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602-771-1601
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June 2, 1964

Pima Farms, Inc.
P. O. Box 277
Marana, Arizona

Re: Water Investigation, Vicinity Sec. 18, T 12 S, R 11 & 12 E, G. & S. R. ~~B & M.~~ Pima County, Arizona.

Gentlemen:

Per phone call from Mr. Ralph Wong on May 15, 1964, on 18, 19 and 20 May, preliminary local research of readily available factual data on hand was made with the U.S.G.S. and University of Arizona personnel and files. On 21 and 22 May magnetic and resistivity geophysical profiles were run and a general geological examination was made in the field. May 25 thru June 1 was spent compiling and interpreting all data and results. These were briefly summarized over the phone to Mr. Bing Wong on May 29 and are set forth below.

If your primary desire is a well along the south side of Section 18, then we would first recommend deepening the shallow poor and abandoned well in the SW corner of Section 18 if feasible. Reportedly, this well was originally drilled in about 1953 by a Phoenix driller to a depth of 378 ft, trouble with hard rock from 352 ft. on was encountered. Presumably the material above 352 ft. is more or less typical unconsolidated sand, gravel, silt and clay--alluvial overburden, but no good factual records or logs were located.

Based on our results and the logs of your Wells No. 1 and No. 2, drilled by Aubrey Lyon, we believe the so called

"hard rock" is most likely the same cemented sand and gravel formation logged by Lyon in Well No. 1. Of course, it is possible it could be something else, but this can be determined by proper geologic logging of material from the old shallow hole when drilling is resumed and especially when deepened below 378 Ft. or whatever depth is the present correct bottom hole depth. If conditions in the hole are not unfavorable, we recommend drilling an additional 222 ft. to 600 ft. or as long as conditions continued favorable.

If an unfavorable situation is encountered in the old hole, then favorable sites exist along the south side of Section 18 anywhere from about 750 ft. to 5,000 ft. east of the old hole, with perhaps a spot 3,000 ft. east being slightly the most favorable.

Generally, conditions for wells anywhere within about a mile radius of the SW corner of Section 18 appear about the same if drilled to 600 ft. and if about equally perforated, cased and otherwise developed and pump tested. Average current water table elevation in the area is about 1,800 ft. above sea level but this will vary somewhat with the season and, as you know, is generally decreasing each year. Thus, the present average depth below surface to water can be expected to be between 270 ft. and 300 ft.

Limestone may be encountered between 450 ft. and 600 ft. in the immediate area and of course, outcrops at Twin Peaks and the hill 1½ miles to the west. The volcanic ridge to the east which extends north from the Tucson Mountains is believed to be an erosional and/or faulted remnant of a volcanic surface flow. Its western edge is a very steep scarp and it most likely does not continue at all further to the west, unless quite deep or conceivably it is the same formation described by Aubrey Lyon in your WELL No. 1 as "cemented sand and gravel". In such case it probably would be a down faulted segment continuation to the west and in any event has not seemed to have adversely affected production from Well No. 1.

We will be interested to hear any reaction or questions you may have and future progress and results. If we may assist further in any way, please let us know.

Attachments in addition to our statement are:

1. Resistivity sectional data work sheets.

2. Magnetic total intensity work record.

3. Magnetic total intensity contour plot work sketch.

4. Drill logs - Wells No. 1 & No. 2 by Aubrey Lyon.

Returned herewith are the two original Aubrey Lyon drill logs left at our office by Mr. Bing Wong.

Respectfully submitted,

HEINRICHS GEOEXPLORATION CO.

Walter E. Heinrichs, Jr.
President & General Manager

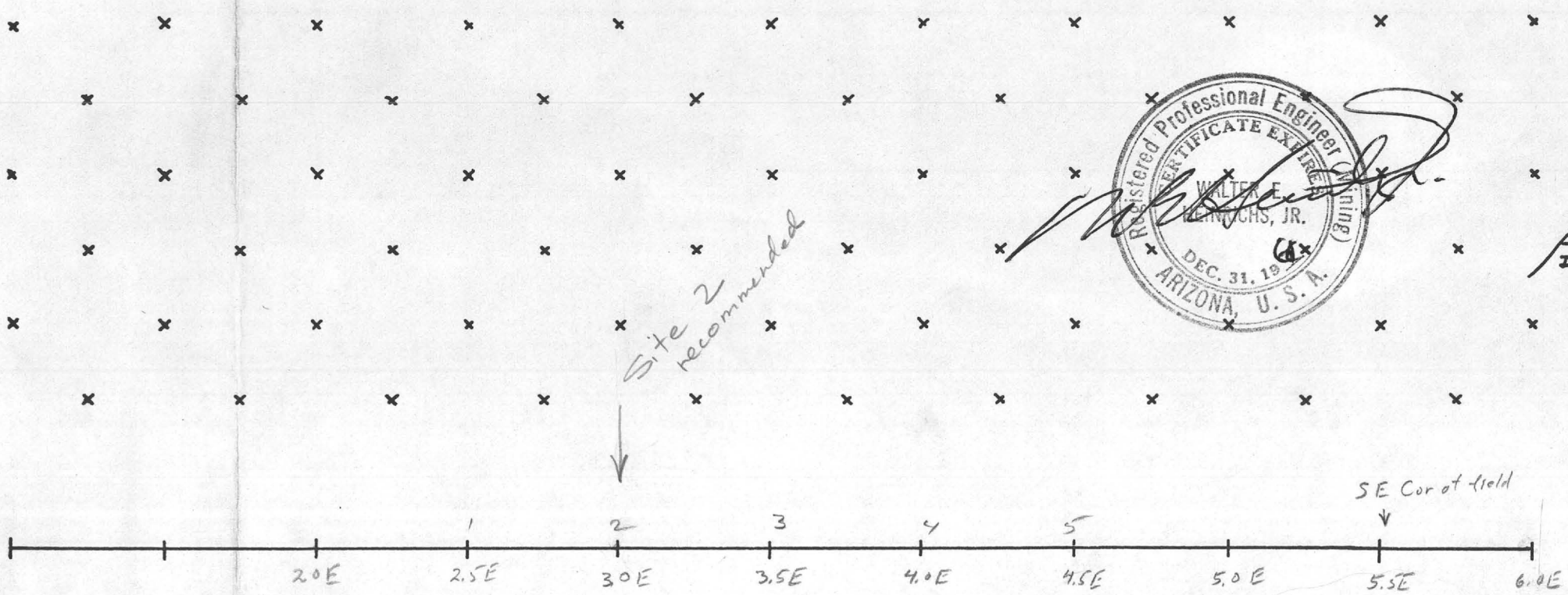
Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E.
HEINRICHS, JR.
DEC. 31,
ARIZONA, U.S.

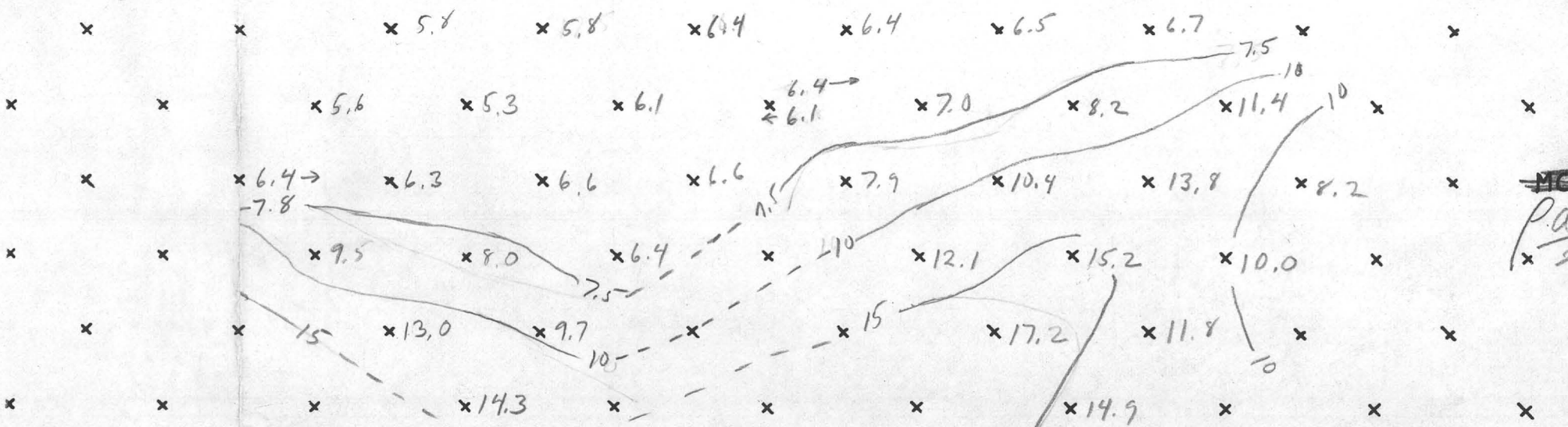
WEH:jh

Enclosures.

