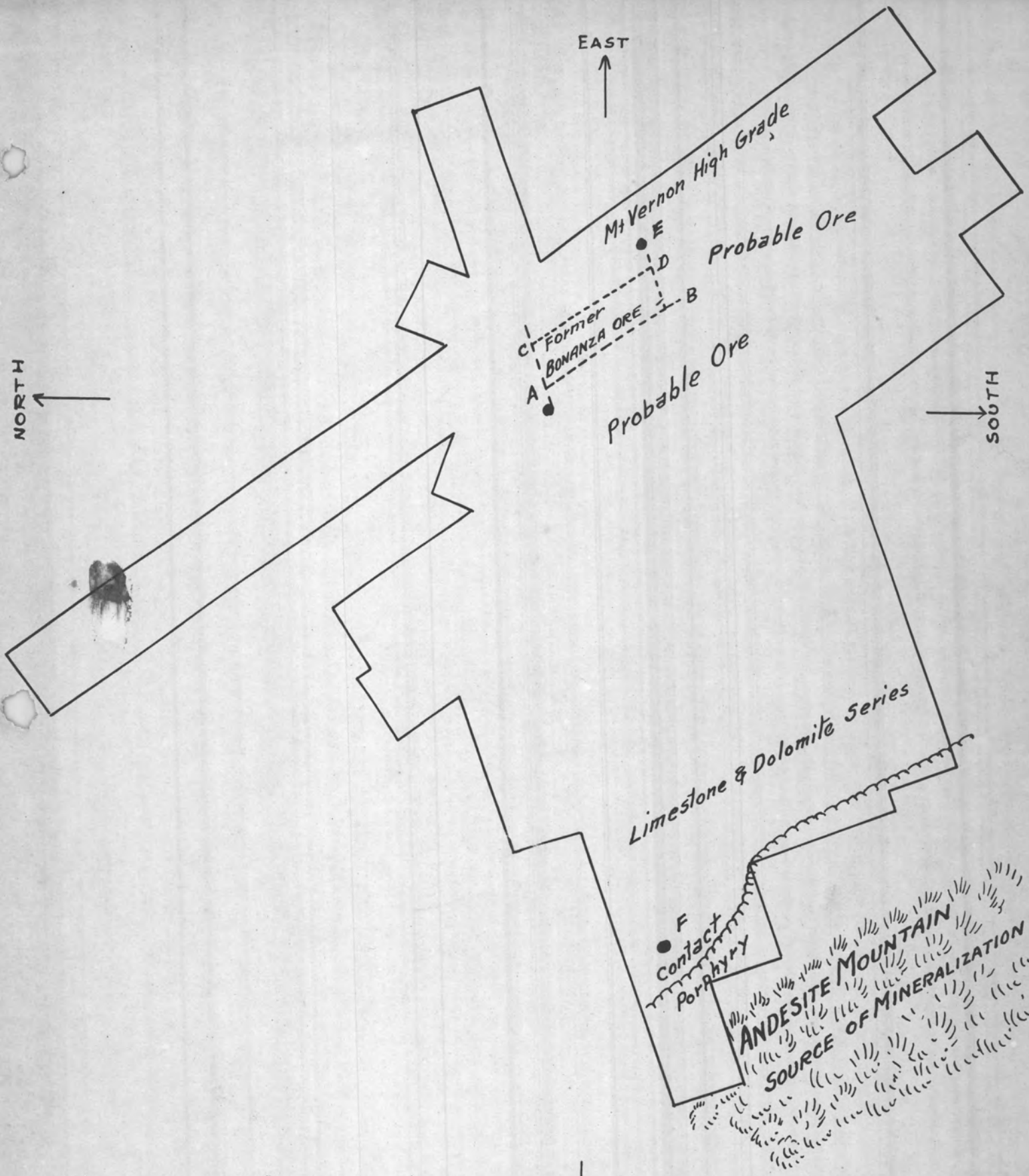
Process employed - Pan-Amalgamation.

HEINRICHS GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX



Part of Southern Arizona
showing Location of Mines
and Prospects

Fig 1



VEKOL MINE

CASA GRANDE
ARIZONA.

Legend

A-B Post Mineral Fault
C-D " " "
E Mt. Vernon High Grade
F Silver showings on surface.

Fig 2

Comparison of small mined section (former Bonanza ore) with large area of virgin ground lying between mine and source of mineralization.

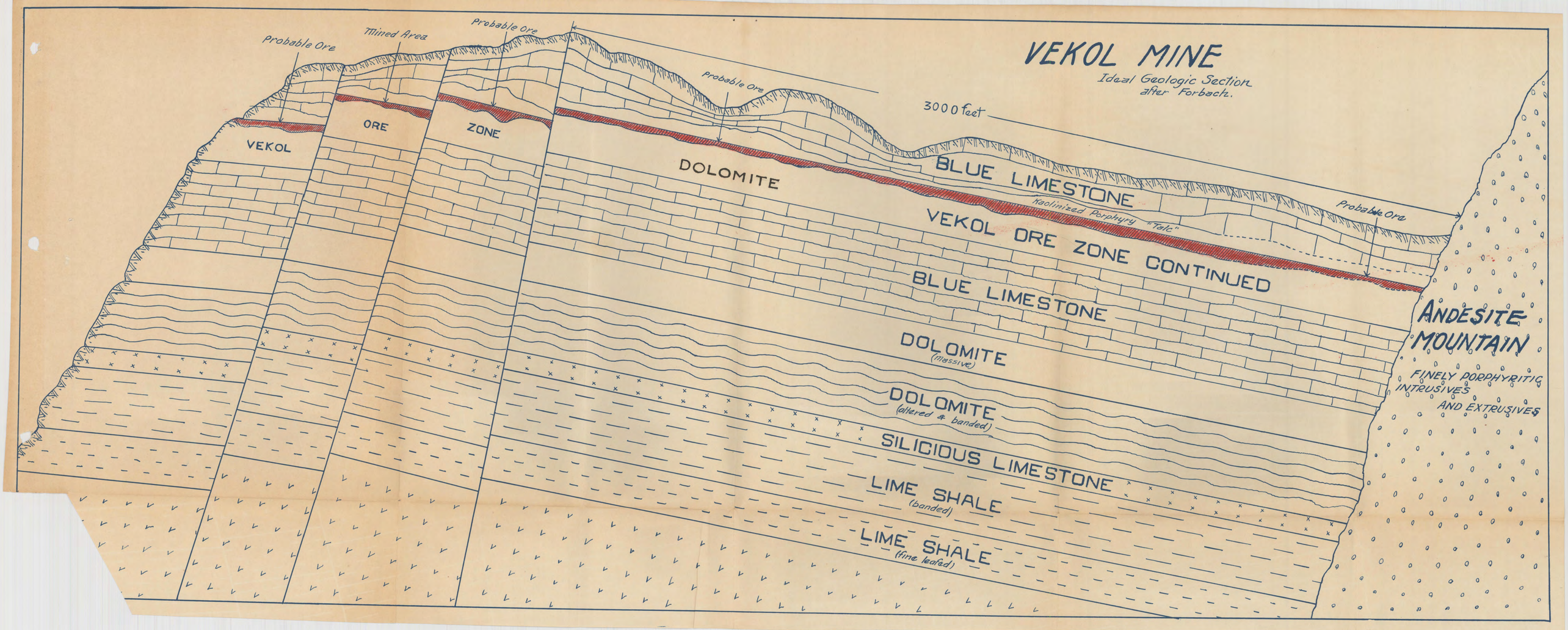

VEKOL MINE
Ideal Geologic Section
after Forbach.
3000 feet
Probable Ore
Mined Area
Probable Ore
Probable Ore
Probable Ore
VEKOL
ORE
ZONE
DOLOMITE
BLUE LIMESTONE
Kaolinized Porphyry "Talc"
VEKOL ORE ZONE CONTINUED
BLUE LIMESTONE
DOLOMITE
(massive)
DOLOMITE
(altered & banded)
SILICIOUS LIMESTONE
LIME SHALE
(banded)
LIME SHALE
(fine leafed)
ANDESITE
MOUNTAIN
FINELY PORPHYRITIC
INTRUSIVES
AND EXTRUSIVES

Fig 3

Bethlehem Steel Company
(INCORPORATED)

Bethlehem, Pa.

M. L. JACOBS
VICE PRESIDENT

February 19, 1943.

Returned to me WPC

Mr. C. A. Kumke,
Klondyke, Ariz.

Dear Mr. Kumke:

Mr. Harlow's card reminded me of your present location and also the fact that we have not heard from each other for many years.

In looking over a lot of old material at my home, I found some old letters from you, and also found a report on the Vekol gold property written by C. A. Mitke some years ago. I presume you are acquainted with Mitke and know that, as far as we know, he is still a prisoner of the Japanese and probably in the Philippine Islands. He was quite enthused about the Vekol mine but it seemed to us to be of rather low grade. In any event, the report will not be of any interest to us here but might possibly be of interest to you, so I am enclosing it herewith.

Things are much the same with us here. We have not purchased or leased any of the new magnetite mines which are being developed in the east although we had rather good information regarding those that are now so much in the public eye. Jones & Laughlin have taken over the Benson mines in St. Lawrence County. Hanna has also developed a small magnetite deposit in the same county, and of course you know that Republic is going strong at Mineville and Lyon Mountain. The big development is really the ilmenite iron ore project in the center of the Adirondacks. I believe Harlow can tell you something about that as I believe he or his men were there when the drilling was going on.

I just attended the Mining Institute meeting in New York and met quite a few of the old M.C.M. men, but through some mixup in the place for the meeting of M.C.M. men just before the smoker at the Waldorf, only about 10 showed up although there were 40 or 50 at the meeting. Hotchkiss was there, as was Jimmy Fisher, who never fails to put in an appearance.

When you have time, drop me a line and give me an idea of what you are doing in the southwest. I wish something would

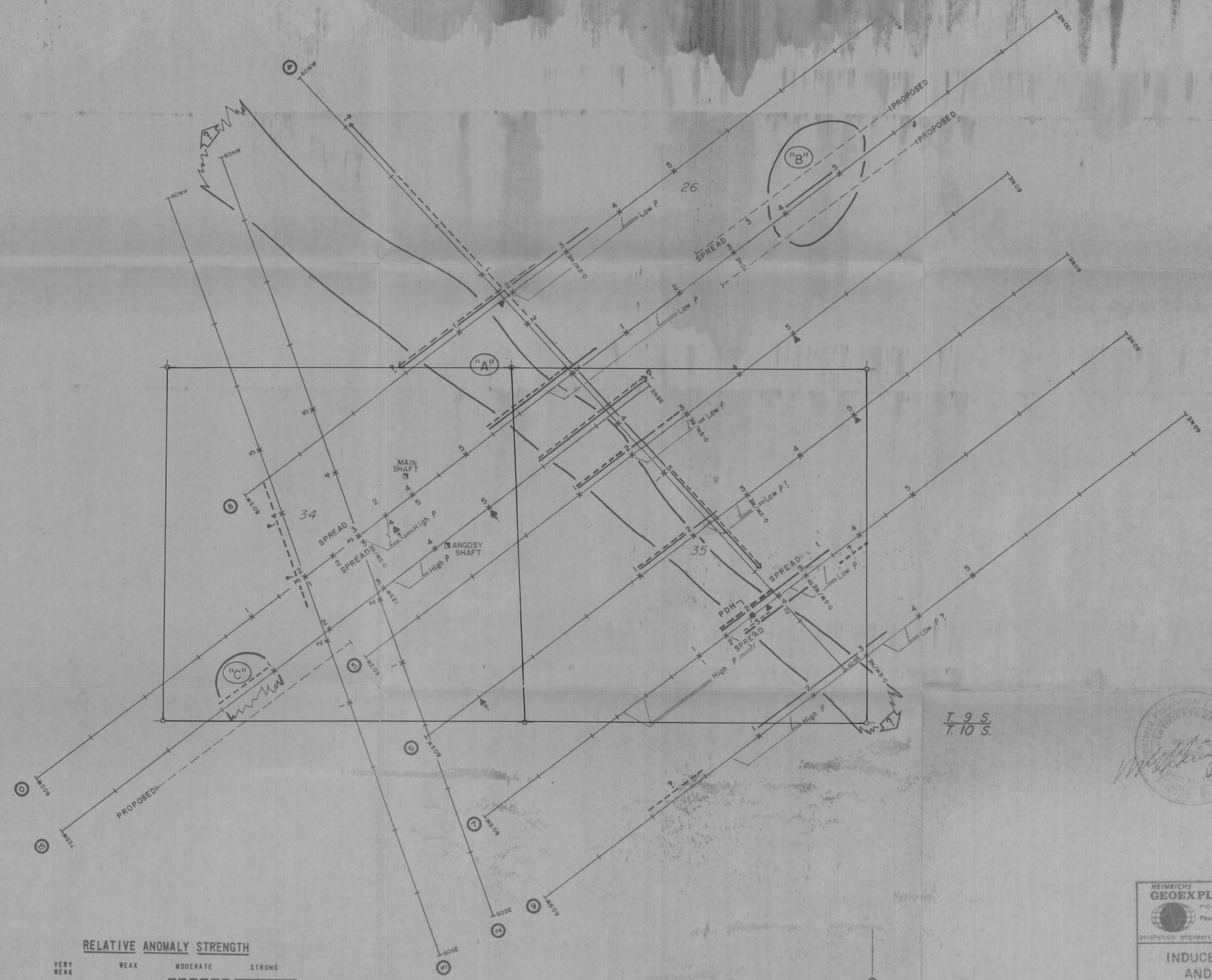
take me out there so that I could see Arizona again, and possibly after the present emergency is over this may come to pass.

With very kind regards and best wishes, I remain,

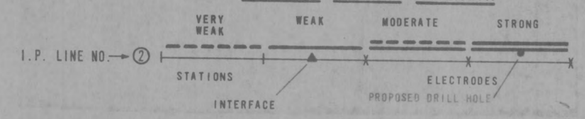
Sincerely yours,

W. L. Lumingo

Geologist.



RELATIVE ANOMALY STRENGTH



HEINRICHS GEOEXPLORATION COMPANY
POST OFFICE BOX 5561, TUCSON, ARIZONA 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
geophysical engineers
vancouver sydney

INDUCED POLARIZATION LOCATION AND INTERPRETATION PLAN
VEKOL MINE AREA
PINAL CO., ARIZ.

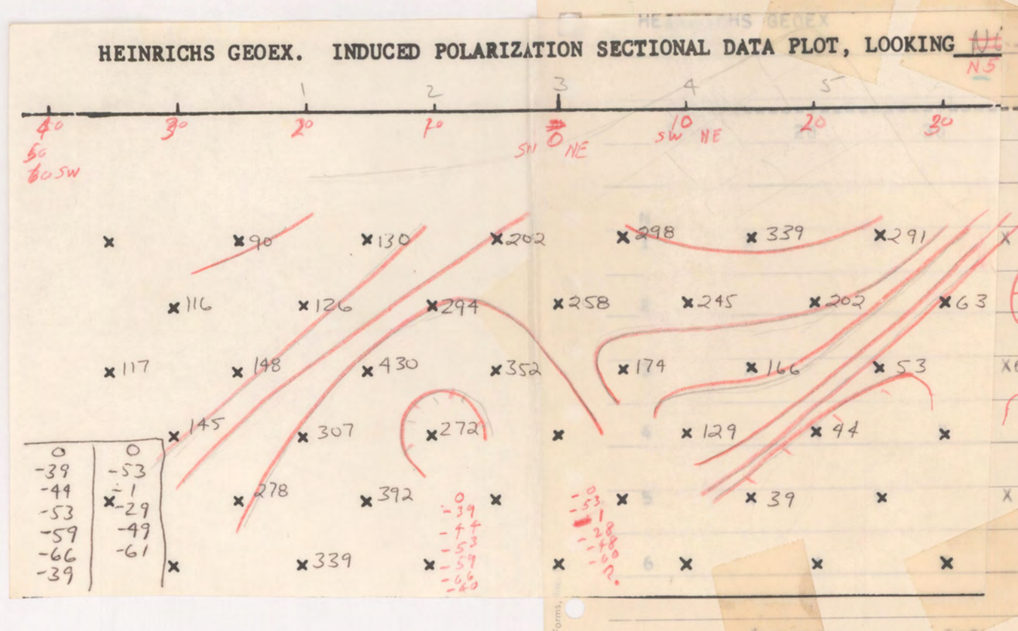
FOR

GUNNEX LIMITED

SCALE: 1" = 1000' | DRAWN BY: JAY DOWNS | DATE: NOV. 1968

Gunnex Vekol

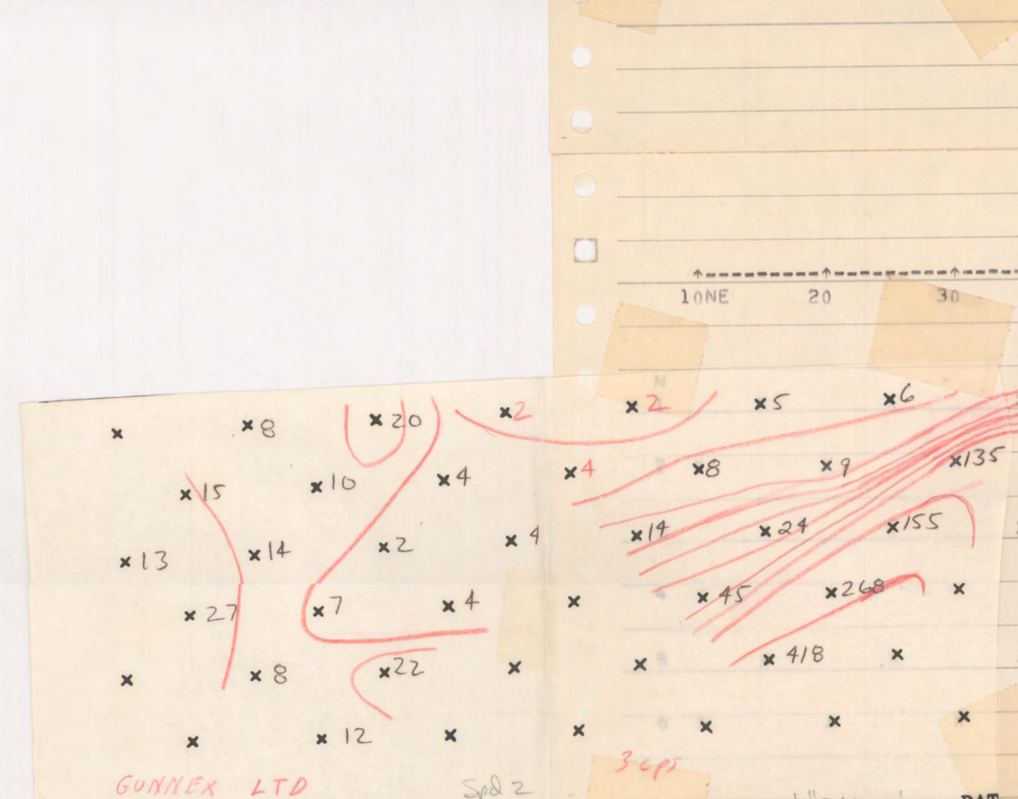
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N5



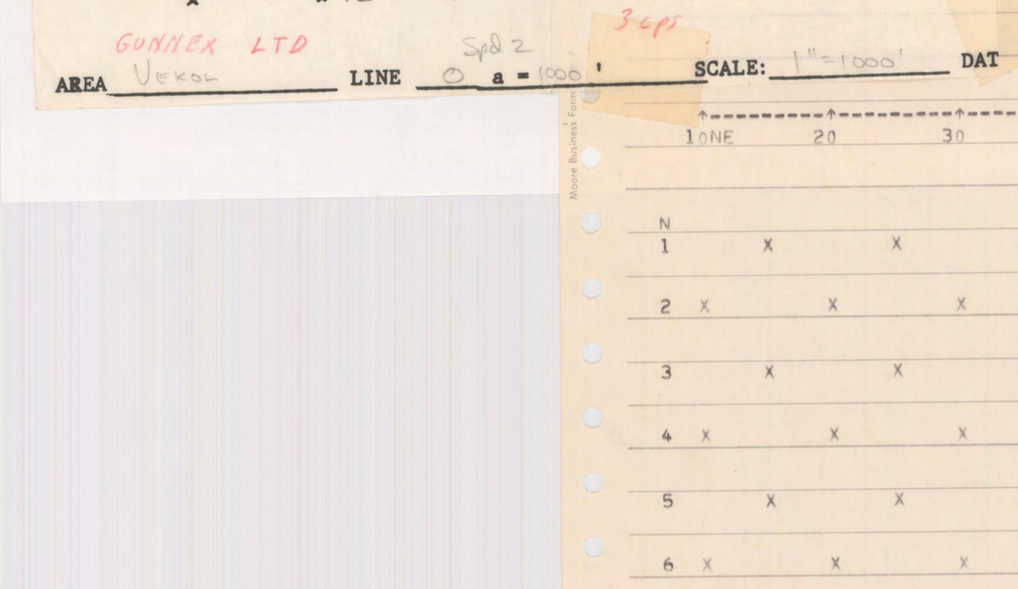
8270-68 LINE 0 SPD 3 LOOKING N37W 8-6-68 A= 1000 FEET

RHO/2PI

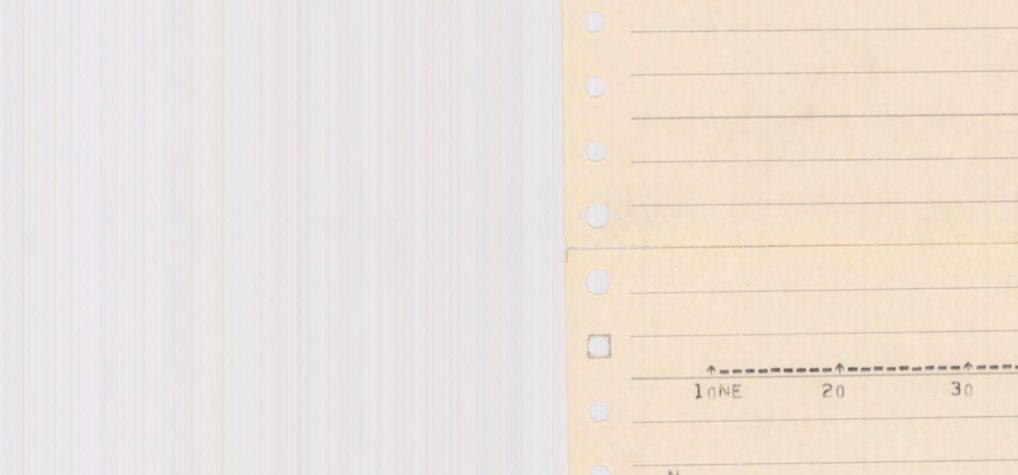
PFE



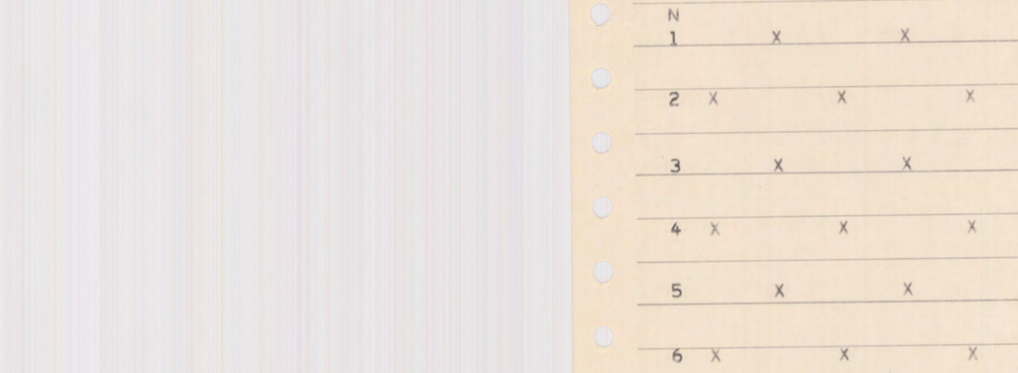
MCF



CCPFE



CCMCF

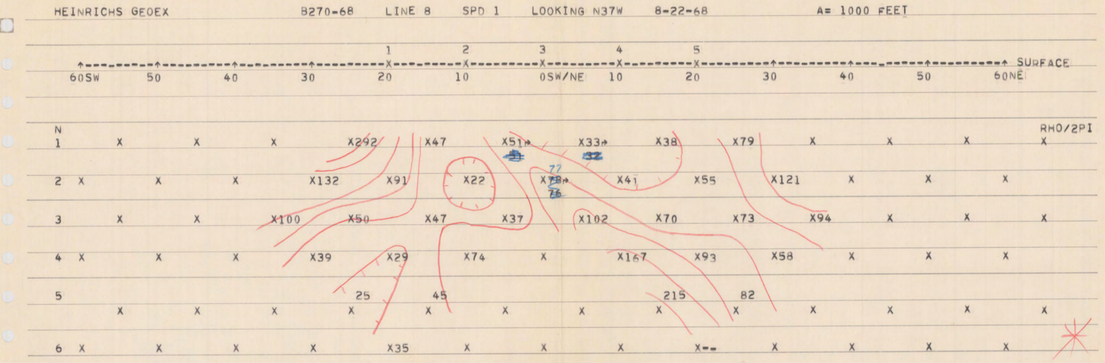


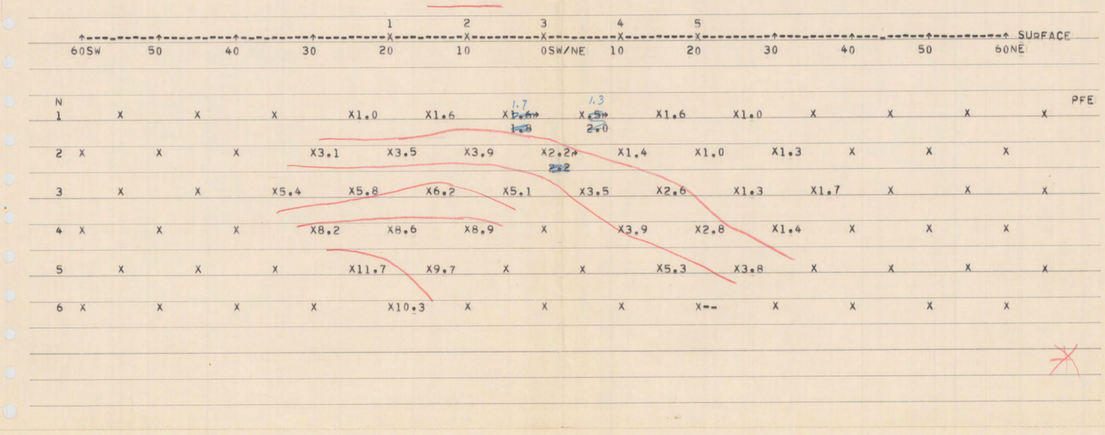
AREA Vekol LINE 0 a = 1000' SCALE: 1" = 1000' DAT

GUNNEX LTD Spd 2 3-cps

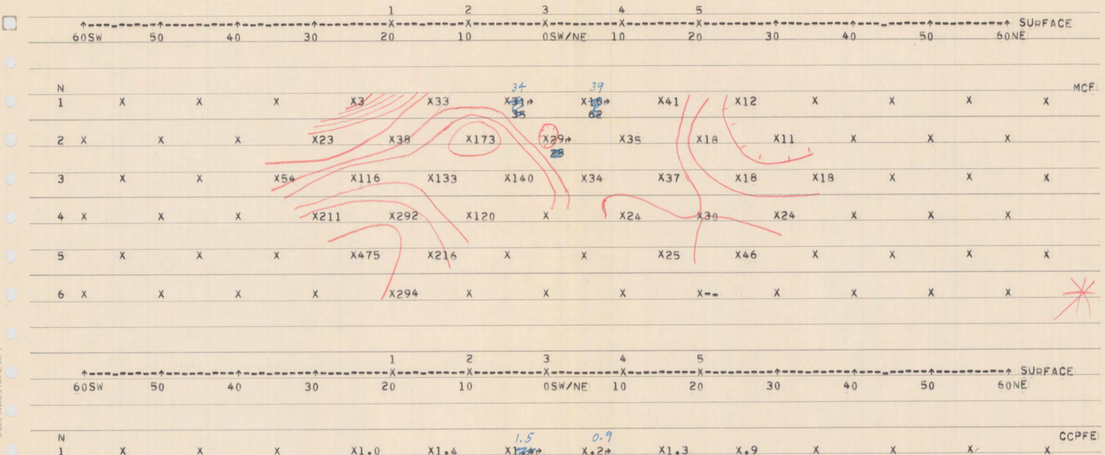
GUNNEX - VEKOL

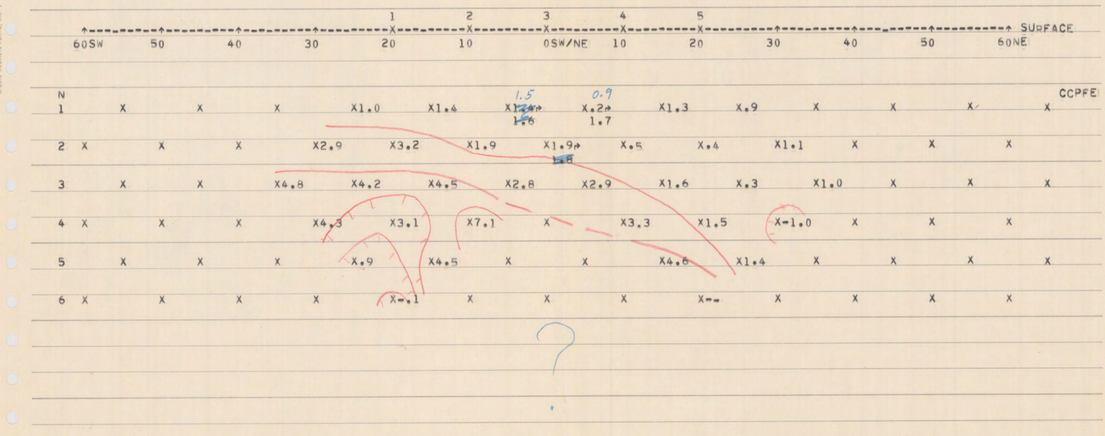
HEINRICHS GEOEX B270-68 LINE 8 SPD 1 LOOKING N37W 8-22-68 A= 1000 FEET

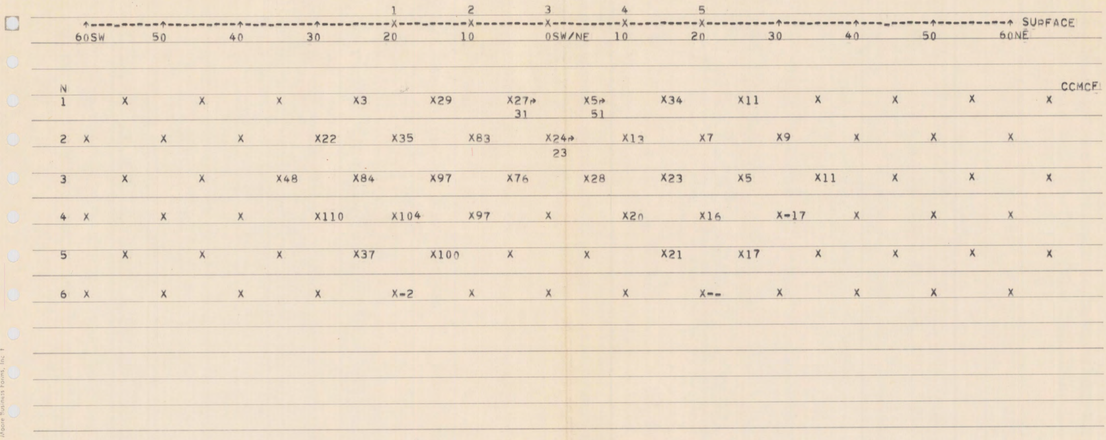




-12 -8 +9 -6 +15 0 0 -19 -21 -20 -18 -25 -23

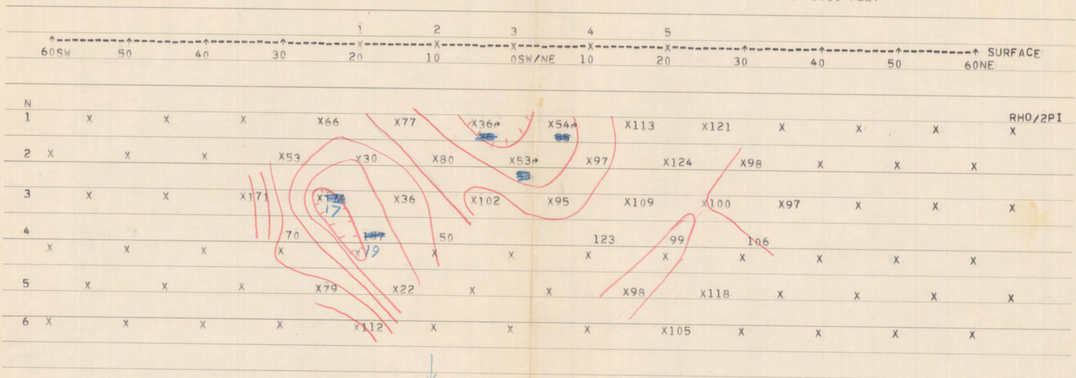


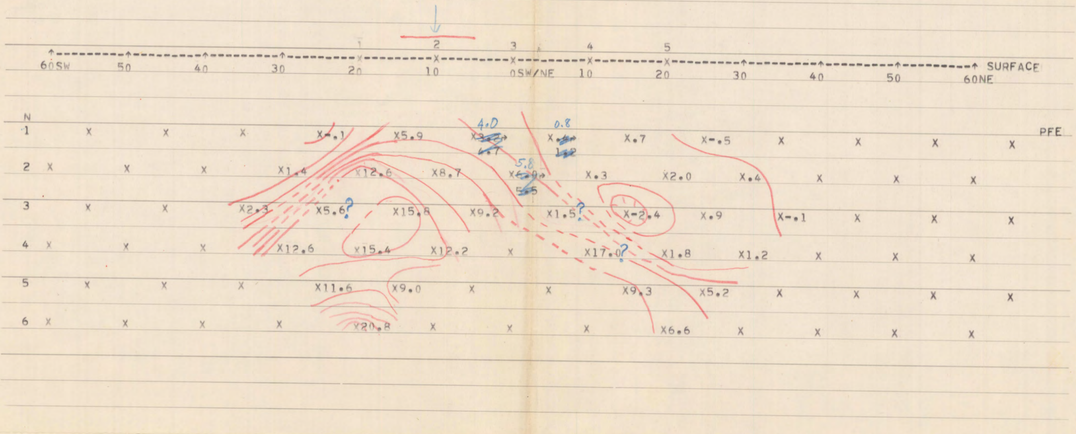




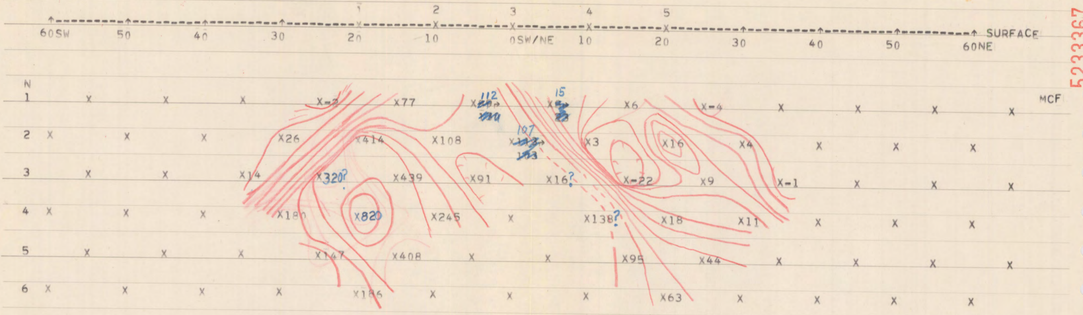
GUNNEX - VEXOL 3.0 Hz

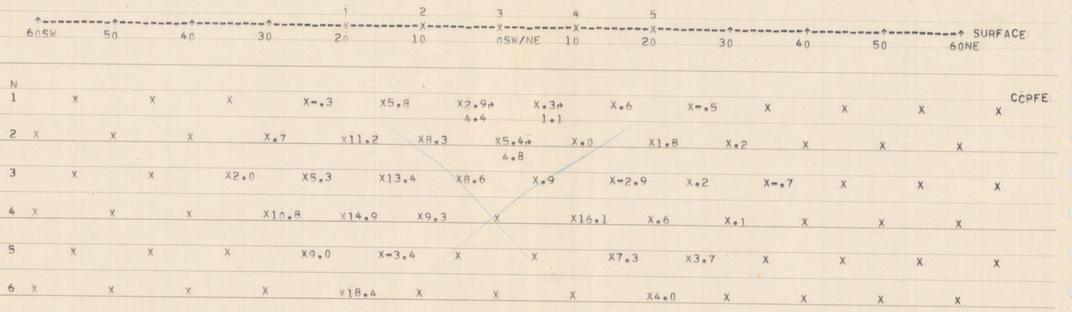
HEINRICHS GEOEX 8270-68 LINE 6 SPD 1 LOOKING N37W 8-14-68 A= 1000 FEET

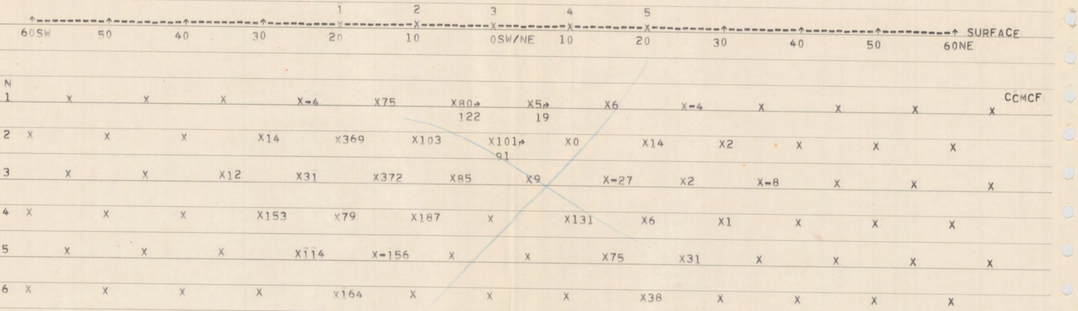




-46 -58 -61 -53 -49 -51 0 -35 -38 -39 -33 -5 -66







52333867

GUNNEX — VEXOL 3.0 Hz

HEINRICHS GEOEX 8270-68 LINE 7 SPD 1 LOOKING N38W 8-16-68 A= 1000 FEET

1 2 3 4 5

60SW 50 40 30 20 10 0SW/NE 10 20 30 40 50 60NE SURFACE

RHO/2PI

N													
1	X	X	X	X213	X48	X89→	X46→	X87	X105	X	X	X	X
2	X	X	X	X239	X62	X31	X125→	X79	X93	X106	X	X	X
3	X	X	X370	X60	X46	X47	X200	X93	X91	X107	X	X	X
4	X	X	X	X94	X44	X58	X	X221	X91	X97	X	X	X
5	X	X	X	X71	X69	X	X	X235	X110	X	X	X	X
6	X	X	X	X	X100	X	X	X	X209	X	X	X	X

1 2 3 4 5

60SW 50 40 30 20 10 0SW/NE 10 20 30 40 50 60NE SURFACE

PFE

N													
1	X	X	X	X1.6	X3.3	X50→	X2.9→	X.4	X1.2	X	X	X	X
2	X	X	X	X2.2	X6.5	X7.6	X7.8→	X3.3	X.5	X1.1	X	X	X
3	X	X	X3.9	X5.1	X26.8?	X12.9	X9.5	X4.1	X.1	X1.8	X	X	X
4	X	X	X	X9.2	X10.7	X13.1	X	X8.4	X1.0	X1.9	X	X	X
5	X	X	X	X6.8	X19.8	X	X	X21.6?	X6.9	X	X	X	X
6	X	X	X	X	X2.7?	X	X	X	X7.7	X	X	X	X

+11 +19 -5 -8 +6 -15 0 +29 +8 +3 +5 -12 -1

1 2 3 4 5

60SW 50 40 30 20 10 0SW/NE 10 20 30 40 50 60NE SURFACE

MCF

N													
1	X	X	X	X8	X69	X56→	X63→	X5	X11	X	X	X	X
2	X	X	X	X9	X105	X247	X63→	X42	X6	X10	X	X	X
3	X	X	X11	X84	X583?	X274	X48	X44	X1	X17	X	X	X
4	X	X	X	X98	X246	X225	X	X38	X11	X20	X	X	X
5	X	X	X	X96	X287	X	X	X92?	X63	X	X	X	X
6	X	X	X	X	X26?	X	X	X	X37	X	X	X	X

1 2 3 4 5

60SW 50 40 30 20 10 0SW/NE 10 20 30 40 50 60NE SURFACE

CCPFE

N													
1	X	X	X	X1.6	X-5.9	X4.7→ 5.0	X2.1→ 3.3	X.4	X1.1	X	X	X	X
2	X	X	X	X2.1	X6.0	X6.2	X7.3→ 7.8	X2.9	X.2	X.8	X	X	X
3	X	X	X1.5	X3.9	X25.0	X11.2	X9.3	X3.4	X-.6	X1.3	X	X	X
4	X	X	X	X7.9	X7.3	X10.8	X	X8.0	X-.3	X.7	X	X	X
5	X	X	X	X3.8	X16.8	X	X	X21.0	X5.2	X	X	X	X
6	X	X	X	X	X-.2	X	X	X	X6.7	X	X	X	X

