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CREW & EXPENSE STATEMENT

$4000.00 Max. Limit on Job

TYPE OF WORK I.P.

ENTER ALL TIME & ALL EXPENSES FOR EACH MAN

Weekend
1 Gen valves act (is missing)
2 Box of W-350's
3 Compute Line 1
4 see about bent wheel → didn't
5 and alignment!!!

WEEK ENDING June 6 1965
NAME OF PROJECT Strong + Harris
CREW CHIEF Keith Henson
ADDRESS ΔT Ranch
Pregoon Ariz
$4000.00 Max. Limit on Job

DATE	NAME	HOURS G.P.	TR.	C.	E-M	OTHER	TOTAL	VEHICLES #	MILES	CLIENT EXPENSES MOTEL	MEALS	OTHER	WORK ACCOMPLISHED	PHONE	REMARKS	GEOEX EXPENSES
SUN May 30																
MON. May 31 ~~June 1~~	KH				5		5						Sender + Generator work (voltage reg)			
TUES. June 1 ~~2~~	KH	7	2½			2 ①	11½	#2	78655	11.48	2.86		Drinks for Lunches Put in wires + ran Line #2. Power reeler broke down.		Survey materials →	14.76
	RP	7	2½			1½	11	#3	12334							
	JB	7	2½			1½	11				1.15					
WED. 2 ~~3~~	KH	9	1	2			12	#2	78686				Repaired power reeler, picked up wire on Line 2, put in pits Line 1 and put up 10 survey markers (centers of #3, #4 + #5 located) Computed Line 2			
	RP	9	1				10	#3	12363							
	JB	9	1				10									
THURS. 3 ~~4~~	KH	7	1			2①	10	#2	78716	24.18			Put in wires, ran, and picked up wires Line #1. Jeep ran out of gas. Shopping in Benson for Powder + Tools		Shovel + Tools → VW Generator valve hours are up and it's developing a miss. Needs work before more use.	3.71
	RP	7	1			2	10	#3	12424							
	JB	7	1			2	10									
FRI. 4 ~~5~~	KH	7	2				9	#2	78806				Put in pits Line #3, Located center of #6 and located all electrodes of #4 + #5.			
	RP	7	2				9	#3	12652							
	JB	7	2				9									
SAT. 5 ~~6~~	KH			2	4		6						Computed Line #1 Vehicle + VW work		VW Tune up →	24.39

CODE: G.P. - GEOPHYSICS, i.e. I.P., E-M, ETC.
TR. - TRAVEL TIME
C - COMPUTING
E-M - EQUIPMENT MAINTENANCE
OTHER - PLEASE EXPLAIN

PLEASE USE THIS SPACE FOR ANY NOTES, MESSAGES, OR EXPLANATIONS YOU FEEL ARE NEEDED.

① Shopping in Benson

KH # 81.33 53½ hrs

Jeep space Exhausting

CREDIT CARD NO. Paid Cash

SOLD TO 28756

X CUSTOMER SIGNATURE J Beeler

SOLD BY Mikes Mobil

Barnes A

DATE 6 4 65

Mobil

THIS CHARGE IS ASSIGNED TO:

Mobil Oil Company

A Division of Socony Mobil Oil Company, Inc.

ORIGINAL INVOICE

LICENSE NO.	STATE
CL-6092	Ariz

PRODUCT OR SERVICE	QUANTITY	PRICE	AMOUNT
MOBIL PREMIUM ☐ MOBIL REGULAR ☑	10.9	34¢	3 69
MOBILOIL SPECIAL ☐ MOBILOIL ☐			
MOBIL LUBRICATION			
	SALES TAX		
J 314965	TOTAL		3 69

3.69
35
19

Ask about our up-to-

12 MONTH EXTENDED TERMS

on Mobil Tires & Batteries

ALL APPLICABLE TAXES ARE INCLUDED HEREON

CO 65 WC (4-62)

CREW & EXPENSE STATEMENT

WEEK ENDING June 12 19 65
NAME OF PROJECT S + H
CREW CHIEF Keith Henson
ADDRESS AT Ranch

TYPE OF WORK I.P.