COPY

INDUCED POLARIZATION WORK SHEET





Area Wong Water 6-1 pd 2 E+W½ Scale 1" = 500' Date 2-25-69

Registered Professional Engineer (Mining) CERTIFICATE EXPIRES DEC. 31, 19 WALTER E. HEINRICHS, JR. ARIZONA, U.S.A.

PFE

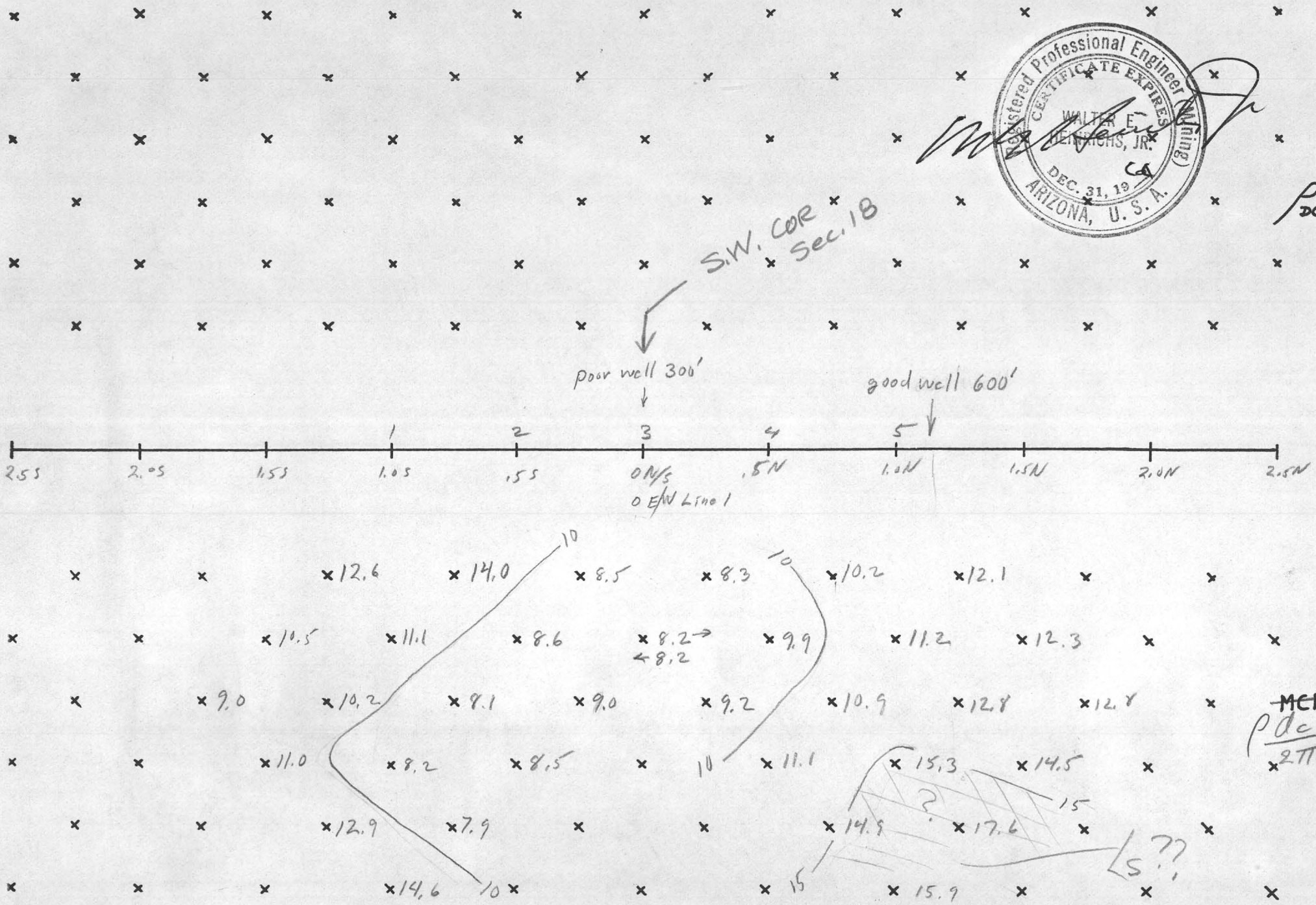
ρdc/2π

~~MCF~~

ρdc/2π

Looking West

INDUCED POLARIZATION WORK SHEET

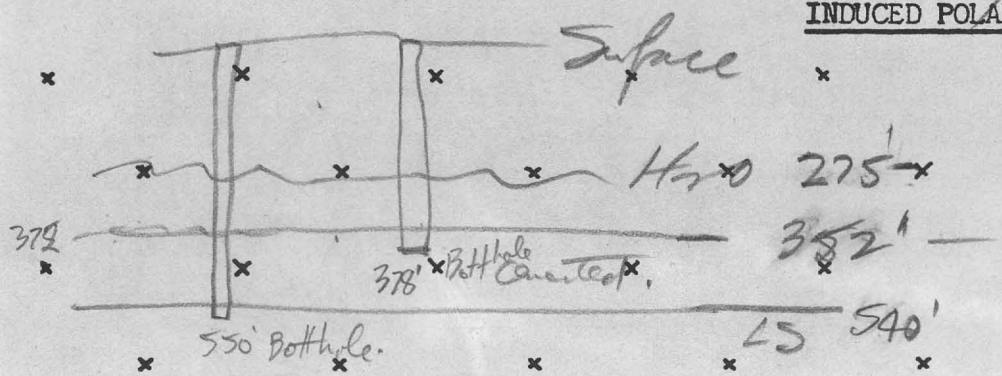


Area Wang Water 1-2-Spd 1 N+S ½ Scale 1" = 500' Date 2-25-64

Look east

Looking North

INDUCED POLARIZATION WORK SHEET

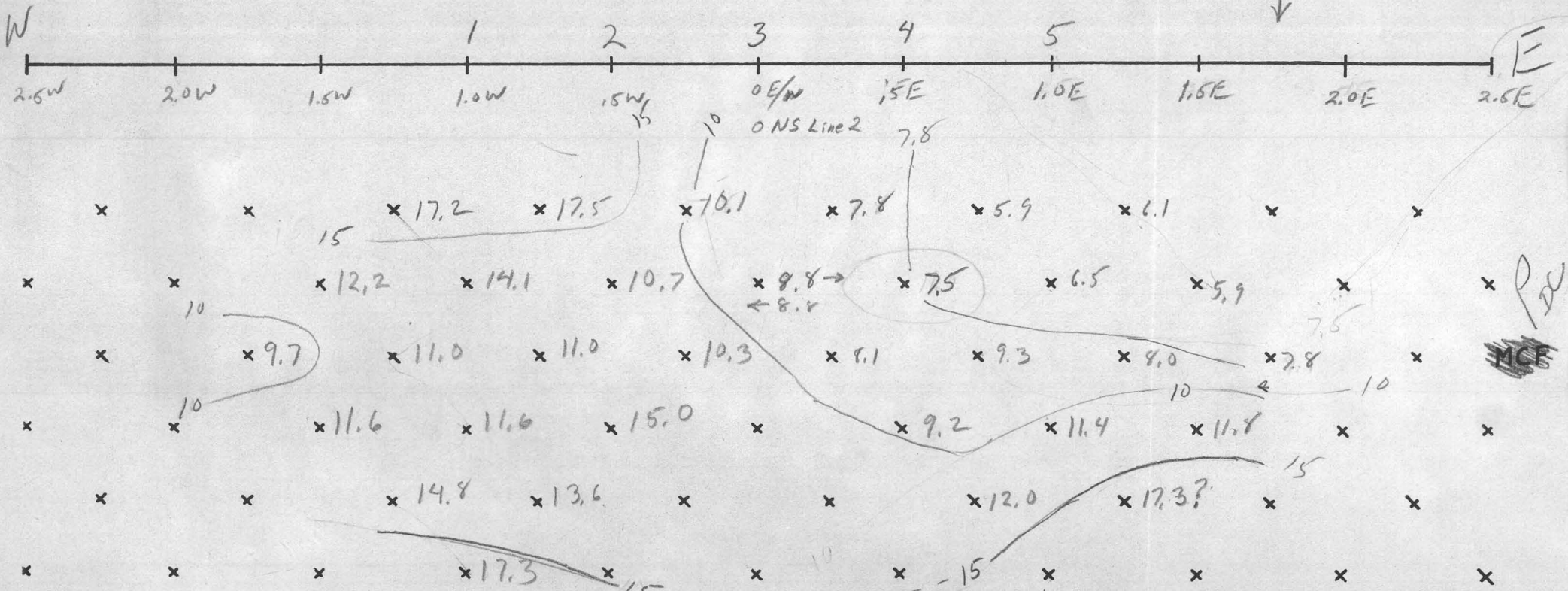


Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E. HEINRICHS JR.