1 2 3 4 5

60SW 50 40 30 20 10 0SW/NE 10 20 30 40 50 60NE SURFACE

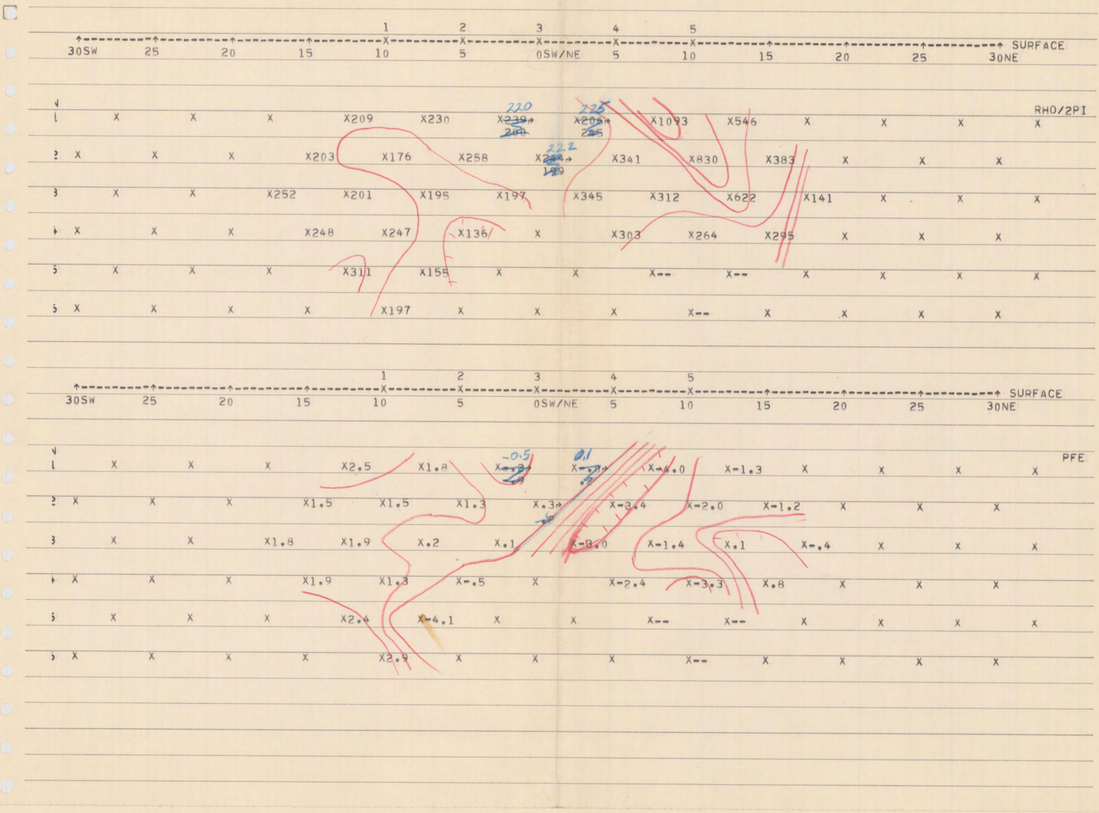
CCMCF

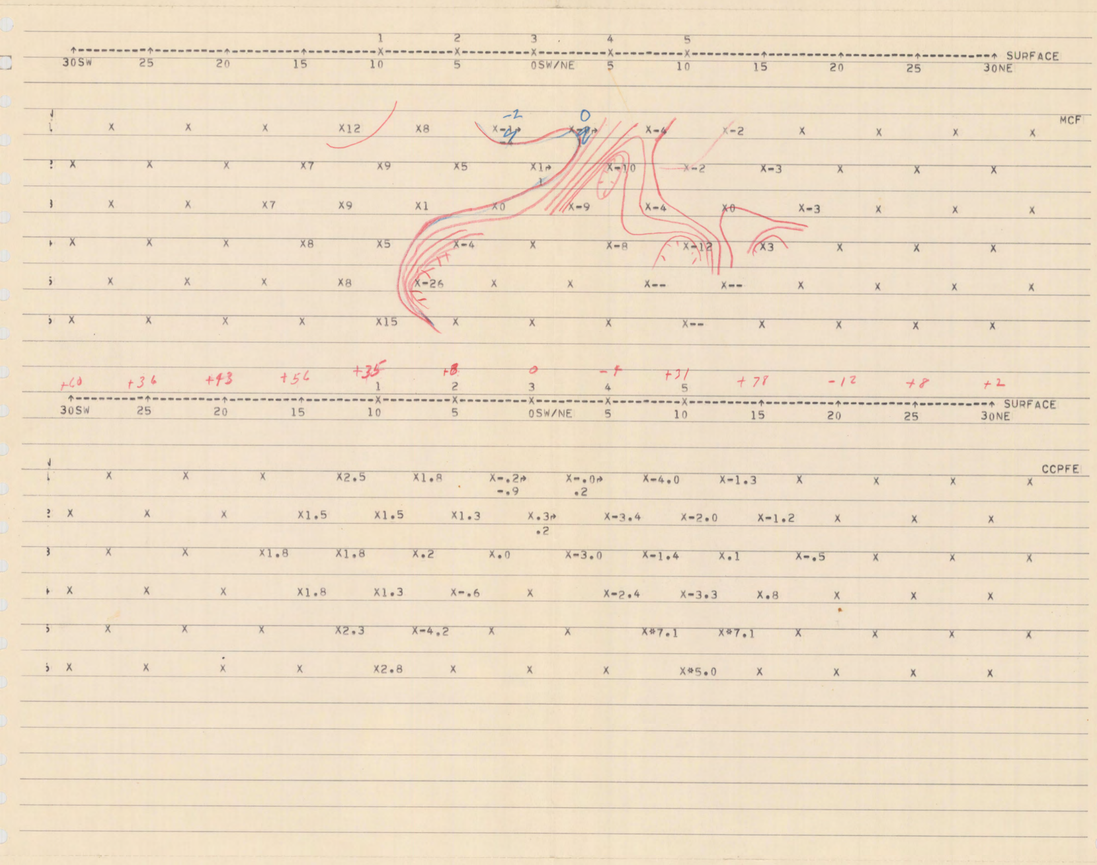
N													
1	X	X	X	X8	X-2334	X53→ 57	X46→ 73	X4	X11	X	X	X	X
2	X	X	X	X9	X96	X203	X58→ 63	X37	X2	X8	X	X	X
3	X	X	X42	X64	X544	X238	X46	X36	X-7	X12	X	X	X
4	X	X	X	X84	X168	X184	X	X36	X-3	X7	X	X	X
5	X	X	X	X54	X243	X	X	X89	X47	X	X	X	X
6	X	X	X	X	X-2	X	X	X	X32	X	X	X	X

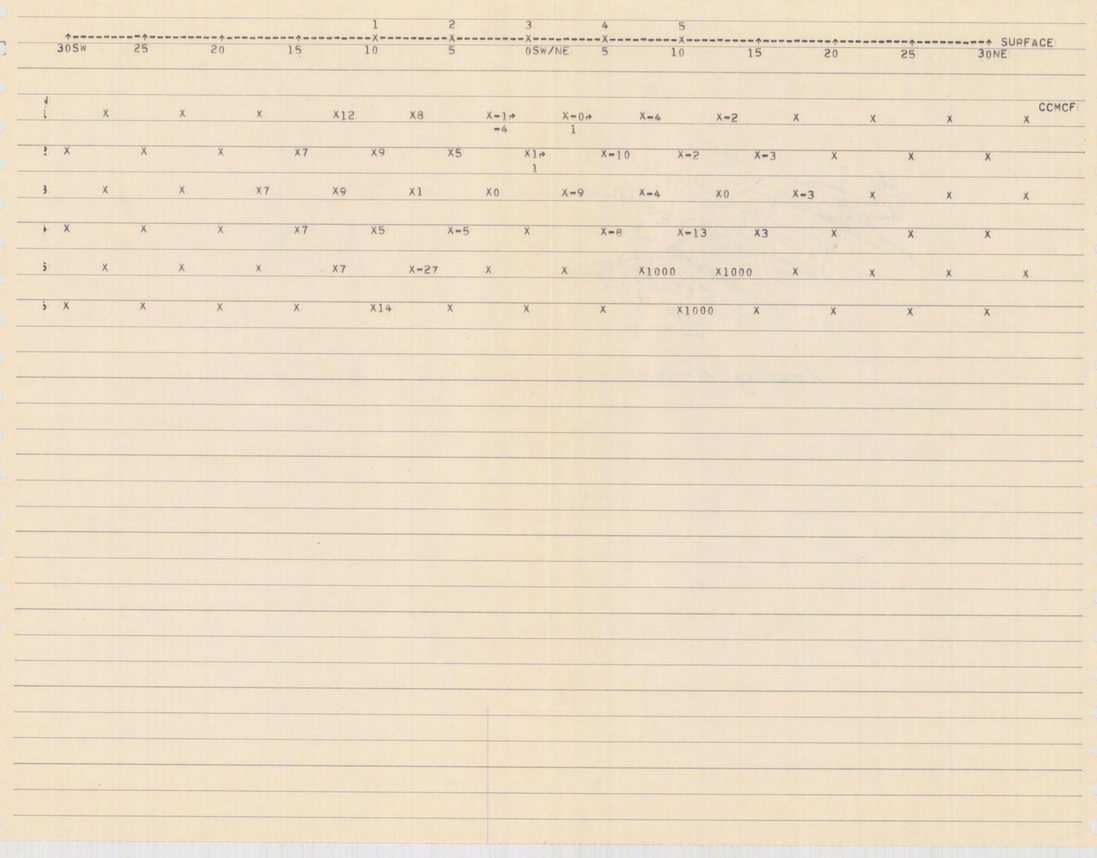
52333E7

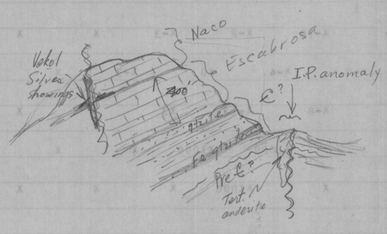
GUNNEX 3.0Hz

HEINRICHS GEOEX B270-68 LINE 0 VEKOL SPD 1 LOOKING N37W 6-24-68 A= 500 FEET





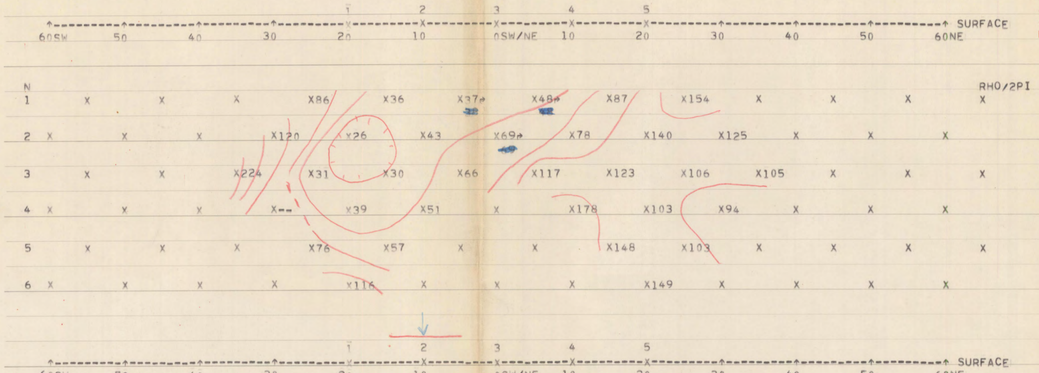


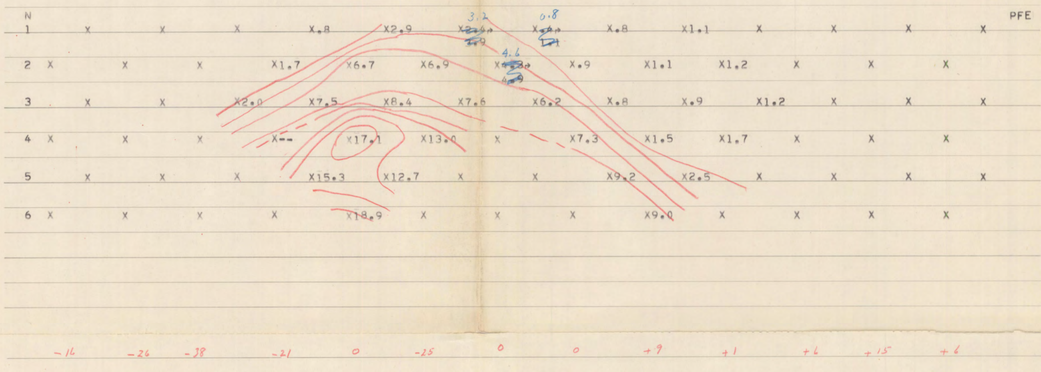

Naco
Escabrosa
Vekol
Silvea
Showings
I.P. anomaly
400'
Pre-Є?
Test N
andesite

Looking N-NW

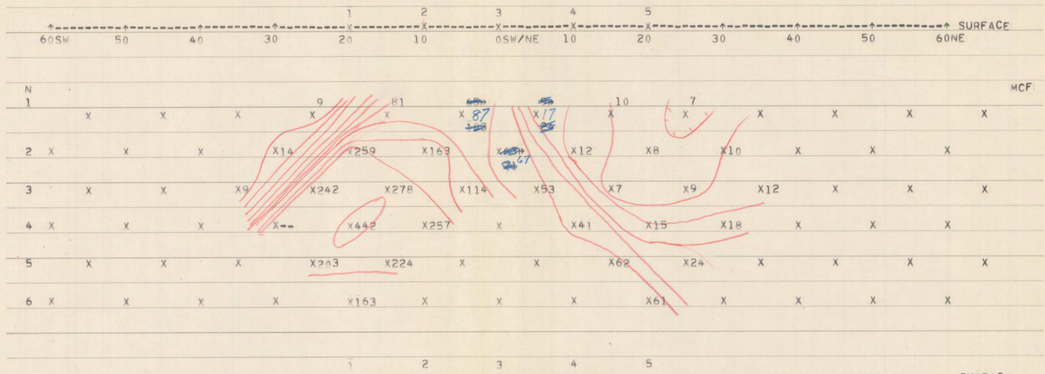
Gunnex - Vekol 3.0 Hz

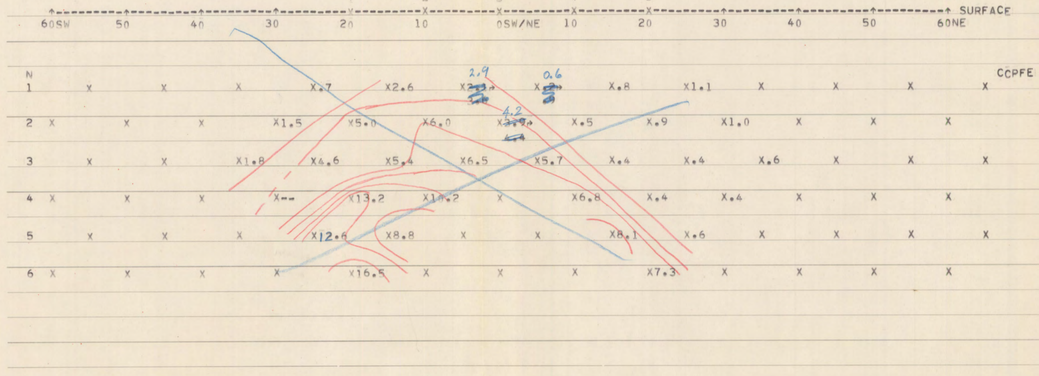
HEINRICHS GEOEX 8270-68 LINE 5 SPD 1 LOOKING N37W 8-8-68 A= 1000 FEET

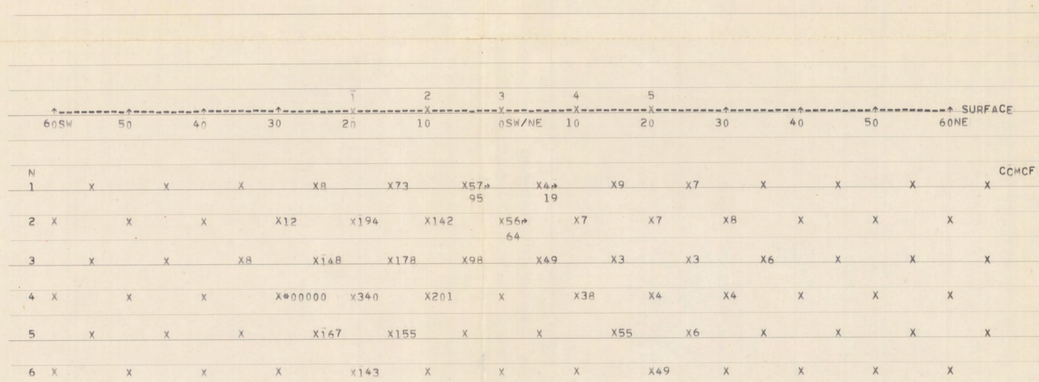




-16 -26 -38 -21 0 -25 0 0 +9 +1 +6 +15 +6







JOB B270-18 LINE 4 SPREAD 1

LOOKING N 47E DATE Aug 2, 1968 A= 1000

CENTER 0 LABEL NW/SE FREQ. 3.0

COUPLING Yes

VEKOL

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT VEKOL - GUNNEY
LINE 4 HALF #NWSP. 1 DATE 2 Aug

PAGE 1

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE										
RANGE	X-10	X-10	X-1	X-1	X-1	X-1	X-10	X-1	X-.1	X-.1
DC 1	2.0	.8	-.7	.8	.4	3.6	.3	-1.0	4.8	1.9
DC 2	-1.7	.7	3.7	.9	2.0	2.0	.8	3.7	.7	6.6
DC 3	2.0	.8	-1.0	.9	.8	2.8	.3	0.0	5.3	.2
DC 4	-1.7	.8	3.4	2.1	1.2	1.7	.8	4.9	.2	8.7
DC 5		.5	-1.1	2.1	1.2	2.8		-1.7	1.1	1.2
DC 6		.8	3.2	.2	1.0	1.0		5.1	1.3	8.7
DC 7		.6	-.8	.1	.8	3.0		-2.4	5.3	.3
DC 8		.4	3.2	0.0	1.5	3.3		6.2	0.0	9.0
DC AVG.										
AC 1	109.0	105.0	49.5	89.6	26.1	18.4	226.0	12.8	7.44	6.96
AC 2	-.2	-.2	+.1	-.5	-.2	+.1	0.0	+.4	-.3	+.1
AC AVG.										
S.P.	+2.8	+26.4	—	-5.1			-23.7			
AC NOISE	.05		.03			.06				.03
POT RES.	4K.		1K			4K				1.5K

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Vekol - Gunnex
LINE 4 HALF ~~SNW~~ SP. 1 DATE 2 Aug

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	CAL 1	
RECEIVE									X-10	
RANGE	X-1	X-.1	X-.1	X-.1	X-1	X-.1	X-.1	X-.1	2-3	
DC 1	-.1	0.6	2.8	14.1	-1.0	3.0	10.1	14.3	-1.4	
DC 2	3.1	6.1	12.0	5.1	5.4	9.1	6.7	6.1	.2	
DC 3	-.6	6.0	3.0	12.4	-1.8	2.0	6.1	11.0	-1.4	
DC 4	3.3	3.9	11.1	2.2	5.1	9.1	4.9	4.3	.2	
DC 5	-.7	5.3	5.4	13.8	-1.5	3.0	4.0	11.1		
DC 6	3.3	-1.8	6.9	1.9	5.2	9.1	4.9	-3.2		
DC 7	-.8	4.2	3.3	17.2	-1.2	1.8	5.1	13.8		
DC 8	3.4	2.2	6.1	1.8	5.2	8.8	1.8	-1.6		
DC AVG.										
AC 1	73.0	5.00	3.57	4.35	36.4	4.39	3.52	4.31	207.0	
AC 2	+.1	-.1	0.0	0.0	0.0	0.0	-.2	0.0	+.1	
AC AVG.										
S.P.	+4.5				+17.5					
AC NOISE				.03					.06	
POT RES.				6K					5K	

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 4 HALF N SP. 1 DATE AUG 2/68

PAGE 12

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE										
RANGE										
VOLTAGE	104X4	112X4	120X4	118X4	112X4	120X4	122X4	118X4	112X4	120X4
CURRENT	6.0	5.0	7.0	5.0	5.0	7.0	7.0	5.0	5.0	7.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	122X4	114X4	110X4	120X4	122X4	114X4	110X4	120X4		54X4
CURRENT	7.0	5.0	5.0	7.0	7.0	5.0	5.0	7.0		2.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVES

RECEIVER NO. MK 4B

OPERATOR JIM B

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT VEKOL - GOHNEX
LINE 4 HALF ~~BSE~~ SP. 1 DATE 2 Aug

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE	X-10	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-.1	X-.1
DC 1	1.2	.5	1.0	1.8	.8	-.6	.1	-.8	12.2	0.0
DC 2	.2	.3	3.0	1.8	5.5	12.5	3.4	9.1	-4.2	19.0
DC 3	1.2	.2	.4	1.1	-1.0	-.3	0.0	-.2	14.0	6.0
DC 4	.2	.3	3.3	1.7	7.0	12.2	4.2	9.6	-3.0	10.9
DC 5		.3	.4	1.8	-.8	0.0	0.0	-.1	11.5	7.0
DC 6		.2	3.3	1.6	8.4	11.8	3.3	8.3	-2.4	13.8
DC 7		.2	.6	1.4	-2.2	-.9	.5	1.5	15.0	2.0
DC 8		.3	3.2	1.7	7.2	10.3	3.6	9.6	2.0	9.8
DC AVG.										
AC 1	145.0	88.8	48.5	57.1	19.5	15.4	83.6	19.2	8.84	9.71
AC 2	0.0	+.2	0.0	0.0	0.0	+.1	0.0	-.1	+.1	0.0
AC AVG.										
S.P.	+6.2	-5.8		+19.4			+5.0			
AC NOISE	.04		.06			.06				.08
POT RES.	2K		1.5K			2K				6K

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT VEKOL - GUNNEX

LINE 4 HALF SE SP. 1 DATE 2 aug

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL 1	CAL
RECEIVE									3 4	
RANGE	X-1	X-.1	X-.1	X-.1	X-1	X-.1	X-.1?	X-.1	X10	-1.9
DC 1	3.2	11.3	6.9	10.7	11.1	4.6	0.0 X-4	2.2 X4	-.4	-.8
DC 2	2.7	5.1	11.1	13.0	1.2	13.2	3.1 X 4	6.8 X4	-1.3	-1.9
DC 3	4.3	7.2	10.0	9.0	9.2	1.0	-2.0 X4	-2.5 X4	-.2	-.8
DC 4	7.7	8.2	13.2	12.2	2.4	14.4	2.8 X4	6.9 X4	-.1	
DC 5	5.3	9.6	9.8	13.7	9.9	3.8	0.0 X4	0.0 X4	-.1	
DC 6	6.4	7.2	12.0	10.3	1.3	12.0	4.2 X4	6.8 X4	-1.0	
DC 7	2.9	6.2	15.1	7.8	9.6	-.5	.8 X 4	-1.6 X4	.1	
DC 8	6.3	10.8	11.9	15.6	2.2	14.0	5.2 X 4	7.0 X4	-.8	
DC AVG.										
AC 1	31.8	9.85	5.20	6.70	14.1	4.96	2.92?	4.15?	207	211.
AC 2	0.0	0.0	0.0	+.1	0.0	-.3	?	0.0	~~0.0~~	0.0
AC AVG.										
S.P.	+2.3				-14.9					
AC NOISE				.08				.08		
POT RES.				6K				4K		

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 6 HALF N SP. 1 DATE AUG 2/68

PAGE 19

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE										
VOLTAGE	122x4	118x4	122x4	110x4	116x4	122x4	118x4	110x4	118x4	120x4
CURRENT	7.0	5.0	7.0	5.0	5.0	7.0	7.0	5.0	5.0	7.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE										
RANGE										3-4
VOLTAGE	118x4	110x4	116x4	122x4	118x4	110x4	116x4	122x4		58x4
CURRENT	7.0	5.0	5.0	7.0	7.0	5.0	5.0	7.0		2.0

FREQUENCIES .05 3.0

SENDER NO. # 1

OPERATOR DAVES

RECEIVER NO. MK4B

OPERATOR JIM B

COMMENTS:

GUNNEX VEKOL 3,0 Hz

HEINRICHS GEOEX B270-68 LINE 4 SPD 1 LOOKING N47E 8-2-68 A= 1000 FEET

6.000	5.000	7.000	5.000	5.000	7.000	7.000	5.000	5.000	7.000	I	7.000	5.000	5.000	7.000	7.000	5.000	5.000	7.000	2.000	
20	8	-7	8	4	30	3	-10	48	19	DC	-1	0	28	141	-10	30	101	143	-14	LEFT
-17	7	37	9	20	20	8	37	7	66		31	61	120	51	54	91	67	61	2	SIDE
	8	-10	9	8	28		0	53	2		-6	60	30	124	-18	20	61	110		
	8	34	21	12	17		49	2	87		33	39	111	22	51	91	49	43		
	5	-11	21	12	28		-17	11	12		-7	53	54	138	-15	30	40	111		
	8	32	2	10	10		51	13	87		33	-18	69	19	52	91	49	-32		
	6	-8	1	8	30		-24	53	.3		-8	42	33	172	-12	18	51	138		
	4	32	0	15	33		62	0	90		34	22	61	18	52	88	18	-16		
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
.1	.7	1.2	1.0	1.1	2.3	.5	1.7	2.3	4.4	PFEA	1.3	3.5	6.6	8.6	1.9	5.7	5.4	7.1	-.6	
109.0	105.0	49.50	89.60	26.10	18.40	226.0	12.80	7.440	6.960	AC1	73.00	5.000	3.570	4.350	36.40	4.390	3.520	4.310	207.0	
-.2	-.2	.1	-.5	-.2	.1	0.0	.4	-.3	.1	AC2	.1	-.1	0.0	0.0	0.0	0.0	-.2	0.0	.1	
108.9	104.9	49.52	89.38	26.07	18.41	226.0	12.83	7.429	6.963	ACA	73.04	4.997	3.570	4.350	36.40	4.390	3.516	4.310	207.1	
53.05	61.65	83.49	52.75	61.57	78.44	94.66	30.38	44.39	60.55	RHO	123.2	30.19	44.37	68.87	154.5	54.11	75.68	107.6	.966	DC CAL
.9	1.4	1.8	1.9	1.9	2.9	1.2	2.2	3.1	5.0	PFE	1.9	4.2	7.2	9.3	2.5	6.4	6.1	7.7	.650	AC CAL
17	23	22	35	31	38	13	72	70	83	MCF	16	141	163	135	17	118	81	72		
.2	.1	.4	.2	.5	.9	.1	1.4	1.8	2.2	CPFE	.2	3.0	3.3	3.1	.3	2.6	2.7	2.6		
.7	1.3	1.5	1.7	1.4	2.1	1.1	.8	1.3	2.8	CCPFE	1.7	1.2	3.9	6.2	2.2	3.8	3.4	5.1		
14	21	18	32	22	26	12	27	29	46	CCMCF	14	40	88	90	14	70	45	48		

7.000	5.000	7.000	5.000	5.000	7.000	7.000	5.000	5.000	7.000	I	7.000	5.000	5.000	7.000	7.000	5.000	5.000	7.000	2.000	
12	5	10	18	8	-6	1	-8	122	0	DC	32	113	69	107	111	46			-19	RIGHT
2	3	30	18	55	125	34	91	-42	190		27	51	111	130	12	132			-8	SIDE
	2	4	11	-10	-3	0	-2	140	60		43	72	100	90	92	10				
	3	33	17	70	122	42	96	-30	109		77	82	132	122	24	144				
	3	4	18	-8	0	0	-1	115	70		53	90	98	137	99	38				
	2	33	16	84	118	33	83	-24	138		64	72	120	103	13	120				
	2	6	14	-22	-9	5	15	150	20		29	62	151	78	96	-5				
	3	38	17	72	103	36	90	20	98		63	108	119	156	22	140				
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
.7	.3	1.9	1.6	3.0	5.7	1.9	4.6	5.4	9.1	PFEA	4.9	7.7	11.5	11.3	5.8	7.6	0.0	0.0	-1.3	
145.0	88.80	48.50	57.10	19.50	15.40	83.60	19.20	8.840	9.710	AC1	31.80	9.850	5.200	6.700	14.10	4.960	0.000	0.000	211.0	
0.0	.2	0.0	0.0	0.0	.1	0.0	-.1	.1	0.0	AC2	0.0	0.0	0.0	.1	0.0	-.3	0.0	0.0	0.0	
145.0	88.89	48.50	57.10	19.50	15.41	83.60	19.19	8.844	9.710	ACA	31.80	9.850	5.200	6.703	14.10	4.953	0.000	0.000	211.0	
60.11	51.32	81.38	33.43	46.28	66.99	35.06	46.28	53.68	87.12	RHO	54.88	61.09	66.76	107.3	61.35	61.46	*000.0	*000.0	.948	DC CAL
2.0	1.5	3.3	2.9	4.3	7.0	3.2	6.0	6.7	10.4	PFE	6.2	9.1	12.9	12.6	7.1	9.1	*000.0	*000.0	1.350	AC CAL
34	30	40	88	94	105	92	130	125	120	MCF	113	148	193	117	116	148	*00000	*00000		
.2	.2	.4	.3	.8	1.1	.3	.8	1.4	1.4	CPFE	.6	1.2	2.0	1.7	1.2	2.2	0.0	0.0		
1.9	1.3	2.9	2.6	3.6	6.0	2.9	5.2	5.3	9.0	CCPFE	5.6	7.8	10.9	10.9	5.9	6.9	*000.0	*000.0		
32	26	36	78	77	89	83	113	98	104	CCMCF	102	128	163	101	96	112	*00000	*00000		

10,283

JOB B270 - 68 (Nekol) LINE 5 - Nekol SPREAD 1

LOOKING N37° W DATE Aug 8, 1968 A= 1000'

CENTER 0 LABEL SW/NE FREQ. 3.0

COUPLING yes

PFE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270
LINE 5 HALF S53°W SP. 1 DATE 8/8/68

PAGE 1

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	0-15W	1-25W		2-35W		3	3-45W			
RANGE	X1	X1	X1	X	X1	X.1	X10	X.1	X.1	X.1
DC 1	1.0	4.0	3.8	2.0	2.9	6.3	0.3	5.0	2.4	13.2
DC 2	-0.4	1.8	5.1	2.6	8.7	7.2	-0.1	5.5	20.4	16.8
DC 3	1.0	4.8	3.0	1.7	3.0	3.8	0.2	8.1	16.0	8.8
DC 4	-0.1	2.1	5.1	2.9	8.3	10.0	-0.1	0.8	31.6	14.4
DC 5	0.7	4.4	2.5	1.6	3.5	3.7	0.2	9.3	-3.2	7.6
DC 6	-0.4	1.8	5.7	2.6	9.0	9.0	0.0	8.7	12.4	6.0
DC 7				1.6	5.0	5.0		7.3	0.0	20.0
DC 8				2.7	8.6	10.0		-1.4	14.4	10.0
DC AVG.										
AC 1	64.7	36.9	27.3	59.4	10.1	8.34	115.0	8.23	2.83	3.03
AC 2	-0.2	+0.1	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.2
AC AVG.										
S.P.	-25	+25		-21			-17			
AC NOISE	.04	.05		.04			.05			
POT RES.	1.4k	500Ω		500Ω			2k			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX B2706B

LINE 5 HALF 553W SP. 1 DATE 8/8/78

PAGE 2

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	4-55W				5-65W					2 3
RANGE	X1	X.1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	-1.0	9.0	-7.2	-1.6	20.0	NO	-14.4	46.4		-1.1
DC 2	2.9	7.1	44.0	33.2	-16.4		14.8	-18.4		-0.4
DC 3	-1.3	10.6	-17.2	-6.8	20.0	DC	3.2	66.8		-1.0
DC 4	2.7	6.9	32.8	36.0	-18.0		12.8	-20.8		-0.5
DC 5	-0.9	11.8	11.2	-14.8	-18.8		0.4	96.4		-1.0
DC 6	2.9	0.2	6.8	36.4	-16.0		58.2	-31.6		-0.5
DC 7		6.4	38.8	-16.4			4.0	56.4		
DC 8		1.2	4.0	35.6			35.6	-86.4		
DC AVG.										
AC 1	40.0	3.91	1.68	1.95	29.7	3.99	1.90	2.35		203.0
AC 2	-0.2	+0.2	0.0	+0.2	0.0	0.0	+0.5	+0.5		0.0
AC AVG.										
S.P.	+12				+10					
AC NOISE	.07				.1					
POT RES.	2k				2k					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 5 HALF S SP. 1 DATE AUG 1976

PAGE 15 3

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE										
RANGE										
VOLTAGE	124X4	104X4	124X4	104X4	102X4	120X4	102X4	84X4	100X4	118X4
CURRENT	4.0	3.0	4.0	5.0	3.0	4.0	4.0	4.0	3.0	4.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	102X4	84X4	98X4	118X4	102X4	84X4	98X4	114X4		64X4
CURRENT	4.0	4.0	3.0	4.0	4.0	4.0	3.0	4.0		2.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVE S

RECEIVER NO. MK4 B

OPERATOR DON B

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B 270 68
LINE 5 HALF N53E SP. 1 DATE 9/12/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	0-1NW	1-2NW		2-3NW			3-4NW			
RANGE	X1	X1	X1	X1	X1	X1	X10	X1	X1	X1
DC 1	-2.1	-1.6 2.7	6.5 0.9	0.2 1.5	1.4 0.5	8.9 6.0	1.0 1.4	1.8 0.1	1.7 2.8	0.6 12.0
DC 2	6.0	-2.0 2.9	8.0 0.0	0.2 1.6	1.8 0.0	7.9 4.6	0.9 1.5	1.7 0.0	-3.9 6.8	4.2 10.0
DC 3	-2.0	-2.1 3.1	9.0 -0.5	0.1 1.6	1.5 0.1	7.3 4.3	0.9 1.6	2.1 -0.1	-5.0 5.4	2.9 15.4
DC 4	6.1	-2.3 3.4	9.1 -0.4	0.0 1.7	1.8 0.5	7.3 4.9	0.6 1.8	2.1 0.0	-1.2 -0.5	-1.3 13.7
DC 5	-2.0	-2.5 3.6	9.2 -0.3	0.0 1.7	1.1 0.6	8.4 4.3	0.8 1.8	1.5 2.1	4.9 -4.1	0.9 14.5
DC 6	6.1				1.0 1.0	7.3 5.2	0.7 1.9	2.0 2.0	3.0 -1.1	-0.5 15.2
DC 7									3.2 -1.8	-2.2 18.0
DC 8										
DC AVG.										
AC 1	49.2	80.5	22.4	87.7	26.2	14.9	155.0	35.1	16.5	11.2
AC 2	-0.8	+0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0
AC AVG.										
S.P.	0	+9		-8			+5			
AC NOISE	.02	.03		.04			.04			
POT RES.	4K	4k		3K			2K			

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 5 HALF N53E SP. 1 DATE 8/12/68

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5 NE				5-5NE					3 4
RANGE	X1	X1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	3.0 -0.2	2.5 -0.8	10.0 -6.0	-4.4 22.3	1.1 0.5	-1.3 3.1	4.1 2.0	5.9 12.5		-1.0
DC 2	3.1 -1.0	3.1 -1.6	8.4 -6.8	-9.2 32.0	1.0 2.0	-0.1 4.3	2.7 2.5	5.8 13.2		1.0
DC 3	3.0 -1.0	4.7 -2.0	9.9 -6.5	-12.4 28.4	-0.5 4.1	-1.2 3.5	1.6 5.0	7.3 7.8		-1.0
DC 4	3.0 -0.1	5.1 -3.2	12.0 -8.4	-8.8 29.2	-2.4 5.8	4.2 2.3	2.5 4.9	8.1 12.1		1.0
DC 5	3.1 -0.8	4.1 -3.7	8.0 -6.5	-10.4 26.8	-3.8 6.9	4.2 -1.4	-1.9 4.8	9.4 4.2		
DC 6	2.8 -0.1	3.0 -2.1	9.6 -6.7	-4.0 16.4	-4.9 6.5	2.3 0.6	-2.4 5.5	13.7 5.1		
DC 7	3.0 -1.1	2.7 -0.5	10.3 -11.0	-3.6 27.2	-3.9 6.7	1.8 -0.9	-1.1 6.2	17.5 3.9		
DC 8										
DC AVG.										
AC 1	31.3	10.7	6.89	5.26	10.5	4.71	4.85	3.30		10.15
AC 2	0.6	0.0	-0.5	-0.3	-0.1	+0.1	-0.1	-0.3		0.0
AC AVG.										
S.P.					-9					
AC NOISE					.05					
POT RES.					2k					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 5 HALF N SP. 1 DATE AUG 12/68

PAGE 16

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE										
VOLTAGE	108x4	112x4	106x4	114x4	94x4	104x4	104x4	112x4	92x4	104x4
CURRENT	4.0	5.0	4.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE										
RANGE										3-4
VOLTAGE	104x4	110x4	90x4	100x4	102x4	110x4	108x4	102x4		176x4
CURRENT	3.0	3.0	4.0	4.0	3.0	3.0	5.0	4.0		1.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVE S

RECEIVER NO. MRC4B

OPERATOR DON B

COMMENTS:

Recopied -

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE 1

PROJECT GUNNEX 8270

LINE 5 HALF 553W SP. 1 DATE 8/7/64

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	0-1SW	1-2SW		2-3SW			3-4SW			
RANGE	X 1	X 1	X1	X1	X1	X.1	X10	X.1	X.1	X 1
DC 1	1.0	4.0	3.8	2.0	2.9	6.3	.03	5.0	0.6 X4	[illegible]
DC 2	-0.4	1.8	5.1	2.6	8.7	7.9	-0.1	5.5	5.1	[illegible]
DC 3	1.0	4.8	3.0	1.7	3.0	3.8	0.2	8.1	-4.0	[illegible]
DC 4	-0.1	2.1	5.1	2.9	8.3	10.0	-0.1	0.8	7.9	[illegible]
DC 5	0.7	4.4	2.5	1.6	3.5	3.7	0.2	9.3	-0.8	[illegible]
DC 6	-0.4	1.8	5.7	2.6	9.0	9.0	0	8.7	3.1	[illegible]
DC 7				1.6	5.0	5.0		7.3	0	
DC 8			/	2.7	8.6	10.0		-1.4	3.6	
DC AVG.	3A		4A							
AC 1	64.7	36.9	22.3	59.4	10.1	8.34	115.0	8.23	2.83	3.03
AC 2	-0.2	+0.1	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.2
AC AVG.										
S.P.	-25	+25		-21			-17			
AC NOISE	.04	.05		.04			.05			
POT RES.	1.4k	500m		600m			2k			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT B270-64

LINE 5 HALF SW SP. 1 DATE 6/7/

PAGE 2

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	4-5SW				5-6SW					2 3
RANGE	X1	X.1	X.1	X.1	X1	X.1	Rd	X.1		X10
DC 1	-1.6	9.0	-1.8 X4	-0.4 X4	5.0 X4		-3.6 X4	11.6 X4		-1.1
DC 2	2.9	7.1	11.0	8.3	-4.1		3.7	-4.6		-0.4
DC 3	-1.3	10.6	-4.3	-1.7	5.0		0.8	16.7		-1.0
DC 4	2.7	6.9	8.2	9.0	-4.5		3.2	-5.2		-0.5
DC 5	-0.9	11.8	2.8	-3.7	4.7		0.1	24.1		-1.0
DC 6	2.9	0.2	1.7	9.1	-4.0		14.3	-7.9		-0.5
DC 7		6.4	9.7	-4.1	4.3		1.0	14.1		
DC 8		1.2	1.0	8.9			8.9	-21.6		
DC AVG.										
AC 1	40.0	38.1	1.68	1.95	29.7	39.9	1.90	23.5		203.0
AC 2	-0.2	+0.2	0.0	+0.2	0.0	0.0	+0.5	+0.5		0.0
AC AVG.										
S.P.	+12				10					
AC NOISE	.07				.1					
POT RES.	2K				2K					

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX BASE
LINE 5 HALF N53W SP. 1 DATE 8/12/68