ENTER ALL TIME & ALL EXPENSES FOR EACH MAN

DATE	NAME	HOURS G.P.	TR.	C.	E-M	OTHER	TOTAL	VEHICLES #	MILES	CLIENT EXPENSES MOTEL	MEALS	OTHER	WORK ACCOMPLISHED	PHONE	REMARKS	GEOEX EXPENSES
SUN	KH														Plastic can for salt →	5.18 Keith
	J.B.														Gas →	3.69 Beeler
76	JB															
MON.	KH	1	6		3	2 ①	12 ✓	2	78931		~~220~~	Lunch stop (soda pop)	Almost none - wires in		Recv Brakedown	
	R.P.	6	3				9 ✓	3	12769				on Line #3 + 3 electrodes			
8/7	S.B.	6	3				9 ✓						Line #4 [Trip to Tucson			
													to fix reciever]			
TUES.	KH	9	2		1 ②		12 ✓	2	—				Ran Line #3 & picked up			
	R.P.						12 ✓	3	12809				wires. Put in wires + 2			
8/8	S.B.	9	2		1		12 ✓						electrodes on Line 4 and ran			
													all but the last station of 1 end.			
													Stopped by rain. Also 2 flats			
													on red jeep - trip to Benson to fix →		and get gas.	
WED.	KH	10	1	2			13 ✓	2	—		220 ← soda pop + lunches		Completed Line 4, put			
	R.P.	10	1		1	1	13 ✓	3	12854				in 3 electrodes of Line 1-A			
8/9	J.B	10	1	2			13 ✓						and ran it. Computed			
													Line 4. Ran went to			
													Benson for gas and a			
													flat tire.			
THURS.	KH	10	1				11 ✓	2	—				Put in pits and ran		Talked to Chris -	
	R.P.	10	1				11 ✓	3	12885				SW½ of Line #6 [much			
8/10	J.B	10	1				11 ✓						brush, ect].			
FRI.	KH	11	2			2 ③	15 ✓	2	79032				Ran NE½ of Line #6		140 miles? Beeler — e1.0¢/mile	
	RP	11	2			2 ③	15 ✓	3	12909				Put in and ran both ends			
8/11	TB	11	2			2 ③	15 ✓						of line #8. No brakes			
													on jeep + no clutch			
													on GMC			
SAT.																
8/12																

CODE: G.P. - GEOPHYSICS, i.e. I.P., E-M, ETC.
TR. - TRAVEL TIME
C - COMPUTING
E-M - EQUIPMENT MAINTENANCE
OTHER - PLEASE EXPLAIN

PLEASE USE THIS SPACE FOR ANY NOTES, MESSAGES, OR EXPLANATIONS YOU FEEL ARE NEEDED.

① Stand by in field waiting for John + Ron

② a sorted — 10 min, broken wire in sender 2 flat changes on red jeep, ect. —

③ Flat Tire + Flat spare on GmC, Trip to Benson to fix, (sort of)

KH 63 hrs
~~7.87~~ 7.38

ORIGINAL INVOICE

CARD NO. 71 384 3710 3

SOLD TO
HEINRICHS
GEO EXPLORATION CO 6
67

SOLD BY
FREEWAY TEXACO
TUCSON ARIZ
71 384 19[illegible]

PURCHASER'S SIGNATURE
X Keith Henson

5 27 65

THANK YOU

MERCHANDISE OR SERVICE	QUAN.	PRICE	AMOUNT
TEXACO GASOLINE SKY CHIEF ☐ FIRE CHIEF ☐	23	299	6 90
TEXACO MOTOR OIL HAVOLINE ☐ TEXACO ☐			
V5658836	TOTAL CHARGE $		6 90

PRICE AND AMOUNT INCLUDES ALL APPLICABLE FEDERAL, STATE AND LOCAL TAXES.

TERMS: PAYABLE WITHOUT DISCOUNT UPON RECEIPT OF MONTHLY STATEMENT OF PURCHASES.

STATE ARIZ LICENSE NUMBER OL 6792

PURCHASER'S CAR NUMBER

PURCHASER'S ORDER NUMBER 78381

FORM S - 199D 12-64

Thank You!

YOUR PATRONAGE IS APPRECIATED

No. of Cks.	Table	No. Persons	Waiter	Book & Check No.
				187-29

dinner	1	70
		30
	2	00
Book		
5/27/65		
TAX		
STYLE OF	Thank You--Call Again	

Thank You!

YOUR PATRONAGE IS APPRECIATED

No. of Cks.	Table	No. Persons	Waiter	Book & Check No.
				187-27

dinner	1	96
TAX		
STYLE OP Thank You--Call Again		

Thank You!