DEC. 31, 1964
ARIZONA, U.S.A.

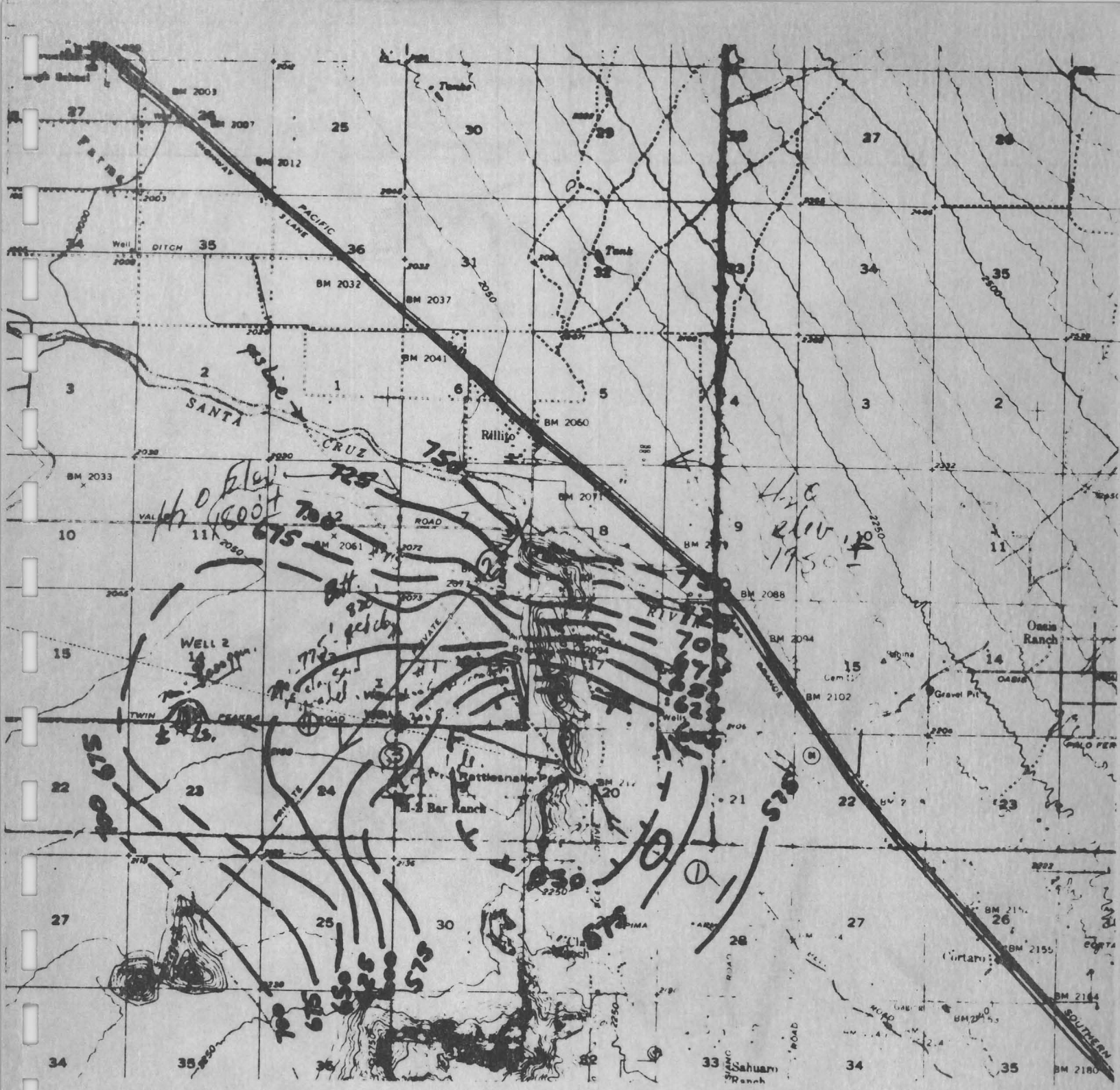
PFE

SW Cor Sec. 18
Poor well Site 1 recommended

Joins L-1 Spd. 2



Area Wong - Rillito H_2O L-1 Spd. 1 Scale 1" = 500' Date 5/21/64

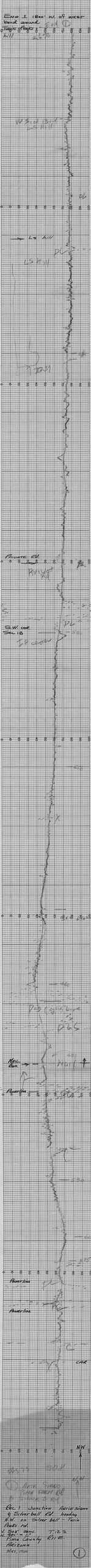


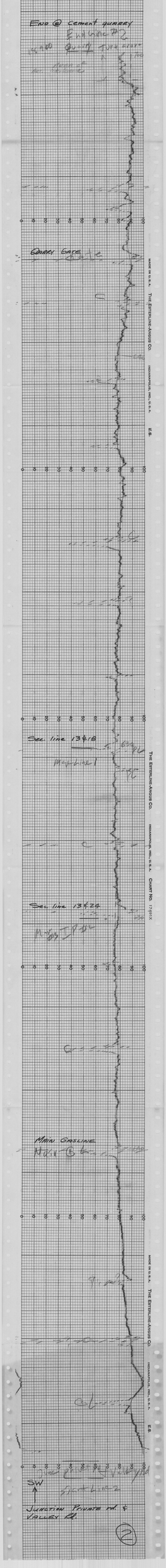
MOBILE MAGNETOMETER SURVEY
Total Intensity

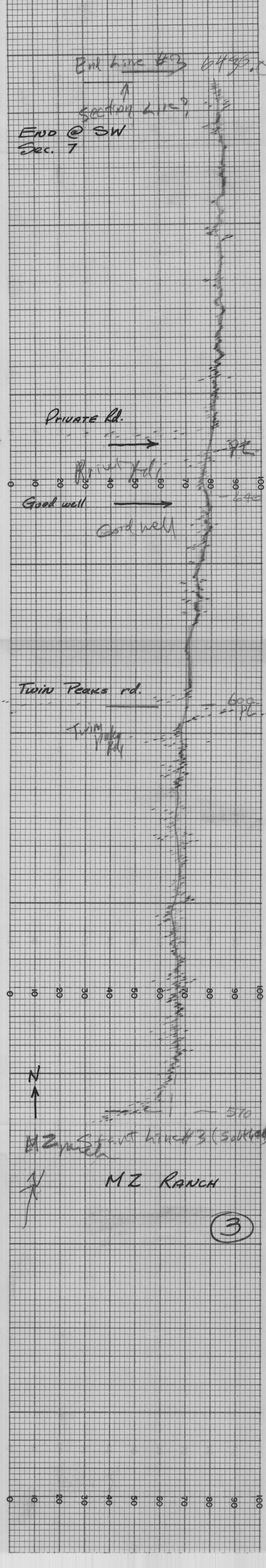
for
Pima Farms, Inc.
by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona

Scale: 1" = 1' May 1964

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E. HEINRICHS, JR.
DEC. 31, 1964
ARIZONA, U. S. A.