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5NW				5-6NW					3 4
RANGE	X1	X1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	3.0 -0.2	2.5 -0.8	10.0 -6.0	-1.1 6.5 X4	1.1 0.5	-1.3 3.1	4.1 2.0	5.9 11.5		-1.0
DC 2	3.1 -1.0	3.1 -1.6	8.4 -6.8	-2.3 8.0	1.0 2.0	-0.1 4.3	2.7 2.5	5.8 13.2		1.0
DC 3	3.0 -0.1	4.7 -2.0	9.9 -6.5	-3.1 7.1	-0.5 4.1	-1.2 3.5	1.6 5.0	7.3 7.8		-1.0
DC 4	3.1 -0.8	5.1 -3.2	12.0 -8.4	-2.2 7.3	-2.4 5.8	4.2 2.2	0.6 4.9	8.1 12.1		1.0
DC 5	2.8 -0.1	4.1 -3.7	8.0 -6.5	-2.6 6.7	-3.8 6.9	4.2 -1.4	-1.9 4.9	9.4 4.2		
DC 6	3.0 -1.1	5.0 -2.1	9.6 -6.7	-1.0 4.1	-4.9 6.5	0.3 0.6	-2.4 5.5	13.7 5.1		
DC 7		2.7 -0.5	10.3 -11.0	-0.9 5.3	-3.8 6.7	1.8 -0.9	-1.1 6.2	12.5 3.9		
DC 8										
DC AVG.										
AC 1	31.3	10.7	6.89	5.26	10.5	4.71	4.85	3.30		102
AC 2	0.0	0.0	-0.5	-0.3	-0.1	+0.1	-0.1	-0.3		+21
AC AVG.										
S.P.	+9				-9					
AC NOISE	.05				.05					
POT RES.	500Ω				2k					

VEKOL

HEINRICHS GEOEX 8270-68 LINE 5 SPD 1 LOOKING N37W 8-8-68 A= 1000 FEET

5233359

4.000	3.000	4.000	5.000	3.000	4.000	4.000	4.000	3.000	4.000	I	4.000	4.000	3.000	4.000	4.000	4.000	3.000	4.000	2.000		
10	40	38	20	29	63	3	50	24	132	DC	-10	90	-72	-16	200		-144	464	-11	LEFT	
-4	18	51	26	87	79	-1	55	204	168		29	71	440	332	-164		148	-184	-4	SIDE	
10	48	30	17	30	38	2	81	-160	88		-13	106	-172	-68	200		32	668	-10		
-1	21	51	29	83	100	-1	8	316	144		27	69	328	360	-180		128	-208	-5		
7	44	25	16	35	37	2	93	-32	76		-9	118	112	-148	188		4	964	-10		
-4	18	57	26	90	90	0	87	124	60		29	2	68	364	-160		582	-316	-5		
			16	50	50		73	0	200			64	388	-164			40	564			
			27	86	100		-14	144	100			12	40	356			356	-864			
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6			
.3	3.2	4.1	2.2	6.2	6.8	.1	5.9	7.7	12.2	PFEA	.9	6.9	16.4	12.1	1.3	0.0	14.9	18.4	-.7		
64.70	36.90	22.30	59.40	10.10	8.340	115.0	8.230	2.830	3.030	AC1	40.00	3.910	1.680	1.950	29.70	3.990	1.900	2.350	203.0		
-.2	.1	-.1	0.0	0.0	-.1	0.0	-.1	0.0	-.2	AC2	-.2	.2	0.0	.2	0.0	0.0	.5	.5	0.0		
64.64	36.92	22.29	59.40	10.10	8.336	115.0	8.226	2.830	3.027	ACA	39.96	3.914	1.680	1.952	29.70	3.990	1.905	2.356	203.0		
48.30	37.79	69.09	36.14	42.56	66.27	85.66	25.95	30.22	50.55	RHO	120.1	31.09	38.78	56.91	223.9	*000.0	75.76	115.9	.985	DC CAL	
1.1	3.9	4.9	2.9	6.9	7.6	.8	6.7	8.4	13.0	PFE	1.7	7.5	17.1	12.7	2.0	*000.0	15.3	18.9	.740	AC CAL	
24	103	71	81	163	114	9	259	278	257	MCF	14	242	442	224	9	*00000	203	163			
.2	.3	.5	.3	.9	1.1	.1	1.7	3.0	2.8	CPFE	.2	2.9	4.0	3.9	.2	1.3	2.7	2.4			
.9	3.6	4.4	2.6	6.0	6.5	.7	5.0	5.4	10.2	CCPFE	1.5	4.6	13.2	8.8	1.8	*998.7	12.6	16.5			
19	95	64	73	142	98	8	194	178	201	CCMCF	12	148	340	155	8	*00000	167	143			

4.000	5.000	4.000	3.000	4.000	4.000	3.000	3.000	4.000	4.000	I	3.000	3.000	4.000	4.000	3.000	3.000	5.000	4.000	1.000		
-21	-16	65	2	14	69	10	18	17	26	DC	30	25	100	-44	11	-13	41	59	-10	RIGHT	
60	27	9	15	5	60	14	1	28	120		-2	-8	-60	225	5	31	20	115	10	SIDE	
-20	-20	80	2	18	79	9	17	-39	42		31	31	84	-92	10	-1	27	58			
61	29	0	16	0	46	15	0	68	100		-10	-16	-68	320	20	43	25	132			
-20	-21	90	1	15	73	9	21	-50	29		30	47	99	-124	-5	-12	16	73			
61	31	-5	16	1	43	16	-1	54	154		-10	-20	-65	284	41	35	50	78			
	-23	91	0	18	73	6	21	-12	-13		30	51	120	-88	-24	42	26	81			
	34	-4	17	5	49	18	0	-5	137		-1	-32	-84	292	58	22	49	121			
	-25	92	0	11	84	8	15	49	9		31	41	80	-104	-38	42	-19	94			
	36	-3	17	6	43	18	21	-41	145		-8	-37	-65	268	69	-14	49	42			
				10	73	-7	0	30	-5		28	50	96	-40	-49	23	-24	137			
				10	52	19	20	-11	152		-1	-21	-67	164	65	6	55	51			
								32	-22		30	27	103	-36	-39	18	-11	125			
								-18	180		-11	-5	-110	272	67	-9	62	39			
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6			
2.0	.5	4.3	.8	.9	6.2	1.1	1.0	.8	7.3	PFEA	1.2	.9	1.3	9.1	1.2	1.7	2.4	8.9	0.0		
49.20	80.50	22.40	87.70	26.20	14.90	155.0	35.10	16.50	11.20	AC1	31.30	10.70	6.890	5.260	10.50	4.710	4.850	3.300	101.5		
-.8	.1	-.1	0.0	0.0	0.0	0.0	-.1	-.1	0.0	AC2	0.0	0.0	-.5	-.3	-.1	.1	-.1	-.3	0.0		
49.20	80.54	22.39	87.70	26.20	14.90	155.0	35.08	16.49	11.20	ACA	31.30	10.70	6.873	5.252	10.49	4.712	4.848	3.295	101.5		
37.09	47.81	69.03	87.14	78.15	116.9	154.4	139.8	122.9	177.6	RHO	124.8	106.4	103.1	148.4	104.7	94.41	102.8	148.7	.985	DC CAL	
2.4	.4	4.3	.8	.9	6.2	1.1	1.1	.8	7.3	PFE	1.2	.9	1.5	9.2	1.2	1.7	2.5	9.0	-0.000	AC CAL	
65	9	63	10	12	53	7	8	7	41	MCF	10	9	15	62	12	18	24	61			
.3	.2	.5	.1	.4	.5	.0	.2	.5	.5	CPFE	.2	.6	1.1	1.1	.6	1.3	1.8	1.7			
2.1	.2	3.9	.8	.5	5.7	1.1	.9	.4	6.8	CCPFE	1.0	.4	.4	8.1	.6	.4	.6	7.3			
57	4	56	9	7	49	7	7	3	38	CCMCF	8	3	4	55	6	4	6	49			

vekal

JOB 270 -68 LINE 0 SPREAD 1

LOOKING N37W DATE June 24, CY A= 500

CENTER 0 LABEL SW/NE FREQ. 30

COUPLING Yes

9-17-68
CA

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Uekor
LINE 0 HALF SW SP. 1 DATE 6-17-68

PAGE 3

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-5	5-10	→	10-15	→	→	15-20	20	→	→
RANGE				300	30	10	300	23.8	10	3
DC 1	570	30.4	6.7	121	142	4.08	111	22.4	4.66	~~1.81~~
DC 2	538	30.0	8.4	122	14.9	4.78	109	24.0	4.22	1.55
DC 3	568	30.4	6.6	121	13.9	3.98	111	22.4	4.70	1.56
DC 4	538	30.0	8.3		15.1	4.82	109	24.0	4.10	1.28
DC 5			6.5		14.2	3.97		22.3	4.70	1.60
DC 6			8.7		15.4	4.82			4.04	1.56
DC 7					13.7	4.18			4.80	1.77
DC 8					15.1	5.05			3.98	1.39
DC AVG.	55.33	30.2	7.5	121.5	1455	4.46	110	23.1	4.41	1.54
AC 1	54.6	30.1	7.4	118	14.2	4.39	106	22.6	4.35	1.53
AC 2	54.5	30.1	7.4	118	14.2	4.39	106	22.5	4.35	1.53
AC AVG.	54.55	30.1	7.4	118	14.2	4.39	106	22.55	4.35	1.53
S.P.	8.4+	26.6+		21+		→	-12.5			?
AC NOISE	.08									
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT UEKOL
LINE 0 HALF SW SP. 1 DATE 6-17

PAGE 68

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	(* ←	CAL
RECEIVE	20-25				25-30					
RANGE	270	30	10	3	30	10				.03
DC 1	26.5	11.1	2.78	.94	12.8		2.24 1.77	.865 .745	339	212
DC 2	27.0	10.1	2.68	1.25	13.8	6.25	2.24 1.77	.865 .710	339	210
DC 3	26.5	11.2	2.85	.78	12.7	6.11 6.30	2.30 1.72	.850 .730	339	210
DC 4		10.0	2.79	1.27	13.9	6.70 6.41		.860 .725	339	212
DC 5			2.90	.80		6.58 6.58		.840 .815		210
DC 6			2.70	1.21		6.48 6.62		.745 .925		
DC 7			2.85	.80		6.4 + 6.66		.665 .880		
DC 8			2.80	1.32 .85		6.39 6.69		.720 .890		
DC AVG.	26.75	10.6	2.79	1.045	13.3	6.54	2.00	.792		
AC 1	26.1	10.3	2.73	1.03	12.9	6.35	1.94	.765	33.5	20.9
AC 2	26.0	10.3	2.72	1.03	12.9	6.35	1.94	.765	33.5	
AC AVG.	26.05	10.3	2.725	1.03	12.9	6.35	1.94	.765		
S.P.	-7.2				+24.0					
AC NOISE										
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PAGE

PROJECT VEKOL

LINE 1 HALF ~~SW~~ SP. 1 DATE JUN 18 68

SEND	4-5	3-4	4-5	2-3	3-4	4 5	1-2	2-3	3-4	4-5
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	420	260	265	440	370	390	325	440	370	390
CURRENT	300MA	300MA	300MA	700	300MA	300MA	700MA	700MA	300MA	300MA
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE	→	→	→	→	→	→	→	→		2-3
RANGE										
VOLTAGE	325	440	370	390	325	440	370	390		450
CURRENT	700MA	700MA	300MA	300MA	700MA	700MA	300MA	300MA		300MA

FREQUENCIES .05 3.0

SENDER NO. 9662-S

OPERATOR DAVE-S

RECEIVER NO. 3641

OPERATOR PHIL M

COMMENTS: 3-4 - 4-5 200MA

500'

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Vetol
LINE 0 HALF NE SP. 1 DATE 6-17

PAGE 1

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-5	5-10	→	10-15	→		15-20	→		
RANGE				300	100	30	300	100		
DC 1	102	84	25.7	232	36.0	13.0	117	~~42.5~~	13.2	5.7
DC 2	101	91	25.7	231	36.1	15.9	114	44.3	13.3	7.2
DC 3	102	84	25.8	232.5	35.9	13.4	118	43.1	13.2	5.5
DC 4	101	91	25.7	231.	36.4	15.9	114	45.1	13.3	6.9
DC 5			260		35.9	13.4	117	43.0		5.4
DC 6			260		37.0	16.3		45.1		7.28
DC 7			262		~~13.1~~	13.1		42.8		6.20
DC 8			260			16.0		45.1		7.20
DC AVG.	101.5	87.5	25.88	231.6	36.1	14.64	115.75	43.96	13.25	6.42
AC 1	95	82	241	22.5	35.0	14.1	110	41.9	12.6	6.14
AC 2	95	81.5	241	226	34.9	14.1	109	41.9	12.5	6.14
AC AVG.	~~95~~	~~81.75~~		225.5	34.95	14.1	109.5	41.9	12.55	6.14
S.P.	-3.5	+35.	→	+46.8	→	→	-89.7			
AC NOISE							.05			
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Vetol
LINE 0 HALF NE SP. 1 DATE 6-17 68

PAGE 2

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE	20-25				25-30					
RANGE	30									
DC 1	20.1	12.7	5.4		2.0	3.2				
DC 2	20.5	12.7	5.9		4.2	3.1				
DC 3	20.3	13.5	5.5		1.6	2.8				
DC 4	20.3	12.7	6.0		4.3	3.7				
DC 5	20.7	13.8	5.5		1.5	2.9				2.12
DC 6	19.7	13.0	5.4		4.5	4.1				2.12
DC 7	20.7	14.0	5.5		1.5	?				2.12
DC 8	[illegible]	12.5	5.3		4.6					
DC AVG.	20.3	13.17	5.59		2.98	3.13				
AC 1	19.2	12.3	5.4	3.3	2.8	2.9				
AC 2	19.2	12.3	5.4	3.3	2.8	2.9				
AC AVG.	19.2	12.3	5.4		2.8	2.9				> 1.98
S.P.	+20.3		?		-6.6					1.98
AC NOISE					?	?				
POT RES.										

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 1 HALF NE SP. 1 DATE JUN 1968

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	345	450	340	440	450	330	460	440	440	325
CURRENT	600MA	600MA	600MA	300MA	600MA	600MA	300MA	300MA	600MA	600MA
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL	~~CAL~~
RECEIVE	→	→	→	→	→	→	→	→	3-4	3-4
RANGE										
VOLTAGE	460	440	430	320	450	440			315	~~BAD~~
CURRENT	300MA	300MA	600MA	600MA	300	300MA			200MA	~~MA~~

FREQUENCIES .05 3.0

SENDER NO. 9662-S

OPERATOR DAVE S.

RECEIVER NO. 3641

OPERATOR PHIL M

COMMENTS: [redacted]

GUNNEX 3.0 Hz

HEINRICHS GEOEX B270-68 LINE 0 VEKOL SPD 1 LOOKING N37W 6-24-68 A= 500 FEET

.300	.200	.200	.700	.300	.300	.700	.700	.300	.300	I	.700	.700	.300	.300	.700	.700	.300	.300	.300	
570	304	67	121	142	408	111	238	466	155	DC	270	111	278	94	128	625	222	865	339	LEFT
538	300	84	122	149	478	109	224	422	156		265	101	268	125	138	691	177	745	339	SIDE
568		66		139	398		240	470	128			112	285	78	127	630	224	865		
538		83		151	482		224	410	160			100	279	127	139	670	177	710		
		65		142	397		240	470	156				290	80		641	230	850		
		87		154	482		223	404	177				270	/		658	172	730		
				137	418			480	139				285	121		658		860		
				151	505			398					280	80		648		725		
														85		665		840		
																644		815		
																666		745		
																639		925		
																669		665		
																		880		
																		720		
																		890		

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
55.33	30.20	7.500	121.5	14.55	4.445	110.0	23.17	4.411	1.540	DCA	26.75	10.62	2.794	1.000	13.28	6.547	2.010	.797	33.90	
54.60	30.10	7.400	118.0	14.20	4.390	106.0	22.60	4.350	1.530	AC1	26.10	10.30	2.730	1.030	12.90	6.350	1.940	.765	33.50	
54.50	30.10	7.400	118.0	14.20	4.390	106.0	22.50	4.350	1.530	AC2	26.00	10.30	2.720	1.030	12.90	6.350	1.940	.765	33.50	
54.55	30.10	7.400	118.0	14.20	4.390	106.0	22.55	4.350	1.530	ACA	26.05	10.30	2.725	1.030	12.90	6.350	1.940	.765	33.50	
244.8	200.4	199.1	230.4	257.5	196.7	208.6	175.8	195.2	136.3	RHO	202.9	201.3	247.3	154.9	251.9	248.3	311.3	197.4	.885	DC CAL
.2	-.9	.2	1.8	1.3	.1	2.5	1.5	.2	-.5	PFE	1.5	1.9	1.3	-4.1	1.8	1.9	2.4	2.9	.988	AC CAL
1	-4	1	8	5	0	12	9	1	-4	MCF	7	9	5	-26	7	8	8	15		
0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	.0	.1	CPFE	0.0	.0	.0	.2	0.0	.0	.1	.2		
.2	-.9	.2	1.8	1.3	.0	2.5	1.5	.2	-.6	CCPFE	1.5	1.8	1.3	-4.2	1.8	1.8	2.3	2.8		
1	-4	1	8	5	0	12	9	1	-5	CCMCF	7	9	5	-27	7	7	7	14		

.600	.600	.600	.300	.600	.600	.300	.300	.600	.600	I	.300	.300	.600	.600	.300	.300	.300	.300	.200	
102	84	257	2320	360	130	117	443	132	570	DC	201	127	54		20	32			212	RIGHT
101	91	257	2310	361	159	114	431	133	720		205	127	59		42	31			212	SIDE
		258	2325	359	134	118	451		550		203	135	55		16	28				
		257	2310	364	159	114	430		690		203	127	60		43	37				
		260		359	134	117	451		540		207	138	55		15	24				
		260		370	163		428		728		197	130	54		45	41				
		262			131		451		620		207	140	55		15					
		260			160				720			125	53		46					

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
101.50	87.50	25.89	231.7	36.16	14.64	115.7	43.97	13.25	6.419	DCA	20.32	13.19	5.593	0.000	2.986	3.130	0.000	0.000	21.20	
95.00	82.00	24.10	225.0	35.00	14.10	110.0	41.90	12.60	6.140	AC1	19.20	12.30	5.400	3.300	2.800	2.900	0.000	0.000	19.80	
95.00	81.50	24.10	226.0	34.90	14.10	109.0	41.90	12.50	6.140	AC2	19.20	12.30	5.400	3.300	2.800	2.900	0.000	0.000	19.80	
95.00	81.75	24.10	225.5	34.95	14.10	109.5	41.90	12.55	6.140	ACA	19.20	12.30	5.400	3.300	2.800	2.900	0.000	0.000	19.80	
239.4	206.4	244.3	1092.8	341.1	345.4	546.0	829.6	312.5	302.8	RHO	383.3	622.0	263.8	*000.0	140.8	295.3	*000.0	*000.0	.943	DC CAL
-.2	-.0	.3	-4.0	-3.4	-3.0	-1.3	-2.0	-1.4	-2.4	PFE	-1.2	.1	-3.3	*000.0	-.4	.8	*000.0	*000.0	.934	AC CAL
-1	-0	1	-4	-10	-9	-2	-2	-4	-8	MCF	-3	0	-12	*00000	-3	3	*00000	*00000		
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	CPFE	0.0	0.0	.0	2.9	.1	.0	2.9	5.0		
-.2	-.0	.3	-4.0	-3.4	-3.0	-1.3	-2.0	-1.4	-2.4	CCPFE	-1.2	.1	-3.3	*997.1	-.5	.8	*997.1	*995.0		
-1	-0	1	-4	-10	-9	-2	-2	-4	-8	CCMCF	-3	0	-13	1000	-3	3	1000	1000		

49683

49682

NE ½ SP 1

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project VEKOL Line 0 Field date 6-17-68 Data page 1 Comp. date 6-18-68. Comp by JAM.

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	0-5	5-10	→	10-15	→	→	15-20	→	→	→		
(C) n separation												
(D) I	600	600	600	300	600	600	300	300	600	600		
(E) Vdc (avg)	101.5	87.5	25.88	231.6	36.1	14.64	115.75	43.96	13.25	6.42		
(F) DCcal	.943	.206	.244									
(G) Kn x 10^{-3}	1.5	1.5	6	1.5	6	15	1.5	6	15	30		
(H) ρ dc=ExFxGx10^3/D	[illegible]	[illegible]										
(I) Vac Σ	95	81.75	24.1	225.5	34.95	14.1	109.5	41.9	12.55	6.14		
(J) AC noise ~~x 2~~	.05	.05	→	.05	→	→	.05	→	→	→		
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.936											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.2	6.0	8.5	2.3	2.5	2.9	4.7	3.9	5.6	3.6		
(O) MCF=(M-1)(10^5)/H												
SP.	-3.5	+35.0	→	+46.8	→	→	-89.7	→	→	→		

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	20-25	→	→	→	25-30	→	→	→				
(B) Receive	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2				
(C) n separation												
(D) I	300	300	600	600	300	300						
(E) Vdc (avg)	20.3	13.17	5.59		2.98	3.13						
(F) DCcal												
(G) Kn x 10^{-3}	6	15	30	52.5	15	30	52.5	84				
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ	19.2	12.3	5.4		2.8	2.9						
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	4.9	6.0	2.5		3.3	7.0						
(O) MCF=(M-1)(10^5)/H												
	+20.3	→	→	→	-6.6	→	→	→				

8711

SP 1

SW

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project VEKOL Line O Field date 6-18-68 Data page 2 Comp. date 6-18-68 Comp by JKM

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-5	5-10	→	10-15	→	→	15-20	→	→	→		
(C) n separation												
(D) I	300	200	200	700	300	300	700	700	300	300		
(E) Vdc (avg)	55.33	30.2	7.5	121.5	14.55	4.46	110	23.1	4.41	1.54		
(F) DCcal	.885											
(G) Kn x 10^{-3}	1.5	1.5	6	1.5	6	15	1.5	6	15	30		
(H) ρ dc=ExFxGx10^3/D	244	200	100									
(I) Vac Σ	54.55	30.1	7.4	118	14.2	4.39	106	22.55	4.35	1.53		
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.990	→	→	→	→	→	→	→	→	→		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.3	-0.5	0.2	1.9	1.5	0.6	2.7	1.4	0.3	-0.4		
(O) MCF=(M-1)(10^5)/H												
S.P.	+8.4	+26.6	→	+21	→	→	-12.5	→	→	→		

Project Line Field date Data page Comp. date Comp by

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				
(B) Receive	20-25	→	→	→	25-30	→	→	→				
(C) n separation												
(D) I	700	700	300	300	700	700	300	300				
(E) Vdc (avg)	26.75	10.6	2.79	1.045	13.3	6.54	2.00	.792			33.9	
(F) DCcal												
(G) Kn x 10^{-3}	6	15	30	52.5	15	30	52.5	84				
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ	26.05	10.3	2.725	1.03	12.9	6.35	1.94	.765			33.5	
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.990	→	→	→	→	→	→	→				
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	1.7	2.0	1.5	0.5	2.1	2.0	2.0	2.6				
(O) MCF=(M-1)(10^5)/H												
	-7.2	→	→	→	+24.0	→	→	→				

.8 67.00

Gunnex Vekol 3.0 Hz

HEINRICHS GEOEX B270-68 LINE 4 SPD 1 LOOKING N47E 8-2-68 A= 1000 FEET

	60NW	50	40	30	20	10	0NW/SE	10	20	30	40	50	60SE	SURFACE
					1	2	3	4	5					
N														RHO/2PI
1	X	X	X	X95	X53	X~~60~~ 61 62	X~~51~~ 52 53	X33	X35	X	X	X	X	
2	X	X	X	X123	X30	X62	X~~81~~ 82 83	X46	X46	X55	X	X	X	
3	X	X	X154	X30	X44	X78	X67	X54	X61	X61	X	X	X	
4	X	X	X	X54	X44	X61	X	X87	X67	X61	X	X	X	
5	X	X	X	X76	X69	X	X	X107	X--	X	X	X	X	
6	X	X	X	X	X108	X	X	X	X--	X	X	X	X	
	+23	+6	+1	+25	+30	+3	0	+6	0	+19	+24	+26	-11	

	60NW	50	40	30	20	10	0NW/SE	10	20	30	40	50	60SE	SURFACE
					1	2	3	4	5					
N														PFE
1	X	X	X	X1.2	X1.9	X2.0 1.4	X1.5 .9	X2.9	X3.2	X	X	X	X	
2	X	X	X	X1.9	X2.2	X1.9	X3.3 1.8	X4.3	X6.0	X6.2	X	X	X	
3	X	X	X2.5	X4.2	X3.1	X2.9	X7.0	X6.7	X9.1	X7.1	X	X	X	
4	X	X	X	X6.4	X7.2	X5.0	X	X10.4	X12.9	X9.1	X	X	X	
5	X	X	X	X6.1	X9.3	X	X	X12.6	X--	X	X	X	X	
6	X	X	X	X	X7.7	X	X	X	X--	X	X	X	X	

1 2 3 4 5

60NW 50 40 30 20 10 0NW/SE 10 20 30 40 50 60SE SURFACE

=30 NE line 0
[illegible] Gunnex Sta

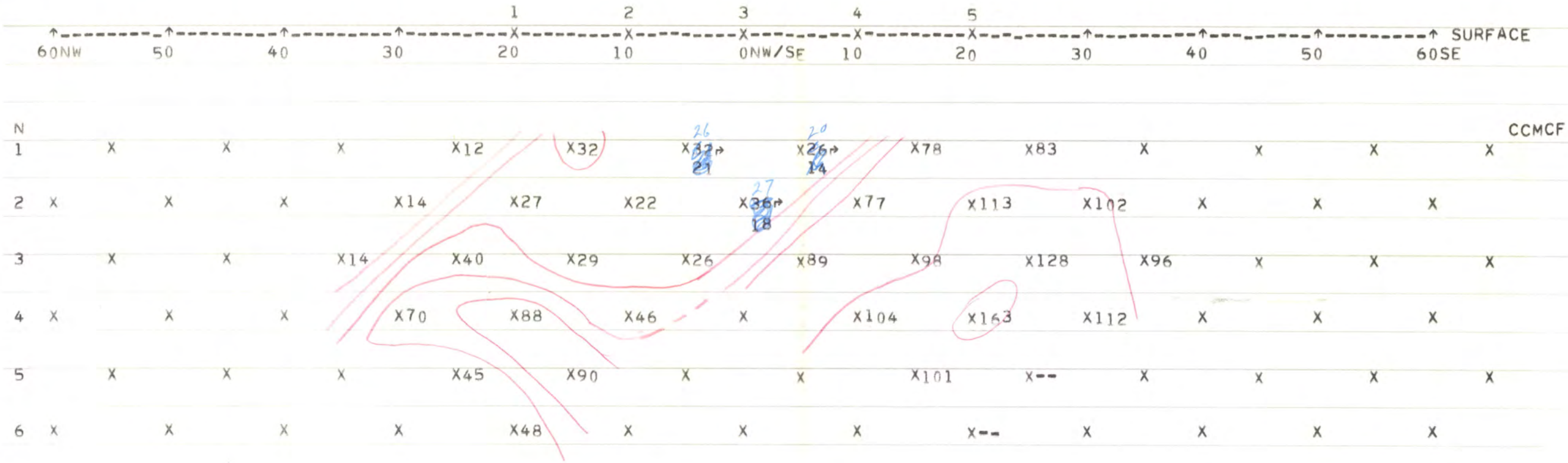
N																		MCF
1		X		X		X		X13		X35		X34→ 23		X30→ 17		X88		X92		X		X		X		X
2	X		X		X		X16		X72		X31		X40→ 22		X94		X130		X113		X		X		X	
3		X		X		X17		X141		X70		X38		X105		X125		X148		X116		X		X		X
4	X		X		X		X118		X163		X83		X		X120		X193		X148		X		X		X	
5		X		X		X		X81		X135		X		X		X117		X--		X		X		X		X
6	X		X		X		X		X72		X		X		X		X--		X		X		X		X	

1 2 3 4 5

60NW 50 40 30 20 10 0NW/SE 10 20 30 40 50 60SE SURFACE

N																		CCPFE
1		X		X		X		X1.1		X1.7		X~~1.9~~→ ~~1.3~~ 1.6		X~~1.3~~→ ~~.7~~ 1.0		X2.6		X2.9		X		X		X		X
2	X		X		X		X1.7		X.8		X1.4		X~~2.9~~→ ~~1.5~~ 2.2		X3.6		X5.2		X5.6		X		X		X	
3		X		X		X2.2		X1.2		X1.3		X2.1		X6.0		X5.3		X7.8		X5.9		X		X		X
4	X		X		X		X3.8		X3.9		X2.8		X		X9.0		X10.9		X6.9		X		X		X	
5		X		X		X		X3.4		X6.2		X		X		X10.9		X--		X		X		X		X
6	X		X		X		X		X5.1		X		X		X		X--		X		X		X		X	

10028CD


1 2 3 4 5
SURFACE
60NW 50 40 30 20 10 0NW/SE 10 20 30 40 50 60SE
N
CCMCF
1 X X X X12 X32 X32 X26 X78 X83 X X X X
2 X X X X14 X27 X22 X36 X77 X113 X102 X X X
3 X X X14 X40 X29 X26 X89 X98 X128 X96 X X X
4 X X X X70 X88 X46 X X104 X163 X112 X X X
5 X X X X45 X90 X X X101 X-- X X X X
6 X X X X X48 X X X X-- X X X X

[redacted] 3.0 Hz

HEINRICHS GEOEX B270-68 LINE 7 [redacted] SPD 2 LOOKING N36W 8-30-68 A= 500 FEET

Vpk-1

	40SW	35	30	25	20	15	10SW	5	0SW/SW	5	10	15	20SW	SURFACE
N					1	2	3	4	5					

RHO/2PI

1	X	X	X	X151	X105	X128	X61	X49	X30	X	X	X	X	
2	X	X	X	X227	X147	X61	X47	X107	X34	X38	X	X	X	
3	X	X	X167	X254	X63	X20	X74	X82	X55	X41	X	X	X	
4	X	X	X	X192	X91	X22	X	X55	X131	X66	X	X	X	
5	X	X	X	X68	X31	X	X	X84	X149	X	X	X	X	
6	X	X	X	X	X--	X	X	X	X99	X	X	X	X	

	40SW	35	30	25	20	15	10SW	5	0SW/SW	5	10	15	20SW	SURFACE
N					1	2	3	4	5					

PFE

1	X	X	X	X1.0	X1.1	X1.1	X2.0	X2.9	X1.8	X	X	X	X	
2	X	X	X	X.7	X.8	X1.4	X3.6	X5.0	X4.4	X-.2	X	X	X	
3	X	X	X-.4	X1.1	X4.2	X4.5	X6.7	X6.9	X2.5	X-.8	X	X	X	
4	X	X	X	X1.2	X2.6	X6.7	X	X8.2	X5.3	X3.4	X	X	X	
5	X	X	X	X2.4	X6.0	X	X	X7.1	X6.1	X	X	X	X	
6	X	X	X	X	X--	X	X	X	X6.9	X	X	X	X	

19 / 1072000 / 1 / 970

0589250

+14 -32 -9 -20 +4 +6 0 -19 +12 +16 +57 +53 +51

	40SW	35	30	25	20	15	10SW	5	0SW/SW	5	10	15	20SW	SURFACE
					1	2	3	4	5					

MCF

N														
1	X	X	X	X7	X10	X12 (9, 5)	X39 (32, 25)	X60	X61	X	X	X	X	
2	X	X	X	X3	X5	X23	X81 (75, 70)	X57	X129	X-6	X	X	X	
3	X	X	X-2	X5	X66	X231	X91	X84	X45	X-18	X	X	X	
4	X	X	X	X6	X29	X302	X	X315 (150)	X40	X51	X	X	X	
5	X	X	X	X36	X189	X	X	X84	X41	X	X	X	X	
6	X	X	X	X	X--	X	X	X	X70	X	X	X	X	

	40SW	35	30	25	20	15	10SW	5	0SW/SW	5	10	15	20SW	SURFACE
					1	2	3	4	5					

CCPFE

N														
1	X	X	X	X1.0	X1.1	X1.6 (.6)	X2.6 (1.4)	X2.9	X1.8	X	X	X	X	
2	X	X	X	X.7	X.8	X1.3	X3.9 (3.0)	X5.0	X4.2	X-.4	X	X	X	
3	X	X	X	X-.4	X1.1	X4.0	X3.7	X6.6	X6.8	X2.3	X-1.1	X	X	X
4	X	X	X	X1.1	X2.4	X5.4	X	X20.0	X5.1	X3.1	X	X	X	
5	X	X	X	X1.9	X4.5	X	X	X6.7	X5.9	X	X	X	X	
6	X	X	X	X	X--	X	X	X	X6.4	X	X	X	X	

	40SW	35	30	25	20	15	10SW	5	0SW/SW	5	10	15	20SW	SURFACE
					1	2	3	4	5					
N														CCMCF
1	X	X	X	X7	X10	X12→ 5	X39→ 25	X59	X59	X	X	X	X	
2	X	X	X	X3	X5	X21	X79→ 68	X5	X124	X-10	X	X	X	
3	X	X	X-3	X5	X63	X187	X89	X83	X41	X-26	X	X	X	
4	X	X	X	X6	X26	X241	X	X329	X39	X46	X	X	X	
5	X	X	X	X28	X144	X	X	X80	X39	X	X	X	X	
6	X	X	X	X	X1000	X	X	X	X65	X	X	X	X	

0589292

Gunnex Vekol 3.0

HEINRICHS GEOEX B270-68 LINE 9 SPR) LOOKING N37W 8-23-68 VEKOL A= 1000 FEET

1 2 3 4 5

↑----------↑----------↑----------↑----------X----------X----------X----------X----------X----------↑----------↑----------↑----------↑----------↑ SURFACE

60SW 50 40 30 20 10 0SW/NE 10 20 30 40 50 60NE

RHO/2PI

N															
1	X	X	X	X218	X88	X69	X67	X67	X115	X	X	X	X		
1															
2	X	X	X	X460	X72	X31	X98	X98	X114	X86	X118	X	X	X	
2															
3	X	X	X1044	X138	X22	X40	X148	X142	X94	X139	X	X	X		
4	X	X	X	X376	X--	X30	X	X171	X160	X118	X	X	X		
5	X	X	X	X91	X--	X	X	X189	X201	X	X	X	X		
6	X	X	X	X	X--	X	X	X	X235	X	X	X	X		

1 2 3 4 5

↑----------↑----------↑----------↑----------X----------X----------X----------X----------X----------↑----------↑----------↑----------↑----------↑ SURFACE

60SW 50 40 30 20 10 0SW/NE 10 20 30 40 50 60NE

PFE

N															
1	X	X	X	X1.8	X-2.1	X6.2	X5.5	X5.5	X1.2	X1.5	X	X	X	X	
1															
2	X	X	X	X3.9	X4.4	X3.2	X7.2	X7.2	X6.9	X1.0	X1.6	X	X	X	
2															
3	X	X	X4.2	X3.9	X8.6	X5.2	X8.6	X7.6	X1.1	X1.3	X	X	X		
4	X	X	X	X7.1	X--	X11.0	X	X9.3	X8.1	X1.5	X	X	X		
5	X	X	X	X11.2	X--	X	X	X10.3	X8.9	X	X	X	X		
6	X	X	X	X	X--	X	X	X	X11.2	X	X	X	X		

015390

? ? -25 +1 -4 -8 0 -9 -16 +8 +2 -3 +9

	60SW	50	40	30	20	10	0SW/NE	10	20	30	40	50	60NE
					1	2	3	4	5				SURFACE
N													MCF
1 1	X	X	X	X8	X-24	X~~89~~ ~~70~~ 80	X~~82~~ ~~88~~ 85	X18	X13	X	X	X	X
2 2	X	X	X	X8	X60	X102	X~~74~~ ~~69~~ 72	X61	X12	X14	X	X	X
3	X	X	X4	X28	X395	X130	X58	X53	X12	X9	X	X	X
4	X	X	X	X19	X--	X368	X	X54	X51	X13	X	X	X
5	X	X	X	X123	X--	XX	X	X55	X44	X	X	X	X
6	X	X	X	X	X--	X	X	X	X48	X	X	X	X

	60SW	50	40	30	20	10
					1	2
N						
1 1	X	X	X	X1.8	X-2.2	
2 2	X	X	X	X3.8	X3.9	X1.8
3	X	X	X4.2	X3.4	X4.0	X3.0
4	X	X	X	X6.9	X--	X5.5
5	X	X	X	X9.0	X--	X
6	X	X	X	X	X--	X

815699

Moore Business Forms, Inc.

JOB 270-68 LINE 1S SPREAD 1

LOOKING N 37 W DATE June 24, 68 A= 1000

CENTER 0 LABEL SW/NE FREQ. 3.0

COUPLING Yes

Vekah

no run

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT VEROK
LINE 1 HALF SW SP. 1 DATE 2-24

PAGE 3

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10	10-20	→	20-30	→	→	30-40	→	→	→
RANGE										
DC 1	28.6	~~[illegible]~~	4.40	66.2	20.8	1.72	50.6	17.9	~~[illegible]~~	.64 - .745
DC 2	27.1	86.0	4.59	66.3	21.3	1.52	48.6	15.7	7.24	.635 - .76
DC 3	28.6	85.5	4.38	66.2	20.8	1.73	50.8	18.1	7.44	.66 - .76
DC 4		86.0	4.55			1.51	48.5	15.6	7.22	.63 - .80
DC 5			4.45			1.74			7.44	.60 - .82
DC 6			4.48			1.49			—	.58 - .82
DC 7			4.52							.59 - .82
DC 8			4.44							.56 - .86
DC AVG.	27.85	85.75	4.54	66.25	21.5	1.62	49.65	16.85	7.33	0.703
AC 1	27.8	84.0	4.44	65.0	20.6	1.60	48.6	16.5	7.18	0.685
AC 2	27.8	84.0	4.44	65.0	20.6	1.60	48.6	16.5	7.18	0.685
AC AVG.	27.8	84.0	4.44	65.0	20.6	1.60	48.6	16.5	7.18	.685
S.P.	-7.9	+14.4	→	-14.8	→	→	+21.1			
AC NOISE	.05	.05 →								
POT RES.						.154				

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT VEROL
LINE 1 HALF SW SP. 1 DATE 2-24

PAGE 4

SEND	1-2	2-3	3-4	4-5		1-2	2-3	3-4	4-5	CHK
RECEIVE	40-50					50			60	
RANGE										~~47.3~~
DC 1	15.6	9.6	5.97			4.59	3.82	2.31		47.4
DC 2	15.6	9.4	4.24			5.05	3.53	1.82		47.3
DC 3	15.7	9.6	5.95			4.58	3.83	2.33		
DC 4	15.6	9.4	4.24			5.09	3.55	1.86		
DC 5			5.97			4.55		2.35		
DC 6						5.10		1.85		
DC 7						4.94		2.30		
DC 8								1.82		
DC AVG.	15.62	9.5	5.1			4.82	3.68	2.082		
AC 1	15.3	9.3	5.0	.540		4.72	3.60	2.02	.230	46.8
AC 2	15.3	9.3	4.95	.540		4.72	3.60	2.02		46.8
AC AVG.	15.3	9.3	4.975							
S.P.	-14.5					+35.7				
AC NOISE	.05									
POT RES.										

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 1 HALF SW SP. 1 DATE JUN 24 68

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE						*				*
VOLTAGE	420	410	420	350	410	420	440	350	410	420
CURRENT	700	900	700	1200	900	700	1200	1200	900	700
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE	→	→	→	→	→	→	→	→		2-3
RANGE				*	[redacted]			*		
VOLTAGE	440	350	410	420	440	350	410	420		160
CURRENT	1200	1200	900	700	1200	1200	900	700		500

FREQUENCIES .05 3.0

SENDER NO. 9662-5

OPERATOR DAVE-S.

RECEIVER NO.

OPERATOR PHIL M

COMMENTS: ALL CURRENTS IN MA.

* .15 DC

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE

PROJECT Vekol

LINE 1S HALF NE SP. 1 DATE 6/21

SEND		2-2	1-2							
RECEIVE										
RANGE		49.0	8.20							
DC 1		46.8	7.1							
DC 2		49.0	8.3							
DC 3		46.8	6.85							
DC 4			8.45							
DC 5			6.78							
DC 6										
DC 7										
DC 8										
DC AVG.		47.9	7.64							
AC 1		48.0	7.66							
AC 2		48.0	7.66							
AC AVG.		48.0	7.66							
S.P.										
AC NOISE										
POT RES.										

replaced marked out data next Tape

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Hekol

LINE 1s HALF NE SP. 1 DATE 6-21

PAGE 1

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10	10-20	→	20-30	→	→	30-40	→	→	→
RANGE										
DC 1	116	48.0	7.67	660	140	29.2	15.5	28.0	12.5	~~4.15~~
DC 2	117	45.4	7.80	646	143	28.3	16.1	29.2	13.3	2.9 4.6
DC 3	116	47.1	7.63	660	140	29.7	15.5	28.0	12.5	3.8 4.6
DC 4		45.4	7.80			26.4			13.4	3.8 4.6
DC 5						29.7			12.4	3.8 4.6
DC 6						27.2				
DC 7										
DC 8										
DC AVG.	116.5	93.5	~~14.94~~	653	141.5	28.46	15.8	28.6	25.82	4.2
AC 1	115.5	48.0	7.67	645	141	28.0	~~15.3~~	28.0	12.5	4.03
AC 2	115.5	48.0	7.63	645	141	28.0	15.5	27.8	12.5	4.03
AC AVG.	115.5	48.0	7.63	645	141		15.5			
S.P.	-22.8	-22	→	+10.5	→	→	1.3			
AC NOISE	.06									.15
POT RES.										