YOUR PATRONAGE IS APPRECIATED

No. of Cks.	Table	No. Persons	Waiter	Book & Check No.
				187-28

dinner	1	45
R.P.		
Tip		25
	1	70
TAX		
STYLE OP		

Thank You--Call Again

CREW & EXPENSE STATEMENT

Mad Triangle T Ranch. Arogoon

WEEK ENDING May 29 19 65
NAME OF PROJECT I S+H
CREW CHIEF Keith Henson
ADDRESS Circle T ranch
Tucson

TYPE OF WORK IP

ENTER ALL TIME & ALL EXPENSES FOR EACH MAN

DATE	NAME	HOURS G.P.	TR.	C.	E-M	OTHER	TOTAL	VEHICLES #	MILES	CLIENT EXPENSES MOTEL	MEALS	OTHER	WORK ACCOMPLISHED	PHONE	REMARKS	GEOEX EXPENSES
SUN																
MON.																
TUES.																
WED.								2	78381		X					
May								3	12085							
THURS.	KH		2			7 ①	9 ✓	2	78443		221		Packing + travel			
	RP		2			7	9 ✓	3	12145		170		Tucson - ΔT			
27	JB		2			7	9 ✓				200					
FRI.	KH	5	1		2①		8 ✓	2	78562		—		Survayed in line 2			
	RP	5	1		2		8	3	12229		—		+ put in electrodes			
28	JB	5	1		2		8 ✓				—					
SAT.																
29																

CODE: G.P. - GEOPHYSICS, i.e. I.P., E-M, ETC.
TR. - TRAVEL TIME
C - COMPUTING
E-M - EQUIPMENT MAINTENANCE
OTHER - PLEASE EXPLAIN

443
381
62

① Packing + EM (assorted)

PLEASE USE THIS SPACE FOR ANY NOTES, MESSAGES, OR EXPLANATIONS YOU FEEL ARE NEEDED.

Millage is end of day

① Check out at ΔT Ranch - problems with sender ← Generator (mainly Gen)

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S+H Line 1 NE½ Field date_____ Data page_____ Comp. date_____. Comp by_____

(A) Send	23	12	34	23	12	45	34	23	12		Col	
(B) Receive	1-2 →		2-3 →			3-4 →					5-3	
(C) n separation	300	100	300	100	30	300	100	30	30		300	
(D) I	4	4	5	4	4	7	5	4	4			
(E) Vdc (avg)	348	147.3	410	67.2	44.4	613	11.59	29.4	228			
(F) DCcal	→											
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60			
(H) ρ dc=ExFxGx10^3/D	261	430	246	202	333	262	278	220	342			
(I) Vac Σ	320	140.2	384	64.0	42.0	570	11.7	22.6	21.5			
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	946	977	946	977	956	946	977	956 →				
(M) ρ dc/ρac=ExL/K	1.030	1.027	1.011	1.027	1.011	1.019	1.013	1.020	1.015			
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H	11	6	4	13	3	7	5	9	4			

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	45	34	23	12	45	34	23	12				
(B) Receive	4-5 →			→	5-6 →			→				
(C) n separation	100	30	10	10	30	10	3	3				
(D) I	7	5	4	4	7	5	4	4				
(E) Vdc (avg)	131.9	38.4	11.72	10.26	36.45	14.26	5.15	4.99				
(F) DCcal	→							→				
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	118				
(H) ρ dc=ExFxGx10^3/D	226	230	176	269	156	171	135	209				
(I) Vac Σ	125.6	36.0	11.00	9.60	34.4	13.40	4.86	4.70				
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	977	956	956	956 →		→	959	→				
(M) ρdc/ρac =ExL/K	1.027	1.021	1.020	1.022	1.013	1.018	1.018	1.019				
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H	12	9	11	8	8	11	13	9				

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S+H Line 1 SW½ Field date 6-4-65 Data page_____ Comp. date 6-5-65 Comp by KH