Exp. 1 (Rec. 1) of week end around.
Tucson Peaks hill
V. Sig. Bat
Lg. hill
Private rd.
S.W. cor. Sec. 16
Power line
Power line
Power line
NW
Rec. 1 Junction Aerial Sians & Silver bell Rd. heading N.W. on Silver bell Twin Peaks rd.
V. Sig. sans. T.12 S.
R.12 E.
Pima County Ariz.
Ariz. Mex. Mon.


End @ cement quarry
Gravel Gate
Sec. line 13&18
Sec. line 13&24
Main Gasline
Junction Private rd. & Valley Rd.
SW
THE ESTERLINE-ANGUS CO.
INDIANAPOLIS, IND., U.S.A.
MADE IN U.S.A.
E.B.
CHART NO. 17691X

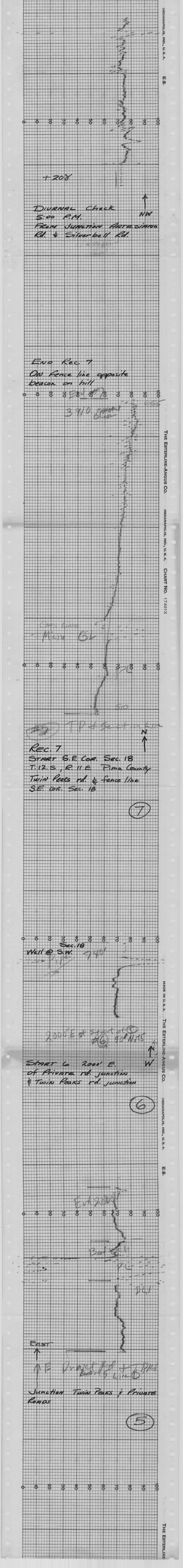


MADE IN U.S.A. THE ESTERLINE-ANGUS CO. INDIANAPOLIS, IND., U.S.A. E.S.
THE ESTERLINE-ANGUS CO. INDIANAPOLIS, IND., U.S.A. CHART NO. 17491X

START 4 @ PRIVATE rd.
& intersection of sec. line
between Sec. 13 & 18

4

0 10 20 30 40 50 60 70 80 90 100


INDIANAPOLIS, IND. U.S.A.
E.B.
+208
DIURNAL Check
5:00 P.M.
From Junction Ajo-Sasabe Rd. & Silverbell Rd.
NW
End Rec. 7
On fence line opposite beacon on hill
3410
THE EDITERLINE-ANGUS CO.
INDIANAPOLIS, IND. U.S.A.
CHART NO. 17491X
Rec. 7
Start S.E. Cor. Sec. 18
T.12.S., R.11.E. Pima County
Twin Peaks rd. & fence line
S.E. cor. Sec. 18
N
7
Sec. 18
Well @ S.W.
2000' E of Start
W
Start 6 2000' E
of Private rd. junction
& Twin Peaks rd. junction
6
MADE IN U.S.A.
THE EDITERLINE-ANGUS CO.
INDIANAPOLIS, IND. U.S.A.
E.B.
End 2000'
EAST
Junction Twin Peaks & Private Roads
5
THE EDITERLINE

PHONE SUNSET 1-5119

Well No I

AUBREY LYON

Well Contractor

8195 LANKERSHIM BOULEVARD

NORTH HOLLYWOOD, CALIF.

Log and record of water well drilled for Bing K. Wong on his property near Marana Arizona.

Work started 11/25/51 Completed 1/12/52

LOG

FROM	TO	FORMATION
0'	15'	Clay and coletchy
15'	35'	Clay and coletchy
35'	70'	Lead coletchy
70'	105'	Grey rock
105'	122'	Rock
122'	160'	Sandy clay
160'	207'	Sandy clay
207'	250'	Clay and gravel
250'	309'	Clay and gravel
309'	372'	Clay and gravel
372'	420'	Cemented sand and gravel
420'	440'	Cemented sand and gravel
440'	456'	Cemented sand and gravel
456'	476'	Cemented sand and conglomerate
476'	504'	Conglomerate
504'	530'	Cemented conglomerate
530'	540'	Cemented conglomerate
540'	550'	Broken lime

~~Water Level : 236' at completion~~

Perforations : Well was perforated from 236' to 490' , 10 holes per round per foot, using a 5/8 " Mills knife

Casing : Well was cased to 514' with 20" No. 10 gauge double stove pipe casing.

Well was Dry Iced at completion

PHONE SUNSET 1-5119

BUSINESS BOND

PAID CONTENT

AUBREY LYON

Well Contractor

5105 LANKERSHIM BOULEVARD

NORTH HOLLYWOOD, CALIF.

February 14, 1951

Log and record of water well drilled for Bing K. Tong on his property near Marana, Arizona

Work Started 1/8/51 Completed 2/5/51 Well No. 2

LOG

From	To	Formation
0'	14'	Colatchie
14	18	Sand and gravel
18	24	Cemented sand
24	30	Sand and gravel
30	44	Colatchie
44	90	Sand and gravel
90	120	Sand, gravel and boulders
120	128	Sand and gravel
128	180	Sandy clay
180	188	Sand and gravel
188	200	Sandy clay
200	260	Sand and gravel
260	264	Cemented sand
264	280	Sand and gravel
280	300	Colatchie
300	308	Sand and gravel
308	320	Cemented sand with streaks of gravel
320	340	Sand and gravel
340	364	Colatchie
364	384	Cemented sand with gravel streaks
384	428	Sand and gravel
428	440	Cemented sand
440	444	Colatchie clay
444	462	Sand and gravel
462	468	Cemented sand
468	496	Hard colatchie clay
496	516	Sand and gravel
516	520	Cemented sand
520	551	Colatchie with streaks of gravel

Casing: Well was cased from top to bottom with 20" Hard red double stove pipe including shoe and shoe.
Perforations: Well was perforated with a mills knife from 212' to 540'. 5/8 cuts 10 holes per round per foot.
Water: Water was first encountered at 204', static level at completion 195'

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Wong Water Line 1 and 2E½ Field date 5/22/64 Data page_____ Comp. date 5/24/64. Comp by KH

(A) Send	23	12	34	23	12	45	34	23	12	45	34	23
(B) Receive	12E	→	23E	→	→	34E	→	→	→	45E	→	→
(C) n separation		—		—	—		—	—	—		—	—
(D) I	1800	→	2000	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	7.40	~~1.46~~	8.30	~~2.26~~	~~1.06~~	8.62	~~2.65~~	~~1.33~~	~~.97~~	3.63	~~1.77~~	~~.98~~
(F) DCcal used 1.043	→	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	6	1.5	6	15	1.5	6	15	30	6	15	[illegible]
(H) ρ dc=ExFxGx10^3/D	6.4	6.4	6.5	7.0	7.9	6.7	8.2	10.4	12.1	11.4	13.8	15.2
(I) Vac Σ												
(J) AC noise x 2	.28	→	.32	→	→	.40	→	→	→	.16	→	→
(K) Vac(corr) =$\sqrt{I^2 - J^2}$		.184		2.24	1.01		2.62	1.31	.775		1.76	.97
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	12	45	34	23	12		Cal					
(B) Receive	→	56E	→	→	→		4.5					
(C) n separation	—	—	—	—	—							
(D) I	→	→	→	→	→		1000					
(E) Vdc (avg)	~~.64~~	~~1.07~~	~~.66~~	~~.48~~	~~.34~~		95.9					
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	52.5	15	31	52.5	84							
(H) ρ dc=ExFxGx10^3/D	17.2	8.2	10.0	11.8	14.9							
(I) Vac Σ												
(J) AC noise x 2	→	.22	→	→	→							
(K) Vac (corr) =$\sqrt{I^2 - J^2}$	.63	1.05	.64	.43	.34							
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Nong Water Line 1 Spd 2 W½ Field date 5-22-64 Data page_____ Comp. date 5-24/64. Comp by KH