015 ok

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT VEROK

LINE 1 HALF NE SP. 1 DATE 6-21

PAGE 2

SEND	1-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE	40-50				50-60					↓
RANGE									53.2	53.4
DC 1	75 77	25 25	162 175	71 64					53.2	53.4
DC 2	77 82	231 249	163 172	75 61						
DC 3	70 88	255 245	165 170	80 55						
DC 4	65 95		169 170	83 55						
DC 5	60 95		168 170	78 58						
DC 6	61 91		168 172	72 70						
DC 7	63 90		163 175	75 62						
DC 8	63 95		162 176	88						
DC AVG.	.78	2.51	1.68	.685						
AC 1	.75	2.38	1.58	.64					53.0	53.2
AC 2	.75	2.38	1.58	.64					53.0	53.2
AC AVG.	8									
S.P.	+4.1									
AC NOISE	.05									
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 1 HALF NE SP. 1 DATE JUN 22

PAGE

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE										*
VOLTAGE	480	400	480	420	400	490	460	470	410	490
CURRENT	1200	1200	1200	900	1200	1200	700	900	1200	1200
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL	CAL
RECEIVE	→	→	→	→	→	→	→	→	3-4	1-2
RANGE	*	*	*	*	*					
VOLTAGE	460	480	410	490					410	410
CURRENT	700	900	1200	1200					500MA	500MA

FREQUENCIES 105 3.0

SENDER NO. 9662-S

OPERATOR DAVE S

RECEIVER NO.

OPERATOR PHIL M

COMMENTS: ALL CURRENTS IN MA.

* .15 D.C.

JOB B 270 68 (Vekol) LINE 6 SPREAD 1

LOOKING N 37 W DATE 8/14/68 A = 1000'

CENTER 0.0 LABEL SW/NE FREQ. 3.0

COUPLING Yes

PFE

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE 1

PROJECT GUNNEX B27068

LINE 6 HALF S53W SP. 1 DATE 8/14/68

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	0-1 SW	1-2 SW		2-3 SW			3-4 SW			
RANGE	X1	X1	X1	X1	X1	X1	X1	X.1	X.1	X.1
DC 1	3.0 -4.2	2.4 5.7	2.8 7.5	8.8 -0.8	4.0 7.7	8.9 14.6	2.8 -0.3	-7.6 18.8	5.6 14.0	16.8 12.4
DC 2	5.1 -1.9	2.7 5.0	2.0 7.7	9.7 1.1	8.1 9.9	-1.8 17.1	4.8 1.3	20.0 40.0	22.4 33.2	16.0 6.0
DC 3	4.6 -3.0	2.7 5.0	2.1 7.1	10.1 -0.1	8.8 9.0	2.1 16.8	2.3 -2.1	18.4 34.8	-8.0 22.8	15.6 16.4
DC 4	4.8 -3.7	3.4 5.7	2.3 7.6	8.0 0.0	6.6 11.3	4.1 19.3	1.5 -7.1	4.0 36.0	2.4 34.0	1.2 12.4
DC 5	4.0 -2.0	3.1 6.0	1.1 8.9	11.3 2.9	6.8 10.1	4.0 15.0	1.7 -5.9	7.2 0.8	0.0 32.0	-12.0 31.6
DC 6		2.6 6.3	0.5 9.9	11.4 1.9	8.5 6.9	3.0 9.0	0.6 -7.2	-1.6 4.0	-7.6 26.4	-0.4 34.8
DC 7		2.3 5.1		10.4 1.5	4.6 13.7	1.8 6.6	1.2 -1.1	5.2 -3.2	9.6 34.8	2.4 36.4
DC 8								0.8 -0.8	-5.2 33.2	-18.8 24.0
DC AVG.	~~-4.2~~	~~4.2~~	~~5.0~~	~~5.4~~	~~7.3~~	~~7.5~~	~~-0.4~~	~~11.0~~	~~15.6~~	~~11.3~~
AC 1	73.5	23.5	17.1	49.3	25.1	15.8	22.3	4.57	4.23	4.16
AC 2	-0.1	-0.1	-0.3	+0.1	+0.1	-0.1	0.0	0.0	0.0	-0.2
AC AVG.										
S.P.	-51	+2		-4			-8			
AC NOISE	.02	.02		.03			.04			
POT RES.	3K	4K		4K			35K			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE 2

PROJECT GUNNEX B27068

LINE 6 HALF S53W SP. 1 DATE 2

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	4-5SW				5-6SW					2 3
RANGE	X.1	X.1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	0.4 2.9	-11.6 36.8	49.2 -8.4	31.6 -14.4	-3.0 3.5	43.6 -10.4	14.4 12.4	4.4 47.2		1.0 -2.1
DC 2	-5.8 8.7	-59.2 47.6	39.2 -15.6	22.8 -5.2	-8.2 5.0	27.2 -19.6	8.2 16.4	-12.4 44.0		1.0 -2.1
DC 3	-10.0 10.8	-38.0 56.0	64.0 34.0	22.2 -4.4	-1.2 5.0	41.6 -5.2	-4.8 28.4	-7.6 53.6		1.0 -2.4
DC 4	10.8 -9.7	-51.6 39.6	23.2 6.4	24.0 -4.8	2.0 9.0	36.4 0.8	0.4 26.4	-16.8 52.0		0.9 -2.3
DC 5	7.9 -7.0	-36.0 44.0	29.2 -9.6	13.6 1.6	1.0 9.1	23.2 11.6	-19.2 40.4	-11.6 41.6		0.9 -2.4
DC 6	5.0 -4.1	-32.4 57.6	14.8 -4.0	16.8 -2.0	-4.9 5.3	0.4 15.2	-0.4 28.8	-19.2 52.8		
DC 7	4.1 -4.3	-41.6 20.4	0.8 20.0	23.6 -7.6	-5.9 9.9	3.6 28.0	-0.4 9.2	11.6 39.2		
DC 8	4.0 -3.3	-52.0 81.2	0.0 12.0	28.0 -8.4	-3.9 9.2	-11.6 38.0	-11.2 46.8			
DC AVG.	~~0.7~~	~~7.9~~	~~15.9~~	~~8.6~~	~~2.0~~	~~13.4~~	~~12.6~~	~~20.3~~		
AC 1	4.43	11.2	11.0	1.06	10.2	2.54	2.88	3.04		102
AC 2	-0.2	-0.1	+0.2	-0.2	+0.2	0.0	-0.1	-0.2		-0.3
AC AVG.										
S.P.	+3				+12					
AC NOISE	.02				.04					
POT RES.	3.8k				4k					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 6 HALF 8 SP. 1 DATE AUG 1976

PAGE AUG/14 AUG

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE										
RANGE										
VOLTAGE	112x4	70x4	110x4	126x4	146x4	138x4	88x4	126x4	144x4	150x4
CURRENT	4.0	2.0	4.0	2.0	4.0	5.0	1.0	2.0	4.0	5.5
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	86x4	122x4	142x4	144x4	140x4	145x4	147x4	142x4		100x4
CURRENT	1.0	2.0	4.0	5.4	1.8	2.4	4.2	5.4		1.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVE S

RECEIVER NO. MK 4 B

OPERATOR DON B.

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 6 HALF A153E SP. 1 DATE 8/17/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	0-1NE	1-2NE		2-3NE			3-4NE			
RANGE	X1	X1	X.1	X10	X1	X.1	X10	X1	X.1	X.1
DC 1	10.9 -8.8	2.0 0.0	-2.1 -1.7	0.2 2.1	0.4 5.1	-18.8 24.0	-0.1 0.8	-1.1 5.1	-0.7 3.4	35.6 -4.4
DC 2	9.9 -3.0	2.5 3.1	8.9 -2.9	0.6 2.7	-0.3 4.4	14.4 0.0	0.0 0.5	-1.2 8.8	-8.7 -1.0	44.4 -28.0
DC 3	13.6 -7.2	-1.2 6.2	14.3 0.8	0.6 3.0	-2.5 6.0	11.6 -9.6	0.2 0.5	-1.9 10.0	-4.1 4.6	59.2 -24.4
DC 4	6.1 0.1	-3.8 8.7	2.8 7.1	0.1 2.6	-4.3 10.0	8.4 -6.0	0.1 0.1	-3.2 7.8	-0.5 2.0	56.0 -6.0
DC 5	13.1 -2.0	-10.1 10.7	22.9 [illegible]	-0.1 2.1	-6.1 5.3	-11.6 -6.8	0.5 0.5	-2.1 5.0	8.0 2.9	60.0 0.0
DC 6	12.9 -1.9	-8.4 8.9	9.0 25.0	-0.1 2.5	-2.9 -1.7	-18.8 4.0	0.1 0.4	1.5 3.0	4.9 -8.1	72.8 -28.8
DC 7			10.0 4.3		-0.9 -1.0	14.8 14.0		1.1 2.4	-7.6 -15.0	69.2 -6.4
DC 8					3.6 3.2	0.0 12.0			-6.9 -0.5	
DC AVG.										
AC 1	11.7	35.7	4.2	112.0	16.1	3.12	163.0	30.5	7.47	1.76
AC 2	0.0	-0.2	0.0	-0.2	-0.1	-0.1	-0.1	-0.3	-0.1	-0.2
AC AVG.										
S.P.	-35	-3		-1			+6			
AC NOISE	.03	.03		.04			.04			
POT RES.	2k	2.5		1.5k			1.5k			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX

LINE 6 HALF N53E SP. 1 DATE 8/13/68

PAGE 4

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5NF				5-6NF					3 4
RANGE	X1	X1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	2.5 -0.2	2.2 1.4	10.0 -0.4	20.0 -8.1	0.3 0.3	10.4 -24.0	15.2 -19.6	-20.8 37.2		1.8 0.1
DC 2	2.4 1.0	2.0 4.2	-1.8 -5.4	40.0 -32.0	5.1 -3.3	22.0 -20.0	12.0 -20.4	-29.6 49.2		1.8 0.1
DC 3	2.0 0.8	0.8 1.7	9.8 -16.9	56.4 -44.4	6.4 -6.9	27.6 -17.6	20.0 -21.6	-40.0 56.8		
DC 4	2.0 1.3	0.0 1.8	10.1 5.1	62.4 -40.8	5.3 -3.7	30.4 -20.4	36.8 -6.4	-52.4 50.8		
DC 5	1.4 1.2	1.9 1.8	3.9 11.0	48.8 -15.2	6.0 -1.5	25.6 -20.4	46.0 -9.2	-26.4 40.4		
DC 6	1.1 0.9	1.5 2.5	-0.2 12.1	20.0 1.2	1.6 -0.1	25.6 -25.2	47.2 -18.0	0.0 5.6		
DC 7		1.8 2.1	-0.8 5.1	17.6 2.4	0.6 -2.3	28.0 -26.0	36.4 -28.8	26.0 -18.8		
DC 8			5.9 -2.9	19.2 33.6	5.0 -4.0	30.8 -30.4	21.2 -22.4	43.2 -41.6		
DC AVG.			2.7	16.3	0.6	1.4	5.5	4.372		
AC 1	40.8	13.2	3.22	1.70	16.2	6.98	2.13	1.18		100.0
AC 2	+0.1	+0.2	+0.2	+0.3	-0.1	-0.5	+0.1	-0.2		+0.2
AC AVG.										
S.P.	+28				-51					
AC NOISE	.04				.03					
POT RES.	1.6K				5K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VERCOL

LINE 6 HALF N SP. 1 DATE AUG 13/68

PAGE

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	→	→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	90X4	124X4	90X4	109X4	124X4	88X4	108X4	110X4	123X4	88X4
CURRENT	1.0	2.0	1.0	3.0	2.0	1.0	4.0	3.0	2.0	1.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE	→	→	→	→	→	→	→	→		
RANGE										3-4
VOLTAGE	136X4	136X4	118X4	155X4	128X4	130X4	116X4	150X4		68X4
CURRENT	5.0	4.0	2.0	2.0	5.0	4.0	2.0	2.0		1.0

FREQUENCIES .05 3.0

SENDER NO. TT 1

OPERATOR DAVES

RECEIVER NO. MK4 B

OPERATOR DON B

COMMENTS:

Recopied

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 6 HALF SSW SP. 1 DATE 8/14/68

PAGE 1

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	0 3	3 4	4 5
RECEIVE	0-1 SW	1-2 SW		2-3 SW			3-4 SW			
RANGE	X1	X1	X1	X1	X1	X1	X1	X.1	X.1	X.1
DC 1	3.0 -4.2	2.4 5.7	2.6 7.5	8.8 -0.8	4.0 7.7	8.9 14.6	2.8 -0.3	-1.9 4.7 X4	1.4 3.5 X4	4.2 3.1 X4
DC 2	5.1 -1.9	2.7 5.0	-0.0 7.7	9.7 1.1	8.1 9.9	-1.8 17.1	4.8 1.3	5.0 10.0	5.6 8.3	4.0 1.5
DC 3	4.6 -3.0	3.4 5.7	2.1 7.1	10.1 -0.1	8.8 9.0	2.1 16.8	2.3 -2.1	4.6 8.7	-2.0 5.7	3.9 4.1
DC 4	4.8 -3.7	3.1 6.0	2.3 7.6	8.0 0.0	6.6 11.3	4.1 19.3	1.5 -7.1	1.0 9.0	0.6 8.5	0.3 3.1
DC 5	4.8 -2.0	2.6 6.3	1.1 8.9	11.3 2.9	6.8 10.1	4.0 15.0	1.7 -5.9	1.8 0.2	0.0 8.0	-3.0 7.9
DC 6		2.3 5.1	0.5 9.9	11.4 1.9	8.5 6.9	3.0 9.0	0.6 -7.2	-0.4 1.0	-1.9 6.6	-0.1 8.7
DC 7				10.4 1.5	4.6 13.7	1.8 6.6	1.2 -1.1	1.3 -0.8	2.4 8.7	0.6 9.1
DC 8								0.2 -0.2	-1.3 8.3	-4.7 6.0
DC AVG.										
AC 1	73.5	23.5	17.1	49.3	25.1	15.8	22.3	4.57	4.23	4.16
AC 2	-0.1	-0.1	-0.3	+0.1	+0.1	-0.1	0.0	0.0	0.0	-0.2
AC AVG.										
S.P.	-51	+2		-4			-8			
AC NOISE	.02	.02		.07			.04			
POT RES.	3k	4k		4k			3.5k			

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 6 HALF 553W SP. 1 DATE 8/14/68

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	4-55W				5-65W					2 3
RANGE	X.1	X.1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	0.4 2.9	-2.9 9.2 X4	12.3 -2.1 X4	7.9 -3.6 X4	-3.0 3.5	10.9 -2.4	3.6 3.1 X4	1.1 11.8 X4	1.0 -2.1	0.9 -1.3
DC 2	-5.8 8.7	-14.8 16.9	8.8 -3.9	5.7 -1.3	-8.2 5.0	6.8 -4.4	2.1 4.1	-3.1 11.0	1.0 -2.1	0.9 -1.3
DC 3	-10.0 10.8	-9.5 14.0	16.0 -8.5	5.3 -1.1	-1.2 5.0	10.4 -1.3	-1.2 7.1	-1.9 13.4	1.0 -2.4	0.9 0.1
DC 4	10.8 -9.7	-12.9 9.9	5.8 6.6	6.0 -1.2	2.0 4.0	9.1 0.2	0.1 6.6	-8.2 13.0	0.9 -2.3	2.6 0.1
DC 5	7.9 -7.0	-9.0 11.0	7.3 -2.4	3.4 0.4	1.0 9.1	5.8 2.8	-4.8 10.1	2.9 10.4	0.9 -2.4	2.6 0.1
DC 6	5.0 -4.1	-2.1 14.4	3.7 -1.0	4.2 -0.5	-4.9 5.3	2.1 3.8	-0.1 7.2	-2.5 11.4		
DC 7	4.1 -4.3	-10.4 17.6	0.2 5.0	5.8 -1.9	-5.9 9.9	2.9 7.0	-0.2 2.3	-3.3 13.2		
DC 8	4.0 -3.3	-3.0 22.3	2.0 3.0	3.0 -2.1	-3.8 9.2	-2.9 9.5	-2.6 11.7	2.9 9.8		
DC AVG.										
AC 1	4.43	11.2	11.0	1.06	10.2	2.54	2.88	3.04		102
AC 2	-0.2	-0.1	+0.2	-0.2	+0.2	0.0	-0.1	-0.2		-0.3
AC AVG.										
S.P.	+3				-12					
AC NOISE	-02				.04					
POT RES.	30K				4K					

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE 3

PROJECT GUNNEX 0270-68

LINE 6 HALF N53E SP. 1 DATE 8/13/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	0-1NE	1-2NE		2-3NE			3-4NE			
RANGE	X1	X1	X.1	X10	X1	X.1	X10	X1	X.1	X.1
DC 1	10.9 -8.8	2.0 0.0	-2.1 -1.7	0.2 3.1	0.4 5.1	-4.7 6.0 X4	-0.1 0.8	-1.1 5.1	-0.7 3.4	8.9 -1.1 X4
DC 2	9.9 -3.0	2.5 3.1	8.9 -2.9	0.6 2.7	-0.3 4.4	3.6 0.0	0.0 0.5	-1.2 8.8	-8.7 -1.0	11.1 -7.0
DC 3	13.6 -7.2	-1.2 6.2	14.3 0.8	0.6 3.0	-2.5 6.0	2.9 -2.4	0.2 0.5	-1.9 10.0	-4.1 4.6	14.8 -6.1
DC 4	5.7 0.1	-3.8 8.7	2.8 7.1	0.1 2.6	-4.3 10.0	2.1 -1.5	0.1 0.1	-3.2 7.8	-0.5 2.0	14.0 -15.0
DC 5	13.1 -2.0	-10.1 10.7	22.8 -21.0	-0.1 2.1	-6.1 5.3	-2.9 -1.7	0.5 0.5	-2.1 5.0	8.0 2.9	13.4 -15.0
DC 6	12.9 -1.9	-8.4 8.9	9.8 25.0	-0.1 2.5	-2.9 5.0	-4.7 1.0	0.1 0.4	1.5 3.0	4.9 -8.1	15.0 0.0
DC 7			10.0 4.3		-0.9 -1.0	3.7 3.5		1.1 2.4	-4.6 -15.0	18.2 -7.2
DC 8			-9.7		3.6 3.2	0.0 3.0			-6.9 -0.5	17.3 -1.6
DC AVG.										
AC 1	11.7	35.7	4.2	112.0	16.1	3.12	163.0	30.5	7.47	1.76
AC 2	0.0	-0.2	0.0	-0.2	-0.1	-0.1	-0.1	-0.3	-0.1	-0.2
AC AVG.										
S.P.	-35		-3	-1			+6			
AC NOISE	.03		.03	.04			.04			
POT RES.	2K		2.5	1.5K			1.5K			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX B230 68

LINE 6 HALF N53E SP. 1 DATE 8/13/68

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5NE				5-6NE					3 4
RANGE	X1	X1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	2.5 -0.2	2.2 1.4	10.0 -0.4	5.0 -2.1 X4	0.3 0.5	2.6 -6.0 X4	3.8 -4.9 X4	-5.2 9.3 X4		1.8 0.1
DC 2	2.4 1.0	2.0 4.2	-1.8 -5.4	10.0 -8.0	5.1 -3.5	5.5 -5.0	3.0 -5.1	-7.4 12.3		1.8 0.1
DC 3	2.0 0.8	0.8 1.7	9.8 -11.9	14.1 -11.1	6.4 -6.9	6.9 -4.4	5.0 -5.4	-10.0 14.2		
DC 4	2.0 1.3	0.0 1.8	10.1 5.1	15.6 -10.2	5.5 -3.7	7.6 -5.1	9.2 -1.6	-13.1 12.7		
DC 5	1.4 1.2	1.9 1.8	3.9 11.0	12.2 -3.8	6.0 -1.5	6.4 -5.1	11.5 -2.3	-6.6 10.1		
DC 6	1.1 0.9	1.5 2.5	-0.2 12.1	5.0 0.4	1.6 -0.1	6.4 -6.3	11.8 -4.5	0.0 1.4		
DC 7		1.8 2.1	-2.8 5.1	4.4 0.6	0.6 -2.5	7.0 -6.5	9.1 -7.2	6.5 -4.7		
DC 8			5.9 -7.9	4.8 8.4	5.0 +4.0	7.7 -7.6	5.3 -5.6	10.8 -10.4		
DC AVG.										
AC 1	40.8	13.2	3.23	1.70	16.2	6.98	2.13	1.18		100.0
AC 2	+0.1	+0.2	+0.2	+0.3	-0.1	-0.5	+0.1	-0.2		+0.2
AC AVG.										
S.P.	+28				-51					
AC NOISE	.04				.03					
POT RES.	1.6K				5K					

HEINRICHS GEOEX 8270-68 LINE 6 SPD 1 LOOKING N37W 8-14-68 A= 1000 FEET

4.000	2.000	4.000	2.000	4.000	5.000	1.000	2.000	4.000	5.500	I	1.000	2.000	4.000	5.400	1.800	2.400	4.200	5.400	1.000		
30	24	28	88	40	89	28	-76	56	168	DC	4	-116	492	316	-30	436	144	44	10	LEFT	
-42	57	75	-8	77	146	-3	188	140	124		29	368	-84	-144	35	-104	124	472	-21	SIDE	
51	27	20	97	81	-18	48	200	224	160		-58	-592	392	228	-82	272	82	-124	10		
-19	50	77	11	99	171	13	400	332	60		87	476	-156	-52	50	-196	164	440	-21		
46	27	21	101	88	21	23	184	-80	156		-100	-380	640	222	-12	416	-48	-76	10		
-30	50	71	-1	90	168	-21	348	228	164		108	560	340	-44	50	-52	284	536	-24		
48	34	23	80	66	41	15	40	24	12		108	-516	232	240	20	364	4	-168	9		
-37	57	76	0	113	193	-71	360	340	124		-97	396	64	-48	90	8	264	520	-23		
40	31	11	113	68	40	17	72	0	-120		79	-360	292	136	10	232	-192	-116	9		
-20	60	89	29	101	150	-59	8	320	316		-70	440	-96	16	91	116	404	416	-24		
	26	5	114	85	30	6	-16	-76	-4		50	-324	148	168	-49	4	-4	-132			
	63	99	19	69	90	-72	40	264	348		-41	576	-40	-20	53	152	288	528			
	23		104	46	18	12	52	96	24		41	-416	8	236	-59	36	-4	116			
	51		15	137	66	-11	-32	348	364		-43	704	200	-76	99	280	92	392			
							8	-52	-188		40	-520	0	280	-39	-116	-112				
							-8	332	240		-33	812	120	-84	97	380	468				
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6			
.7	4.2	4.8	5.5	8.2	8.7	-.6	12.1	15.3	11.6	PFEA	.8	5.1	15.0	8.4	1.9	12.1	11.0	20.2	-.6		
73.50	23.50	17.10	49.30	25.10	15.80	22.30	4.570	4.230	4.160	AC1	4.430	11.20	11.00	1.060	10.20	2.540	2.880	3.040	102.0		
-.1	-.1	-.3	.1	.1	-.1	0.0	0.0	0.0	-.2	AC2	-.2	-.1	.2	-.2	.2	0.0	-.1	-.2	-.3		
73.46	23.49	17.07	49.32	25.11	15.79	22.30	4.570	4.230	4.156	ACA	4.426	11.19	11.01	1.059	10.21	2.540	2.879	3.037	101.8		
54.77	36.23	53.05	76.94	80.40	101.6	65.59	30.30	36.08	49.95	RHO	52.87	174.1	187.1	22.03	171.0	70.22	78.83	112.1	.982	DC CAL	
1.2	4.7	5.5	5.9	8.7	9.2	-.1	12.6	15.8	12.2	PFE	1.4	5.6	15.4	9.0	2.3	12.6	11.6	20.8	.494	AC CAL	
23	130	103	77	108	91	-2	414	439	245	MCF	26	32	82	408	14	180	147	186			
.2	.3	.6	.1	.4	.6	.1	1.4	2.4	2.9	CPFE	.7	.3	.5	12.4	.3	1.9	2.6	2.5			
1.1	4.4	4.8	5.8	8.3	8.6	-.3	11.2	13.4	9.3	CCPFE	.7	5.3	14.9	-3.4	2.0	10.8	9.0	18.4			
19	122	91	75	103	85	-4	369	372	187	CCMCF	14	31	79	-156	12	153	114	164			

1.000	2.000	1.000	3.000	2.000	1.000	4.000	3.000	2.000	1.000	I	5.000	4.000	2.000	2.000	5.000	4.000	2.000	2.000	1.000		
109	20	-21	2	4	-188	-1	-11	-7	356	DC	25	22	100	200	3	104	152	-208	18	RIGHT	
-88	0	-17	31	51	240	8	51	34	-44		-2	14	-4	-81	5	-240	-196	372	1	SIDE	
99	25	89	6	-3	144	0	-12	-87	444		24	20	-18	400	51	220	120	-296			
-30	31	-29	27	44	0	5	88	-10	-280		10	42	-54	-320	-35	-200	-204	492			
136	-12	143	6	-25	116	2	-19	-41	592		20	8	98	564	64	276	200	-400			
7	62	8	30	60	-96	5	100	46	-244		8	17	-119	-444	-69	-176	-216	568			
-72	-38	28	1	-43	84	1	-32	-5	560		20	0	101	624	55	304	368	-524			
7	87	71	26	100	-60	1	78	20	-600		13	18	51	-408	-37	-204	-64	508			
61	-101	228	-1	-61	-116	5	-21	80	600		14	19	39	488	60	256	460	-264			
1	107	-210	21	53	-68	5	50	29	0		12	18	110	-152	-15	-204	-92	404			
131	-84	7	-1	-29	-188	1	15	49	728		11	15	-2	200	16	256	472	0			
-20	89	98	25	-17	40	4	30	-81	-288		9	25	121	12	-1	-252	-180	56			
129		250		-9	148		11	-46	692			18	-28	176	6	280	364	260			
-19		100		-10	140		24	-150	-64			21	51	24	-25	-260	-288	-188			
		43		36	0			-69				59	192	50	308	212	432				
				32	120			-5				-79	336	-40	-304	-224	-416				
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6			
4.1	1.2	6.9	1.4	1.1	2.3	.3	2.7	-1.6	17.7	PFEA	1.3	1.8	2.8	10.3	.7	1.8	6.1	7.4	.9		
11.70	35.70	4.200	112.0	16.10	3.120	163.0	30.50	7.470	1.760	AC1	40.80	13.20	3.230	1.700	16.20	6.980	2.130	1.180	100.0		
0.0	-.2	0.0	-.2	-.1	-.1	-.1	-.3	-.1	-.2	AC2	.1	.2	.2	.3	-.1	-.5	.1	-.2	.2		
11.70	35.66	4.200	111.9	16.09	3.118	162.9	30.45	7.466	1.758	ACA	40.82	13.21	3.233	1.703	16.19	6.963	2.131	1.179	100.1		
36.19	53.68	53.39	112.6	96.74	94.89	121.5	124.1	109.2	123.3	RHO	98.30	99.85	98.66	97.59	96.97	105.5	117.6	105.5	.999	DC CAL	
3.2	.4	6.0	.7	.3	1.5	-.5	2.0	-2.4	17.0	PFE	.4	.9	1.8	9.3	-.1	1.2	5.2	6.6	-.850	AC CAL	
69	8	113	6	3	16	-4	16	-22	138	MCF	4	9	18	95	-1	11	44	63			
.3	.2	.6	.1	.3	.7	.1	.2	.6	.9	CPFE	.3	.6	1.2	2.0	.7	1.1	1.5	2.7			
2.9	.3	5.4	.6	.0	.9	-.5	1.8	-2.9	16.1	CCPFE	.2	.2	.6	7.3	-.7	.1	3.7	4.0			
80	5	101	6	0	9	-4	14	-27	131	CCMCF	2	2	6	75	-8	1	31	38			

52333365

JOB B270-68 (Vekol) LINE 7 SPREAD 1

LOOKING ~~N/W~~ N36W DATE 8/16/68 A = 1000

CENTER ~~0 NE/SW~~ 0.0 LABEL ~~NE/SW 54°~~ SW/NE FREQ. 3.0

COUPLING

PFE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX 0270 68
LINE 2 HALF 554W SP. 1 DATE 8/18/68

PAGE 1

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	0-154W	1-2 5W		2-3 5W			3-4 5W			
RANGE	X1	X1	X1	X1	X.1	X.1	X1	X1	X.1	X.1
DC 1	8.2 4.9	3.7 4.1	12.3 0.5	33.2 -22.8	50.8 -24.4	8.0 24.4	-2.5 4.7	30.8 -18.0	36.8 -20.0	-47.2 24.8
DC 2	3.0 -1.8	3.7 3.3	7.5 8.0	33.6 -26.0	48.4 -35.2	22.4 43.6	-3.0 5.3	28.8 -19.6	74.8 16.0	-29.2 68.4
DC 3	5.9 -0.1	8.0 6.0	14.8 -7.0	32.4 -17.2	17.6 -12.0	0.4 0.4	-3.2 4.5	32.8 -21.2	17.6 8.0	10.8 75.2
DC 4	2.1 -1.1	8.5 2.1	16.2 0.1	24.0 -20.0	31.2 -24.0	26.4 0.4	-2.8 4.8	32.8 -25.2	43.0 -10.4	-56.8 78.4
DC 5	6.4 -3.1	6.4 1.8	13.1 4.6	24.0 -20.8	38.8 -32.0	8.4 8.8	-2.5 3.9	33.2 -26.0	44.8 -13.2	21.2 95.2
DC 6	14.9 -6.6	8.0 0.6	13.1 3.7	28.0 -24.4	12.8 17.2	27.6 -7.6	-2.0 3.9	34.0 -21.8	55.2 22.0	-78.8 23.6
DC 7	13.1 -14.0	10.0 -2.0	11.0 2.4	24.4 -24.0	-0.8 9.2	25.2 0.0	-2.0 4.2	39.6 -20.0	80.4 3.6	-71.2 68.0
DC 8	15.1 -1.2	11.1 -2.0	16.5 0.6	27.2 -30.4	3.2 -3.2	4.8 -13.6	-2.3 4.3	36.0 -21.2	72.8 -40.4	-65.6
DC AVG.										
AC 1	15.0	57.2	19.5	15.9	7.26	4.26	71.1	9.9	3.69	2.63
AC 2	-0.2	+0.5	0.0	0.0	0.0	0.0	-0.1	+0.3	0.0	-0.2
AC AVG.										
S.P.	-15	+21		-14			+3			
AC NOISE	.03	.03		.02						
POT RES.	1.8K	8K		64						

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 7 HALF 5 54W SP. 1 DATE 8/15/68

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	4-5 5W				5-6 5W			X.1		2 3
RANGE	X1	X.1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	0.4 5.0	-40.8 39.6	-21.2 32.4	68.0 52.4	25.6 -16.8	-24.0 51.2	21.6 -7.6	38.0 -27.6		0.8 -2.1
DC 2	-1.3 3.6	-49.6 61.2	12.0 3.2	43.6 5.2	24.8 -20.4	-40.0 64.4	87.2 -71.2	73.2 -20.4		0.8 -2.2
DC 3	-1.6 4.9	-43.2 59.6	12.8 8.0	12.8 -19.4	25.6 -20.8	-32.0 58.8	63.6 -50.8	20.4 -52.4		0.6 -2.2
DC 4	-2.0 7.5	-52.0 61.6	4.0 11.6	32.0 4.0	30.4 -20.0	-13.6 28.0	83.2 -24.4	40.4 -79.6		0.6 -2.2
DC 5	-3.9 8.6	-54.8 72.4	10.4 11.6	25.4 -40.0	24.0 -18.4	-26.4 19.2	56.4 -76.4	52.0 -73.8		
DC 6	-5.5 8.8	-59.2 68.4		15.6 -64.0	27.2 -21.6	-4.0 28.0	42.8 -92.0	71.2 -28.8		
DC 7	-5.6 8.9	-66.4 68.8		91.6 -58.4	28.0 -24.0	11.6 4.4		75.2 -88.4		
DC 8	-6.1 6.9	-52.8 65.6			29.6 -22.0	-33.6 41.2		23.2 -45.2		
DC AVG.										
AC 1	19.9	3.90	2.01	1.68	1.68	3.81	1.93	1.78		102.0
AC 2	0.0	-0.1	-0.3	-0.1	+0.1	0.0	-0.2	0.0		-0.2
AC AVG.										
S.P.	+24				-8					
AC NOISE	.04				.03					
POT RES.	8K				3.4K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 7 HALF S SP. 1 DATE AUG 15/68

PAGE

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE					3.0					
RANGE					140X4					
VOLTAGE	57X4	100X4	99X4	67X4	~~48X4~~	138X4	70X4	107X4	138X4	136X4
CURRENT	1.0	2.0	2.0	1.0	3.0	3.0	1.0	2.0	3.0	3.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	70X4	106X4	136X4	134X4	94X4	138X4	134X4	124X4		68X4
CURRENT	1.0	2.0	3.0	3.0	1.4	2.6	3.0	3.0		1.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVE S

RECEIVER NO. MK4 B

OPERATOR DON B

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT _____
LINE 7 HALF N54E SP. 1 DATE 8/15/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	0-1NE	1-2NE		2-3NE			3-4 NE			
RANGE	X1	X1	X1	X1	X.1	X.1	X1	X1	X.1	X.1
DC 1	1.2 100	4.3 -0.8	9.2 2.4	-1.1 1.3	8.2 -2.9	14.3 3.8	0.7 0.5	-1.7 4.9	18.0 -7.2	22.8 -4.8
DC 2	2.3 6.9	5.9 -3.9	13.7 4.3	-1.2 1.9	14.3 -11.2	15.8 2.2	0.9 1.0	-2.0 2.1	23.2 -11.6	27.0 -4.8
DC 3	1.1 5.8	9.1 -6.8	11.4 2.7	-1.6 1.2	13.9 -15.0	22.1 4.2	0.4 0.2	-1.0 0.1	20.4 -15.6	28.8 -12.0
DC 4	2.2 6.2	9.2 2.0	9.7 1.8	-1.5 1.1	17.1 -16.2	19.9 -1.9	0.3 1.2	-1.0 0.2	18.8 -15.2	32.8 -21.2
DC 5	0.3 7.8	8.0 2.3	12.5 -1.6	-0.8 2.0	9.0 -4.2	17.0 2.9	1.2 1.2	-0.6 0.5	17.6 -12.4	26.8 -9.2
DC 6	0.8 4.0	1.0 1.4	17.6 0.2	-1.3 3.7	4.9 8.2	14.8 -1.8	0.2 1.2	-1.2 0.3	18.0 -12.0	26.0 -8.4
DC 7		1.9 -6.1	14.4 1.5	-2.4 0.6	-2.0 7.9	11.9 7.1	1.1 0.7		20.0 -6.8	24.0 -6.8
DC 8				-1.8 2.5	-5.6 18.1	19.7 2.8				20.8 -12.0
DC AVG.										
AC 1	28.7	15.0	9.8	56.4	6.44	6.15	77.2	17.1	4.20	4.12
AC 2	-0.5	+0.3	+0.3	+0.1	-0.5	-0.2	0.0	0.0	0.0	-0.1
AC AVG.										
S.P.	+29	-21					+2			
AC NOISE	.04	.04					.04			
POT RES.	2.5	3k					1.5k			

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 7 HALF N54E SP. 1 DATE 8/1/68

PAGE 4

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5NE				5-6NE					3 4
RANGE	X1	X.1	X.1	X.1	X.1	X.1	X.1	X.1		X10
DC 1	+0.2 3.6	-3.5 2.0	4.8 -20.0	20.0 26.8	0.0 5.6	12.8 5.2	-11.2 32.8	9.2 0.8		0.0 -0.8
DC 2	-1.1 3.8	-3.5 2.4	12.0 -16.0	20.0 52.0	-7.8 4.4	0.0 3.6	7.6 50.4	15.6 -18.8		0.0 -0.8
DC 3	-2.2 3.9	-4.4 8.9	12.0 -17.2	26.8 36.4	-2.9 12.6	9.2 4.4	-16.8 9.6	0.0 7.6		
DC 4	-3.9 4.2	-4.6 5.0	16.4 -10.4	11.6 25.2	-6.9 14.8	-12.8 0.0	-21.6 40.0	6.8 13.6		
DC 5	-3.4 5.5	-4.0 3.7	12.0 -16.4	22.0 37.2	-8.0 11.6	-2.4 10.0	-41.2 16.4	-7.6 16.4		
DC 6	-4.0 5.4	-4.3 4.9	19.6 -9.2	8.8 12.0	-13.0 13.1	0.4 3.2	-32.0 38.0	-3.2 28.0		
DC 7	-4.9 7.0	-5.7 4.7	13.6 -6.8	5.2 16.0	-11.9 13.2	-4.0 6.4	-24.4 33.6	23.6 10.8		
DC 8			20.8 -7.6	-0.8 18.8	-12.1 18.2	-8.4 2.4	-16.4 50.4	1.6 23.6		
DC AVG.										
AC 1	18.4	7.33	3.05	3.35	7.08	3.19	1.98	1.98		270.0
AC 2	+0.1	-0.2	+0.0	+0.1	0.0	-0.1	-0.2	-0.1		0.0
AC AVG.										
S.P.	-17				+11					
AC NOISE	0.3				.03					
POT RES.	1.8K				2.2K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 7 HALF N SP. 1 DATE AUG 15/82

PAGE

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE										
VOLTAGE	91X4	78X4	88X4	96X4	76X4	94X4	104X4	106X4	104X4	104X4
CURRENT	1.0	1.0	1.0	2.0	1.0	1.0	2.2	2.2	1.4	1.2
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE										
RANGE										3-4
VOLTAGE	104X4	108X4	102.4	108X4	94X4	94X4	98X4	98X4		96X4
CURRENT	2.2	2.4	2.0	1.8	2.0	2.0	2.0	1.7		2.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVE S.

RECEIVER NO. MK4 B

OPERATOR DON B.