(A) Send	34	45	23	34	45	12	23	34	45		Cal	
(B) Receive	1-2 →		2-3 →			3-4 →						
(C) n separation	1000	300	300	300	100	1000	100					
(D) I	5	8	4	5	8	4	4	5	8		3	
(E) Vdc (avg)	788	294	512	217.5	114.1	1002	202.10	125.6	76.9		301	
(F) DCcal 1.000												
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60			
(H) ρ dc=ExFxGx10^3/D	472	441	384	522	438	765	606	753	577			
(I) Vac Σ	727	274	470	212	108.2	916	188.0	116.0	72.0		286	
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	953	946	→	→	977	953	977	→				
(M) ρ dc/ρac=ExL/K	1.032	1.017	1.031	1.017	1.031	1.050	1.050	1.058	1.042			
(N) PFE=(M-1)(10²) MCF	7	4	8	3	7	7	8	8	7			
(O) MCF=(M-1)(10^5)/H												

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	12	23	34	45	12	23	34	45				
(B) Receive	45 →			→	5-6			→				
(C) n separation	300	100	100	30	300	100	100	30				
(D) I	4	4	5	8	4	4	5	8				
(E) Vdc (avg)	340	85.1	65.0	47.0	262	74.2	63.5	48.8				
(F) DCcal								→				
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	1002	745	780	617	1970	1110	1330	1002				
(I) Vac Σ	316	80.0	61.6	437	236	68.2	588	44.6				
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	946	977	→	956	946	977	→	956				
(M) ρdc/ρac =ExL/K	1.039	1.040	1.049	1.030	1.050	1.062	1.056	1.046				
(N) PFE=(M-1)(10²) MCF	4	5	6	5	3	6	4	5				
(O) MCF=(M-1)(10^5)/H												

953 986 7

996 980 10

1017 976 31

946 7 953

46 31 977

1000 953
300 946
100 977
30 956

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project S+A Line 2 NE½ Field date 6-2-65 Data page _____ Comp. date 6-3-65. Comp by KH

(A) Send	23	12	34	23	12	45	34	23	12	45	34	23
(B) Receive	12 →		2-3 →			34 →				4-5		
(C) ~~n separation~~ Range	300	30	300	100	10	300	100	30	3	100	30	10
(D) I	6	1	5	6	1	5	5	6	1	5	5	6
(E) Vdc (avg)	595	33.2	492	140.5	11.78	372	102.2	47.2	5.04	69.3	30.8	15.10
(F) DCcal 1000												
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	298	398	295	271	353	223	246	236	302	166	185	191
(I) Vac Σ	570	32.3	470	133.5	11.34	354	96.0	46.0	4.90	64.7	30.0	14.70
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.960	982	.960	952	982	.960	952	982	982	952	982	
(M) ρ dc/ρac=ExL/K	1.002	1.010	1.005	1.002	1.022	1.010	1.015	1.008	1.010	1.020	1.009	1.003
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H	6.5	2.5	1.5	7.0	6.0	4.5	6.0	3.5	3.5	1.0	4.5	1.5

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

(A) Send	12	45	34	23	12			Cal				
(B) Receive	→	5-6 →										
(C) n separation	3	30	10	10	1			300				
(D) I	1	5	5	6	1			3				
(E) Vdc (avg)	2.28	21.1	12.72	8.88	→			304				
(F) DCcal	→											
(G) Kn x 10^{-3}	105	30	60	105	168							
(H) ρ dc=ExFxGx10^3/D	239	127	153	153								
(I) Vac Σ	2.20	26.4	12.36	8.64	1.12			292				
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	→											
(M) ρdc/ρac =ExL/K	1.018	1.017	1.011	1.011								
(N) PFE=(M-1)(10^2)	7.5	13.5	7.0	7.0								
(O) MCF=(M-1)(10^5)/H												

3-10-30 982 $\frac{1.960}{21}$ 939-1R 952

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S+H Line 2 SW ½ Field date 6-2-65 Data page_____ Comp. date 6-3-65. Comp by S+H

(A) Send	34	45	23	34	45	12	23	34	45	12	23	34
(B) Receive	1-2	→	23	→	→	34	→	→	→	45	→	→
(C) ~~n separation~~ Range	300	100	300	300	100	100	300	100	30	100	300	100
(D) I	5	5	3	5	5	1	6	5	5	1	6	5
(E) Vdc (avg)	631	167.7	528	201	74.8	179.4	304	945	46.0	87.8	234	96.1
(F) DCcal 1.000	→	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	379	402	528	482	449	539	608	568	552	1050	1170	1150
(I) Vac Σ	602	159.4	504	190.0	69.1	168.0	286	88.0	43.8	81.8	216	88.4
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	960	952	960	—	952	—	960	952	982	952	960	952
(M) ρ dc/ρac=ExL/K	1.007	1.002	1.008	1.017	1.030	1.018	1.021	1.022	1.031	1.022	1.040	1.037
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H	1	.5	1.5	3.5	6.5	3.0	3.5	4.0	5.5	2.0	3.5	3.0