(A) Send	34	45	23	34	45	12	23	34	45	12	23	34
(B) Receive	12 W	→	23 W	→	→	34 W	→	→	→	45 W	→	→
(C) n separation		—		—	—			—	—	—	—	—
(D) I	2000	→	→	→	→	→	→	→	→	2150	→	→
(E) Vdc (avg)	8.18	~~2.00~~	7.40	~~1.94~~	~~.89~~	7.43	1.70	~~.74~~	~~.42~~	~~1.96~~	~~.91~~	~~.62~~
(F) DCcal Used 1.042	→	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	6	1.5	6	15	1.5	6	15	30	6	15	[illegible]
(H) ρ dc=ExFxGx10^3/D	6.4	6.1	5.8	6.1	6.6	5.8	5.3	6.6	6.4	5.6	6.3	8.0
(I) Vac Σ												
(J) AC noise x 2	.40	→	.28	→	→	.08	→	→	→	.28	→	→
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		1.96		1.96	.845			.785	.41	1.93	.87	.55
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	45	12	23	34	45		Cal					
(B) Receive	→	56 W	→	→	→		23					
(C) n separation	—	—	—	—	—							
(D) I	→	→	→	→	→		1000					
(E) Vdc (avg)	~~.48~~	~~.90~~	~~.65~~	~~.58~~	~~.50~~		96.0					
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	52.5	15	30	52.5	84		1.042					
(H) ρ dc=ExFxGx10^3/D	9.7	6.4	9.5	13.0	14.3							
(I) Vac Σ	.30	.20	.24	.28	.36							
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	.38	.88	.65	.51	.35							
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

INDUCED POLARIZATION - RECEIVER NOTES PAGE 5

Project: RILLITO Line: 1 Spd. 2 E1/2 Int.Cal 488 Date: 5/22/84

Send	23	12	34	23	12	45	34	23	12	45	34	23
Rec.	12E	→	23E		→	34E			→	45E		
Time/Rg.	10	3	10	3	3	10	3	3	3	3	3	3
DC-1	34.8 39.2	1.0 8.5	4.0 4.3	1.02 1.24	.52 .53	4.42 4.23	1.52 1.13	.64 .70	.44 .44	1.78 1.86	.91 .87	.50 .49
DC-2	34.3 39.6	1.0 8.6	4.0 4.3	1.02 1.24	.56 .52	4.36 4.28	1.50 1.14	.60 .75	.40 .48	1.78 1.85	.87 .90	.52 .47
Σ	74.0 73.9	1.85 1.86	8.3 8.3	2.26 2.26	1.05 1.08	8.65 8.64	2.65 2.64	1.34 1.35	.88 .88	3.64 3.63	1.78 1.77	.99 .99
DC-3	34.0 40.0	.79 8.7	4.0 4.3	1.04 1.23	.55 .51	4.18 4.42	1.49 1.17	.60 .70	.34 .53	1.82 1.80	.87 .92	.50 .45
Dc-4	36.0 38.2	1.93 8.4	8.3	1.03 1.23	.57 .49	4.30 4.30	1.53 1.11	.67 .65	.55 .30	1.85 1.78	.85 .91	.53 .44
Σ	74.0 74.2	1.86 1.87		2.27 2.26	1.06 1.06	8.60 8.60	2.66 2.64	1.36 1.32	1.86 .85	3.63 3.63	1.79 1.76	9.5 .98
DC-AV	74.0	1.86	8.30	2.26	1.06	8.62	2.65	1.33	.87	3.63	1.77	.98
AC-1												
AC-2												
Σ												
S. P.	+5	+50	-36.0	-36	-36	+17.1	+17.1	+17.1	+17.1	+20.3	+20.3	+20.3
AC-N	.14	.14	.16	.16	.16	.20	.20	.20	.20	.09	.09	.09

INDUCED POLARIZATION - RECEIVER NOTES PAGE 6

Project: RILLITO Line: 1 Spd 2 E½ Int.Cal _____ Date: 5/22/84

Send	12	45	34	23	12	CAL						
Rec.	→	56	→	→	→	4-5						
Time/Rg	3	3	3	3	3	100						
DC-1	.28 .30 .34 .33	.60 .64 .99 .50	.32 .42 .34 .26	.28 .25 .18 .23	.20 .22 .17 .18	48.0 47.9						
DC-2	.29 .29 .35 .35	.68 .53 .40 .55	.36 .28 .32 .40	.30 .28 .17 .19	.23 .21 .15 .19	48.0 47.9						
Σ	.62 .63 .64 .64	1.09 1.14 1.08 1.08	.66 .68 .68 .68	.46 .48 .47 .45	.37 .40 .38 .40	95.9 95.9						
DC-3	.34 .35 .27 .27	.65 .25 .30 .30	.36 .32 .32 .36	.25 .25 .24 .23	.25 .22 .14 .18							
Dc-4	.36 .40 .30 .24	.68 .50 .90 .65	.40 .35 .28 .34	.25 .23 .23 .27	.26 .24 .13 .15							
Σ	.63 .62 .66 .64	.95 .105 .108 .115	.68 .68 .64 .69	.49 .48 .48 .50	.39 .40 .39 .39							
DC-AV	.64	1.08	.68	.48	.39	95.9						
AC-1												
AC-2												
Σ												
S. P.	+20.3	+26.1	+26.1	+26.1	+26.1							
AC-N	.09	.11	.11	.11	.11							

INDUCED POLARIZATION - RECEIVER NOTES PAGE 7

Project: RILLITO Line: 1 SDX 2 W½ Int.Cal 48.5 Date: 5-22-69

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Rec.	→		→		→		→		→		→	
Time RG	10	3	10	3	3	10	3	3	3	3	3	3
DC-1	4.10 4.09	1.03 1.00	3.60 3.72	9.5 10.5	5.0 3.8	3.95 3.50	.82 .88	.43 .37	.25 .17	.93 1.05	.49 .42	.31 .31
DC-2	4.10 4.09	1.03 1.97	3.78 3.66	10.2 9.5	.51 .34	3.93 3.50	.90 .90	.42 .37	.25 .18	.92 1.06	.47 .44	.31 .31
Σ	8.18 8.18	2.03 2.00	7.32 7.40	2.00 1.97	.84 .89	7.45 7.43	1.70 1.70	.80 .79	.42 .43	1.98 1.94	.91 .91	.62 .62
DC-3	4.08 4.10	1.03 .97	3.64 3.78	9.6 10.0	.50 .494	3.97 3.49	.84 .95	.41 .39	.25 .17	.90 1.06	.47 .44	.31 .30
Dc-4	4.08 4.10	1.04 .96	3.78 3.68	10.5 9.4	.51 .37	4.0 3.42	.80 .90	.44 .34	.25 .17	.93 1.02	.43 .49	.32 .31
Σ	8.18 8.18	2.00 2.00	7.42 7.46	1.96 2.00	.87 .89	7.42 7.42	1.69 1.70	.32	.25	.93 1.03	.91	.31 .32
DC-AV	8.18	2.00	7.40	1.98	.89	7.43	1.70	.47	.17	.98 .92	.91	.62
AC-1								.31 .48	.42 .42	1.96		
AC-2								.28 .34	.42			
Σ								.79	.42			
S. P.			+42					.79				
AC-N	.12		.14		.14	.04		.79	.04	.14		

INDUCED POLARIZATION - RECEIVER NOTES PAGE 8

Project: Rilkito Line: Lepid 2 W½ Int.Cal — Date: 5/22/69

Send	4-5	1-2	2-3	3-4	4-5		CAL						
Rec.	→	→	→	→	→								
Time RG	3	3	3	3	3								
DC-1	.22 .27	.50 .40	.36 .34	.30 .30	.24 .26		480 480						
DC-2	.21 .28	.50 .41	.34 .34	.26 .32	.25 .26		480 480						
Σ	49 49	90 91	.70 .68	.60 .64	.50 .51		960 960						
DC-3	.20 .26	.44 .41	.32 .35	.25 .32	.23 .28								
Dc-4	.25 .20	.48 .40	.35 .34	.26 .32	.23 .27								
Σ	.27 .32	.90 .81	.67 .69	.57 .58	.51 .50								
DC-AV	.26 .21	.90	.35 .34	.26 .30	.23 .27		960						
AC-1	.28 .20		.30 .35	.28 .28	.50								
AC-2	.48		.69 .69	.58 .58	.50								
Σ			.69	.58									
S. P.													
AC-N	.15	.10	.12	.16	.18								