COMMENTS:

Recopied

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX 0770 68
LINE 7 HALF SSW SP. 1 DATE [illegible]

PAGE 1

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5	
RECEIVE	0-1 SW	1-2 SW		2-3 SW			3-4 SW				
RANGE	X1	X1	X1	X1	X.1	X.1	X1	X1	X.1	X.1	
DC 1	8.2 4.9	3.7 4.1	12.3 0.5	5.8 -5.7 X4	12.7 -6.1 X4	7.0 6.1 X4	-2.5 4.2	7.7 -4.5 X4	9.2 -5.0 X4	11.8 6.2 X4	
DC 2	3.0 -1.9	3.7 3.3	7.5 8.0	6.4 -6.5	12.1 -8.8	5.8 10.9	-3.0 5.3	7.2 -4.9	18.7 4.0	-7.3 17.1	
DC 3	5.9 -2.1	8.0 6.0	14.8 -7.0	8.1 -4.3	4.9 -3.0	0.1 0.1	-3.2 4.5	8.2 -5.3	4.4 2.0	2.7 18.8	
DC 4	22.1 -1.1	8.5 2.1	16.2 0.1	6.0 -5.0	9.8 -6.0	6.6 0.1	12.8 4.8	8.2 -6.3	10.5 -2.6	14.2 19.6	
DC 5	6.4 -3.1	6.4 1.8	13.1 4.6	6.0 -5.2	9.7 -8.0	2.1 2.2	-2.5 3.9	8.3 -6.5	11.2 -3.3	5.3 23.8	
DC 6	14.4 -6.6	8.0 0.5	13.1 3.7	7.0 -6.1	3.2 4.3	7.4 -1.9	-2.0 3.9	8.5 -5.4	13.8 5.5	-14.7 5.9	
DC 7	13.1 -14.0	10.0 -2.0	11.0 2.4	6.1 -6.0	-0.2 2.3	6.3 0.6	-2.0 4.2	9.9 -5.0	20.1 0.9	-17.8 17.0	
DC 8	15.1 -1.2	11.1 -3.0	16.5 0.6	5.8 -5.1	0.8 -0.8	1.2 -3.4	-2.3 4.3	9.0 -5.3	18.2 -10.1	-16.4	
DC AVG.											
AC 1	15.0	57.2	12.5	15.9	7.2.6	4.26	71.1	9.9	3.69	2.63	
AC 2	-0.2	+0.5	0.0	0.0	0.0	0.0	-0.1	+0.3	0.0	-0.2	
AC AVG.											
S.P.	-15	+21		-14			+3				
AC NOISE	.03	+03		.02			.02				
POT RES.	1.8K	8K		6K			4K				

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B27068
LINE 7 HALF S54W SP. 1 DATE 8/6/68

SEND	1 2	2 3	3 4	4 5	4 2	2 3	3 4	4 5		CAL
RECEIVE	4-5SW				5-6SW					2 3
RANGE	X1	X.1	X.1	X.1	X1	X.1	X.1	X.1		X10
DC 1	0.4 5.0	-10.2 9.9 X4	-53 81 X4	17.0 13.1 X4	6.4 -4.2 X4	-6.0 12.8 X4	5.4 -1.9 X4	9.5 -6.9 X4		0.8 -2.1
DC 2	-1.3 3.6	-12.4 15.3	3.0 0.8	10.9 1.3	6.2 -5.1	-10.0 16.1	21.8 -18.8	18.3 -5.1		0.8 -2.2
DC 3	-1.6 4.9	-10.8 14.9	3.2 2.0	3.2 -2.6	6.4 -5.2	-8.0 14.7	15.9 -17.7	6.6 -13.1		0.6 -2.2
DC 4	-2.0 7.5	-13.0 15.4	1.0 2.9	8.0 1.0	7.6 -5.0	-3.4 7.0	20.8 -6.1	12.1 -19.9		0.6 -2.2
DC 5	-3.7 6.6	-13.7 18.1	2.6 2.9	6.6 -10.0	6.5 -4.6	-6.6 4.8	12.6 -19.1	13.0 -18.2		
DC 6	-5.5 8.8	-14.8 17.1		23.9 -16.0	6.8 -5.4	-1.0 7.0	10.7 -27.0	17.8 -7.2		
DC 7	-5.6 8.9	-16.6 17.2		22.9 -17.1	7.0 -6.2	2.9 1.1		18.8 -22.1		
DC 8	-6.1 6.9	-13.2 16.4		20	7.4 -5.5	-8.4 12.3		5.8 -11.3		
DC AVG.										
AC 1	19.9	3.90	2.01	1.68	1.68	3.61	1.93	1.78		102.0
AC 2	0.0	-0.1	-0.3	-0.1	+0.1	0.0	-0.2	0.0		-0.2
AC AVG.										
S.P.	+24				-8					
AC NOISE	.04				.03					
POT RES.	8K				3.4K					

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX 1270 68
LINE 7 HALF N54E SP. 1 DATE 8/1/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	0-1 NE	1-2 NE		2-3 NE			3-4 NE			
RANGE	X1	X.1	X1	X1	X.1	X.1	X1	X1	X.1	X.1
DC 1	1.2 10.0	4.3 -0.8	9.2 2.4	-1.1 1.3	8.2 -2.9	16.3 3.8	0.7 0.5	-1.7 4.9	4.5 -2.3 x4	5.9 -1.2 x4
DC 2	2.0 6.9	5.9 -3.9	13.7 4.3	-1.2 1.9	14.3 -11.2	15.8 2.2	0.9 1.0	-2.0 2.1	5.8 -2.9	5.5 -1.2
DC 3	1.1 5.8	9.1 -6.8	11.4 2.3	-1.6 1.2	13.9 -15.0	22.1 4.2	0.4 0.2	-1.0 0.1	5.1 -3.9	7.2 -3.0
DC 4	2.2 6.2	2.5 0.0	9.7 1.8	-1.5 1.1	17.1 -16.2	9.9 -1.9	0.3 1.2	-1.0 0.2	4.7 -3.8	8.2 -5.3
DC 5	0.3 2.8	8.0 2.3	12.5 -1.0	-0.8 2.0	9.0 -4.2	17.0 2.9	1.2 1.2	-0.6 0.5	4.4 -3.1	5.7 -2.3
DC 6	0.8 4.0	1.0 1.4	17.0 6.2	-1.3 3.2	4.9 8.2	14.8 -1.6	0.2 1.2	-1.2 0.3	4.5 -3.0	6.5 -2.1
DC 7		1.9 -1.1	14.4 1.5	-2.4 0.6	-2.0 7.9	11.9 7.1	1.1 0.7		5.0 -1.7	6.0 -1.7
DC 8				-1.8 2.5	-5.6 18.1	17.7 2.8				5.2 -3.0
DC AVG.										
AC 1	28.7	15.0	1.8	58.4	6.44	6.15	77.2	17.1	4.26	4.12
AC 2	-0.5	+0.3	+0.3	+0.1	-0.5	-0.2	0.0	0.0	0.0	-0.1
AC AVG.										
S.P.	+29	-21		-5			+2			
AC NOISE	.04	.04		.04			.04			
POT RES.	2.5	3K		2K			1.5K			

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B870 68
LINE 7 HALF N54E SP. 1 DATE 8/15/68

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5NE				5-6NE					3 4
RANGE	X1	X.1	X.1	X.1	X.1	X.1	X.1	X.1		X10
DC 1	-0.2 3.0	-3.5 2.0	1.2 -5.0 x4	5.0 6.7 x4	8.0 5.6	3.2 13 x4	-2.8 8.2 x4	2.3 0.2 x4		0.0 -0.8
DC 2	-1.1 3.8	-3.5 2.4	2.0 -4.0	5.0 13.0	-7.8 4.4	0.0 0.9	1.9 12.6	3.9 -4.7		0.0 -0.8
DC 3	-2.2 3.9	-4.4 2.9	3.0 -4.3	6.7 9.1	-2.9 12.0	2.3 1.1	-4.2 2.4	2.0 1.9		
DC 4	-3.9 4.2	-4.8 5.0	4.1 -2.6	2.9 6.3	-6.9 14.0	-3.2 0.0	-5.4 10.0	1.7 3.4		
DC 5	-3.4 5.5	-4.0 3.3	2.0 -4.1	5.5 9.3	-8.0 1.6	-0.6 2.5	-10.3 4.1	-1.9 4.1		
DC 6	-4.0 5.4	-4.3 4.9	4.9 -2.3	2.2 7.0	-13.0 13.1	0.1 0.9	-8.0 4.5	-0.8 6.5		
DC 7	-4.9 7.0	-5.7 4.7	3.4 -1.7	1.3 4.0	-11.9 13.2	-1.0 1.6	-6.1 8.4	5.9 2.7		
DC 8			5.2 -1.9	-0.2 4.7	-12.1 18.2	-2.1 0.6	-4.1 12.6	0.4 5.9		
DC AVG.										
AC 1	14.4	7.33	3.05	3.35	7.08	3.19	1.98	1.98		207.0
AC 2	+0.1	-0.2	+0.0	+0.1	0.0	-0.1	-0.2	-0.1		0.0
AC AVG.										
S.P.	-17				+11					
AC NOISE	0.3				0.3					
POT RES.	1.8K				2.2K					

HEINRICHS GEOEX B270-68 LINE 7 SPD 1 LOOKING N38W 8-16-68 A= 1000 FEET

1.000	2.000	2.000	19.000	3.000	3.000	1.000	2.000	3.000	3.000	I	1.000	2.000	3.000	3.000	1.400	2.600	3.000	3.000	1.000	
82	37	123	232	508	80	-25	308	368	-472	DC	4	-408	-212	680	256	-240	216	380	8	LEFT
49	41	5	-228	-244	244	42	-180	-200	248		50	396	324	524	-168	512	/	-276	-21	SIDE
30	37	75	336	484	224	-30	288	748	-292		-13	-496	120	436	248	-400	-76	732	8	
-19	33	80	-260	-352	436	53	-196	160	684		36	612	32	52	-204	644	872	-204	-22	
59	80	148	324	196	4	-32	328	176	108		-16	-432	128	128	256	-320	-712	264	6	
-1	50	-70	-172	-120	4	45	-212	80	752		49	596	80	-104	-208	588	636	-524	-22	
21	85	162	240	392	264	-28	328	420	-568		-20	-520	40	320	304	-136	-508	404	6	
-11	21	1	-200	-240	4	48	-252	-104	784		75	616	116	40	-200	280	832	-796	-22	
64	64	131	240	388	84	-25	332	448	212		-39	-548	104	264	240	-264	-244	520		
-31	18	46	-208	/	88	39	-260	-132	952		66	724	116	-400	-184	192	564	-738		
149	80	131	280	-320	296	-20	340	552	-788		-55	-592		956	272	-40	-764	712		
-66	6	37	-244	/	-76	39	-216	220	236		88	684		-640	-216	280	428	-288		
131	100	110	244	128	252	-20	396	804	-712		-56	-664		916	280	116	-920	752		
-140	-20	24	-240	172	0	42	-200	36	680		89	688		-684	-240	44		/		
151	111	165	272	-8	48	-23	360	728	-656		-61	-528			296	-336		-884		
-12	-30	6	-204	92	-136	43	-212	-404			69	656			-220	492		/		
				32														232		
				-32														-452		

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6	
2.8	4.7	7.4	2.7	6.9	12.3	.9	6.0	26.1	12.4	PFEA	1.5	4.4	10.0	19.2	3.3	8.6	6.1	2.0	-.7
15.00	57.30	19.50	15.90	7.260	4.260	71.10	9.900	3.690	2.630	AC1	19.90	3.900	2.010	1.680	1.680	3.810	1.930	1.780	102.0
-.2	.5	0.0	0.0	0.0	0.0	-.1	.3	0.0	-.2	AC2	0.0	-.1	-.3	-.1	.1	0.0	-.2	0.0	-.2
14.98	57.34	19.50	15.90	7.260	4.260	71.06	9.915	3.690	2.627	ACA	19.90	3.898	2.007	1.679	1.681	3.810	1.928	1.780	101.9
45.68	88.74	124.1	48.0	30.66	47.21	212.6	62.19	45.90	58.33	RHO	239.4	60.30	43.63	69.12	36.72	94.24	70.73	100.4	.981 DC CAL
3.5	5.1	8.0	3.3	7.6	12.9	1.6	6.5	26.8	13.1	PFE	2.2	5.1	10.7	19.8	3.9	9.2	6.8	2.7	.643 AC CAL
78	58	65	1295	247	274	8	105	583	225	MCF	9	84	246	287	106	98	96	26	
.2	.1	.2	9.2	1.3	1.7	0.0	.5	1.8	2.4	CPFE	.1	1.2	3.4	3.1	2.4	1.3	3.0	2.8	
3.3	5.0	7.8	-5.9	6.2	11.2	1.6	6.0	25.0	10.8	CCPFE	2.1	3.9	7.3	16.8	1.5	7.9	3.8	-.2	
73	57	63	-2334	203	238	8	96	544	184	CCMCF	9	64	168	243	42	84	54	-2	

1.000	1.000	1.000	2.000	1.000	1.000	2.200	2.200	1.400	1.200	I	2.200	2.400	2.000	1.800	2.000	2.000	2.000	1.700	2.000
12	43	92	-11	82	163	7	-17	180	228	DC	-2	-35	48	200	0	128	-112	92	0 RIGHT
100	-8	24	13	-29	38	5	49	-92	-48		30	20	-200	268	56	52	328	8	-8 SIDE
23	59	137	-12	143	158	9	-20	232	220		-11	-35	120	200	-78	0	76	155	
69	-39	43	19	-112	22	10	21	-116	-48		38	24	-160	520	44	36	504	-188	
11	91	114	-16	139	221	4	-10	204	288		-22	-44	120	268	-29	92	-168	0	
58	/	23	12	-150	42	2	1	-156	-120		39	29	-172	364	120	44	96	76	
22	-68	97	-15	171	99	3	-10	188	328		-39	-46	164	116	-59	-128	-216	68	
62	/	18	11	/	-19	12	2	-152	-212		42	50	-104	252	141	0	400	136	
3	22	125	-8	-162	170	12	-6	176	268		-34	-40	120	220	-80	-24	-412	-76	
78	0	-10	20	/	29	12	5	-124	-92		55	33	-164	372	116	100	164	164	
8	80	170	-13	90	148	2	-12	180	260		-40	-43	196	88	-130	4	-320	-32	
40	23	2	32	-42	-18	12	3	-120	-84		54	49	-92	120	131	32	380	260	
	10	144	-24	49	119	11		200	240		-49	-57	136	52	-119	-40	-244	236	
	14	15	6	82	71	7		-68	-68		70	47	-68	160	132	64	336	108	
	19		-18	-20	177				208				208	-8	-121	-84	-164	16	
	-11		25	79	28				-120				-76	188	182	24	504	236	
				-56															
				181															

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6	
4.2	2.1	7.2	.1	2.7	9.0	.8	.1	3.7	8.0	PFEA	.7	-.4	.6	21.2	1.4	1.5	6.4	7.3	-.4
28.70	15.00	9.800	58.40	6.440	6.150	77.20	17.10	4.200	4.120	AC1	19.40	7.330	3.050	3.350	7.080	3.190	1.980	1.980	202.0
-.5	.3	.3	.1	-.5	-.2	0.0	0.0	0.0	-.1	AC2	.1	-.2	0.0	.1	0.0	-.1	-.2	-.1	0.0
28.63	15.02	9.815	58.43	6.424	6.144	77.20	17.10	4.200	4.118	ACA	19.41	7.323	3.050	3.352	7.080	3.188	1.978	1.979	202.0
89.14	45.67	155.3	87.16	78.85	199.9	105.5	92.83	92.73	221.0	RHO	106.0	90.70	91.50	235.4	107.1	96.55	109.9	208.6	.990 DC CAL
4.8	2.3	7.5	.4	3.3	9.5	1.2	.5	4.1	8.4	PFE	1.1	.1	1.0	21.6	1.8	1.9	6.9	7.7	.400 AC CAL
54	51	60	5	42	48	11	6	44	38	MCF	10	1	11	92	17	20	63	37	
.1	.2	.2	.1	.4	.2	.1	.3	.7	.4	CPFE	.3	.7	1.3	.6	.6	1.2	1.7	1.1	
4.7	2.1	7.3	.4	2.9	9.3	1.1	.2	3.4	8.0	CCPFE	.8	-.6	-.3	21.0	1.3	.7	5.2	6.7	
53	46	58	4	37	46	11	2	36	36	CCMCF	8	-7	-3	89	12	7	47	32	

5233355

JOB 270-68 LINE VEKOL 7 SPREAD 2

LOOKING N 36 W DATE Aug 30, 68 A= 500

CENTER - 10. LABEL SW / SW FREQ. 3.0

COUPLING yes

9.12.68
CS

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270
LINE 7 HALF SSW SP. 2 DATE 8/3/68

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	1-1.5 SW	1.5-2 SW		2-2.5 SW			2.5-3 SW			
RANGE	100	300	10	100	30	3	300	30	10	1
DC 1	361 360	815 820	720 701	678 678	995 960	123 134	950 990	239 232	418 391	703 715
DC 2	351 360	815 820	720 700	677 678	995 965	135 117	950 990	240 232	418 383	705 701
DC 3	361 360	815 820	720 701	677 678	990 985	129 130	950 990	240 232	403 407	726 757
DC 4			721 701		995 995	117 133			397 418	640 656
DC 5			721 698		965 100	118 138			383 421	803 742
DC 6			729 697		965 995	110 137			392 417	733 745
DC 7			722 697			114 140			395 418	709 739
DC 8			726 694			110 144			396 417	721 742
DC AVG.										683 757
AC 1	35.0	80.0	6.78	66.0	9.55	1.18	94.5	23.0	3.80	.661
AC 2	35.0	80.0	6.79	66.0	9.50	1.20	94.5	23.1	3.85	.660
AC AVG.										
S.P.	+6	+3		-29		+11				
AC NOISE	.07	.05		.06		.09				
POT RES.	7.5K	10K		7.5K		10K				

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 7 HALF 354W SP. 2 DATE 8/8/68

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	3-3.55W				3.5-4SW					2 3
RANGE	100	30	10	3	30	10	3	1		300
DC 1	370 360	162 164	290 296	115 116	106 106	619 615	220 211			95.0 98.6
DC 2	373 360	161 164	290 291	116 114	109 104	620 620	256 189			95.0 98.0
DC 3	372 361	160 165	292 294	117 116	111 107	611 627	224 217			95.0 98.0
DC 4	370 361	160 165	283 293	114 115	105 110	617 610	235 217			
DC 5	370 361		280 302	117 114	104 111	630 622	230 212			
DC 6			281 301	117 116	103 114	629 626	224 242			
DC 7			284 298	117 116	101 114	602 612	207 248			
DC 8			288 301	115 116	100 114	637 595	234 213			
DC AVG.										
AC 1	35.6	15.9	2.80	1.08	10.6	6.01	2.16	.455		95.0
AC 2	35.9	15.9	2.80	1.07	10.6	6.01	2.16	.450		95.0
AC AVG.										
S.P.	-23				+46					
AC NOISE	.09				.05					
POT RES.	11K				14.5K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL
LINE 7 HALF 8 SP. 2 DATE AUG 30

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE										
RANGE										
VOLTAGE	70x4	76x4	70x4	104x4	176x4	70x4	104x4	104x4	96x4	68x4
CURRENT	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	104x4	104x4	74x4	122x4	104x4	104x4	130x4	122x4		104x4
CURRENT	1.0	1.0	1.0	2.0	1.0	1.0	1.8	2.0		1.0

FREQUENCIES .1 3.0
SENDER NO. 1
OPERATOR DAVE S
RECEIVER NO. 10661-R
OPERATOR DON B

COMMENTS: N = 500'

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX B27068

LINE 7 HALF NSYE SP. 2 DATE 8/29/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	1-0.5 SW	0.5-0 SW		0-0.5 NE			0.5-1 NE			
RANGE	300	100	10	100	30	10	100	10	10	3
DC 1	850 870	437 436	820 819	322 321	175 176	496 488	394 397	561 570	541 546	181 182
DC 2	850 870	437 435	823 819	321 322	176 176	499 486	395 394	564 568	541 548	178 183
DC 3		438 435	821 826	321 322	176 176	491 491	392 395	563 569	539 545	178 176
DC 4		438 435	817 833	321 322		490 495	392 395	562 567	541 541	183 180
DC 5			811 837			489 490	393 394	565 566	541 545	179 181
DC 6			816 839				393 394	564 568	540 544	186 173
DC 7			802/818					562 567	545 541	184 180
DC 8			835 819					566 561	543 542	180 176
DC AVG.										
AC 1	83.5	41.9	7.80	30.9	165.0	4.39 4.54	38.2	5.34	5.01	1.64
AC 2	83.5	42.0	7.81	30.7	165.5	4.53	38.1	5.34	5.00	1.64
AC AVG.										
S.P.	-19	+31		+4			+41			
AC NOISE	.08	.07		.08			.09			
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68

LINE 7 HALF N54E SP. 2 DATE 8/2 9/68

$\frac{x}{98.88} = .986$

PAGE 5

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2	10661K	CAL
RECEIVE	1-1.5NE				1.5-2NE				3 4	4 5
RANGE	10	10	10	3	10	3	10	3	300	300
DC 1	620 692	720 733	423 430	154 168	266 278	219 214	292 268	119 107	95.5 99	100.5 100.5
DC 2	579 647	722 731	438 421	154 166	257 260	217 213	291 271	117 108	95.5 99	100.5 100.5
DC 3	627 639	725 721	438 427	156 153	271 271	221 212	302 253	118 111	95.5 99	
DC 4	658 663	742 717	441 420	168 154	281 285	224 217	279 275	126 109		
DC 5	618 620	720 739	430 444	167 144	254 287	215 217	299 262	117 115	PAGE	
DC 6	634 621	724 720	421 433	170 155	258 290	221 210	296 271	123 111		4
DC 7	625 632	739 719	429 430	160 157	245 261	231 202	292 270	119 112	5	
DC 8	621 622	737 721	428 439	168 144	272 277	215 214	299 265	124 113	98.88	
DC AVG.									98.88	
AC 1	6.21	7.01	4.04	1.47	2.69	2.07	2.62	1.07	~~95.5~~	~~99.5~~
AC 2	6.22	7.00	4.03	1.46	2.69	2.07	2.61	1.07	~~95.5~~	~~99.5~~
AC AVG.									97.50	
S.P.	-4				-2					
AC NOISE	.07				.07				cal .986	cal
POT RES.	10k				24k				.982	.990

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 17 HALF N SP. 2 DATE AUG 29/67

PAGE 5

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE										
VOLTAGE	108x4	104x4	106x4	80x4	104x4	106x4	128x4	78x4	104x4	106x4
CURRENT	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL	CAL
RECEIVE	70x4								*	
RANGE	1.0 *	*	*	*	*	*	*	*	3-4	~~4-5~~
VOLTAGE	~~128x4~~	138x4	104x4	104x4	70x4	76x4	104x4	104x4	78x4	96x4
CURRENT	~~2.0~~	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

FREQUENCIES .1 3.0

SENDER NO. 1

OPERATOR DAVE S

RECEIVER NO. MK 4 B

OPERATOR DON B

COMMENTS: N = 500' * AUG 30
* 1066 I-R

Gunnex

HEINRICHS GEOEX B270-68 LINE 7 VEKOL SPD 2 LOOKING N36W 8-30-68 A= 500 FEET

1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	I	1.000	1.000	1.000	2.000	1.000	1.000	1.800	2.000	1.000		
361	815	720	678	995	123	95	239	418	703	DC	370	162	290	115	106	619	220			95	LEFT
360	820	701	678	960	134	99	232	391	715		360	164	296	116	106	615	211			98	SIDE
		720	677	995	135		240	419	705		373	161	290	116	109	620	256				
		700	678	965	117		232	383	/		360	164	291	114	104	620	189				
		720	677	990	129		240	/	701		372	166	292	117	111	611	/				
		701	678	985	130		232	403	726		/	165	299	116	103	627	224				
		721		975	117			407	/		361	160	283	114	/	/	217				
		701		995	133			397	757		370	165	/	115	105	617	235				
		721		965	118			418	640		361		293	117	110	610	217				
		698		1000	138			385	656		370		280	114	104	630	230				
		729		965	110			421	803		361		302	117	111	/	212				
		692		995	137			392	/				281	116	103	622	/				
		/			114			417	742				301	117	114	609	224				
		722			140			395	733				284	116	101	626	242				
		697			110			418	745				298	115	114	602	207				
		726			144			396	709				288	116	100	/	248				
		694						417	739				301		115	612	/				
									721							637	234				
									/							596	213				
									742												
									693												
									757												
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6			
36.05	81.75	7.106	67.76	9.809	1.264	97.00	23.59	4.047	.71[illegible]	DCA	36.57	16.34	2.918	1.157	10.72	[illegible].175	2.247	0.000	96.50		
35.00	80.00	6.780	66.00	9.550	1.180	94.50	23.00	3.800	.661	AC1	35.60	15.90	2.800	1.080	10.60	6.010	2.160	.455	95.00		
35.00	80.00	6.790	66.00	9.500	1.200	94.50	23.10	3.850	.660	AC2	35.90	15.90	2.800	1.070	10.60	6.010	2.160	.450	95.00		
35.00	80.00	6.785	66.00	9.525	1.190	94.50	23.05	3.825	.660	ACA	35.75	15.90	2.800	1.075	10.60	6.010	2.160	.452	95.00		
56.04	127.1	44.19	105.3	60.99	19.64	150.8	146.7	62.91	22.26	RHO	227.4	253.9	90.72	31.47	166.7	192.0	67.93	*000.0	1.036	DC	CAL
1.4	.6	3.1	1.1	1.4	4.5	1.0	.8	4.2	6.7	PFE	.7	1.1	2.6	6.0	-.4	1.2	2.4	*000.0	.984	AC	CAL
25	5	70	10	23	231	7	5	66	302	MCF	3	5	29	189	-2	6	36	*00000			
0.0	0.0	.1	0.0	.1	.9	0.0	0.0	.2	1.4	CPFE	0.0	0.0	.2	1.4	.0	.1	.5	0.0			
1.4	.6	3.0	1.1	1.3	3.7	1.0	.8	4.0	5.4	CCPFE	.7	1.1	2.4	4.5	-.4	1.1	1.9	*000.0			
25	5	68	10	21	187	7	5	63	241	CCMCF	3	5	26	144	-3	6	28	1000			

1.000	1.000	1.000	1.000	1.000	1.000	2.000	1.000	1.000	1.000	I	1.000	2.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
85	437	820	322	175	496	394	561	541	181	DC	620	720	423	154	266	219	292	119	9888	RIGHT	
87	436	819	321	176	488	397	570	546	182		692	733	430	168	278	214	268	107	9888	SIDE	
	437	823	321	176	499	395	564	541	178		/	722	438	/	257	217	291	/			
	435	819	322	176	486	394	568	548	183		579	731	421	154	/	213	271	117			
	438	/	321	176	491	392	563	539	178		647	725	438	166	260	221	302	108			
	435	821	322	176	491	395	569	545	176		/	721	427	156	291	212	253	/			
	438	826	321		490	392	562	541	183		627	742	441	153	/	224	/	118			
	435	817	322		490	395	567	541	180		639	717	420	168	271	217	279	111			
		833			/	393	565	541	179		658	/	430	154	261	/	275	126			
		811			489	394	566	545	181		603	720	444	167	285	215	299	109			
		837			490	393	564	540	186		618	739	421	144	254	217	262	117			
		816				394	568	544	173		/	724	433	170	287	221	296	115			
		839					562	545	184		620	720	429	155	258	210	271	123			
		802					567	541	180		634	739	430	160	290	231	292	111			
		/					566	543	180		621	719	428	157	245	202	270	119			
		818					561	542	~~176~~		625	737	439	168	/	/	299	112			
		835							15		632	721		144	261	215	260	124			
		819									621				272	214		113			
											622				277						
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6			
86.00	43.64	8.235	32.14	175.9	4.909	39.40	5.655	5.428	2.001	DCA	6.288	7.279	4.307	1.591	2.707	2.170	2.813	1.160	98.88		
83.50	41.90	7.800	30.90	165.0	4.540	38.20	5.340	5.010	1.640	AC1	6.210	7.010	4.040	1.470	2.690	2.070	2.620	1.070	97.50		
83.50	42.00	7.810	30.70	165.5	4.530	38.10	5.340	5.000	1.640	AC2	6.220	7.000	4.030	1.460	2.690	2.070	2.610	1.070	97.50		
83.50	41.95	7.805	30.80	165.2	4.535	38.15	5.340	5.005	1.640	ACA	6.215	7.005	4.035	1.465	2.690	2.070	2.615	1.070	97.50		
130.5	66.21	49.97	48.76	1067.4	74.47	29.88	34.31	82.34	50.71	RHO	38.15	55.21	130.7	84.50	41.07	65.84	149.3	98.54	1.011	DC	CAL
1.6	2.6	4.0	2.9	5.0	6.7	1.8	4.4	6.9	~~20.3~~ 8.2	PFE	-.2	2.5	5.3	7.1	-.8	3.4	6.1	6.9	.986	AC	CAL
12	39	81	60	5	91	61	129	84	335	MCF	-6	45	40	84	-18	51	41	70			
0.0	0.0	.1	.0	0.0	.1	.1	.2	.1	.4	CPFE	.2	.2	.1	.4	.3	.3	.2	.5			
1.6	2.6	3.9	2.9	5.0	6.6	1.8	4.2	6.8	20.0	CCPFE	-.4	2.3	5.1	6.7	-1.1	3.1	5.9	6.4			
12	39	79	59	5	89	59	124	83	329	CCMCF	-10	41	39	80	-26	46	39	65			

1.011
14
26

1011

JOB B270-68 LINE 8 SPREAD 1

LOOKING N37W DATE 8/22/68 A= 1000'

CENTER 0.0 LABEL SW/NE FREQ. 3.0

COUPLING Yes

PFE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX D270 68
LINE 8 HALF 55SW SP. 1 DATE 8/22/68

PAGE 1

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	0-15W	1-25W		2-35W			3-4 5W			X.1
RANGE	X1	X1	X1	X1	X1	X.1	X10	X1	X.1	6.0 12.4
DC 1	3.8 -0.2	0.2 2.9	1.5 2.7	-1.0 3.4	0.2 6.2	4.9 4.5	0.0 1.3	4.0/.4	-2.0 11.6	6.4/7.6
DC 2	3.7 -0.2	0.5 3.0	3.0 0.9	-1.0 3.5	4.9 4.5	4.4 5.3	0.1 1.4	2.3 4.9	-0.8 12.0	7.6 8.0
DC 3	3.7 -0.2	0.0 2.8	3.1 0.9	-0.9 3.3	3.2 3.7	4.0/3.2	-0.1 1.8	-1.2 2.4/	-3.6 16.4/	12.4/3.6
DC 4	3.8 -0.1	0.5 2.2	2.8 1.4	-0.8 3.5	3.8 3.2	2.4 2.7	-1.0 2.8	1.0 6.9	3.2 10.8	14.0 3.6
DC 5	3.7 0.0	0.9 2.1	2.1 1.5	-0.7 3.3	3.8 4.2	8.0/4.6	-1.3 2.8	0.0 5.8	-0.8 14.0	14.0 0.8
DC 6		2.8 2.3	2.0 2.2	-0.1 3.1	1.6 6.3/	3.4/5.0	-1.3 2.5	1.4 6.3	1.2 7.2	16.0 1.6
DC 7		0.4 2.5	1.5 1.5	0.2 3.0	2.5 5.0	2.9 3.0	-1.3 2.9	0.1 6.6/	3.2 11.2	
DC 8		0.5 2.5	3.0 0.1	0.2 3.1	2.3 5.4	8.0 2.9	-1.6 3.1	2.3 6.2	0.0 12.4	
DC AVG.						2.1 2.9				
AC 1	54.0	85.4	37.9	31.4	9.18	5.95	118.0	14.9	7.49	5.76
AC 2	+0.1	+0.2	0.0	+0.2	0.0	+0.5	0.0	0.0	-0.1	+0.1
AC AVG.										
S.P.	0	+15		-21			+10			
AC NOISE	.03	.03		.03			.03			
POT RES.	3.8K	6.4K		11K			10K			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX 8270 58

LINE 8 HALF SS3W SP. 1 DATE 8/168

PAGE 2

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	4-5 SW				5-6 SW					2 3
RANGE	X 1	X 1	X 1	X 1	X 1	X 1	X 1	X 1		X 1
DC 1	5.7 0.8	7.1 3.1	6.8 17.8	10.1 9.8	7.9 2.2	7.2 10.8	12.9 9.1	-16.0 39.2	0.3 -1.0	0.3 -0.9
DC 2	5.1 0.9	9.4 5.4	6.9 12.3	10.0 8.6	7.7 4.0	13.2 4.2	14.8 7.2	-18.4 40.4	0.5 -1.0	0.5 -0.8
DC 3	5.0 1.0	4.9 6.4	7.2 14.1	12.1 6.6	8.2 2.6	8.9 12.1	10.1 9.5	-23.6 44.8	0.5 -1.0	0.7 -0.8
DC 4	5.0 1.1	3.9 8.0	6.9 13.0	8.8 11.7	9.1 2.4	1.8 3.7	15.9 7.8	-4.4 23.6	0.5 -1.0	0.7 -0.8
DC 5	5.0 1.0	3.6 7.2	5.4 13.1	7.9 10.0	9.9 7.8	11.4 4.2	14.1 12.3	-3.6 23.2		0.9 -0.6
DC 6	5.1 1.2	5.0 5.4	5.4 12.8	9.8 8.2	3.1 8.3	13.0 0.4	7.8 9.6	-4.8 26.4		0.9 -0.5
DC 7	5.0 1.3	6.3 3.5	6.2 12.4	11.1 7.1	2.2 7.0	2.7 14.3	14.4 6.9	8.8 11.2		1.0 -0.4
DC 8	4.9 1.7	7.0 3.2	6.8 11.7	9.7 9.9	4.8 7.0	3.0 15.0	16.3 5.9	10.8 8.4		1.0 -0.3
DC AVG.										
AC 1	15.2	3.19	2.77	2.90	4.49	1.22	1.29	1.35		102.0
AC 2	+0.5	0.0	0.0	-0.1	+1.0	+0.1	-0.1	0.0		0.8
AC AVG.										
S.P.	-12				-4					
AC NOISE	.03				.02					
POT RES.	9.5K				5K					

4.9	7.8	9.5	9.1
4.4	8.0	9.1	9.1
3.9	8.4	9.0	9.5
3.0	9.1	8.9	10.3
		7.0	12.6

10.7	6.9	17.0	5.6	11.2	8.8
7.1	10.6	11.3	12.2	10.8	9.2
9.0	11.6	9.7	15.8	8.4	12.0
4.2	11.0	7.7	14.1	6.0	16.0
9.4	8.7				
9.9	7.9				

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 8 HALF S SP. 1 DATE AUG. 21/68

PAGE

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE										
RANGE	A	A	A	A	A	A	A	A	A	
VOLTAGE	98x4	122x4	112x4	98x4	120x4	98x4	104x4	96x4	11[illegible]x4	96x4
CURRENT	5.0	5.0	6.0	2.0	5.0	5.0	1.2	2.0	5.0	5.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	124x4	98x4	142x4	130x4	124x4	96x4	140x4	128x4		56x4
CURRENT	1.4	2.0	6.0	7.0	1.4	2.0	6.0	7.0		1.0

FREQUENCIES [illegible] 13.0

SENDER NO. #1

OPERATOR DAVE S.

RECEIVER NO. MK 4B

OPERATOR DON B

COMMENTS: ALL DC'S .1 HZ

A AUG 20/68

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNER BAY 65
LINE 8 HALF N53E SP. 1 DATE 8/65

PAGE 3

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	0-1 NE	1-2 NE		2-3 NE			3-4 NE			
RANGE	X1	X1	X.1	X1	X.1	X.1	X10	X1	X.1	X.1
DC 1	1.3/1.6	0.9 0.1	-1.3 5.2	4.2 -0.4	-2.7 4.2	-0.9 2.7	0.1 0.0	1.7 0.4	0.9 2.7	6.4 2.8
DC 2	2.0 0.8	1.1 0.2	-1.1 6.5	3.4 -0.6	-0.9 5.4	1.1 4.9	2.2 0.0	1.3 0.8	2.0 1.9	5.3 5.0
DC 3	2.6 1.0	0.9 0.3	0.1 4.0	4.0 -0.8	2.4 1.1	0.5/0.0	2.1 0.0	1.0 1.1	3.3 1.4	4.7 -0.7
DC 4	2.0 1.5	0.4 1.0	1.5 1.3	4.1 -0.3	2.0 0.9	10.1 -2.8	2.0 0.1	1.2 1.3	3.4 6.0	3.9 2.2
DC 5	2.1 1.0	0.1 0.9	5.1/2.0	3.8 -0.1	1.6 3.0	10.5/8.0	2.1 0.1	0.8 2.0	2.0 4.1	3.9/-0.5
DC 6	3.0 0.0	0.5 6.0	1.7 3.8	3.9 -0.9	-0.1 1.7	0.0 5.9	2.1 0.1	0.1 2.1	-0.1 3.7	1.6 6.8
DC 7	0.8 3.6	1.5 -0.9	1.8 2.0	3.2 -0.1	2.6 0.6	-0.7 5.8		0.1 2.2	0.2 4.1	1.8 2.3
DC 8	0.1 3.3	2.2 -1.2	2.5 2.3	2.5 0.6	1.4 1.9	2.0 2.3		0.0 1.9	-1.0/0.0	1.4 6.7
DC AVG.						↓			↓	↓
AC 1	16.7	21.9	6.35	24.9	6.82	3.31	104.5	22.7	4.57	2.72
AC 2	+0.2	-0.2	+0.2	+0.0	+0.1	+0.3	+0.1	+0.1	+0.3	-0.2
AC AVG.										
S.P.	-1.9	-2		+1			+2			
AC NOISE	-.02	.02		.02			.03			
POT RES.	3.4K	2.5K		3.7K		↓	-9K			

0.4	7.6	0.6	6.0
2.4	3.8	0.7	6.9
5.8	2.6	-0.5	6.9
5.0	3.4	1.2	5.1
1.3	4.1	0.2	

0.6	4.5
3.0	8.1
-1.3	8.7
-4.7	12.0
-3.0	4.8
-6.6	12.4
-1.4	10.4
-2.4	2.7
3.2	2.2
5.7	3.1
4.8	4.3
0.4	7.8
1.1	6.2
2.4	4.8

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GKAINEX 8270 68

LINE 8 HALF N53E SP. 1 DATE 8 68

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5NE				5-6 NE					3 4
RANGE	X1	X1	X.1	X.1	X1	X.1	X1	X.1		X10
DC 1	2.6 0.9	4.9 -2.4	3.2 1.6	0.0 10.4	4.3 -1.0	-3.9 5.4	2.8 6.4			-0.2 0.3
DC 2	2.7 0.1	4.9 -2.0	-0.4/-4.4	2.8 6.0	4.2 -0.8	-2.0 5.9	6.4 1.6			-0.2 0.3
DC 3	3.0 0.0	4.9 -2.1	11.6 -6.4	2.8 7.2	4.1 -0.4	-4.3/3.2	5.6 5.2			-0.2 0.3
DC 4	3.1 0.1	5.1 -2.5	12.4 -8.0	8.0 0.4	4.4 -1.7	-1.7 3.8	2.4 4.8			
DC 5	2.9 0.4	5.0 -2.1	12.4 -2.0	15.6 -4.0	6.9/-1.1	2.0 -0.5	0.4 9.2			
DC 6	3.0 0.1	4.1 -0.9	2.8 15.6	2.0 5.2	6.9 -4.0	4.2 -2.1	0.0 6.8			
DC 7	3.2 0.0	3.9 -1.5	4.0 -1.6	8.0 6.0	6.3 -1.2	-1.5 3.5	0.0 11.2	—		
DC 8	3.5 -0.1	4.0 -1.0	8.0 -3.2	4.4 2.8	4.0 1.0	1.1 -1.7	-4.0 10.4	—		
DC AVG.										
AC 1	40.0	12.1	3.04	1.95	12.4	4.79	2.12	6.47		201.0
AC 2	+0.5	0.0	+0.2	+0.1	+0.3	-0.3	+0.2	+0.1		+0.0
AC AVG.										
S.P.	-7				+2					
AC NOISE	.03				.03					
POT RES.	1.1K				1.2K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 8 HALF N SP. 1 DATE AUG. 20/68

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE	*	*	*	*	*	*	*	*	*	*
VOLTAGE	94x4	100x4	94x4	60x4	100x4	94x4	82x4	124x4	100x4	94x4
CURRENT	1.0	2.0	1.0	2.0	2.0	1.0	4.0	5.0	2.0	1.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE										*
RANGE	*	*	*	*	*					3.4
VOLTAGE	82x4	124x4	98x4	94x4	80x4	124x4	134x4	124x4		60x4
CURRENT	4.0	5.0	2.0	1.0	4.0	5.0	2.8	1.4		2.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVES

RECEIVER NO. MK 4B

OPERATOR DON B

COMMENTS: * .1#2

GUNNEX VEKOL

HEINRICHS GEOEX B270-68 LINE 8 SPD 1 LOOKING N37W 8-22-68 A= 1000 FEET

5.000	5.000	6.000	2.000	5.000	5.000	1.200	2.000	5.000	5.000	I	1.400	2.000	6.000	7.000	1.400	2.000	6.000	7.000	1.000							
38	2	15	-10	2	49	0	40	-20	60	DC	57	71	68	101	79	72	129	-160	3	LEFT						
-2	29	17	34	62	45	13	/	116	124		8	31	130	98	22	108	91	392	-10	SIDE						
37	0	30	-10	19	/	1	4	-8	64		51	94	69	100	77	/	148	-184	5							
-1	30	9	35	45	44	14	23	120	/		9	/	123	86	40	132	72	404	-10							
37	0	31	-9	32	53	-1	49	-36	76		50	54	/	121	82	42	/	-236	5							
-2	28	9	33	37	40	18	-12	164	76		10	49	72	66	26	89	101	448	-10							
38	5	28	-8	38	/	-10	74	/	80		50	64	141	/	91	121	95	/	5							
-1	22	14	35	32	32	28	/	32	124		11	39	/	88	24	18	159	-44	-10							
37	9	21	-7	38	74	-13	10	108	/		50	80	68	117	99	/	76	236								
0	21	15	33	42	27	28	69	-8	36		10	36	130	79	/	37	141	-36								
	28	20	-1	16	80	-13	0	140	140		51	72	54	100	78	114	123	232								
	23	22	31	63	/	25	58	12	36		12	50	131	98	31	42	78	-48								
	4	15	2	/	46	-13	14	92	140		50	54	54	82	83	130	/	264								
	25	15	30	25	34	29	63	32	8		13	63	128	111	22	4	96	/								
	5	30	2	50	/	-16	1	112	160		49	35	62	71	/	27	144	88								
	25	1	31	23	50	31	66	0	16		17	70	124	97	70	143	69	112								
				54	79		/	124				32	68	99	48	30	163	108								
					30		23						117	/	70	150	59	84								
					80		62						49	95		/	/	/								
					29								78	91		107	170	112								
					71								44	91		69	56	88								
					29								80	91		71	/	108								
													39	90		106	113	92								
													84	95		/	122	84								
													30	89		40	97	120								
													91	103		116	158	60								
														70		42	77	160								
														126		110	141								
																94	/									
																87										
																99										
																49										

*** = /

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
1.8	1.6	1.9	1.4	3.6	5.1	.7	3.2	5.9	8.7	PFEA	3.1	5.5	8.3	9.4	5.6	8.0	11.4	10.0	-.3	
54.00	85.40	37.90	31.40	9.180	5.950	118.0	14.90	7.490	5.760	AC1	15.20	3.190	2.770	2.800	4.490	1.220	1.290	1.350	102.0	
.1	.2	0.0	.2	0.0	.5	0.0	0.0	-.1	.1	AC2	.5	0.0	0.0	-.1	1.0	.1	-.1	0.0	0.0	
54.03	85.49	37.90	31.43	9.180	5.965	118.0	14.90	7.486	5.763	ACA	15.24	3.190	2.770	2.799	4.512	1.221	1.289	1.350	102.0	
32.42	51.18	75.92	46.95	22.44	36.89	292.0	90.69	46.79	73.81	RHO	132.0	47.01	29.49	45.16	99.92	38.85	24.72	35.04	.980	DC CAL
2.0	1.8	2.2	1.6	3.9	5.1	1.0	3.5	6.2	8.9	PFE	3.1	5.8	8.6	9.7	5.4	8.2	11.7	10.3	.264	AC CAL
62	35	28	33	173	140	3	38	133	120	MCF	23	116	292	216	54	211	475	294		
.4	.2	.4	.2	2.0	2.3	0.0	.3	1.7	1.7	CPFE	.2	1.6	5.6	5.2	.6	3.9	10.8	10.4		
1.7	1.6	1.8	1.4	1.9	2.8	1.0	3.2	4.5	7.1	CCPFE	2.9	4.2	3.1	4.5	4.8	4.3	.9	-.1		
51	31	23	29	83	76	3	35	97	97	CCMCF	22	84	104	100	48	110	37	-2		