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	45	12	23	34	45			Cal				
(B) Receive	→	5-6	→	→	→							
(C) n separation	30	30	100	30	30							
(D) I	4	1	6	5	4			3				
(E) Vdc (avg)	41.5	49.2	142.1	61.2	26.0			302				
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	105	30	60	105	168							
(H) ρ dc=ExFxGx10^3/D	1090	1480	1420	1280	1090							
(I) Vac Σ	39.5	46.8	132.0	58.0	24.2			290				
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	982	—	952	982	—							
(M) ρdc/ρac =ExL/K	1.031	1.032	1.026	1.037	1.055							
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H	3.0	2.0	2.0	3.0	5.0							

960

INDUCED POLARIZATION SENDER NOTES

Project: S H Line: 2 N Date: 6-1-65

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2			
Receive	→	→	→	→	→	→	→	→	→			
Time												
~~Range~~ Voltage	700	700										
Current	6.	1.	5.	6.	1.	5.	5.	6.	1.			
Send	4 5	3 4	2-3	1-2	4-5	3-4	2-3	1-2			Cal	
Receive	→	→	→	→	→	→	→	→			3-4	
Time											23.	
Range												
Current	5.	5.	6.	1.	5.	5.	6.					

?

INDUCED POLARIZATION SENDER NOTES

Project: Line: Date:

Send	3-4	4-5	2 3	3 4	4 5	1-2	2 3	3 4	4 5			
Receive	→	→	→	→	→	→	→	→	→			
Time												
Range	700	700	400									
Current	5.	5.	3.	5.	5.	1.	6.	5	5.			
Send	1 2	2 3	3 4	4 5	1-2	2-3	3-4	4-5			Cal	
Receive	→	→	→	→	→	→	→	→			23	
Time											3.	
Range												
Current	1	6	5	4	1	6	5	4				

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S+H Line: 2 NE½ Inc.Cal _____ Date: 6-1-65

Send	23	12	34	23	12	45	34	23	12	45	34	23
Rec.	1-12	→	23	→	→	34	→	→	→	45		
Time	368	30	300	100	10	300	100	30	3	100	30	10
DC-1	298	16.0 17.3	246 246	69.8 70.6	6.34 6.42 5.46	187 185	49.8 52.2	22.0 25.2	2.82 2.79 2.19	34.0 35.2	15.5 15.5	9.40 9.70
DC-2	297 298	15.9 17.4	246 246	69.4 71.0	6.38 5.44	187 186	50.0 52.0	21.9 25.3	2.84 2.21	34.0 35.4	15.2 15.5	9.42 9.68
Σ												
DC-3	297	15.7 17.5		69.8 70.0	6.37 5.33	187 185	49.9 52.5	22.0 25.3	2.25 2.22	34.0 35.4	15.3 15.6	9.42 9.68
Dc-4	298	15.7 17.5		69.6 70.8	6.42 5.34	187	49.8 52.4	21.9	2.83 2.25	33.9 35.3	15.3 15.6	
Σ												
DC-AV	595	33.2	492	140.5	11.78	372	102.2	47.2	5.04	69.3	30.8	19.11
AC-1	285	16.15	235	66.8	5.68	177	48.0	23.0	2.45	32.4	15.0	9.35
AC-2	285	16.15	235	66.7	5.68	177	48.0	23.0	2.45	32.3	15.0	9.35
Σ	570	32.3	470	133.5	11.34	354	96.0	46.0	4.90	64.7	30.0	18.70
S. P.	-6.0	→	-37.1	→	→	+1.7	→	→	→			
AC-N	7.5	→	.05	→	→	.04	→	→	→			

78655

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S+H Line: 2 NE½ Inc.Cal _____ Date: 6-1-65