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project Nong Nuter Line 1 spd 1 W½ Field date 5-21-64 Data page 1 Comp. date 5 21 64. Comp by KH

(A) Send	34	45	23	34	45	12	23	34	45	12	23	34
(B) Receive	12 W	→	23 W	→	→	34 W	→	→	→	45 W	→	→
(C) n separation				—	—		—	—	—		—	—
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	11.55	2.49	19.9	3.03	1.44	19.6	3.94	1.34	.86	3.46	1.29	.75
(F) DCcal 0 gal	1.054	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	6	1.5	6	15	1.5	36	15	30	6	15	
(H) ρ dc=ExFxGx10^3/D	10.13	8.8	17.5	10.7	10.3	17.2	14.1	11.0	15.0	12.2	11.0	11.6
(I) Vac Σ												
(J) AC noise x 2	.30	→	.84	→	→	.06	.50	→	→	.48	.32	.36
(K) Vac(corr) = $\sqrt{I^2 - J^2}$				2.91	1.17		3.82	1.25	.85		1.25	.66
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

Project " Line 1 Spd 1 W½ Field date 5/21/64 Data page 2 Comp. date 5/21/64 Comp by

(A) Send	45	12	23	34	45							
(B) Receive	→	56 W	→	→	→							
(C) n separation												
(D) I	1800	→	→	→	→							
(E) Vdc (avg)	.59	1.09	.75	.60	.50							
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	52.5	15	30	52.5	44							
(H) ρ dc=ExFxGx10^3/D	13.6	9.7	11.6	14.8	12.3							
(I) Vac Σ												
(J) AC noise x 2	.40	.34	.36	.36	.36							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	.44	1.04	.66	.48	.35							
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Nonty Water Line 1 spl 1E½ Field date 5-21-64 Data page 3 Comp. date 5-21-64. Comp by KH&Ww

(A) Send	23	12	34	23	12	45	34	23	12	45	34	23
(B) Receive	12E	→	23E	→	→	34E	→	→	→	45E	→	
(C) n separation												
(D) I	1000	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	8.82	2.60	6.7	2.12	.94	6.9	1.83	1.175	.56	1.68	.925	.68
(F) DCcal used	1.058	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	6	1.5	6	15	1.5	6	15	30	6	15	[illegible]
(H) ρ dc=ExFxGx10^3/D	7.84	8.8	5.9	7.5	8.6	6.1	6.5	.93	9.15	5.9	80	11.4
(I) Vac Σ												
(J) AC noise x 2	.4	→	.2	→	→	.2	→	→	→	.2	→	
(K) Vac(corr) = $\sqrt{I^2 - J^2}$					.92			1.057	520		904	.65
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

Project _____ Line 1 spl 1E½ Field date 5-21-64 Data page 4 Comp. date 5/21/64 Comp by KH&Ww

(A) Send	12	45	34	23	12		Cal					
(B) Receive	→	56E			→							
(C) n separation							1000					
(D) I	→	→	→	→	→							
(E) Vdc (avg)	.44	1.03	.28	.75	.63		94.5					
(F) DCcal	→	→	→	→	→		1.058					
(G) Kn x 10^{-3}	52.5	15	30	52.5	84							
(H) ρ dc=ExFxGx10^3/D	12.0	7.8	11.8	17.3?								
(I) Vac Σ												
(J) AC noise x 2	.2	.5	→	→	→							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	.39	.9	.67	.56								
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: Kellito Line: Lect 1 E-2 Int.Cal 49.2 Date: 5-21-4

Send	23	12	34	23	12	45	34	23	12	45	34	23
Rec.	12E	→	23E	→	→	34E	→	→	→	45E		
Time	10	3	10	3	3	10	3	3	3	3	3	3
DC-1	4.42 4.42	1.25 1.28	3.1 3.2	1.25 .97	.51 .43	3.2 3.3	.91 .92	.51 .56	.28 .29	.80 .88	.44 .60	.29 .40
DC-2	4.62 4.22	1.28 1.20	3.6 3.1	1.25,87	.51 .43	2.3 3.6	.90 .93	.59 .54	2.4 .30	.80 .87	.52 .91	.40 .29
Σ	8.42 8.62	2.50	6.7	2.12	.94	6.9	1.83 1.83	1.07 1.04	.57 .54	1.68 1.67	.94 .93	.69 .69
DC-3	4.42 4.42	1.28 1.30	3.1 3.1				.91 .93	.57 .51	.35 .22	.83 .84	.45 .47	.30 .38
Dc-4							.96 .87	.58 .49	.20 .35	.75 .88	.51 .40	.30 .37
Σ	8.82	2.50					1.87 1.83	1.04 1.03	.57 .55	1.56 1.70	.93 .87	.68 .67
DC-AV	8.82	2.50	6.7	2.12	.94	6.9	1.43	1.075	.56	1.68	.925	.68
AC-1	4.42	1.25	3.3									
AC-2	4.42	1.25	3.3									
Σ												
S. P.												
AC-N	.2	→	.25	.1	→	.1	.1	→	→	.1		

INDUCED POLARIZATION - RECEIVER NOTES PAGE 2

Project: Bellito Line: 1 Spd 1 E1/2 Int.Cal Date: 5-21-64

Send	12	45	34	23	12	Cc1	34	45				
Rec.	→	5-6	→	→	→		100					
Time	3	3	3	3	3		100					
DC-1	.24 .18	.47 .57	.35 .47	.34 .40	.29 .33			.48 .56	.45 .35			
DC-2	.25 .18	.57 .47	.32 .51	.46 .30	.29 .35			.41 .61	.41 .39			
Σ	.42 .46	1.04 1.04	.82 .83	.74 .75	.61 .64				Bill			
DC-3	.22 .22	.54 .46	.53 .33	.46 .30	.25 .34			.42 .57	.4 .4			
Dc-4	.21 .23	.54 .46	.53 .34	.46 .30	.30 .33			.43 .56	.42 .37			
Σ	.44 .44	1.02 1.02	.86 .77	.76 .76	.63 .63							
DC-AV	.44	1.03	.85	.75	.63							
AC-1							42.0	23.2				
AC-2												
Σ												
S. P.												
AC-N	.1	.25	.25	.25	.25							

INDUCED POLARIZATION - RECEIVER NOTES PAGE 3

Project: Billeta Line: 1 sp4 / W2 Int.Cal 48.5 Date: 5-21-74

Send	34	45	23	34	45	12	23	34	45	12	23	34
Rec.	12 W →		23 W		→	34 W			→	45 W		→
Time	10	3	30	3	3	30	3	3	3	3	3	3
DC-1	58 61	1.35 1.14	9.9 10.0	1.60 1.54	.79 .68	9.8 9.8	2.30 1.64	.70 .64	.44 .50 .40 .36	1.69 1.75	.63 .62	.40 .45 .36 .30
DC-2	61 58	1.36 1.13	9.9 10.0	1.51 1.51	.75 .65	9.8 9.9	2.31 1.66	.70 .67	.45 .51 .40 .35	1.72 1.80	.66 .68	.42 .41 .33 .30
Σ	11.9 11.3	2.49 2.49	19.9 19.9	3.04 3.02	1.43 1.40	19.6 19.7	3.99 3.96	1.34 1.32	.49 .56 .85 .86	3.47 3.52	1.28 1.21	.75 .76 .75 .71
DC-3	62 58	1.35 1.15	10.1 9.9	1.53 1.49	.79 .67	9.7 9.9	2.33 1.67	.69 .68	.45 .51 .39 .35	1.7 1.78	.61 .69	.41 .46 .32 .28
Dc-4	62 58	1.32 1.18	9.9 10.0	1.54 1.54	.66 .79	9.7 9.9	1.78 2.3	.65 .66	.45 .86	1.62 1.80	.62 .66	.49 .61 .32 .35
Σ	12.0 12.0	2.50 2.50	19.9 19.9	3.03 3.04	1.45 1.49	19.6 19.6	4.00 4.00	1.34 1.31		3.48 3.42	1.30 1.24	.73 .71 .36 .31
DC-AV	11.55	2.49	19.9	3.05	1.44	19.6	3.98	1.34	.86	3.46	1.29	.75
AC-1												
AC-2												
Σ												
S. P.												
AC-N	.16	.10	.42 →			.68	.25 →			.20	.16	