1.000	2.000	1.000	2.000	2.000	1.000	4.000	5.000	2.000	1.000	I	4.000	5.000	2.000	1.000	4.000	5.000	2.800	1.400	2.000	
13	9	-13	40	-27	-9	21	17	9	64	DC	26	49	32	0	43	-39	28		-2	RIGHT
16	1	58	/	42	77	0	4	27	28		8	-24	16	104	-10	54	64		3	SIDE
20	11	-11	4	-9	11	22	18	20	/		27	49	-4	28	42	-20	/			
8	2	65	34	54	49	0	8	19	53		1	-20	/	60	-8	59	64			
26	9	/	-6	/	5	21	10	33	50		30	49	-44	28	41	-43	16			
10	3	1	40	24	/	0	11	14	47		0	-21	116	72	-4	/	56			
20	4	40	-8	11	0	20	12	34	-2		31	51	-64	80	44	32	52			
15	10	15	41	20	101	1	13	101	/		1	-25	124	4	-17	-17	24			
21	1	13	-3	9	-28	21	8	/	39		29	50	-80	156	69	38	48			
10	9	51	38	16	105	1	20	20	22		4	-21	124	-40	/	20	4			
30	0	/	-1	30	/	21	1	41	39		30	41	-20	/	-11	-5	92			
0	0	30	39	-1	80	1	21	-1	/		1	-9	28	-20	69	42	/			
/	15	17	-9	17	0		1	37	-5		32	39	156	52	-40	-21	0			
8	-9	38	32	26	59		20	2	16		0	-15	/	80	63	/	68			
36	22	18	-1	6	-7		0	41	68		35	40	40	60	-12	-15	0			
1	-22	20	25	14	58		19	-10	18		-1	-10	-16	44	40	35	112			
33		25	6	19	20			/	73				80	28	10	11	-40			
		23			73			0	14				-32			-17	104			
					/			/	67											
					6			6	/											
					45			60	4											
					30			7	76											
					81			69	24											
					-13			-5	38											
					82			69	58											
					/			12	26											
					-19			51	50											
					120			2	34											
					-30				13											
					98				91											
					-66															
					104															
					-19															
					104															
					-29															
					77															
					32															
					22															
					57															
					31															
					48															
					43															
					4															
					78															
					11															
					62															
					24															
					49															

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
1.7	.5	2.4	1.6	1.5	3.7	1.1	1.1	2.8	3.9	PFEA	1.6	1.4	2.9	5.4	1.9	1.3	4.0	0.0	.0	
16.70	21.90	6.360	24.90	6.820	3.310	104.5	22.70	4.570	2.700	AC1	40.00	12.10	3.040	1.950	12.40	4.790	2.120	1.470	201.0	
.2	-.2	.2	0.0	.1	.3	.1	.1	.3	-.2	AC2	.5	0.0	.2	.1	.3	-.3	.2	.1	0.0	
16.72	21.88	6.366	24.90	6.823	3.315	104.6	22.71	4.577	2.697	ACA	40.10	12.10	3.043	1.951	12.42	4.783	2.122	1.471	201.0	
50.68	32.83	77.72	37.75	41.32	102.4	78.78	54.78	70.11	167.4	RHO	121.3	73.18	93.37	214.6	94.24	57.89	82.21	*000.0	.995	DC CAL
1.6	.5	2.2	1.6	1.4	3.5	1.0	1.0	2.6	3.9	PFE	1.3	1.3	2.8	5.3	1.7	1.4	3.8	*000.0	-.050	AC CAL
31	16	29	41	35	34	12	18	37	24	MCF	11	18	30	25	18	24	46*00000			
.2	.4	.4	.3	.9	.6	.1	.6	1.0	.6	CPFE	.2	1.0	1.3	.7	.7	2.4	2.5	0.0		
1.4	.2	1.9	1.3	.5	2.9	.9	.4	1.6	3.3	CCPFE	1.1	.3	1.5	4.6	1.0	-1.0	1.4	*000.0		
27	5	24	34	13	28	11	7	23	20	CCMCF	9	5	16	21	11	-17	17*00000			

JOB 270-68 Vekol LINE 9 SPREAD 1

LOOKING N 37 W DATE August 23 A= 1000

CENTER 0.0 LABEL SW / NE FREQ. 3.0

COUPLING YES

9-12-68

PAGE

MK4B — MK2B

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT B 270 68

LINE 9 HALF S53W SP. 1 DATE 8/ /68

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	0-1SW	1-2SW		2-3SW			3-4SW			
RANGE	X1	X1	X1	100	10	10	300	30	3	3
DC 1	7.3 6.6	5.7 5.0	7.5 7.8	323 280	301 332	261 263	150 155	123 125	114 94	104 102
DC 2	7.9 6.4	6.0 4.6	7.1 8.0	323 300	305 336	287 265	150 151	125 124	116 95	106 101
DC 3	8.3 6.1	6.2 4.5	6.6 8.7	299 283	299 340	281 266	147 149	124 124	115 92	100 107
DC 4	7.0 7.6	6.1 5.2	7.1 7.7	299 319	323 310	282 271	146 150	123 125	119 101	102 104
DC 5	6.8 7.7	5.0 5.1	8.2 7.2	311 300	329 312	281 268	147 153		106 97	98 104
DC 6	7.0 7.5	5.6 5.2	8.4 7.1	305 301	321 320	283 264	146 156		110 100	98 103
DC 7	6.9 7.4	6.0 4.8	7.9 7.6		319 320	284 264	146 154		108 103	96 109
DC 8	6.2 7.9		7.8 7.1		323	283	151 150			96 109
DC AVG.										
AC 1	45.1	35.6	15.9	30.7	3.09	2.60	147.0	11.9	.960	.920
AC 2	+0.5	0.0	0.0	30.9	3.09	2.60	147.5	11.9	.960	.925
AC AVG.										
S.P.	-8	+4		+5						
AC NOISE	.04	.04		.09						
POT RES.	6.3K	4K								

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B270 68
LINE 9 HALF 553W SP. 1 DATE 8/68

PAGE

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5	MK2B	CAL
RECEIVE	4-5SW				5-6SW				3 4	2 MK2B
RANGE	100	30	1	1	100	30	3	3	300	X10
DC 1	779 800	940 945			721 716	130 128	122 128		105 102	1.9 -0.6
DC 2	779 800	940 983			721 716	130 128	123 126		104 102	1.9 -0.6
DC 3		940 990			721 716	130 129	123 125		104 102	1.9 -0.7
DC 4		940 985			710 719	130 129	124 122		104 102	1.9 -0.7
DC 5		950 980			712 720	129 129	128/129			1.9 -0.8
DC 6		950 980				129 130	127 121			1.9 -0.8
DC 7							137/125		USE MK2B	1.9 -0.8
DC 8							119			MK 4B
DC AVG.										
AC 1	75.9	9.10	.669	.677	68.8	12.1	1.12	1.29	103	100.4
AC 2	76.0	9.10	.670	.677	68.8	12.0	1.125	1.29	103	+0.1
AC AVG.										
S.P.	-26									
AC NOISE	.08								X	
POT RES.										

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VERTOL

LINE 9 HALF S SP. 1 DATE AUG 23/68

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE				*	*	*	*	*	*	*
RANGE										
VOLTAGE	124x4	132x4	124x4	64x4	116x4	130x4	126x4	118x4	114x4	128x4
CURRENT	2.0	1.6	2.0	1.0	1.2	2.0	2.0	2.0	1.4	2.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	*CAL	CAL
RECEIVE	*	*	*	*	*	*	*	*		*
RANGE									2-3	2-3
VOLTAGE	122x4	112x4	114x4	124x4	124x4	114x4	112x4	128x4	64x4	84x4
CURRENT	2.0	2.0	1.4	2.0	2.0	2.0	1.4	2.0	1.0	1.0

FREQUENCIES .1 3.0

SENDER NO. 1

OPERATOR DAVE S

RECEIVER NO. MK 4 B

OPERATOR DON B

COMMENTS: * AUG 27

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE 3

PROJECT GUNNEX B27068

LINE 9 HALF N53E SP. 1 DATE 8/1/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	0-1 NE	1-2 NE		2-3 NE			3-4 NE			
RANGE	X1	X1	X1	X1	X1	X.1	X1	X.1	X.1	X.1
DC 1	5.9 5.6	4.0 5.0	6.8 7.2	1.7 1.1	7.0 6.9	8.6 7.9	1.1 1.9	1.0 1.7	6.3 8.9	7.4 5.9
DC 2	6.0 5.5	3.8 5.2	6.0 8.1	1.8 1.2	7.8 6.1	9.6 7.8	0.9 2.1	0.0 2.0	6.2 9.1	9.2 9.3
DC 3	6.2 5.2	5.1 5.5	6.8 7.5	1.4 1.5	6.2 7.0	9.8 7.5	1.0 1.9	0.0 2.0	8.0 6.0	9.9 9.9
DC 4	6.6 5.0	5.8 6.0	7.0 7.7	1.2 1.7	6.8 7.5	10.0 8.0	1.2 1.8	-0.1 2.1	9.8 5.4	8.8 10.2
DC 5	6.3 5.5	5.5 5.6	7.0 7.5	1.1 1.9	6.3 7.6	8.8 8.9	1.2 1.9	0.1 1.5	7.4 7.6	8.0 11.9
DC 6	6.5 5.1	5.8 5.3	7.4 6.9	0.6 2.5	6.1 8.2	7.7 8.1	1.1 1.9	1.8 0.1	7.2 7.9	7.1 11.9
DC 7	6.9 5.0	5.4 6.1	7.8 6.4	1.6 1.2	6.3 7.6	9.4 7.2	1.2 1.8	2.3 0.0	7.8 7.2	7.3 11.6
DC 8	7.1 4.9	5.0 6.7	8.0 6.9	1.8 1.2	6.5 7.9	10.4 6.9	1.3 1.6	2.1 -0.2	8.3 6.4	6.2 12.9
DC AVG.										
AC 1	43.8	43.0	15.4	22.3	17.9	9.16	76.3	7.17	8.87	5.86
AC 2	-0.5	-0.2	0.0	+0.5	+0.2	0.0	+0.1	+0.2	0.0	0.0
AC AVG.										
S.P.	-9	-7		+24			-6			
AC NOISE	.04	.04		.04			.04			
POT RES.	4.4	1-6K		2K			3.5			OVER

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270 68
LINE 9 HALF N53E SP. 1 DATE 8/68

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	4-5NE				5-6 NE					3 4
RANGE	X1	X.1	X.1	X.1	X.1	X.1	X.1	X.1	0.7 -1.0	X10
DC 1	0.8 2.9	1.1 0.0	2.9 7.9	9.5 12.0	0.8 1.3	4.4 0.0	7.0 10.0	10.8 12.2	0.8 -0.9	-0.7 1.3
DC 2	0.5 2.7	1.9 0.0	7.6 2.9	10.4 11.0	1.5 0.5	0.4 2.0	6.1 12.0	10.0 12.0	0.8 -1.0	-0.5 1.1
DC 3	-2.9 2.2	3.0 -1.0	7.0 10.2	11.2 7.3	2.1 0.0	8.9 5.2	6.0 8.0	12.0 9.4	0.8 -0.9	-0.8 1.3
DC 4	1.3 1.8	0.0 4.0	7.4 11.2	9.3 12.2	1.2 1.0	-3.6 5.2	10.9 8.2	15.0 5.9	0.9 -0.9	-0.5 1.6
DC 5	4.9 1.5	-1.8 3.4	6.4 9.8	7.2 12.5	1.8 1.0	-3.6 7.6	10.2 8.0	8.1 14.8	1.0 -0.9	-0.1 1.7
DC 6	2.2 1.3	0.0 2.3	5.6 10.2	9.9 10.8	2.0 1.0	-1.2 4.4	9.6 6.0	9.0 13.8		-0.1 1.7
DC 7	2.3 1.1	0.2 1.0	9.8 5.8	8.3 11.4	2.4 0.2	-1.6 5.6	12.8 5.9	10.6 11.8		-0.1 1.7
DC 8	2.5 1.0	2.2 -0.7	9.1 7.2	10.1 8.3	2.8 0.0		-10.9 7.8	7.6 15.0		-0.1 1.7
DC AVG.										
AC 1	19.6	5.03	4.97	4.94	7.24	3.14	3.56	3.81		104.0
AC 2	+0.3	+0.1	0.0	-0.2	+0.1	+0.2	-0.1	-0.2		+0.0
AC AVG.										
S.P.	-5				+12					
AC NOISE	.04				.04					
POT RES.	2.9	OVER			1.5K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 9 HALF N SP. 1 DATE AUG 22/67

PAGE

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE										
VOLTAGE	92x4	126x4	90x4	90x4	124x4	90x4	124x4	90x4	124x4	90x4
CURRENT	2.0	2.0	2.0	1.0	2.0	2.0	2.0	1.0	2.0	2.0
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
RECEIVE										CAL
RANGE										3-4
VOLTAGE	124x4	130x4	122x4	124x4	124x4	126x4	120x4	124x4		106x4
CURRENT	2.0	1.6	2.0	3.0	2.0	1.6	2.0	3.0		1.0

FREQUENCIES .1 3.0

SENDER NO. 1

OPERATOR DAVE S

RECEIVER NO. MKH B

OPERATOR DON B

COMMENTS:

Gunnex - VekoL

HEINRICHS GEOEX   8270-68   LINE 9   SPD 1   LOOKING N37W   8-23-68   VEKOL   A= 1000 FEET

2.000	1.600	2.000	1.000	1.200	2.000	2.000	2.000	1.400	2.000	I	2.000	2.000	1.400	2.000	2.000	2.000	1.400	2.000	1.000	
			323	301	261	150	123	114	104	DC	779	940			721	130	122		105	LEFT
			280	332	263	155	126	94	102		800	995			716	128	128		102	SIDE
			323	305	287	150	125	116	106			940			721	130	123		104	
			300	336	265	151	124	95	101			983			716	128	126		102	
			/	299	281	147	124	115	100			940			721	130	123		104	
			299	340	266	149	124	92	107			990			716	129	125		102	
			283	/	282	146	123	119	102			940			/	130	124		104	
			299	323	271	150	125	/	104			985			710	129	122		102	
			319	310	281	147		101	98			950			719	129	128			
			/	329	268	153		106	104			870			712	129	/			
			311	312	283	146		97	98			850			720	129	129			
			300	321	264	156		110	107			980				130	127			
			305	320	284	145		100	96								121			
			301	319	264	154		108	109								137			
				320	283	151		103	96								/			
				323		150			109								125			
																	119			
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
0.000	0.000	0.000	30.18	3.190	2.736	150.0	12.43	1.043	1.024	DCA	78.95	9.457	0.000	0.000	71.73	12.92	1.249	0.000	103.1	
0.000	0.000	0.000	30.70	3.090	2.600	147.0	11.90	.960	.920	AC1	75.90	9.100	.669	.677	68.80	12.10	1.120	1.290	103.0	
0.000	0.000	0.000	30.90	3.090	2.600	147.5	11.90	.960	.925	AC2	76.00	9.100	.670	.677	68.80	12.00	1.125	1.290	103.0	
0.000	0.000	0.000	30.80	3.090	2.600	147.2	11.90	.960	.922	ACA	75.95	9.100	.669	.677	68.80	12.05	1.122	1.290	103.0	
*000.0	*000.0	*000.0	87.85	30.95	39.82	218.3	72.35	21.68	29.81	RHO	459.6	137.6	*000.0	*000.0	1043.9	376.0	90.90	*000.0	.970	DC CAL
*000.0	*000.0	*000.0	-2.1	3.2	5.2	1.8	4.4	8.6	11.0	PFE	3.9	3.9	*000.0	*000.0	4.2	7.1	11.2	*000.0	.999	AC CAL
*00000	*00000	*00000	-24	102	130	8	60	395	368	MCF	8	28	*00000	*00000	4	19	123	*00000		
0.0	0.0	0.0	.1	1.3	2.1	0.0	.4	4.6	5.5	CPFE	.0	.4	0.0	0.0	0.0	.2	2.2	0.0		
*000.0	*000.0	*000.0	-2.2	1.8	3.0	1.8	3.9	4.0	5.5	CCPFE	3.8	3.4	*000.0	*000.0	4.2	6.9	9.0	*000.0		
1000	1000	1000	-25	59	77	8	54	184	184	CCMCF	8	25	1000	1000	4	18	100	1000		

1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	I	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
										DC									100	RIGHT
																			100	SIDE
1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	DCA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	AC1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	AC2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	ACA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0	
*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	RHO	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	1.000	DC CAL
*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	PFE	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	1.000	AC CAL
*00000	*00000	*00000	*00000	*00000	*00000	*00000	*00000	*00000	*00000	MCF	*00000	*00000	*00000	*00000	*00000	*00000	*00000	*00000		
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CPFE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	CCPFE	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0		
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	CCMCF	1000	1000	1000	1000	1000	1000	1000	1000		

0167045

0167044

Gunnex 3.0 Hz

HEINRICHS GEOEX 8270-68 LINE 9 SPD 1 LOOKING N37W 8-23-68 VEKOL A= 1000 FEET

2.000	1.600	2.000	1.000	1.200	2.000	2.000	2.000	1.400	2.000	I	2.000	2.000	1.400	2.000	2.000	2.000	1.400	2.000	1.000	
73	57	75								DC									19	LEFT
66	50	78																	-6	SIDE
79	60	71																	19	
64	46	80																	-6	
83	62	66																	19	
61	45	87																	-7	
/	61	/																	19	
70	52	71																	-7	
76	56	77																	19	
68	51	82																	-8	
77	56	72																	19	
70	52	84																	-8	
75	60	71																	19	
69	48	79																	-8	
74		76																		
62		78																		
79		71																		

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
7.2	5.4	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	PFEA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.6	
45.10	35.60	15.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	AC1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0	
.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	AC2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	
45.21	35.60	15.90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	ACA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	100.0	
72.11	69.96	102.1	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	RHO	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	1.000	DC CAL
6.4	4.9	7.1	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	PFE	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	*000.0	-.546	AC CAL
88	70	69	*00000	*00000	*00000	*00000	*00000	*00000	*00000	MCF	*00000	*00000	*00000	*00000	*00000	*00000	*00000	*00000		

2.000	2.000	2.000	1.000	2.000	2.000	2.000	1.000	2.000	2.000	I	2.000	1.600	2.000	3.000	2.000	1.600	2.000	3.000	1.000	
59	40	68	17	70	86	11	10	63	74	DC	8	11	79	95	8	44	70	108	7	RIGHT
56	50	72	11	69	79	19	17	89	59		29	0	79	120	13	0	100	122	-10	SIDE
60	38	60	18	78	96	9	0	62	92		5	19	76	104	15	4	61	100	8	
55	52	81	12	61	78	21	20	91	/		27	0	79	110	5	20	130	120	-9	
62	51	68	14	/	98	10	0	/	93		9	30	76	112	21	4	60	120	9	
52	55	75	15	62	75	19	20	80	99		22	-10	102	73	0	52	80	84	-10	
66	58	70	12	70	100	12	/	60	99		13	/	/	/	/	-36	109	150	9	
50	60	77	17	68	80	18	-1	98	88		18	0	74	93	12	52	82	59	-9	
/	55	70	11	75	88	12	21	54	102		19	40	112	122	10	-36	102	/	9	
63	56	75	19	63	89	19	1	/	80		15	-18	64	72	18	76	80	81	-9	
55	58	74	6	76	77	11	15	74	119		22	34	98	126	10	-12	96	148	10	
65	53	69	25	61	81	19	18	76	71		13	0	66	/	20	44	60	90	-9	
51	54	78	/	82	94	12	1	72	119		23	23	102	99	10	-16	128	138		
69	61	64	16	/	72	18	23	79	73		11	2	/	108	24	56	59	/		
50	50	80	12	63	104	13	0	78	116		25	10	98	83	2	/	109	100		
71	67	69	18	76	69	16	21	72	62		10	22	58	114	28	36	78	118		
49			12	65			-2	83	128			-7	91	101	0	-4	/	76		
				79				64	/			/	72	83		72	117	150		
									93			10	/	/		-36	62	/		
									96			12	110	119		44	118	113		
									89			11	61	89		-20	59	110		
									99			20	89	110			101	90		
									98			5	81	81			100	112		
									84			9	81	131			79	134		
									114				83	73			87	72		
									/				61	/			89			
									93				89	94			73			
									94				83	108			104			
									98				82	79			50			

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6		
5.9	5.4	7.2	1.4	7.0	8.6	1.5	1.1	7.6	9.3	PFEA	1.7	1.1	8.1	10.2	1.3	1.6	8.8	11.0	-.0	
43.80	43.00	15.40	22.30	17.90	9.160	76.30	7.170	8.870	5.260	AC1	19.60	5.030	4.970	4.940	9.240	3.140	3.560	3.810	101.0	
-.5	-.2	0.0	.5	.2	0.0	.1	.2	0.0	0.0	AC2	.3	.1	0.0	-.2	.1	.2	-.1	-.2	0.0	
43.69	42.96	15.40	22.36	17.92	9.160	76.34	7.177	8.870	5.260	ACA	19.63	5.033	4.970	4.935	9.245	3.143	3.558	3.806	101.0	
68.88	67.30	98.11	67.20	113.8	147.8	115.1	86.13	141.7	170.8	RHO	118.5	94.47	159.7	188.6	139.1	118.5	201.4	234.6	.990	DC CAL
6.2	5.5	7.2	1.2	6.9	8.6	1.5	1.0	7.6	9.3	PFE	1.6	1.1	8.1	10.3	1.3	1.5	8.9	11.2	.027	AC CAL
89	82	74	18	61	58	13	12	53	54	MCF	14	12	51	55	9	13	44	48		

Moore Business Forms, Inc.

JOB B 270-18 (Vekol) LINE 0 SPREAD 3

LOOKING N 37° W DATE Aug 4, 1988 A= 1000

CENTER 70 LABEL NE / NE FREQ. 3.0

COUPLING yes

PFE
PROGRAM

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX B270
LINE 0 HALF 554W SP. 3 DATE 8/6/68

PAGE 1

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	7-6NE	6-5NE		5-4NE			4-3NE			
RANGE	X10	X10	X1	X1	X1	X1	X1	X1	X1	X1
DC 1	-0.2	0.8	-0.2	3.5	5.0	1.8	3.4	1.8	2.9	5.5
DC 2	0.0	2.0	0.9	1.0	9.4	-3.1	2.8	7.4	5.9	4.0
DC 3	0.9	0.4	0.4	2.5	2.7	1.6	1.8	2.1	1.3	7.0
DC 4	0.1	1.7	1.6	-3.0	5.1	-4.5	1.8	8.0	5.7	4.7
DC 5	0.9	0.0	1.4	1.8	-3.0	-0.9	3.0	1.9	4.7	5.0
DC 6	0.1	1.2	1.9	-3.0	0.2	-3.0	1.5	8.1	5.5	5.0
DC 7	0.9	-0.1	0.1	0.2	-7.1	2.0	1.2	1.8	1.0	7.9
DC 8	0.1	1.0	1.0	-2.1	-1.6	-0.5	2.1	6.0	5.9	3.7
DC AVG.										
AC 1	309.0	118.0	61.8	41.8	25.7	22.5	31.2	19.5	22.8	20.5
AC 2	+0.2	0.0	+0.1	+0.1	+0.1	-0.1	+0.2	+0.5	+0.1	+0.5
AC AVG.										
S.P.	-14	+1		-9			+9			
AC NOISE	.03						.03			
POT RES.	1.5 K						1 K			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX 8270

LINE 0 HALF S54W SP. 3 DATE 8/4/68

PAGE 2

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		CAL
RECEIVE	3-2NE				2-1NE					2 3
RANGE	X.1	X.1	X.1	X.1	X.1	X.1	X.1	X.1		X10
DC 1	12.0	6.8	11.2	8.7	0.8	-9.2	-18.0	32.8		-1.0
DC 2	-5.1	9.3	6.1	6.4	16.2	36.4	42.0	-13.6		0.7
DC 3	16.1	4.2	9.4	12.0	-4.3	-18.8	-20.0	31.2		-1.0
DC 4	-7.6	8.3	3.4	5.4	21.8	34.8	32.0	-14.0		0.8
DC 5	14.9	0.4	9.7	12.3	4.6	-17.2	-18.0	35.6		-0.4
DC 6	-4.9	8.8	6.9	3.9	9.4	29.6	43.2	-8.0		0.8
DC 7	13.4	6.9	8.1	10.5	5.2	-9.2	40.4	26.0		
DC 8	-7.0	12.1	5.8	5.4	9.6	28.0	-23.0	-7.2		
DC AVG.										
AC 1	5.50	4.44	6.15	6.17	3.94	3.85	6.17	6.63		2030
AC 2	+0.2	+0.1	+0.2	0.0	-0.1	+0.1	+0.2	+0.1		+0.5
AC AVG.										
S.P.	+37				-26					
AC NOISE	.03				.04					
POT RES.	1K				1K					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT UEHOC
LINE 0 HALF S SP. 3 DATE AUG 8/67

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1-2	23	3-4	4-5
RECEIVE										
RANGE										
VOLTAGE	112x4	104x4	112x4	104x4	104x4	104x4	100x4	122x4	114x4	106x4
CURRENT	8.0	7.0	8.0	3.0	7.0	8.0	2.0	3.0	7.0	7.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	102x4	122x4	116x4	108x4	102x4	122x4	118x4	108x4		102x4
CURRENT	2.0	3.0	7.0	7.0	2.0	3.0	7.0	7.0		2.0

FREQUENCIES .05 3.0

SENDER NO. #1

OPERATOR DAVES

RECEIVER NO. MK4B

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT CONNEX B270 6B
LINE 6 HALF W 54E SP. 3 DATE 8/6/68

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	7-8NE	8-9NE		9-10NE			10-11NE			
RANGE	x1	x10	x1	x10	x1	x.1	x10	x1	x1	x.1
DC 1	2.0	0.8	2.9	2.5	3.2	-1.7	1.5	4.3	3.1	40.0
DC 2	0.8	0.7	1.0	4.4	0.9	2.4	1.4	1.9	-1.8	10.8
DC 3	2.7	0.5	-0.5	2.1	4.1	2.9	1.4	2.9	2.3	33.6
DC 4	-0.4	0.6	0.0	4.7	1.8	3.7	1.3	2.0	-7.0	-10.6
DC 5	1.0	0.1	3.6	2.0	3.1	3.3	1.4	2.9	3.0	0.0
DC 6	-1.5	1.0	-2.0	4.3	2.0	6.8	1.3	2.9	-6.2	-40.0
DC 7	2.0	0.9	-4.0	2.1	2.5	2.4	1.3	3.3	7.2	22.0
DC 8	1.8	0.5	3.2	4.1	1.0	5.9	1.5	2.5	-1.4	-22.8
DC AVG.										
AC 1	50.7	113.0	19.7	339.0	33.9	9.25	328.0	57.8	11.7	3.91
AC 2	+0.1	0.0	0.0	+0.3	+0.1	0.0	+0.5	0.0	+0.1	0.0
AC AVG.										
S.P.	-10	-5		+5			-4			
AC NOISE	.02	.02		.02						
POT RES.	1.5K	2.5K		200K						

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE 3

PROJECT GUNNEX B270 68

LINE 6 HALF N54E SP. 3 DATE 8/6/68

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	11-12NE				12-13NE					3 4
RANGE	X1	X1	X.1	X.1	X1	X.1	12.4			X10
DC 1	1.9	2.0	3.2	-16.8	-1.1	6.0	-16.0	DRIFT		0.0
DC 2	1.1	5.6	7.9	11.0	4.2	-1.8	-4.4			0.1
DC 3	1.8	2.5	2.3	-7.0	-1.7	-2.0	-17.6			0.0
DC 4	1.0	10.4	1.6	16.9	4.6	-3.0	12.4			0.1
DC 5	1.7	0.0	-5.8	-6.0	0.1	1.9	-3.2			
DC 6	1.8	9.8	6.9	7.2	7.2	1.4	19.6			
DC 7	2.0	1.3	-12.0	-19.6	-1.8	5.2	7.6			
DC 8	0.9	6.6	3.1	10.4	2.9	0.2				
DC AVG.										
AC 1	85.1	20.9	5.22	2.11	21.4	7.73	2.0	.918		19.7
AC 2	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+0.1		+0.1
AC AVG.										
S.P.	-3				+4					
AC NOISE	.02				.02					
POT RES.	800n				1k					

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOK
LINE 0 HALF N SP. 3 DATE AUG 6/68

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE										
VOLTAGE	38×4	112×4	120×4	98×4	112×4	120×4	120×4	98×4	112×4	120×4
CURRENT	3.0	3.0	2.6	6.0	3.0	2.6	8.0	6.0	3.0	2.6
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE										
RANGE										3-4
VOLTAGE	120×4	98×4	112×4	120×4	120×4	108×4	110×4	112×4		44×4
CURRENT	8.0	6.0	3.0	2.6	8.0	7.0	3.0	2.6		2.0

FREQUENCIES .05 3.0
SENDER NO. #1
OPERATOR DAVE S.
RECEIVER NO. MH4B
OPERATOR DON B

COMMENTS:

$$\begin{array}{r} 5.50 \\ 5.45 \\ 5.60 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 52 \\ 3\overline{)155} \\ \underline{15} \\ 5 \end{array}$$

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX B270-68

LINE 0 HALF N53E SP. 3 DATE 8/6/68

PAGE 1

SEND	1 2	2 3	1 2	3 4	2 3	1 2	4 5	3 4	2 3	1 2
RECEIVE	7-8NE	8-9NE		9-10NE			10-11NE			
RANGE	X1	X10	X1	X10	X1	X.1	X10	X1	X1	X.1
DC 1	2.6	0.8	2.9	2.5	3.2	-1.7	1.5	4.3	3.1	10.0x4
DC 2	0.8	0.7	1.0	4.4	0.9	2.4	1.4	1.9	-1.8	2.7
DC 3	2.7	0.5	-0.5	2.1	4.1	2.9	1.4	2.9	2.3	8.4
DC 4	-0.4	0.6	0.0	4.7	1.8	3.7	1.3	2.0	-7.0	-2.9
DC 5	1.0	0.1	3.6	2.0	3.1	3.3	1.4	2.9	3.0	0
DC 6	-1.5	1.0	-2.0	4.3	2.0	6.8	1.3	2.9	-6.2	-10
DC 7	2.0	0.9	-4.0	2.1	2.5	2.4	1.3	3.3	7.2	5.5
DC 8	1.8	-0.5	3.2	4.1	1.0	5.9	1.5	2.5	-1.4	-5.7
DC AVG.	1.5			3.3	2.3	3.2	1.4	2.8	-0.1	21.4
AC 1	50.7	113.0	19.7	239.0	33.9	92.5	328.0	57.8	11.7	3.91
AC 2	+0.1	0.0	0.0	+0.3	+0.1	0.0	+0.5	0.0	+0.1	0.0
AC AVG.										
S.P.	-10	-6	1	+5		-2	-4			
AC NOISE	.02	.02		.02			.02			
POT RES.	1.5K	2.5K		200m			150m			

ROAD AT 11,200'
WINDMILL 2000' EAST

NW C 35

T9SR2E

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B270 68
LINE 0 HALF WEST SP. 3 DATE 9/6/68

PAGE 2

SEND	4 5	3 4	2 3	1 2	4 5	3 4	2 3	1 2		CAL
RECEIVE	11-12NF				12-13NF					3 4
RANGE	X1	X1	X.1	X.1	X1	X.1	X.1	X.01		X10
DC 1	1.9	2.0	3.2	-4.2	-1.1	6.0	3.1	X4 20.8/4		0.0
DC 2	1.1	5.6	7.9	11.0	4.2	-1.8	-4.0	1.8		0.1
DC 3	1.8	2.5	2.3	-7.0	-1.7	-2.0	-1.1	8.4		0.0
DC 4	1.0	10.4	1.6	16.9	4.6	-3.0	-4.4			0.1
DC 5	1.7	0.0	-5.8	-1.5 X4	0.1	1.9	3.1			
DC 6	1.8	9.8	6.9	1.9	7.2	1.4	-.8			
DC 7	2.0	1.3	-12	-4.9	-1.8	5.2	4.9	DRIF		
DC 8	0.9	6.6	3.1	-2.6	2.9	0.2	1.9			
DC AVG.	1.5	4.7	5.1	-2.5						0.05
AC 1	85.1	20.9	5.2	21.1	21.4	7.3	2.0.0	9.1.8		19.7
AC 2	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	+0.1		+0.1
AC AVG.										
S.P.	-3				+4					
AC NOISE	.02				.02					
POT RES.	800Ω				1K					

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT GUNNEX B270-68

LINE 0 HALF S54W SP. 3 DATE 8/6/68

SEND	4 5	3 4	4 5	2 3	3 4	4 5	1 2	2 3	3 4	4 5
RECEIVE	7-6NE	6-5NE		5-4NE			4-3NE			
RANGE	X10	X16	X1	X1	X1	X1	X1	X1	X1	X1
DC 1	-0.2	0.8	-0.2	3.5	5.0	1.8	6.4 X4	.05 X4	4.9	11.9
DC 2	0	2.0	0.9	1.0	9.4	-3.1	-4.0	-.9	12.9	0
DC 3	0.9	0.4	0.4	2.5	2.7	1.6	8.2	1.6	2.1	5.1
DC 4	0.1	1.7	1.6	-3.0	5.1	-4.5	-6.1	-1.0	7.6	5.4
DC 5	0.9	0	1.4	1.8	-3.0	-0.9	9.1	.9	5.1	12.0
DC 6	0.1	1.2	1.9	-3.0	0.2	-3.0	-6.3	0	3.1	9.0
DC 7	0.9	-0.1	0.1	0.2	-7.1	2.0	9.0	3.0	8.4	11.1
DC 8	0.1	1.0	1.0	-2.1	-1.6	-0.5	-6.3	-0.2	0.5	4.8
DC AVG.										6
AC 1	30.9	11.8	61.8	41.8	25.7	22.5	15.6	19.2	22.4	23.7
AC 2	+0.2	0.0	+0.1	+0.1	+0.1	-0.1	0.0	0.0	+0.1	0.0
AC AVG.										
S.P.	-14	+16		-9			+9			
AC NOISE	.03	.03		.04			.06			
POT RES.	15K	1.4K		3K			1K			

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT GUNNEX [illegible]
LINE 0 HALF SSW SP. 3 DATE

PAGE

SEND	1 2	2 3	3 4	4 5	1 2	2 3	3 4	4 5		C & L
RECEIVE	3-2 NE				2-1 NE	X				2 3
RANGE	X.1	X.1	X.1	X.1	X.1	X.1	X.1	X.1		X.10
DC 1	12.0	6.8	11.2	8.7	0.0	-2.3 x4	-4.5 x4	8.3 x4		-1.0
DC 2	-5.1	9.3	6.1	5.4	16.2	9.1	10.5	-3.4		0.7
DC 3	16.4	4.2	9.4	12.0	-4.3	-4.7	-5.0	7.8		-1.0
DC 4	-7.8	8.3	3.4	5.0	21.5	8.7	8.0	-3.5		0.8
DC 5	14.9	0.4	9.7	12.2	4.6	-4.8	-4.5	8.9		-0.9
DC 6	-4.9	9.8	5.9	3.9	7.4	7.4	10.8	-2.0		0.8
DC 7	13.4	6.9	8.1	3.5	5.2	-2.3	13.1	6.5		
DC 8	-7.0	12.1	5.8	5.9	9.0	7.0	3.9	-1.8		
DC AVG.										
AC 1	55.0	44.4	61.5	61.7	37.4	38.5	61.7	65.3		203.0
AC 2	+0.3	-0.1	+0.2	0.0	-0.1	+0.1	+0.2	+0.1		10.5
AC AVG.										
S.P.	+37				-2.6					
AC NOISE	.03				.04					
POT RES.	1K									

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE

PROJECT GUNNEX B270 68

LINE 0 HALF S54W SP. 3 DATE

SEND	1 2	2 3	3 4	5 7	1 2	2 3	3 4	4		
RECEIVE	[illegible]									13.2
RANGE	X1	X1	X1	X1						16.8
DC 1	3.4	1.8	2.9	5.5						8.8
DC 2	2.8	7.4	5.9	4.0						14.4
DC 3	1.8	2.1	1.3	7.0						7.6
DC 4	1.8	8.0	5.7	4.7						6.0
DC 5	3.0	1.9	4.7	5.0						20.0
DC 6	1.5	8.1	5.5	5.0						10.0
DC 7	1.2	1.8	1.0	2.9						
DC 8	2.1	6.0	5.9	3.7						
DC AVG.										
AC 1	31.2	19.5	27.8	20.5						
AC 2	+0.2	+0.5	+0.1	+0.5						
AC AVG.										
S.P.										
AC NOISE	[illegible]									
POT RES.	[illegible]									

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VERCOR
LINE 0 HALF 5 SP. 3 DATE AUG 6/68

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE							54X4			
RANGE							1.0			
VOLTAGE	112X4	104X4	112X4	104X4	104X4	110X4	110X4	106X4	104X4	110X4
CURRENT	8.0	7.0	8.0	3.0	7.0	8.0	2.6	3.0	7.0	8.0
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE										
RANGE										2-3
VOLTAGE	124X4	126X4	104X4	112X4	120X4	108X4	106X4			110X4
CURRENT	3.0	3.0	7.0	8.0	3.0	3.0	7.0			2.0

FREQUENCIES .05 3.0
SENDER NO. #1
OPERATOR DAVE S.
RECEIVER NO. MK4B
OPERATOR DON B

COMMENTS:

$$
\begin{array}{r}
14.76 \\
15.06 \\
14.86 \\
14.98 \\
14.78 \\
14.96 \\
14.74 \\
\hline
4.14
\end{array}
\qquad
\begin{array}{r}
7.44 \\
14\overline{)104.14} \\
98 \\
\hline
61 \\
56 \\
\hline
54
\end{array}
$$

Gunnex Vekol

HEINRICHS GEOEX B270-68 LINE 0 SPD 3 LOOKING N37W 8-6-68 A= 1000 FEET

8.000	7.000	8.000	3.000	7.000	8.000	2.000	3.000	7.000	7.000	I	2.000	3.000	7.000	7.000	2.000	3.000	7.000	7.000	2.000	
-2	8	-2	35	50	18	34	18	29	55	DC	120	68	112	87	8	-92	-180	328	-10	LEFT
0	20	9	10	94	-31	28	74	59	40		-51	93	61	64	162	364	420	-136	7	SIDE
9	4	4	25	27	16	18	21	13	70		161	42	94	120	-43	-188	-200	312	-10	
1	17	16	-30	51	-45	18	80	57	47		-76	83	34	59	218	348	320	-140	8	
9	0	14	18	-30	-9	30	19	47	50		149	4	97	123	46	-172	-180	356	-9	
1	12	19	-30	2	-30	15	81	55	50		-49	88	69	39	94	296	432	-80	8	
9	-1	1	2	-71	20	12	18	10	79		134	69	81	105	52	-92	/	260		
1	10	10	-21	-16	-5	21	60	59	37		-70	121	58	54	90	280	404	-72		
																	-230			

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6	
.4	.9	1.0	.0	1.3	-1.0	2.1	4.7	4.1	5.5	PFEA	4.2	6.8	7.4	8.3	8.3	9.3	9.5	10.0	-.1
309.0	118.0	61.80	41.80	25.70	22.50	31.20	19.50	22.80	20.50	AC1	5.500	4.440	6.150	6.170	3.940	3.850	6.170	6.630	203.0
.2	0.0	.1	.1	.1	-.1	.2	.5	.1	.5	AC2	.2	.1	.2	0.0	-.1	.1	.2	.1	.5
309.3	118.0	61.83	41.82	25.71	22.49	31.23	19.55	22.81	20.55	ACA	5.505	4.442	6.156	6.170	3.938	3.852	6.176	6.633	203.5
114.7	50.31	92.29	41.24	44.01	82.35	47.13	80.57	100.3	182.7	RHO	33.90	46.74	55.85	98.82	63.08	82.97	99.97	172.6	.983 DC CAL
.7	1.2	1.3	.3	1.6	-.6	2.4	4.8	4.4	5.6	PFE	4.4	7.1	7.7	8.6	8.7	9.6	9.8	10.3	.350 AC CAL
6	24	14	8	36	-8	50	60	44	30	MCF	131	151	138	87	137	116	98	60	
.1	.2	.3	.3	.8	.8	.2	.4	.6	.5	CPFE	1.2	1.7	2.5	1.9	1.2	1.5	1.9	1.4	
.6	1.0	1.0	.1	.8	-1.5	2.2	4.5	3.7	5.0	CCPFE	3.3	5.3	5.2	6.7	7.5	8.1	7.9	8.9	
5	20	10	2	17	-18	46	56	37	28	CCMCF	96	114	93	68	119	97	79	52	