Send	12	45	34	23	12			Cal				
Rec.	→	56	→	→	→							
Time	3	30	10	10	1							
DC-1	1.23 1.11 1.07	11.1 9.9	6.40 6.36	4.32 4.60	.57,56 .63,66			152 152				
DC-2	1.17 1.13	11.2 9.8	6.36 6.32	4.28 4.61	.60,56 .60,59			152 152				
Σ												
DC-3	1.16 1.13	11.3 9.8	6.36 6.36	4.24 4.64	.63,64 .60,56							
Dc-4	1.11 1.18	11.4 9.7	6.38 6.36	4.24 4.64	.59,65 .64,54							
Σ												
DC-AV	2.28	21.1	12.72	8.84				304				
AC-1	1.10	10.2	6.18	4.32	.56			146				
AC-2	1.16	10.2	6.18	4.32	.56			146				
Σ	2.20	20.4	12.36	8.64	1.12			292				
S. P.	-8.3	-37	→	→	→							
AC-N	.04	.04										

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S & H Line: 2 SW ½ Int.Cal _____ Date: 6-1-65

Send	34	45	23	34	45	12	23	34	45	12	23	34
Rec.	12 →	→	23	→	→	34	→	→	→	4-5		
Time	300	100	300	300	100	100	300	100	30	100	300	101
DC-1	313 316 315 314	85.0 85.2 83.2	263 265	102 99	39.0 35.8	~~89.4~~ 90.4 ~~88.6~~	152 151	47.0 47.4	22.7 22.5 22.4	43.6 44.2	117 117	48.6 48.0
DC-2	314 315 317	84.6 82.8	263 266	102 99	39.0 35.8	89.2 90.4	152 152	47.0 47.6	23.2 23.6	43.8 44.4	117 116	48.0 48.0
Σ												
DC-3	314	84.6 83.0	262	102	39.0	89.4 89.6	152 152	47.0	23.2 22.9	43.0 44.0	117 117	47.8 48.2
Dc-4	318 316	84.8 82.6				90.2 88.8			22.9 22.8	44.0 44.0		
Σ												
DC-AV	331	167.7	528	201	74.8	175.4	304	94.5	46.0	87.8	234	96.1
AC-1	301	79.7	252	95.0	34.5	84.0	143	44.0	21.9	40.6	108	44.2
AC-2	301	79.7	252	95.0	34.6	84.0	143	44.0	21.9	40.6	108	44.2
Σ	602	159.4	504	190.0	69.1	168.0	286	88.0	43.8	81.8	216	88.4
S. P.	-34.5	—	413.5	—	—	-33.9	—	—	—			
AC-N	.06	—	.10	.10		.1	—	—	—			

3A

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S & H Line: 2 SW ½ Int.Cal _____ Date: 6-1-65

Send	45	12	23	34	45				Cal			
Rec.	→	5-6	→	→	→							
Time	30	30	100	30	30				151 151			
DC-1	21.2 19.8	24.1 24.0 25.0	71.0 71.0	31.1 30.0	12.3 12.2 13.6 13.8				150 151			
DC-2	21.6 20.3	24.2 25.0	70.8 71.4	31.2 30.2	12.4 12.3 13.3				151 151			
Σ												
DC-3	21.3 20.1	24.1 25.1	70.8 71.4	31.0 30.1	12.4 13.9							
Dc-4	21.5 20.3	24.5 25.0	70.6	31.0 30.1	12.5 13.4							
Σ												
DC-AV	41.5	49.2	142.1	61.2	26.0				145			
AC-1	19.8	23.4	66.0	29.0	12.1				145			
AC-2	19.7	23.4	66.0	29.0	12.1							
Σ	39.5	46.8	132.0	58.0	24.2							
S. P.	-2.8	-4.9	—	—	—							
AC-N	.2	.1-.2	—	—	—							

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project S+H Line 1A NEL Field date 6-10-65 Data page _____ Comp. date 6-17-65. Comp by KH

(A) Send	23	12	34	23	12	45	34	23	12	45	34	23
(B) Receive												
(C) n separation	1000	300	1000	100	100	1000	300	100	30	300	100	30
(D) I	5	3	5	5	3	5	5	5	3	5	5	5
(E) Vdc (avg)	642	211	960	195.2	92.4	964	241	735	448	215.5	80.9	30.1
(F) DCcal 1,000												
(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	192	422	288	234	462	289	289	222	448	258	242	181
(I) Vac Σ	588	1960	880	183.6	87.6	880	220	65.6	41.8	200	76.0	28.2
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	944	935	944	966	—	944	935	966	945	935	966	945
(M) ρ dc/ρac=ExL/K	1.031	1.018	1.030	1.029	1.019	1.034	1.025	1.026	1.013	1.019	1.029	1.009
(N) PFE=(M-1)(10^2)	3.1	1.8	3.0	2.5	1.9	3.4	2.5	2.6	1.3	1.9	2.9	0.9
(O) MCF=(M-1)(10^5)/H	16	4	10	12	4	12	9	12	3	7	12	5