INDUCED POLARIZATION - RECEIVER NOTES PAGE 4

Project: Rellito Line: 1 and 1 W½ Int.Cal _____ Date: 5-21-84

Send	45	12	23	34	45		Cal	12				
Rec.	→	56	→	→	→		1000	600				
Time							100					
DC-1	.30 .26 .30 .32	.75 .77 .35 .31	.40 .41 .38 .34	.29 .28 .33 .35	.25 .26		47.0					
DC-2	.30 .26 .30 .32	.72 .80 .35 .30	.40 .42 .35 .33	.28 .24 .32 .36	.24 .26		47.5					
Σ	.60 .57 .60 .57	1.10 1.08 1.07 1.10	.78 .82 .75 .75	.62 .60 .60 .60	.50 .50							
DC-3	.28 .24 .31 .36	.85 .80 .35 .28	.39 .40 .35 .36	.28 .26 .34 .34	.25 .25		47.0 47.5					
Dc-4	.26 .29 .33	.78 1.10 .31	.41 .39 .35 .36	.25 .27 .35 .33	.30 .20							
Σ	.59 .59	1.10 1.09	.74 .76 .76 .74	.59 .60 .60 .60	.50 .50							
DC-AV	.59	1.09	.75	.60	.50		9.45					
AC-1												
AC-2												
Σ												
S. P.												
AC-N	.20	.17	.18	.18	.18							

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Nony Water Line 2 spl N½ Field date 5-22-64 Data page_____ Comp. date 5-24-64 Comp by KH

(A) Send	23	12	34	23	12	45	34	23	12	45	34	23
(B) Receive	12N	→	23N	→	→	34N	→	→	→	45N	→	→
(C) n separation		—							—		—	—
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	9.59	~~2.39~~	11.79	2.85	1.06	13.9	3.22	1.37	~~.65~~	3.54	~~1.44~~	~~.92~~
(F) DCcal 6 spl 1.042	→	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	6	1.5	6	15	1.5	6	15	30	6	15	30
(H) ρ dc=ExFxGx10^3/D	8.3	8.2	10.2	9.9	9.2	12.1	11.2	10.9	11.1	12.3	12.8	15.3
(I) Vac Σ												
(J) AC noise x 2	.30	→	.08	→	→	.10	→	→	→	.20	.20	.26
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		2.37							.64		1.47	.88
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	12	45	34	23	12		Bc/34					
(B) Receive	→	56N	→	→	→							
(C) n separation	—		—	—	—							
(D) I	→	→	→	→	→		1000					
(E) Vdc (avg)	~~.59~~	1.47	~~.44~~	~~.57~~	~~.34~~		95.9					
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	52.5	15	30	52.5	84							
(H) ρ dc=ExFxGx10^3/D	14.9	12.8	14.5	17.6	15.9							
(I) Vac Σ												
(J) AC noise x 2	.26	.10	→	→	→							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	.49		.835	.58	.326							
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Nony Water Line 2 and 1 St Field date 5-22-64 Data page_____ Comp. date 5-24-64 Comp by KH

(A) Send	34	45	23	34	45	12	23	34	45	12	23	34
(B) Receive	1-25 →		235 →			345 →				455 →		
(C) n separation				—	—							—
(D) I	1800 →											
(E) Vdc (avg)	9.83	2.38	16.1	~~2.52~~	~~1.08~~	14.55	3.19	.93	.49	3.02	1.175	~~.49~~
(F) DCcal used 1.042												
(G) Kn x 10^{-3}	1.5	6	1.5	6	15	1.5	6	15	30	6	15	
(H) ρ dc=ExFxGx10^3/D	8.5	8.2	14.0	8.6	9.0	12.6	11.1	8.1	8.5	10.5	10.2	8.2
(I) Vac Σ												
(J) AC noise x 2	0 →		.30 →			0 →				0 →		.04
(K) Vac(corr) = $\sqrt{I^2 - J^2}$				2.48	1.04							.47
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	45	12	23	34	45		Cal					
(B) Receive	→	525 →					48					
(C) n separation	—	—	—	—	—							
(D) I	→						1000					
(E) Vdc (avg)	~~.29~~	~~1.08~~	~~.65~~	~~.51~~	~~.41~~		95.8					
(F) DCcal	→											
(G) Kn x 10^{-3}	525	15	30	52.5	84							
(H) ρ dc=ExFxGx10^3/D	2.9	9.0	11.0	12.9	14.6							
(I) Vac Σ												
(J) AC noise x 2	.04	.24 →										
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	.26	1.04	.63	.424	.30							
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

INDUCED POLARIZATION - RECEIVER NOTES PAGE 9

Project: Killeto Line: 2 and 1 N½ Int.Cal 49.0 Date: 5 12 83

Send	23	12	34	23	12	45	34	23	12	45	34	23
Rec.	48 2N	→	→	→	→	34N	→	→	→	48N	→	→
Time	10	3	10	3	3	30	3	3	3	3	3	3
DC-1	4.85 4.76	1.20 1.18	5.80 6.00	1.4 1.45	.50 .62 .57 .43	7.0 7.0	1.65 157	.70 64 .68 75	.35 39 .28 27	1.70 1.90 1.75 1.69	.70 .75 .78 .72	.41 .38 .50 .52
DC-2	4.86 4.70	1.21 1.18	5.81 6.00	1.39 1.46	.55 .65 .50 .40	7.0 6.8	1.64 1.66	.64 62 .70 71	.38 38 .26 30	1.80 1.73	.70 .73 .76 .76	.39 .39 .52 .52
Σ	9.61 9.56	2.38 2.39	11.80 11.81	2.85 2.85	1.07 1.05 1.05 1.05	14.0 13.4	3.22 3.22	1.38 1.39 1.38 1.33	.63 66 .64 .68	3.48 3.54 3.53	1.48 1.49 1.46 1.49	.91 .90 .91 .91
DC-3	4.90 4.71	1.22 1.16	5.85 5.9	1.39 1.45	.59 .49 .49 .39	7.0 6.9	1.66 1.55	.66 65 .70 75	.38 35 .26 30	1.84 1.70	.74 .77 .74 .70	.39 .38 .53 .55
Dc-4	4.86 4.74	1.22 1.18	5.9 5.9	1.40 1.45	.60 .70 .48 .35	7.0 6.9	1.69 1.52	.65 64 .73 72	.38 35 .26 30	1.88 1.66	.80 .79 .70 .70	.38 .34 .52 .60
Σ	9.61 9.60	2.39 2.40	11.75 11.80	2.84 2.85	1.08 1.09 1.08 1.05	13.9 13.9	3.21 3.21	1.36 1.40 1.38 1.36	.66 68 .66 68	3.54 3.54	1.48 1.47 1.50 1.48	.92 .93 .90 .94
DC-AV	9.59	2.39	11.79	2.85	1.06	13.9	3.22	1.37	.65	3.54	1.48	.92
AC-1												
AC-2												
Σ												
S. P.	0	→	+17	→	→	-24.0	→	→	→	0	0	0
AC-N	.15	→	.04			.05	→	→	→	.10	.10	.13