3.000	3.000	2.600	6.000	3.000	2.600	8.000	6.000	3.000	2.600	I	8.000	6.000	3.000	2.600	8.000	7.000	3.000	2.600	2.000	
20	8	29	25	32	-17	15	43	31	400	DC	19	20	32	-168	-11	60	124		0	RIGHT
8	7	10	44	9	24	14	19	-18	108		11	56	79	110	42	-18	-160		1	SIDE
27	5	-5	21	41	29	14	29	23	336		18	25	23	-70	-17	-20	-44			
-4	6	0	47	18	37	13	20	-70	-106		10	104	16	169	46	-30	-176			
10	1	36	20	31	33	14	29	30	0		17	0	-58	-60	1	19	124			
-15	10	-20	43	20	68	13	29	-62	-400		18	98	69	72	72	14	-32			
20	9	-40	21	25	24	13	33	72	220		20	13	-120	-196	-18	52	/			
18	5	32	41	10	59	15	25	-14	-228		9	66	31	104	29	2	196			
																	76			

1	1	2	1	2	3	1	2	3	4	N	2	3	4	5	3	4	5	6	
.9	.6	.2	3.3	2.4	3.4	1.4	2.8	-.2	3.5	PFEA	1.5	4.8	.6	-.1	1.9	.7	-1.2	0.0	.0
50.70	113.0	19.70	239.0	33.90	9.250	328.0	57.80	11.70	3.910	AC1	85.10	20.90	5.220	2.110	21.40	7.730	2.000	.918	197.0
.1	0.0	0.0	.3	.1	0.0	.5	0.0	.1	0.0	AC2	0.0	0.0	0.0	-.1	0.0	0.0	0.0	.1	.1
50.73	113.0	19.70	239.4	33.92	9.250	328.8	57.80	11.71	3.910	ACA	85.10	20.90	5.220	2.109	21.40	7.730	2.000	.918	197.1
51.92	115.4	92.41	125.2	140.8	112.0	126.5	120.5	118.4	94.75	RHO	131.5	111.2	106.5	86.38	83.00	67.69	70.15*000.0	1.015	DC CAL
.9	.6	.2	3.1	2.3	3.4	1.1	2.8	-.3	3.5	PFE	1.5	4.8	.6	-.0	1.9	.7	-1.2*000.0	.000	AC CAL
17	6	2	25	16	30	9	23	-2	37	MCF	12	44	5	-1	23	10	-18*00000		
.2	.1	.3	.1	.2	.5	.1	.2	.5	1.3	CPFE	.2	.5	1.1	2.3	.8	1.9	3.0	0.0	
.7	.6	-.1	3.1	2.1	2.8	1.1	2.5	-.8	2.2	CCPFE	1.4	4.3	-.5	-2.4	1.1	-1.3	-4.2*000.0		
13	5	-2	24	15	25	8	21	-7	24	CCMCF	10	39	-5	-27	13	-19	-60*00000		

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HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project VEKOL Line 3 Field date 6-26 Data page _____ Comp. date _____. Comp by JPM

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-10	10-20	→	20-30	→	→	30-40	→	→	→		
(C) n separation												
(D) I	1000	1350	1100	1350	1350	1100	1350	1400	1400	1100		
(E) Vdc (avg)	45.0	83.65	21.6	90.1	27.66	8.8	90.15	31.1	12.64	4.58		
(F) DCcal	1.047											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	141	~~213~~ 194	276	210	257	251	210	279	284	262		
(I) Vac Σ	44.55	81.8	21.1	89.9	27.1	8.5	90.0	30.75	12.5	4.42		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.2	1.9	2.0	-0.2	1.6	3.1	~~2.3~~ 0.1	0.7	0.8	3.1		
(O) MCF=(M-1)(10^5)/H	~~0.2~~ 1	~~+~~ 10	8	-1	6	12	1	3	3	12		
	+3.7	+5.3	→	+44.2	→	→	+9.9	→	→	→		

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				CAL
(B) Receive	40-50	←	→		50-60	→	→	→				
(C) n separation												
(D) I	1400	1400	1400	1100	1400	1450	1450	1450				
(E) Vdc (avg)	24.25	10.47	5.06	1.95	12.55	6.36	3.143	1.32				47.75
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	218	235	227	195	282	276	238	202				
(I) Vac Σ	24.2	10.5	4.92	1.925	12.5	6.27	3.11	1.28				47.4
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K				1.2		1.3	0.9	3.4				
(N) PFE=(M-1)(10^2)	-0.3	-0.8	2.4	0.9	0	1.0	0.7	2.6				
(O) MCF=(M-1)(10^5)/H	-1	-16	11	6	0	5	4	13				
	-27.5	→	→	→	+44.6	→	→	→				

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HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project VEKOL Line 3 Field date 6-26 Data page _____ Comp. date _____. Comp by JPM

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	0-10	10-20	→	20-30	→	→	30-40	→	→	→		
(C) n separation												
(D) I	1400	1450	1500	1500	1500	1500	1150	1500	1500	1500		
(E) Vdc (avg)	89.0	58.5	27.73	53.15	19.7	11.25	46.7	21.09	10.5	6.7		
(F) DCcal	1.06	→										
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	202	128	235	113	167	239	129	179	223	284		
(I) Vac Σ	86.6	56.5	26.7	51.2	19	11.35	44.65	20	10	6.82		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.974											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0	0.8	1.2	1.1	0.9	-3.5?	1.9	2.7	2.3?	-4.3?		
(O) MCF=(M-1)(10^5)/H	0	6	5	10	5	-15	15	15	10	15		
	+7.7	+21.6	→	-32.0	→	→	+2.9	→	→	→		

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2				
(B) Receive	40-50	→	→	→	50-60	→	→	→			②	①
(C) n separation												
(D) I	1150	1525	1650	1650	1200	1500	1650	1650				
(E) Vdc (avg)	15	9.3	5.92	4.28	5.82	4.16	3.01	2.30			48.0	~~45~~ 47.0
(F) DCcal	1.041	→										
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	166	194	228	289	154	176	203	248				
(I) Vac Σ	15.15	9.2	5.86	4.21	5.79	4.11	2.97	2.25			48.0	45.8
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.0	→										
(M) ρdc/ρac =ExL/K					0.7	1.2	1.7	2.9				
(N) PFE=(M-1)(10^2)	0	1.1	1.0	1.7	0.5	0.9	1.3	2.2				
(O) MCF=(M-1)(10^5)/H	0	6	4	6	5	7	8	12				
	+15.8	→	→	→	+16.2	→	→	→				

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Vreoe

LINE 3 HALF S SP. 1 DATE 6-26

SEND	1-5	2-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10	10-20	→	20-30	→	→	30-40		→	→
RANGE	44.0						.3	.1	.03	
DC 1	46.0	83.8	21.4	89.9	28.7	7.7	90.1	32.1	13.3	4.60
DC 2	44.0	83.5	21.8	90.3	26.6	10.0	90.2	30.1	12.0	4.46
DC 3		83.8	21.5	89.9	28.8	7.7	90.1	32.1	13.4	4.59
DC 4		83.5	21.5	90.3	26.7	9.7	90.2	30.4	11.7	4.65
DC 5			21.9		28.8	7.8	90.1	32.2	13.0	4.80
DC 6			21.2		26.4		90.2	30.2	11.8	4.59
DC 7			21.9		28.7			32.0	13.7	4.78
DC 8			21.4					30.2	12.1	4.19
DC AVG.	45.0	83.65	21.6	90.1	27.66	8.8	90.15	31.1	13.6 12.8	4.58
AC 1	44.6	81.8	21.1	89.9	27.1	8.5	90.0	30.8	12.5	4.42
AC 2	44.5	81.8	21.1	"	27.1	"	90.0	30.7	12.5	"
AC AVG.	44.55	81.8	21.1	89.9	27.1	8.5	90.0	30.75	12.5	4.42
S.P.	+3.7	+5.3	→	+44.2	→	→	+9.9	→	→	
NOISE	.04									

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT VEKOL

LINE ____ HALF ____ SP. ____ DATE ____

PAGE 3

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAPs
RECEIVE	40-50				50-60					
RANGE										
DC 1	~~21.2~~	~~9.8~~ 11.3	4.89	226 188	12.3 17	6.78 6.08	349 292	146 126		47.8
DC 2	24.7	9.7 11.3	5.38	206 186	12.4 13.0	660 628	317 321	102 165		47.7
DC 3	23.7	9.6 11.3	5.00 5.23	226/207	12.0	648 608	318 302	104 148		47.8
DC 4	24.8	9.6	4.86 5.29	188 207		6.67 627	338 298	130 121		
DC 5	23.7		4.90 5.23	168 212		641 626	330 311	135 144		
DC 6	24.8		4.75 4.99	174 198		661 610	315 317	.93/106		
DC 7				194 220		655 611	310 300	146 118		
DC 8				161 216		641 638	317 308	162 107		
DC AVG.	24.25	10.47	5.06	195	12.55	636	3.143	132		
AC 1	24.2	10.5	4.92	1.93	12.5	6.27	3.11	1.28		47.4
AC 2	"	"	"	1.92	"	6.27	3.11	1.28		47.4
AC AVG.	24.2	10.5	4.92	1.925	12.5	6.27				
S.P.	-27.5				-44.6					
AC NOISE	.10				.10					
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT VEKOL
LINE ____ HALF ____ SP. ____ DATE ____

PAGE 3

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10	10-20	→	20-30	→	→	30-40	→	→	→
RANGE										
DC 1	88	57.2	26.9	53.3	20.2	12.7	45.3	21.1	11.2	7.22
DC 2	92	59.8	28.9	53.0	19.5	11.3	48.3	20.5	9.8	7.38
DC 3	88	57.2	26.6	53.4	20.1	12.9	45.3	21.6	11.2	7.20
DC 4	90	59.8	28.9	53.1	19.0	10.9	48.5	20.5	9.8	7.45
DC 5	86.5				20.2	12.8	45.0	22.0		7.05
DC 6						10.8		20.5		7.45
DC 7						13.0		21.9		6.90
DC 8						10.8		20.2		7.30
DC AVG.	89.0	58.5	27.73	53.15	19.7	11.25	46.7	21.09	10.5	6.70
AC 1	~~87~~	56.5	26.7	51.3	19.0	11.4	44.7	20.0	10.1	6.83
AC 2	86.6	56.5	26.7	"	19.0	11.3	44.6	20.0	10.0	6.82
AC AVG.	86.6	56.5	26.7	51.2		11.35	44.65	-		
S.P.	17.7	21.6+	→	-22.0	→	→	2.9+			
AC NOISE		.05	→	.05	→	→				.05
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE

PROJECT _____

LINE _____ HALF _____ SP. _____ DATE _____

0.15 10 28

SEND	4-5	3-4	2-3	1-2		4-5	3-4	2-3	1-2	3-4
RECEIVE										CAL
RANGE										
DC 1	15.8	9.4	~~[illegible]~~ 6.20	4.81 470	6.19 540	423 408	3.33 289	2.25 2.13		46.8
DC 2	14.2	9.2	5.62 6.21	486 561	630 538	423 409	319 288	2.36 2.23		47.2
DC 3	15.8	9.4	5.60 6.26	498 340	624 542	422 409	320 282	2.34 2.20		
DC 4		9.2		4.18 4.37	621 543	425 405	318 290	2.41 2.12		
DC 5				4.21 4.36	617 561		301 300	2.38 2.00		
DC 6				4.17 4.40	600 563		298 300	2.63 1.92		
DC 7				4.09 4.61	595 545		299 307	2.67 1.90		
DC 8			5.92	3.91 ~~[illegible]~~	599 582		291 307	2.69 1.99		
DC AVG.	15.0	9.3	5.86	4.28	~~[illegible]~~	4.16	3.01	2.30		47.0
AC 1	15.1	9.2	"	4.22	5.79	4.11	2.97	2.25		45.8
AC 2	15.2	"	5.86	4.21	"	"	"	2.25		"
AC AVG.	15.15	9.2			5.79	4.11	2.97			45.8
S.P.	+15.8				16.2					
AC NOISE					.04					
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT _____

LINE _____ HALF _____ SP. _____ DATE _____

PAGE 5

SEND						2.5	2.4			
RECEIVE										
RANGE										48.1
DC 1						48.2	21.8			48.0
DC 2						47.6	21.2			48.0
DC 3						48.1	22.0			47.9
DC 4						47.5	21.3			
DC 5							21.9			
DC 6							21.2			
DC 7										
DC 8										
DC AVG.										
AC 1						47.1	21.3			48.0
AC 2						47.	21.3			47.9
AC AVG.						42.9				
S.P.										
AC NOISE										
POT RES.										

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VETOL

LINE 3 HALF S SP. 1 DATE JUN 26 '68

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	410	470	500	470	470	500	470	490	490	495
CURRENT	1000	1350	1100	1350	1350	1100	1350	1400	1400	1100
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE	→	→	→	→	→	→	→	→		23
RANGE				*		*	*	*Δ		
VOLTAGE	480	480	480	490	480	485	500	510		160
CURRENT	1400	1400	1400	1100	1400	1450	1450	1550		500

FREQUENCIES .05 3.0

SENDER NO. 9662-5

OPERATOR DAVES

RECEIVER NO. 3641

OPERATOR PHIL M

COMMENTS: ALL CURRENTS IN MA

* .15 DC

Δ EST 510V DC.

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 3 HALF N SP. 1 DATE JUN 26-7 67

PAGE

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE		→		→		→				→
RANGE										
VOLTAGE	460	470	490	500	485	485	500	500	480	480
CURRENT	1400	1450	1500	1500	1500	1500	1150	1500	1500	1500
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	JUN 27	CAL
RECEIVE	→			→	→			→	45	3-4
RANGE	☒	☒			*	*	*			
VOLTAGE	450	470	460	460	465	460	460	460	190	320
CURRENT	1150	1525	1650	1650	1200	1500	1650	1650	500	500

FREQUENCIES .05 3.0

SENDER NO. 9662 S

OPERATOR DAVE S

RECEIVER NO. 3641

OPERATOR PHIL M

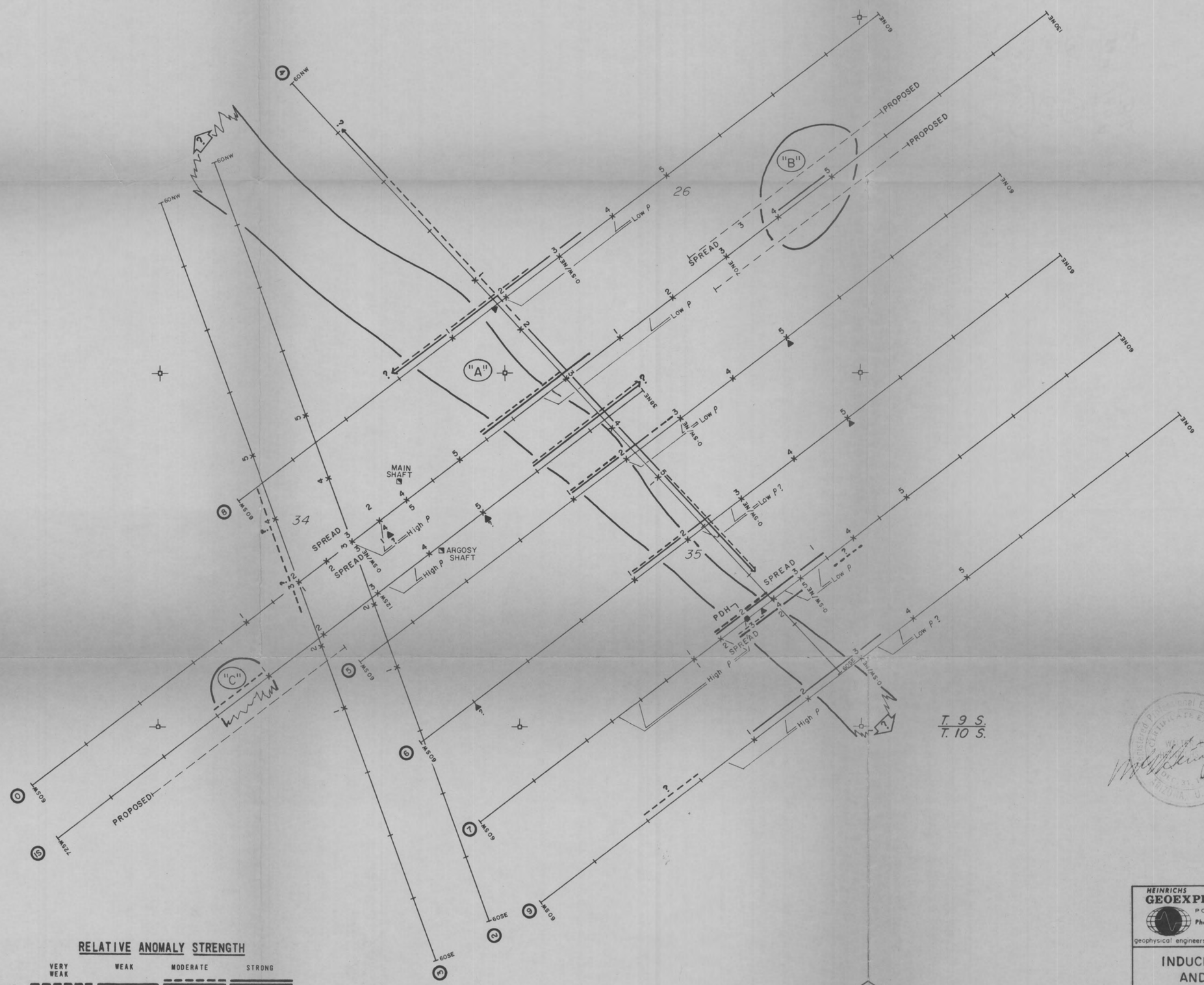
COMMENTS:

4-5	3-4
☒	
465	465
1200	1525

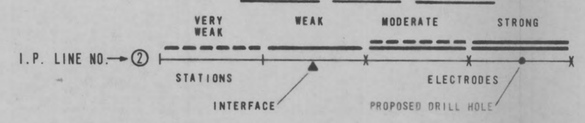
ALL CURRENTS IN MA.

* .15 #2 DC.

R. 2 E.



RELATIVE ANOMALY STRENGTH



File

HEINRICHS
GEOEXPLORATION COMPANY
geophysical engineers
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
vancouver sydney

INDUCED POLARIZATION LOCATION AND INTERPRETATION PLAN
VEKOL MINE AREA
PINAL CO., ARIZ.

FOR

GUNNEX LIMITED

SCALE: 1" = 1000' | DRAWN BY: JAY DOWNS | DATE: NOV. 1968

270-68

CLIENT GUNNEX LTD PROJECT VEKOL Mine Area

FIELD WORK: START _____ COMPLETE _____

DISTRIBUTION: 1-Walker, 2-Dix, 1-Geoex

LINE NUMBER	SPREAD NO	DIPOLE SIZE	FIELD DATA RCVD	FIELD DATA CHKD	FIELD SECT DATA SHEET CHKD	DRAFTING VALUES	DRAFTING CONTOURS	DRAFTING SELF POT	DRAFTING INTERPR.	DRAFTING TITLE BLK	CHK PRINT	INTERPRET	FINAL CHK	FINAL PRINT BL LINE	FINAL PRINT SEPIA	LOCATION PLAN DRAFT	LOCATION PLAN CHKD	LOCATION PLAN BL LINE	LOCATION PLAN SEPIA	Computer Chart
0	1	500	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
0	2	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				
0	3	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
1S	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				
2	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				
3	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				
4	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
5	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
6	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
7	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
8	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
9	1	1000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X
7	2	500	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓				X

270-68

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PAGE 1

PROJECT Vekol

LINE 2 HALF S SP. 1 DATE 6-[illegible]

SEND	4-5	[illegible]	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10	10-20	→	20-30		→	30-40			
RANGE									*	
DC 1	144	196	40.9	182	49.1	17.9	273	41.1	17.8	7.51
DC 2	144	195	42.5	182	48.5	16.9	272	42.3	16.8	7.53
DC 3	144	196	40.9	182	49.1	18.0	273	41.0	17.8	7.51
DC 4			42.4		48.4	16.7		42.3	16.8	7.51
DC 5					49.2	18.1		41.0		7.59
DC 6										7.41
DC 7										7.61
DC 8										7.43
DC AVG.	144	196.5	41.7	182	48.8	17.4	272.5	41.66	17.3	7.53
AC 1	144	195	41.6	181	48.6	17.4	270	41.8	17.2	7.46
AC 2	144	195	41.7	181	48.6	17.4	270	41.8	17.2	7.46
AC AVG.	144	195	41.65	181	48.6	17.4	270	41.8	17.2	7.46
S.P.	.05	-9.9	→	-21.9		→	-8.9			
AC NOISE	20.3 -	~~-9.9~~	.05	.05			[illegible]			
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT [illegible]

LINE [illegible] HALF [illegible] SP. [illegible] DATE [illegible]

PAGE [illegible]

SEND		[illegible]	[illegible]	4-5	1-2	2-3	3-4	4-5		[illegible]
RECEIVE	[illegible]				50-50					
RANGE										
DC 1	35.1	10.7	[illegible]		18.4	7.20	3.63	[illegible]		47.7
DC 2	[illegible]	11.4	[illegible]	2.76	19.0	[illegible]	3.79	1.57		47.6
DC 3	35.1	10.8	[illegible]	2.72	18.3	7.26	3.62	2.34		47.7
DC 4	[illegible]	11.3	[illegible]	[illegible]	19.1	[illegible]	3.99	1.59		
DC 5			5.89	2.47	18.1	[illegible]		2.38		
DC 6			5.81	3.08		[illegible]		1.49		
DC 7			[illegible]	2.43				2.43		
DC 8			[illegible]	2.05	18.66			1.45		
DC AVG.	35.6	11.05	5.85	2.77	[illegible]	7.03	3.81	196		47.65
AC 1	35.8	11.0	5.80	2.73	18.5	6.8	3.8	[illegible]		47.5
AC 2	35.8				"	"	"	1.91		47.5
AC AVG.	35.8	11.0	5.80	2.73	18.5	6.8	3.8	1.91		
S.P.	33.1				-11.6					
AC NOISE	.02				.03					
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Vekor

LINE 2 HALF N SP. 1 DATE 6-30

PAGE 2

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	[illegible]	[illegible]	→	30-30		→	30-45			→
RANGE										
DC 1	216	156	46.1	176	43.9	22.3	188	43.0	16.6	~~10.4~~
DC 2	216	159	50.3	177	44.8	22.7	187	44.2	19.0	12.3
DC 3	216	156	46.1	176	43.9	22.7	188	43.0	16.4	10.7
DC 4			50.3		44.1	22.6	187	44.2	18.9	12.3
DC 5					44.3				16.4	10.6
DC 6					44.1				18.9	12.4
DC 7					44.3					
DC 8									17.7	
DC AVG.	216	157.5	48.2	176.5	44.35	22.5	187.5	43.6	~~35.4~~	11.5
AC 1	212	154	47.5	172.	43.2	21.9	182	42.4	17.2	11.1
AC 2	212		47.5	172	43.2	21.9	"	"	"	"
AC AVG.	212	154	47.5	172	43.2	21.9	1.82	42.4	17.2	11.1
S.P.	-34.4	[illegible]	→	0		→	-1.4			
AC NOISE	.1	.02	→	.02		→	.03			→
POT RES.	20K									

	3.4		1.2			2		1
34.9	15.6	7.70	5.17	15.8	7.80	4.59	3.23	47.0
34.7	16.9	7.00	5.15	14.8	7.97	4.60	3.39	46.6
34.4	15.6	7.80	5.20	15.9	7.42	4.53	3.49	47.0
33.0	16.4	7.00	5.05	14.9	7.78	3.92	3.40	46.5
38		7.85	5.24	15.7	7.60	4.61	3.50	
33.7		6.97	5.05	14.7	7.75	3.90	3.30	
38.2		7.85	5.20	15.9	7.71	4.68	3.46	
37.9		6.94	5.15	14.7	7.75	3.81	3.32	
38			5.14	15.9	7.76	4.79	3.65	
			5.18		7.62	3.78	3.25	
					7.80	4.70 (4.28)	3.56 (3.41)	
DC AV 35.4	16.0					3.81	3.20	
	16.0					5.10	3.66	
						3.60	3.18	
						4.98	3.68	
34.8		7.30	5.15	15.3	7.69	3.62	3.17	46.1
34.9	15.6	7.18	4.99	14.9	7.41	4.10	3.25	45.9
~~34.0~~	"	7.18	4.99	"	"	"	3.25	
~~28~~					7.41			
34.85	15.6	7.18	4.99	14.9		4.10	3.25	
-7.5				+7.3				
.05				.64				

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 2 HALF S SP. 4 DATE JUN 25/68

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	450	440	450	410	440	440	440	410	440	440
CURRENT	1600	1700	1600	1800	1700	1600	1800	1800	1700	1600
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	CAL	[redacted]
RECEIVE	→	→	→	→	→	→	→	→	2-3	[redacted]
RANGE										
VOLTAGE	440	410	460	440	440	410	410	450	170	
CURRENT	1800	1800	1800	1600	1800	1800	1800	1650	500	

FREQUENCIES .05 3.0

SENDER NO. 9662-S

OPERATOR DAVE S.

RECEIVER NO. 3C41

OPERATOR PHIL M

COMMENTS: ALL CURRENTS IN MA

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE 2 HALF N SP. 1 DATE JUN 25/80

PAGE

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	440	400	440	450	400	440	480	450	400	440
CURRENT	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE	→	→	→	→	→	→	→	→		3-4
RANGE										
VOLTAGE	430	450	400	440	430	450	440	460		250
CURRENT	1600	1800	1800	1800	1600	1800	2,000	1900		500

FREQUENCIES .05 3.0

SENDER NO. 9662-S

OPERATOR DAVE S

RECEIVER NO. 3641

OPERATOR PHIL M

COMMENTS: ALL CURRENTS IN MA.

N½

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project VEKOL Line 2 Field date 6-25-68 Data page _____ Comp. date _____. Comp by JPM

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	0-10	10-20	→	20-30	→	→	30-40	→	→	→		
(C) n separation												
(D) I	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
(E) Vdc (avg)	216	157.5	48.2	176.5	44.35	22.5	187.5	43.6	17.7	11.5		
(F) DCcal	1.068											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	384	280	342	314	315	401	334	310	315	408		
(I) Vac Σ	212	154	47.5	172	43.2	21.9	1.82	42.4	17.2	11.1		
(J) AC noise x 2	.1	.02	→	.03	→	→	.03	→	→	→		
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.985	→	→	→	→	→	→	→	→	→		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.5	0.8	0	1.1	1.2	1.1	1.4	1.1	1.5	2.1		
(O) MCF=(M-1)(10^5)/H	1	3	0	4	4	3	4	4	5	5		
	-34.4	+27.1	→	0	→	→	-4.4	→	→	→		

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2				CAL
(B) Receive	40-50	→	→	→	50-60	→	→	→				
(C) n separation												
(D) I	1600	1800	1800	1800	1600	1800	2000	1900				
(E) Vdc (avg)	35.4	16.0	7.30	5.15	15.3	7.69	4.28	3.41				46.8
(F) DCcal	1.068											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	352	285	360	321	306	273	240	321				
(I) Vac Σ	34.85	15.6	7.18	4.99	14.9	7.41	4.10	3.25				46.05
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.985	→	→	→	→	→	→	→				
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	0.1	1.0	0	1.6	1.1	2.1	2.9	3.4				
(O) MCF=(M-1)(10^5)/H	0	4	0	5	4	8	12	11				
	-7.5	→	→	→	+7.3	→	→	→				

15.04
15.04
15.02
15.10
15.00
15.12
15.04
6

14.04
14.10
14.03
14.02
14.05
24

5
7) 36
35
10

7.53
2) 15.05
14
10
10

7.03
5 2) 14.05
14
05

3.93
3.90
3.92
3.87
3.92
3.98
2

92
6) 552
54
19 12
2) 392
2
19
18

HEINRICHS GEOEXPLORATION COMPANY

S½ INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

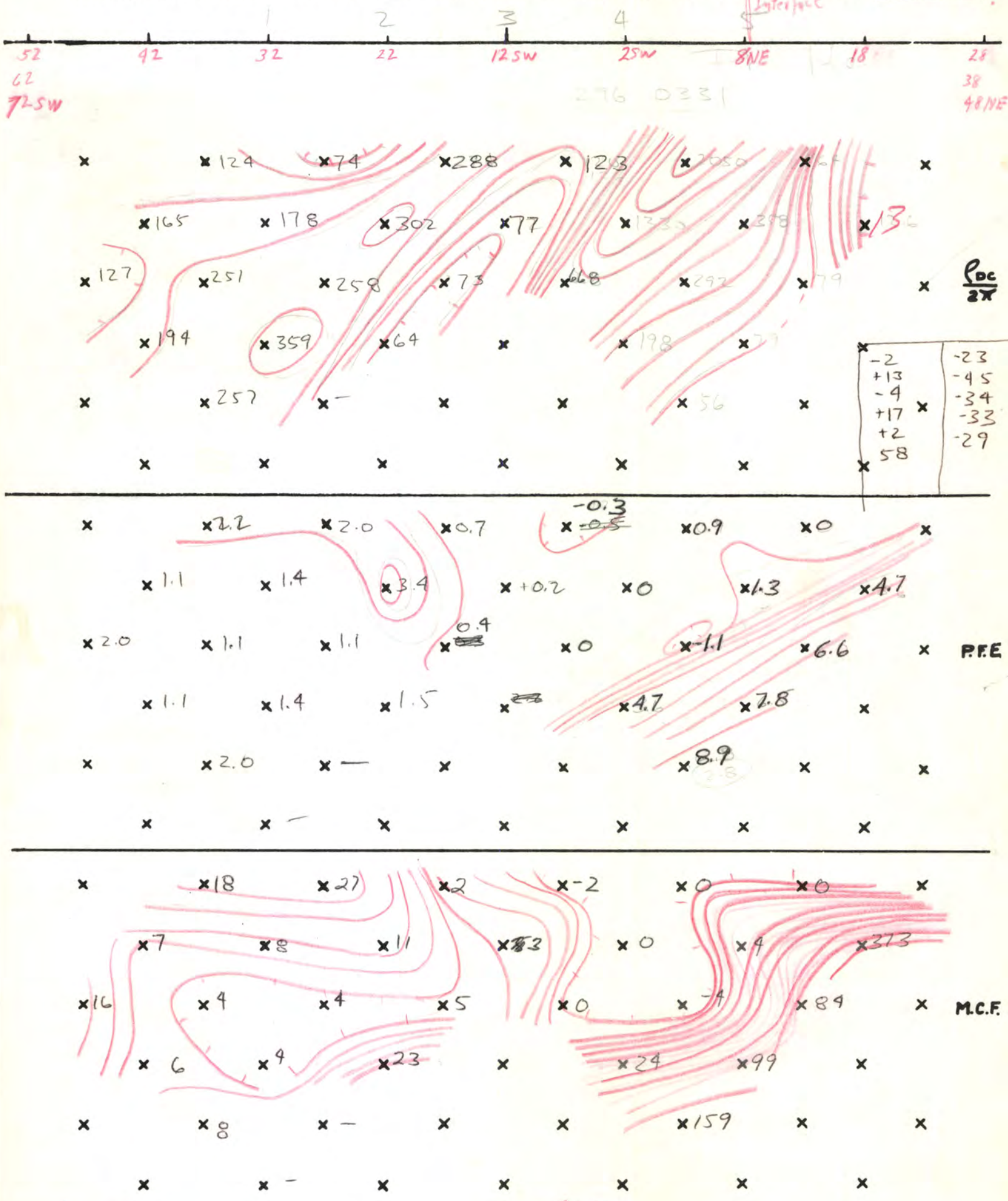
Project VEKOL Line 2 Field date 6-25-68 Data page _____ Comp. date _____. Comp by JPM

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-10	10-20	→	20-30	→	→	30-40	→	→	→		
(C) n separation												
(D) I	1600	1700	1600	1800	1700	1600	1800	1800	1700	1600		
(E) Vdc (avg)	144	196.5	41.7	182	48.8	17.4	272.5	41.66	17.3	7.53		
(F) DCcal	1.05											
(G) Kn x 10^{-3}	3	~~12~~ 3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	283	364	328	320	352	344	478	292	322	296		
(I) Vac Σ	144	195	41.65	181	48.6	17.4	270	41.8	17.2	7.46		
(J) AC noise x 2	.05	.05 →	→	.05 →	→	→	.05 →	→	→	→		
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995	→	→	→	→	→	→	→	→	→		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	-0.5	0.4	-0.2	0.1	0.4	-0.5	0.4	-1.0	0.1	1.0		
(O) MCF=(M-1)(10^5)/H	-2	1	-1	0	1	-12	1	-3	0	3		
	-20.3	-9.9 →	→	+21.9 →	→	→	-8.7 →	→	→	→		

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				CMR
(B) Receive	40-50		→	→	50-60	→	→	→				
(C) n separation												
(D) I	1800	1800	1800	1600	1800	1800	1800	1650				500
(E) Vdc (avg)	35.6	11.05	5.85	2.77	18.66	7.03	3.81	196				47.65
(F) DCcal	1.05											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	249	194	205	191	328	246	234	210				
(I) Vac Σ	35.8	11.0	5.80	2.73	18.5	6.8	3.8	1.91				47.5
(J) AC noise x 2	.03	→	→	→	.03 →	→	→	→				
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995	→	→	→	→	→	→	→				
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	-1.0	0	0.5	1.0	0.2	2.9?	-0.1	2.1				
(O) MCF=(M-1)(10^5)/H	-4	0	2	5	1	12	-0	10				
	+33.1 →	→	→	→	-11.6 →	→	→	→				

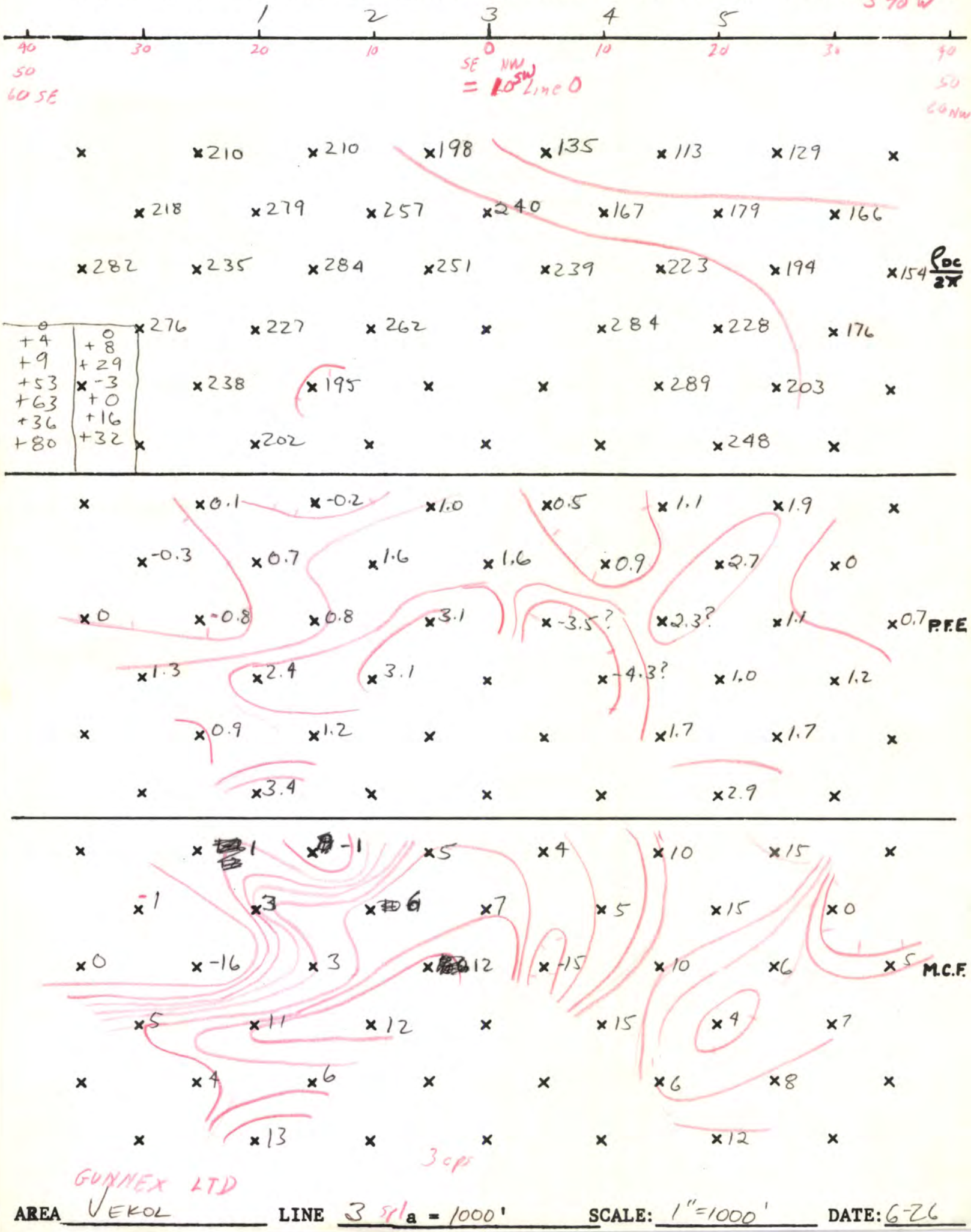
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING ~~N 51 W~~ NW ?



GUNNEX LTD.

AREA VEKOL LINE 18 sp/a = 1000' SCALE: 1"=1000' DATE: 6-21-68

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING ~~S 00~~ S 70 W



GUNNEX LTD

AREA VEKOL LINE 3 sp/a = 1000' SCALE: 1"=1000' DATE: 6-26

GUNNEX LTD

B 270-68
VEKOL Mine Area

HAGUE TIRE CENTER

1111 SO. KOLB ROAD AT 22nd STREET
TUCSON, ARIZONA

Phone 298-4829

LEE
OF CONSHOHOCKEN

NEW - USED

RETREADS

JOB 270-68 LINE 0 SPREAD 2

LOOKING N37W DATE June 18, 1968 A= 1000

CENTER 0 LABEL SW/NE FREQ. 3.0

COUPLING yes

no RUN

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Vekol

LINE 0 HALF NE SP. 2 DATE 6-18

PAGE 1

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10	10-20	→	20-30		→	30-40			→
RANGE	300	300							6.7 7.1	
DC 1	86	125	26.9	68.0	26.25	7.38	~~62.8~~	10.7	6.8 7.0	2.90
DC 2	85	125	27.1	67.9	26.25	7.50	62.0	10.8		2.80
DC 3	86	125	26.9	68.0	26.3	7.40	62.3	10.7		2.60 2.85
DC 4					26.0	7.88	62.2	10.8		
DC 5						7.30	62.4			2.55
DC 6						7.58 7.18	62.			2.95
DC 7					7.44	7.88 6.98				2.50 3.1
DC 8						8.00 6.98				
DC AVG.	85.5	125	27.0	67.95	26.26	8.18 6.56	62.23	10.75	6.9	? 2.76
AC 1	85	123	26.6	66.4	25.6	7.23	60.8	10.5	6.6	2.6
AC 2	85	123	26.6	66.4	25.6	7.23	60.8	10.5	6.6	2.6
AC AVG.	85	123	26.6	66.4	25.6	7.23	60.8	10.5	6.6	2.6
S.P.	-53.4	+52.0	→	-27.1			-20.0			
AC NOISE		←	.08							
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

.15

PROJECT Vebor

LINE 0 HALF NE SP. 2 DATE 6-18

PAGE 2

SEND	40 50	3-4	2-3	1-2	50-60					CAL
RECEIVE	40-50				50-60					
RANGE										53.5
DC 1	2.4 3.08	1.22 1.15	1.1 .75	.49 .44						53.5
DC 2	3.3 3.25	1.20 [illegible]	1.1 .77	.495 —						53.5
DC 3	3.15 3.34	1.15 1.09	1.1 .77	.46 .47						
DC 4	3.03 3.45	1.20 1.08	1.1 .73	.48 .48						
DC 5	3.0 3.46	1.26 1.00	1.2 .78	.50 .48						
DC 6	2.93	1.32 .93	1.06 .78	.48 ??						
DC 7		1.33 .92	1.07 .75							
DC 8		1.35 .94	1.1 .93 .67							
DC AVG.	3.34?	1.31 1.13 .93	1.35 1.17	.48 ??						
AC 1	3.06	1.06	.85 .67	.425?						53.2
AC 2	3.07	1.06	.85	.425						53.2
AC AVG.	3.065	1.06	.85	.425						
S.P.	-12.4									
AC NOISE										
POT RES.										