INDUCED POLARIZATION - RECEIVER NOTES PAGE 10

Project: Billie Line: 2 grid/N½ Int.Cal Date: 5/22/84

Send	N	45	34	23	12						Cal	
Rec.	→	66R	→	→	→							
Time	3	3	3	3	3							
DC-1	.28 .28 .29 .29	.72 .80 .77 .66	.42 .40 .43 .46	.29 .35 .30 .32	.20 .18 .17 .16						47.9	
DC-2	.28 .28 .30 .30	.73 .82 .74 .64	.41 .40 .45 .42	.25 .27 .37 .30	.20 .16 .16 .19						48.0	
Σ	.57 .57 .58 .58	1.45 1.46 1.47 1.48	.85 .82 .86 .82	.59 .57 .60 .57	.32 .34 .36 .35						95.9	
DC-3	.28 .27 .27 .28	.76 .81 .72 .60	.35 .41 .50 .45	.20 .23 .40 .36	.13 .12 .22 .14						47.9	
Dc-4	.29 .30 .29 .27	.79 .81 .69 .55	.38 .38 .44 .45	.28 .19 .30 .40	.18 .18 .16 .14						49.0	
Σ	.55 .55 .54 .57	1.49 1.41 1.48 1.46	.85 .86 .82 .83	.60 .59 .58 .59	.35 .36 .34 .32						98.9	
DC-AV	.57	1.47	.84	.59	.34							
AC-1												
AC-2												
Σ												
S. P.	0	-4	-4	-4	-4							
AC-N	.13	.05	.05	.05	.05							

INDUCED POLARIZATION - RECEIVER NOTES PAGE 11

Project: Wood Mountain Line: 2 and 1 & 1/2 Int.Cal 489 Date: 5-22-83

Send	34	45	23	34	45	12	23	34	45	12	23	34
Rec.	125	→	235	→	→	345	→	→	→	455	→	→
Time	10	3	30 10	3	3	30 10	3	3	3	3	3	3
DC-1	5.0 4.9	1.20 1.20	8.2 8.15 7.9 8.22	1.25 1.32 1.25 1.18	.55 .52	7.5 7.6 6.8 7.2	1.38 1.35 1.32 1.35	.41 .36 .52 .38	.20 .19 .30 .28	1.52 1.50	.58 .58 .60 .60	.23 .20 .28 .28
DC-2	4.95 4.82	1.15 1.22	8.3 8.1 7.8 8.23	1.25 1.34 1.25 1.17	.55 .53	7.6 7.58 6.8 7.14	1.35 1.34 1.33 1.35	.38 .34 .54 .59	.18 .19 .32 .30	1.51 1.52	.57 .55 .59 .62	.22 .20 .27 .29
Σ	9.90 9.77	1.40 1.40	16.1 16.1	2.50 2.66 2.50 2.51	1.07 1.08	14.3 14.8 14.4 14.76	3.20 3.20 3.18 3.19	.93 .93 .92 .93	.50 .47 .50 .49	3.02 3.03	1.18 1.18 1.16 1.17	.51 .47 .49 .49
DC-3	4.99 4.82	1.15 1.21	8.3 8.1 7.8 8.25	1.26 1.35 1.23 1.15	.55 .54	7.6 7.6 6.8 7.15	1.38 1.31 1.31 1.33	.40 .33 .55 .58	.15 .16 .32 .32	1.49 1.53	.58 .56 .60 .60	.22 .20 .28 .29
Dc-4	4.99 4.85	1.18 1.19	8.4 8.1 7.9 8.25	1.32 2.60 1.20	.56 .52	7.6 7.6 6.8 7.1	1.36 1.30 1.32 1.92	.38 .36 .57 .54	.16 .13 .30 .49	1.50 1.52	.57 .58 .60 .60	.20 .20 .29 .29
Σ	9.81 9.84	1.36 1.37	16.1 16.1	2.49 2.52	1.09 1.08	14.4 14.70 14.2 14.76	3.19 3.29 3.14 3.23	.95 .92 .95 .90	.47 .48 .46 .53	3.02 3.02	1.18 1.16 1.17 1.18	.50 .49 .49 .49
DC-AV	9.83	1.38	16.1	2.50	1.08	14.55	3.19	.93	.49	3.02	1.175	.49
AC-1												
AC-2												
Σ												
S. P.	-12.6		+12.7			+3.1	→	→	→	-10	-10	-10
AC-N	0	0	.15	→	→	0			.01	0	0	0.02

INDUCED POLARIZATION - RECEIVER NOTES PAGE 12

Project: Rillito Line: 2 pd 1 st 2 Int.Cal Date: 5-22-64

Send	45	12	23	39	45				Cd			
Rec.	→	8 25			→							
Time/m	3	3	3	3	3							
DC-1	.12 .12 .17 .17	.34 .53 .82	.38 .28 .31 .40	.28 .20 .16 .28	.24 .15 .16 .29				48.0 47.8			
DC-2	.13 .12 .17 .17	.52 .52 .58 .49	.44 .34 .24 .35	.20 .20 .30 .25	.26 .16 .15 .25				48.0 47.8			
Σ	.29 .29 .30 .29	1.16 1.10 1.01	.69 .68 .68 .69	.44 .48 .50 .45	.40 .44 .41 .41				95.3 95.3			
DC-3	.11 .12 .18 .17	.44 .67 .68 .35	.50 .38 .19 .30	.16 .23 .41 .18	.22 .20 .15 .22				48.8 47.8			
Dc-4	.11 .12 .18 .16	.36 .76 .75 .30	.28 .40 .44 .51	.20 .30 .18 .27	.26 .16 .17 .27				45.8			
Σ	.29 .29 .29 .28	1.12 1.02 1.11 1.06	.69 .68 .72 .71	.57 .41 .68 .57	.37 .42 .43 .43							
DC-AV	.29	1.08	.69	.51	.41							
AC-1												
AC-2												
Σ												
S. P.	-10	0	0	0	0							
AC-N	0.02	.14	.14	.14	.14							

INDUCED POLARIZATION SENDER NOTES

Project: RILLITO Line: 1 Spr 1 E½ Date: 5-21-64

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
Receive	→	→	→	→	→	→	→	→	→	→	→	→
Time												
Range												
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Send	1-2	4-5	3-4	2-3	1-2		CAL					
Receive	→	→	→	→	→		~~3-4~~	3-4				
Time												
Range												
Current	1800	1800	1800	1800	1800		1000	300				

INDUCED POLARIZATION SENDER NOTES

Project: RILLITO Line: 1 Spx 1 W½ Date: 5-21-64

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Receive	→		→			→				→		
Time												
Range												
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Send	4-5	1-2	2-3	3-4	4-5	CAL	1-2				CAL	1-2
Receive	→	→			→							
Time												
Range												
Current	1800	1800	1800	1800	1800	1000	1000					1000

INDUCED POLARIZATION SENDER NOTES

Project: RILLITO Line: Z SPR 2 E 1/2 Date: 5-22-

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4 5	3-4	2-3
Receive	→	→		→	→		→	→	→	→	→	→
Time												
Range												
Current	1800	1800	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Send	1-2	4-5	3-4	2-3	1-2		CAL					
Receive	→	→	→	→	→		4-5					
Time												
Range												
Current	2000	2000	2000	2000	2000		100					

INDUCED POLARIZATION SENDER NOTES

Project: RILLITO Line: 1Spy 2 W½ Date: 5-22-6

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Receive	→	→	→	→	→	→	→	→	→	→	→	→
Time												
Range												
Current	2000	2000	2K	2K	2K	2K	2K	2K	2K	2150	2150	2150

Send	4-5	1-2	2-3	3-4	4-5							
Receive	→	→	→	→	→							
Time												
Range												
Current	2150	2150	2150	2150	2150							

S

INDUCED POLARIZATION SENDER NOTES

Project: Rillito Line: 2 spr 2 N ½ Date: 5-22-6

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Receive	→		→		→		→		→		→	
Time												
Range												
Current	1800	1800	1800	1800	1800	1800	1900	1900	1800	1800	1900	1800
Send	4-5	1-2	2-3	3-4	4-5		CAL					
Receive	→	→			→		3-4					
Time												
Range												
Current	1800	1800	1800	1800	1800		1000					

INDUCED POLARIZATION SENDER NOTES

Project: RILLITO Line: 2 SPR 2 S½ Date: 5-22-6

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
Receive	→	→	→	→	→	→	→	→	→	→	→	→
Time												
Range												
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800

Send	1-2	4-5	3-4	2-3	1-2		CAL					
Receive	→	→	→	→	→		2-3					
Time												
Range												
Current	1800	1800	1800	1800	1800		1000					