28.5
28.4
28.5
28.4
28.5
14.225
2) 28.45

56.03
2) 112.05
112
0

15.9
15.9

90.4
5) 202
20
2

10.05
4) 12
90
20

11.205

9.865
2) 19.73
18
17
16
13
12
10

6.40
6.40
6.45
6.35
6.42
20.2

111.9
112.0
112.0
112.3

16.3
16.2
16.2
16.2

19.7
19.8
19.7

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL

LINE ____ HALF N-E SP. ____ DATE ____

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	350	390	360	240	390	360	390	240	390	360
CURRENT	1200	1200	1200	600 MA	1200	1200	600	600	1200	1200
SEND	4-5	3-4	2-3	1-2	4-5	3-4	-2-3	1-2		CAL
RECEIVE		*	*	*						3-4
RANGE										
VOLTAGE	370	240	390	360						300
CURRENT	600 MA	600 MA	1200	1200						500

FREQUENCIES .05 3.0

SENDER NO. 9662-S

OPERATOR DAVE-S

RECEIVER NO. 3641

OPERATOR PHIL

COMMENTS: * [redacted] .15 DC

1000'

$$\frac{2.79}{1700} \cdot 60000$$

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT [illegible]

LINE 0 HALF SW SP. 2 DATE 6-18

PAGE 3

SEND	4-5	3-4	4-5	2-3	3-4	4-5	[illegible]	2-3	3-4	4-5
RECEIVE	0-10	10-20	→	20-30	→	→				
RANGE										
DC 1	65.5	~~44.5~~	14.4	~~58.5~~	15.7	8.35 [illegible]	42.5	10.1	7.5	~~3.32~~
DC 2	66.0	44.0	14.1	~~57.5~~	16.1	8.35 [illegible]	42.2	9.6	8.8	~~3.05~~
DC 3	65.4	44.1	14.3	55.4	15.7	8.45 [illegible]	42.5	10.2	7.4	3.00
DC 4	66.0	44.1	14.2	56.5	16.0	8.6 [illegible]		9.5	8.8	3.40
DC 5			14.2	55.5		8.9 [illegible]			7.4	3.00
DC 6			14.3	56.5						3.45
DC 7				55.8						2.90
DC 8										3.52
DC AVG.	65.75	44.075	14.23	56.03	15.88	7.61	42.4	9.87	16.2	3.2
AC 1	62.5	41.5	13.4	52.6	14.9	7.15	41.9	9.7	8.0	~~3.7~~ 3.15
AC 2	62.5	41.5	13.4	52.6	14.9	7.15	41.9	9.7	8.0	3.15
AC AVG.	62.5	41.5	13.4	52.6	14.9	7.15	41.9	9.7	8.0	3.15
S.P.	-38.7	-50	→	-93	→	→	-5.8			
AC NOISE	.05									
POT RES.										

13.68
2) 27.37
26
13
12
27.2 17
27.4 16
27.3 10
27.5
27.5
27.4
27.3

10.94
11.01
11.01
11.03
11.01

3) 11.
7) 29
29
50

2.94
2) 5.99
4
19
18
19

11.08
11.25
11.37
11.03
11.05
11.21
11.17
116

1.43
2) 2.86

5.99
5.99
165
7) 116
7
46
42
40
35
5

2.85
2.87
2.86
2.87
2.86
2.85
2.86
2.86

5.5828
2) 11.1657
10
11
10
16
16
5
4
17

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT VEKOL

LINE 0 HALF SW SP. 2 DATE 6-19

PAGE 4

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	(3)	(1)
RECEIVE	40-50				0.15					
RANGE										
DC 1	13.8	5.78	5.85 5.68	2.63 2.50	5.90 5.04	2.85 2.67	2.90 3.09	1.43 1.42	47.0	54.0
DC 2	13.4	5.30	5.85 5.77	2.65 2.66	5.97 5.03	2.84 2.61	2.90 3.09	1.45 1.41	47.0	54.0
DC 3	14.6	5.95	5.91	2.63 2.54	5.99 5.02	2.90 2.50	2.88	1.46 1.46	47.0	
DC 4	[illegible]	5.42	5.85	2.75 2.52		2.97 2.49		1.45 1.41		
DC 5	[illegible]	5.61		2.73 2.61		2.10 2.42				
DC 6	13.3	5.44		2.87 2.62		3.02 2.41				
DC 7	14.1	5.37		2.95 2.67	2.64	3.02 2.43				
DC 8	13.2	5.40		2.65 2.65		3.10 2.42				
DC AVG.	13.69	5.58	5.79	2.63 2.60	5.5	2.74	2.99	1.43	47.0	54.0
AC 1	~~2.3~~ 10.4	5.45	5.65	2.56	~~4.2~~ 5.39	2.66	~~2.8~~ 2.93	1.38	46.8	51.5
AC 2	13.4	5.45	5.65	2.56	5.39	2.66	2.925	1.38	46.7	51.4
AC AVG.	13.4	5.45	5.65	256	5.39	2.66	2.927	1.38	46.75	51.45
S.P.	-6.8				+26.3					
AC NOISE	.05	.05		.05	.05		.05			
POT RES.										

15.25
15.30
15.35
15.40
15.45
15.50
15.55
15.20
15.15
15.10
15.05

212
191
18
11
20

1.60
15.21
14
12
12

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT VEKOL LINE ____ HALF SW SP. 2 DATE JUN 19-20 1966

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE		→	→	→	→	→	→	→	→	→
RANGE								360		
VOLTAGE	370	240	370	390	240	370	440	~~480~~	440	440
CURRENT	600MA	600MA	600MA	1200	600MA	600MA	1500	1200	1200	750
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	CAL	CAL
RECEIVE				*		*	*	*	1-2	2-3
RANGE										
VOLTAGE	440	360	440	440	450	360	440	440	180	220
CURRENT	1500	1200	1200	750	1500	1200	1200	750	500MA	500MA

FREQUENCIES .05 3.0

SENDER NO. 9662-5

OPERATOR DAVE S

RECEIVER NO. 3641

OPERATOR PHIL M

COMMENTS: * .15HZ

1000'

$\frac{\cancel{600}}{\cancel{600}}$ 12 000

$\cancel{12\,000}$ 20

$\frac{1.1}{\cancel{600}}$ = 500

$\frac{1.13}{\cancel{600}}$ = 30000

$\frac{16}{12\cancel{00}}$ × 30000 (25)

$\frac{3.7}{75\cancel{0}}$ 50000

5 ρ 2 a=1000

SW

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project VEKOL Line O Field date 6-19 Data page _____ Comp. date 6-24 . Comp by JPM

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive												
(C) n separation												
(D) I	600	600	600	1200	600	600	1500	1200	1200	750		
(E) Vdc (avg)	15.75	44.075	14.23	5.603	15.88	7.61	42.4	9.87	~~16.2~~ 8.1	3.2		
(F) DCcal	.925						1.002					
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D	304	204	264	130	294	352	90	126	430	~~237~~	272	
(I) Vac Σ	62.5	41.5	13.4	52.6	14.9	7.15	41.9	9.7	8.0	3.15		
(J) AC noise x 2												
(K) Vac(corr) =$\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.952						.995					
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)		1.0	1.0	2.6	1.3	1.4	0.7	1.2	0.9	1.1		
(O) MCF=(M-1)(10^5)/H	0	5	4	20	4	4	8	10	2	4		
	-38.7	-5.0	→	-9.3	→		-5.8	→				

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5			DCAL	③CAL
(B) Receive												
(C) n separation												
(D) I	1500	1200	1200	750	1500	1200	1200	750			5	
(E) Vdc (avg)	13.69	5.58	5.79	2.64	5.5	2.74	2.99	1.43			54	47
(F) DCcal	.862											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	116	148	307	392	117	145	278	339				
(I) Vac Σ	13.4	5.45	5.65	2.56?	5.39	2.66	2.927	1.38			51.45	46.75
(J) AC noise x 2												
(K) Vac (corr) =$\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995											
(M) ρdc/ρac =ExL/K				8.8??		3.9	2.1	4.1				
(N) PFE=(M-1)(10^2)	1.7	2.0	2.0	6.7??	1.5	3.0??	1.6?	3.1??				
(O) MCF=(M-1)(10^5)/H	15	14	7	22	13	27	8	12				
	-6.8	→			+26.3	→						

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project VEKOL Line 0 Field date 6-18 Data page _____ Comp. date 6-24-68 Comp by LPM

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive												
(C) n separation	~~3~~	~~12~~	~~12~~	~~3~~	~~12~~	~~30~~	~~3~~	~~12~~	~~30~~	~~60~~		
(D) I	1200	1200	1200	600	1200	1200	600	600	1200	1200		
(E) Vdc (avg)	85.5	125	27.0	67.95	26.26	7.44	62.23	10.75	6.90	2.76		
(F) DCcal	.935									?		
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	200	292	252	339	245	174	291	202	166	159		
(I) Vac Σ	85.0	123	26.6	66.4	25.6	7.23	60.8	10.5	6.6	26		
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995	→										
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0	1.1	1.0	1.6	2.0	2.4	1.7	1.9	4.0	5.8		
(O) MCF=(M-1)(10^5)/H	0	4	4	5	8	14	6	9	24	45		

-33.4 +52.0 → -27.1 → -20 →

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	4-5	3-4	2-3	1-2								CAL
(B) Receive												
(C) n separation												
(D) I	600	600	1200	1200								
(E) Vdc (avg)	3.34?	1.13?	.93	.48								53.5
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105								
(H) ρ dc=ExFxGx10^3/D	23	53	44	39								
(I) Vac Σ	3.065	1.06	.85	.425								53.2
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995	→										
(M) ρdc/ρac =ExL/K	0	8.2	11.9	16.3								
(N) PFE=(M-1)(10^2)	8.5?	6.1?	9.0?	12.4?								
(O) MCF=(M-1)(10^5)/H	135	155	268	418								

-12.4 →

3.48
3.38
3.55
3.40
6.49
6.38
6.48
6.45
6.46
.07

$2\overline{)96}$

$$\begin{array}{r} 3.33 \\ 18\overline{)60.07} \\ 54 \\ \hline 60 \\ 54 \\ \hline 67 \\ 54 \\ \hline 130 \end{array}$$

2.24
2.29
2.24
2.28
2.24
2.32
2.25
2.26
2.25
2.27
2.29
2.25
2.24
2

$$\begin{array}{r} 26 \\ 13\overline{)342} \\ \cancel{26} \\ \hline 82 \\ 78 \\ \hline 40 \end{array}$$

1.85
1.85
1.87
1.87
1.87

$$\begin{array}{r} .93 \\ 2\overline{)1.87} \\ 18 \end{array}$$

~~1.93~~

.93
.95
.96
.98
.98
.96

36

5.28
5.28
5.27
5.29
5.31
5.29
5.17
5.29
5.27
5.25
5.34

$$\begin{array}{r} 2.63 \\ 2\overline{)5.27} \\ 4 \\ \hline 12 \\ 12 \end{array}$$

11.53
11.53
11.62
11.68
11.61
11.58
11.52
7

$$\begin{array}{r} 27 \\ 11\overline{)2.99} \\ 2 \\ \hline 99 \\ 77 \\ \hline 2\overline{)11.58} \\ 10 \\ \hline 15 \\ 14 \\ \hline 18 \end{array}$$

5.48
5.47
5.45
5.51
5.40
5.47
5.41
5.54
5.52
5.44
5.43
5.42
5.45
5.53
5.52
5

$$\begin{array}{r} 2.73 \\ 2\overline{)5.47} \\ 4 \\ \hline 14 \\ 14 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 1.8 \\ 1.5\overline{)1.87} \\ 1.5 \\ \hline 1.87 \end{array}$$

5

NE 1/2 Spd 1

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project VEKOL Line 15 Field date 6-21 Data page _____ Comp. date _____. Comp by AM

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive												
(C) n separation									1200	1200		
(D) I	1200	1200	1200	900	1200	1200	700	900	12.41			
(E) Vdc (avg)	116.5	47.9	7.64	653	141.5	28.46	15.8	28.6	~~2582~~	4.2		
(F) DCcal	.940											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	274	120	32	2050	1335	668	64	358	292	198		
(I) Vac Σ	115.5	48.0	7.66	645	141	28.0	15.5	27.9	12.5	4.03		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995	→										
(M) ρ dc/ρac=ExL/K										4.7		
(N) PFE=(M-1)(10^2)	0.3	-0.7	-0.7	0.9	0	~~14~~ 0	0	1.3	-1.1	3.6		
(O) MCF=(M-1)(10^5)/H	1	-6	-10	0	0	0	0	4	-4	24		
	-22.8	-22.	→	10.5	→		+1.3	→				

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	2-3	3-4	2-3	1-2								
(B) Receive												
(C) n separation												
(D) I	700	900	1200	1200								
(E) Vdc (avg)	.78	2.51	1.68	.685								53.2
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105								
(H) ρ dc=ExFxGx10^3/D	~~140~~ 13	~~79~~	79	56								
(I) Vac Σ	.75	2.38	1.58	.640								53.0
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.995	→										
(M) ρdc/ρac =ExL/K	4.7	6.6	7.8	8.9								
(N) PFE=(M-1)(10^2)	3.6	5.0	5.9	6.9								
(O) MCF=(M-1)(10^5)/H	373	84	99	159								
	+4.1	→										

9.64
9.63
9.67
9.64
9.65
9.54
377

63
6)377
36
17

9.82
2)9.63
8
16
3
2
1

7.35
7.36
7.38

3.68
2)7.36
6
13
12
16

4.13
4.15
4.19
4.21
4.20
4.15
4.12
5

16
7)115
7
45
42
30

2.082
2)4.164
4
16
16

93.4
93.5
93.5

14.97
14.93
14.93

13

653
2)1306
1206
10

7.97
2)14.94
14
.8
14

141.5
2)283

28.6
2)57.2
56
12

15.8
2)31.6
30
16

57.5
58.0
56.1
56.1
56.9
284.6

10)284.6

2.50
2)5.01
4
10
10

5.00
5.01
5.00
5.04
5.00

152
154
159
152
158
153
160
155
155
156
152
154
153
158
1

8.5
8.4
8.4
8.4
8.4
8.4
8.4

57.2
7.2

25.8
25.8
25.9
25.8

55
14)771
70
71

.775
2)1.55
14
15
14
10

SW 1/2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project VEKOL Line 1 Field date _____ Data page _____ Comp. date _____. Comp by JPM

(A) Send	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
(B) Receive												
(C) n separation												
(D) I	700	900	700	1200	900	700	1200	1200	900	700		
(E) Vdc (avg)	27.85	85.75	4.59	66.25	21.5	1.62	49.65	16.85	7.33	.0.703		
(F) DCcal	1.055											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	126	[illegible]	82	74	[illegible]	73	124	178	258	[illegible]		
(I) Vac Σ	27.8	84.0	4.44	65.0	20.6	1.60	48.6	16.5	7.18	.685		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.990	—	—	—	—	—	—	—	—	→		
(M) ρ dc/ρac=ExL/K						0.4		1.4				
(N) PFE=(M-1)(10^2)	0.2	1.1	1.2	2.0	~~3.5~~ 3.4	0.3	2.2	1.1	1.1	1.5		
(O) MCF=(M-1)(10^5)/H	2	4	15	27	11	5	18	8	4	23		

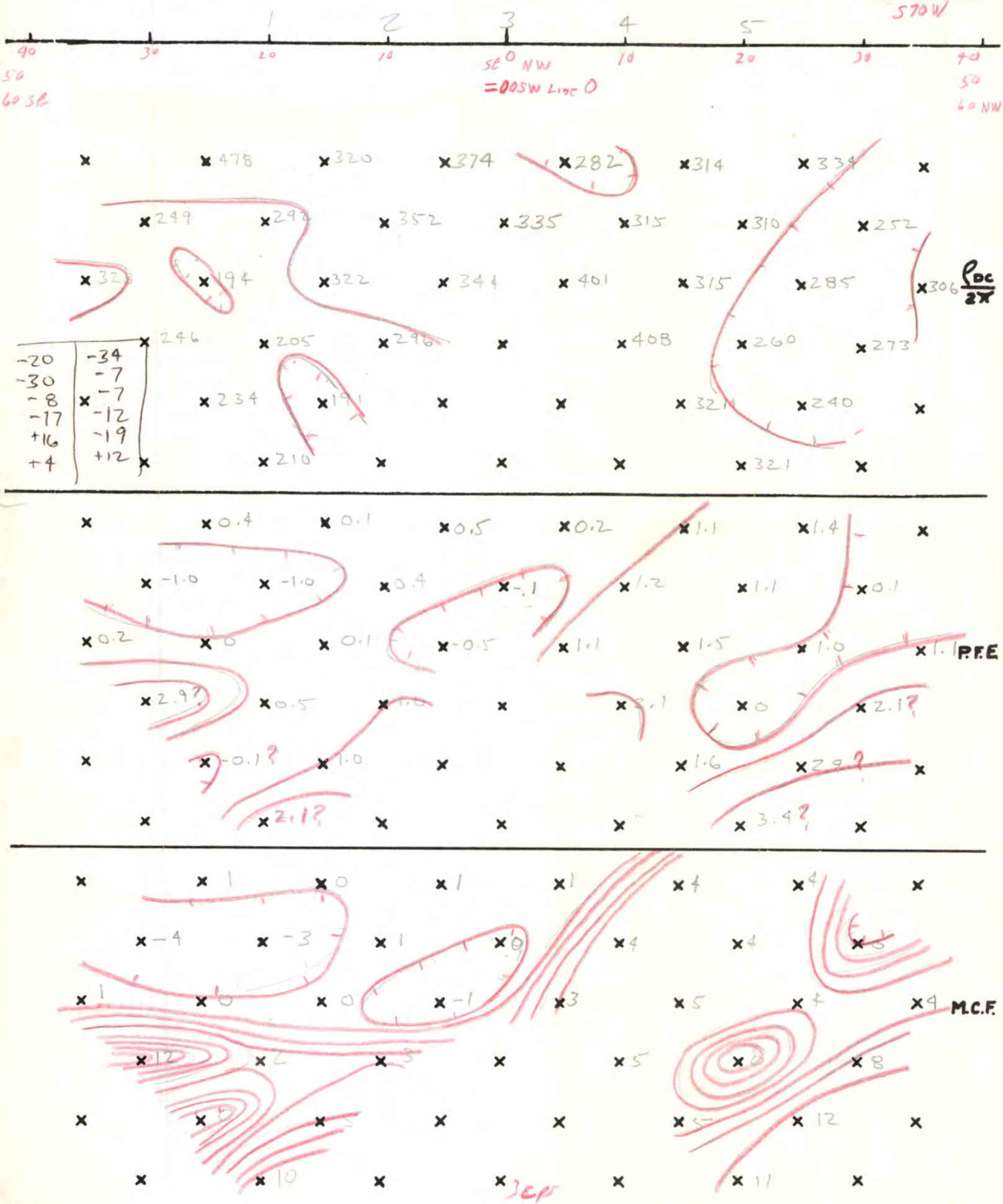
* .15 → .125 -7.9 +14.4 → -16.8 → +21.1 →

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
(B) Receive												
(C) n separation												
(D) I	1200	1200	900	700	1200	1200	900	700				
(E) Vdc (avg)	15.62	9.5	5.1		4.82	3.68	2.082	—				47.35
(F) DCcal	1.055											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	[illegible]	[illegible]	359		[illegible]	194	257					
(I) Vac Σ	15.3	9.3	4.975	.540	4.72	3.60	2.02	2.03				46.8
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.990	—	—	—	—	—	—	→				
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	1.1	1.1	1.4		2.0	1.1	2.0	—				
(O) MCF=(M-1)(10^5)/H	7	4	4		16	6	8					

-14.5 → +55.7 →

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING ~~S~~ S70W



GUNNEX LTD

AREA Uekol LINE 2 Sp! a = 1000' SCALE: 1" = 1000' DATE: 6-25

270-65

GUNNEX
VEKOL

June, Aug & Dec 68

ELECTRICAL GEOPHYSICAL SURVEY

Using The

Dual Frequency Induced Polarization, Resistivity and

Self Potential Methods

VEKOL MINE AREA

PINAL COUNTY, ARIZONA

June, August, and December 1968

For

Gunnex Limited
Toronto, Canada

By

Heinrichs Geoexploration Company
P. O. Box 5671 Tucson, Arizona 85703
Phone: 623-0578 Area Code: 602

TABLE OF CONTENTS

	PAGE
INDEX MAP	
INTRODUCTION	1
CONCLUSION AND RECOMMENDATIONS	2
INTERPRETATION	3
BASIS OF THE INDUCED POLARIZATION METHOD	1a
CONTENTS OF MAP POCKET:	
12 Sectional Data Sheets	
1 Induced Polarization Location and Interpretation Plan	

INTRODUCTION

At the request of Dr. John Walker and on behalf of Gunnex Limited, Heinrichs Geoexploration Company conducted a combined induced polarization and resistivity survey in the vicinity of the Vekol Mine, Pinal County, Arizona. The field work was completed in the interim from June 21 to August 23, 1968, in two phases.

The first phase consisted of five spreads near the Vekol Mine using Geoex standard duty equipment; Mark 5 sender, and Mark 3 receiver, and 1.5 kilowatt generator. The second phase was delayed until extra high power equipment was available because of anomalous frequency effects and the extreme low resistivities encountered northeast of the mine area. At this time the extra high power Geoex Mark 3 thyratron sender, Mark 4B receiver and 1.5 Kilowatt generator were used.

All data were obtained using the dual frequency induced polarization technique as described in the herein appended "Basis of the Induced Polarization Method", using an upper frequency of 3.0 Hz and 0.05 Hz as a lower frequency unless severe telluric noise was encountered. Noisy conditions were encountered on some spreads and 0.15 Hz was used to help speed up data aquisition and improve its quality. All data were subsequently reduced to 3.0 and 0.05 Hz for presentation.

The electrode configuration used was the conventional collinear dipole-dipole array employing five sending electrodes per spread. Two spreads used dipole separations having integer multiples of 500 feet, and 11 spreads used 1000 foot multiples.

The data obtained and its interpretation is summarized on the I. P. Location and Interpretation Plan and is presented in detail on the Sectional Data Sheets. The plotting conventions and general interpretational procedures are as discussed in the "Basis of the Induced Polarization Method".

The field work was carried out by the following Geoex personnel: Mr. Phil Matthews and Mr. Don Berglind were crew chiefs; Mr. Dave Swanson and Jim Bauersachs were sender operators and Mr. Jeff Anderson was field assistant. These men were not all involved simultaneously but were exchanged during the process of the job. Final interpretation and report was done under the direction of Mr. Paul Head, Geophysicist in charge, assisted by the Geoex staff in Tucson.

CONCLUSIONS AND RECOMMENDATIONS

It is felt that anomaly "A" is most likely a formational feature because of its relatively uniform strength over a known length of at least 8,000 feet. Dr. Walker has reported that its cause has not been definitely identified in the field. This supports the geophysical data which infers that the cause of anomaly "A" must be at least 500 feet deep and as much as 1,200 feet deep at some places along the anomaly. Generally speaking the anomalious body is deeper on its northwest end and less deep to the southeast. Topographic effects somewhat compromise the quality of the depth estimates of anomaly "A".

The 500 foot spread on Line 7 confirms that, at least at Line 7, the main part of anomaly "A" is due to a dike-like body less than 500 feet wide buried at least 500 feet deep with a possible parallel body about 1,500 feet to the northeast. Line 8 indicates the body to be well over 1000 feet deep, but due to incomplete data to the SW, no estimate of width can be made.

A vertical drill hole collared in the vicinity of Station 10.0 SW on Line 7 is recommended to identify the cause of anomaly "A". Despite the pessimistic aspects of this feature, it should be positively proven to be formational and non-economic before dropping the property. Should the drill hole intersect interesting mineralization we would then recommend tracing the anomaly northwest from Line 8 and southeast of Line 9 to determine its total extent. It should be noted at this point that more than one vertical hole may be required to locate the anomalous formation.

Another consideration is that while "A" may not be of economic interest over its entire length, its intersection with strong cross structure could conceivably make ore. It is therefore recommended that the anomalous trend be inspected in relation to known strong geologic structure of the area.

Anomaly B on Line 0 does not merit drilling at this time, and before any eventual drilling, it should be more completely defined by additional I. P. using 300 foot dipoles spreads on Line 0 and on two intermediate lines 300 feet on each side of Line 0. Anomaly "C" should also be detailed further to the SE with 300 foot dipole spreads prior to more extensive work in that area.

INTERPRETATION

Anomaly "A" is a band of moderate frequency effects bearing approximately N 50° W across Lines 0, 1S, 5, 6, 7, 8, and 9. In general it appears to be of fairly uniform strength for at least 8,000 feet along its strike. The observed variations of anomaly strength are thought to be due to variable depth of overburden. Line 4 bears N 43° W, probably crossing anomaly "A" between Lines 7 and 9 although the more intense I. P. anomaly is located at Station 30.0 SE or about at the intersection of Lines 6 and 4. Because of its length, uniformity, and predictable characteristics, anomaly "A" is likely due to pyritic or graphitic formations of non-comercial value.

There is the slightest possible hint that the extreme northwest end of Line 2 has also detected anomaly "A". If true, "A" would be continuous for some 12,000 feet.

A low resistivity body parallels anomaly "A" to the NE. A less well defined high resistivity body has fair correlation to "A".

Other resistivity features are present in the area but seem to have little or no useful correlation to the I. P. survey. No significant S.P. anomalism was detected.

Anomaly "B" is a weak frequency effect centered at about 85.0 NE on Line 0, Spread 2. It has the appearance of being caused by a relatively narrow body, perhaps with limited dip length and limited along its strike to about 2,000 feet by the constraint of Lines 5 and 8 which show no unusual frequency effects in this area. The depth of the anomalous body is likely to be less than 200 feet and less than 200 feet wide. It is apparent that 1000 foot dipoles are much too large to properly delineate this anomaly.

Anomaly "C" is a very weak frequency effect centered at 37.0 SW on Line 1 S. It is also due to a near surface body of unknown strike length to the SE but extends less than 300 feet NW from Line 1S.

Two other induced polarization effects noticed on this survey, one on Line 3 between Stations 5.0 SE and 15.0 NW. It is very weak and of questionable validity. The second is on Line 9 at about 35.0 SW. It also is very weak and questionable.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Paul A. Head

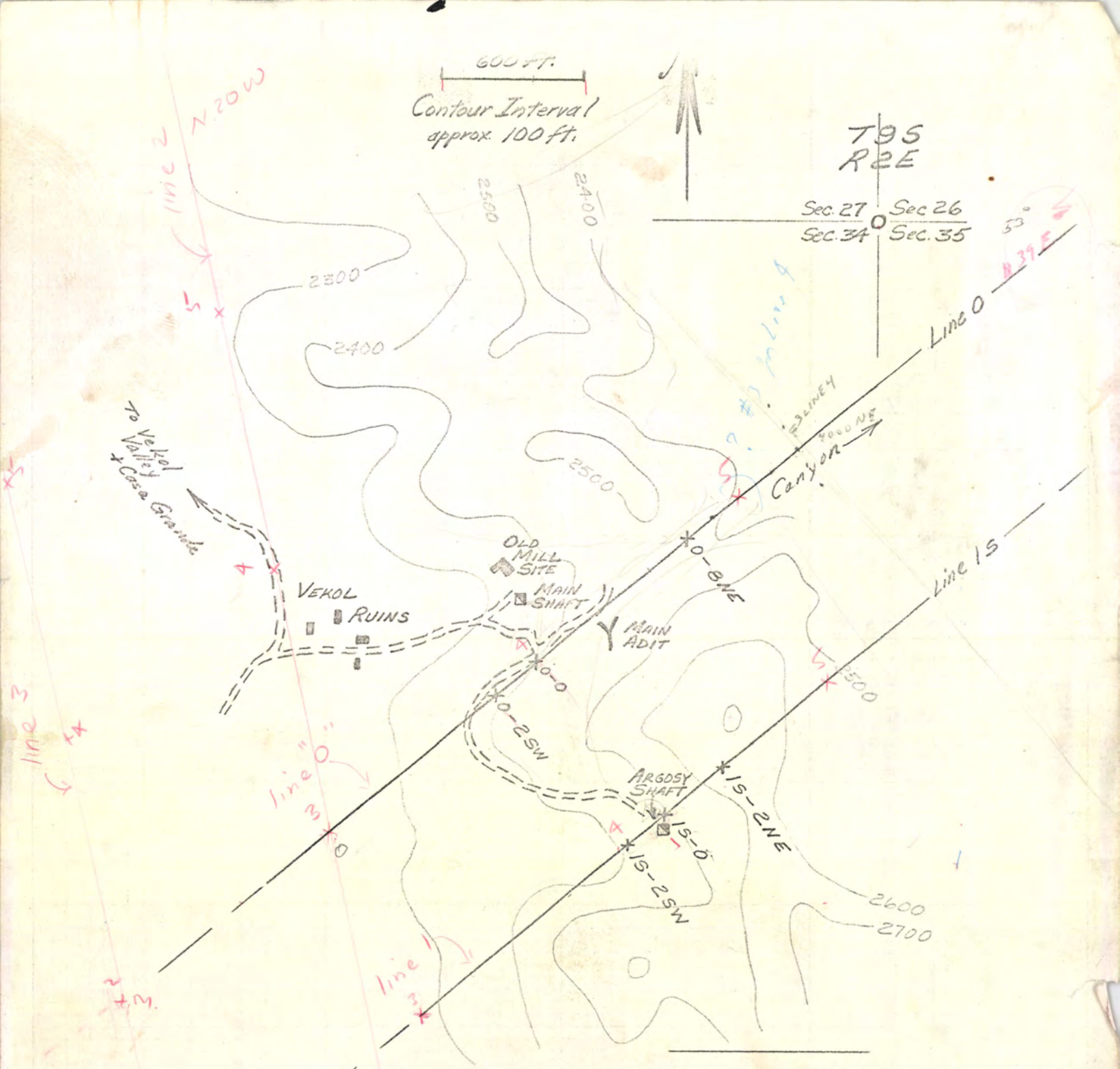
Paul A. Head
Geophysicist

APPROVED: Walter E. Heinrichs, Jr.
President & General Manager

Registered Professional Engineer
CERTIFICATE EXPIRES
WALTER E. HEINRICHS, JR.
DEC. 31, 1968
ARIZONA, U.S.A.

GENERAL LOCATION OF
VEKOL MINE AREA
FOR
GUNNEX LIMITED
ARIZONA

HEINRICHS
GEOEXPLORATION COMPANY
GEOPHYSICAL ENGINEERS
BOX 5671 TUCSON, ARIZONA 85703
PH: 602 623-0578 CABLE: GEOEX, TUCSON
SYDNEY VANCOUVER



GUNNEX LIMITED

VEKOL MINE AREA:

Approx. Location of Initial Lines for Preliminary I.P. Survey by Heinrichs Geoexploration Company.

Additional lines to be chosen.

J.W.R. Walker, June 16/68

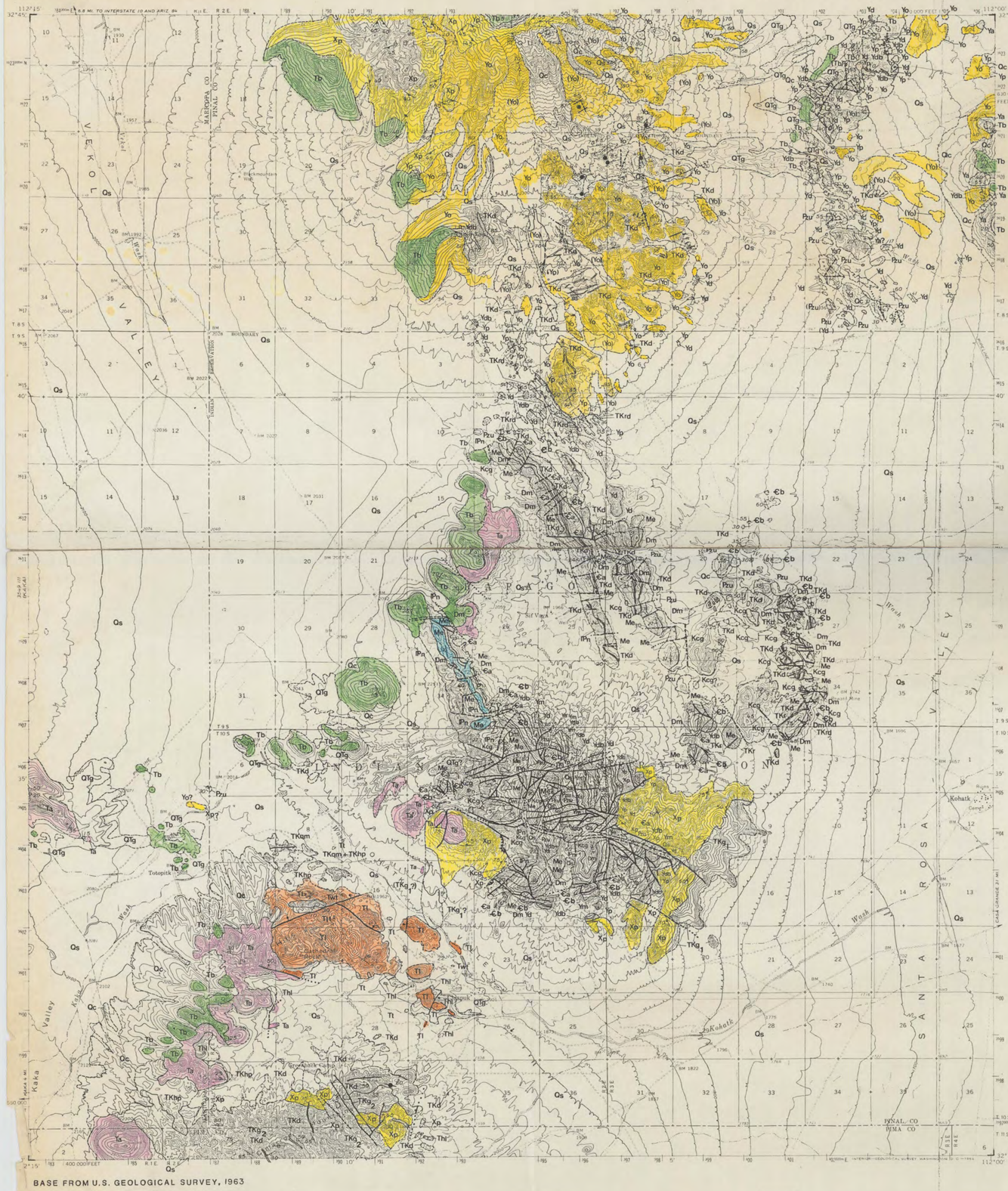
3 9001 01492 9528
G3701s
.H1
1978
.U57
MF931

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared in cooperation with the
PAPAGO INDIAN TRIBE AND THE BUREAU OF INDIAN AFFAIRS

MISCELLANEOUS FIELD STUDIES
MAP MF-931

DOCKTER AND KEITH-VEKOL MTS, ARIZONA

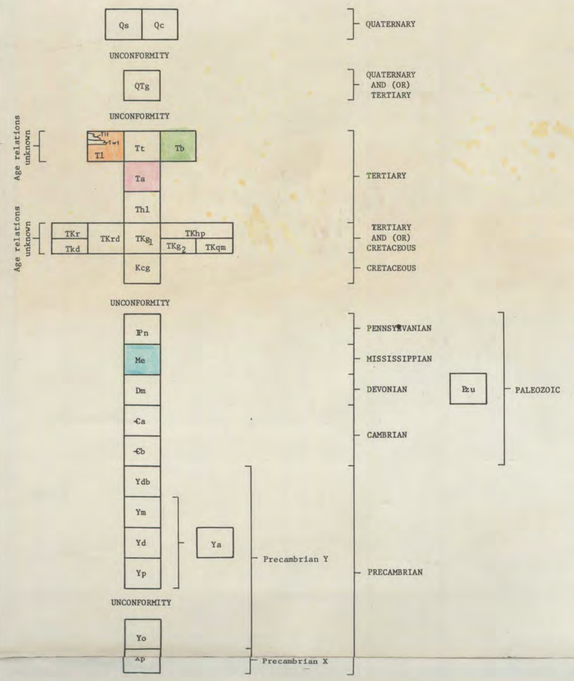


BASE FROM U.S. GEOLOGICAL SURVEY, 1963

SCALE 1:62 500

Geology mapped in reconnaissance fashion during 1-5 man

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qs SEDIMENTARY DEPOSITS--Unconsolidated sand and silt in flat-lying areas. Weakly consolidated gravel and conglomerate near, and locally on, bedrock

Qc COLLUVIUM--Unconsolidated deposits on or at base of steep slopes. Includes talus and debris fans

QTg GRAVEL--Brownish to orange-red, poorly sorted, fine- to coarse-grained, locally well-consolidated. Beds dip at shallow to moderate angles

TUFF AND LATITE

Tlt LITHIC TUFF--Pale-yellow crystal-rich lithic tuff of probable air-fall origin

Twt WELDED TUFF--Biotite latite welded tuff

Tl LATITE--Flows, breccias, dikes and sills of pale- to dark-maroon, pink, orange-brown, and black porphyritic biotite latite

Tt TUFF--White, kaolinitic and siliceous tuff

Tb BASALT--Brownish-gray to dark-gray, locally grayish-red, vesicular basalt flows and flow breccias that contain phenocrysts of olivine, augite, and plagioclase in a dense groundmass. May locally contain patches of aphanitic andesite

Ta ANDESITE--Andesite flows and flow breccias. Locally includes subordinate dikes and sills.

Thl HORNBLENDE LATITE--Pink, porphyritic, hornblende-bearing latite

TKr RHYOLITE--Light-gray to pinkish-gray felsite with euhedral phenocrysts of feldspar and quartz

TKd DACITE--Porphyritic dacite to diorite containing phenocrysts of hornblende, feldspar, and biotite in a dense, pinkish-gray to greenish-gray groundmass. Occurs as flows, dikes, and sills. Includes some isolated outcrops of pinkish-gray pyroxene andesite which contain accessory oxyhornblende 2.2 km southeast of Greenback mine

TKrd RHYODACITE--Greenish-gray to pink felsite. Contains a few phenocrysts of feldspar and biotite. When stained by a sodium cobaltinitrite solution an abundant potassium feldspar in groundmass is indicated

TKg_1 GRANITE--Large phenocrysts of orthoclase in a medium-grained equigranular groundmass of quartz, feldspar, and biotite. Fresh and nonfoliated

TKhp HORNBLENDE PORPHYRY--Hornblende and plagioclase-bearing porphyry. Intrudes quartz monzonite (unit TKqm) and granite (unit TKg_2). Includes some dark-gray to black intrusive trachyte and latite porphyry 4.4 km west of Greenback mine

TKg_2 GRANITE--Generally medium- to coarse-grained rocks that range in composition from a leucocratic quartz monzonite containing abundant white mica, traces of accessory garnet, and tourmaline, to a two-mica quartz diorite or tonalite; pegmatite locally abundant, slightly to moderately foliated; includes xenoliths of Pinal Schist

TKqm QUARTZ MONZONITE

Kcg CONGLOMERATE--Red-brown boulder conglomerate, red-feldspathic sandstone, volcanic breccia, quartzite, and andesitic flows. As mapped, includes Vekol Formation, Chiapuk Rhyolite, and Phonodoree Formation (Heindl, 1965) although the Cretaceous age designation for the Phonodoree Formation is questionable

IPn NACO LIMESTONE (Pennsylvanian)

Me ESCABROSA LIMESTONE (Mississippian)

Dm MARTIN FORMATION (Devonian)--Locally includes rocks called the Ouray and Picacho de Calera Formations by Carpenter (1947)

Ꞓa ABRIGO FORMATION (Cambrian)--Locally includes the Southern Belle Member and rocks called the Santa Catalina Formation by Carpenter (1947)

Ꞓb BOLSA QUARTZITE (Cambrian)--As mapped, may locally include Abrigo Formation. Called Troy Quartzite by Carpenter (1947); assigned to Bolsa(?) Quartzite by Heindl and McClymonds (1964) and Bolsa Quartzite by Chaffee (1974)

Pzu PALEOZOIC ROCKS, UNDIVIDED

Ydb DIABASE

Ym MESCAL LIMESTONE (Precambrian Y)

Yd DRIPPING SPRING QUARTZITE (Precambrian Y)--Locally includes Barnes Conglomerate Member (dotted pattern) at base

Yp PIONEER SHALE (Precambrian Y)--Locally includes Scanlan Conglomerate Member (dotted pattern) at base

Ya APACHE GROUP, UNDIVIDED (Precambrian Y)

Yo ORACLE GRANITE OF PETERSON (1938) (Precambrian Y)

Xp PINAL SCHIST (Precambrian X)

735½

——?— Contact--Dashed where approximately located or gradational; queried where uncertain

20 Fault, showing dip--Dashed where approximately located or inferred; dotted where concealed. Bar and ball on downthrown side

Thrust fault--Sawteeth on upper plate

Massive quartz

10 Quartz vein, showing dip

( ) Pediment surface with sporadic outcrop of unit

Strike and dip of beds

20 Inclined

Vertical

Strike and dip of planar features in volcanic rocks

30 Inclined

Vertical

Strike and dip of joints

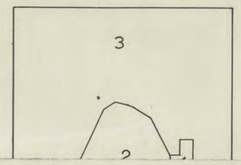
40 Inclined

Vertical

Strike and dip of foliation

50 Inclined

Vertical



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(Numbers refer to Index of mapping)

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