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

(A) Send	12	45	34	23	12			cal				
(B) Receive												
(C) n separation	30	100	30	10	10			300				
(D) I	3	5	5	5	3			3				
(E) Vdc (avg)	19.5	29.1	36.6	15.70	10.93			312				
(F) DCcal												
(G) Kn x 10^{-3}	525	15	30	525	84							
(H) ρ dc=ExFxGx10^3/D	341	238	220	165	306							
(I) Vac Σ	18.40	2.40	34.2	14.64	10.24			292				
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	945	966	945	—	—							
(M) ρdc/ρac =ExL/K	1.002	1.032	1.011	1.013	1.010							
(N) PFE=(M-1)(10^2)	0.2	3.2	1.1	1.3	1.0							
(O) MCF=(M-1)(10^5)/H	1	13	5	8	3							

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S+H Line 1-A SW½ Field date 6-10-65 Data page_____ Comp. date 6-14-65. Comp by KH

(A) Send	34	45	23	34	45	12	23	34	45	12	23	34
(B) Receive												
(C) ~~n separation~~ Range	1000	300	1000	300	100	1000	300	100	100	300	100	100
(D) I	5					3	5	5	5	3	5	5
(E) Vdc (avg)	1078	358	860	404	183.5	641	240	153.7	79.3	266	134.0	97.0
(F) DCcal 1.000												
(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	323	429	258	485	550	321	650	461	476	524	403	582
(I) Vac Σ	1004	334	790	374	175.6	59.0	222	146.0	75.6	243	124.8	91.2
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	944	935	944	935	966	944	935	966	—	935	966	—
(M) ρ dc/ρac=ExL/K	1.013	1.013	1.028	1.010	1.011	1.027	1.011	1.017	1.013	1.036	1.039	1.029
(N) PFE=(M-1)(10^2)	1.3	1.3	2.8	1.0	1.1	2.7	1.1	1.7	1.3	3.6	3.9	2.9
(O) MCF=(M-1)(10^5)/H	4	3	11	2	2	8	2	4	2	7	10	5

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	45	12	23	34	45			Cal				
(B) Receive												
(C) ~~n separation~~	30	100	100	100	30			300				
(D) I	5	3	5	5	5			3A				
(E) Vdc (avg)	57.7	138.6	73.6	62.0	40.3			310				
(F) DCcal												
(G) Kn x 10^{-3}	52.5	15	30	52.5	84							
(H) ρ dc=ExFxGx10^3/D	606	693	441	651	677							
(I) Vac Σ	53.2	127.6	68.0	57.6	37.0			290				
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	945	966	—	—	945							
(M) ρdc/ρac =ExL/K	1.027	1.050	1.048	1.040	1.031							
(N) PFE=(M-1)(10^2)	2.7	5.0	4.8	4.0	3.1							
(O) MCF=(M-1)(10^5)/H	5	7	11	6	5							

1000 944
300 935
100 966
30 — 945
10 — 948

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S+H Line: 1A-NE Int.Cal _____ Date: 6-10-65

Send	12	45	34	23	12			Cal				
Rec.	30 →				→							
Time	30	106	30	10	10							
DC-1	10.0 9.5	37.3 38.9	18.8 17.8	756 820	494 546			155 135				
DC-2	10.0 9.4	39.2 39.8	18.9 17.8	748 820	496 597			154 154				
Σ												
DC-3	10.0 9.5	39.4	18.8 17.7	749 820	492 610			157 155				
Dc-4					478 604			157 158				
Σ												
DC-AV	19.5	79.1	36.6	15.70	10.93			312				
AC-1	9.20	37.0	17.1	7.32	5.12			146				
AC-2	9.20	37.0	17.1	7.32	5.12			146				
Σ	18.40	74.0	34.2	14.64	10.24			292				
S. P.	-2.0	+15.1										
AC-N	.04	.03										

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S+H Line: 1-A 500' NE Int.Cal _____ Date: 6-10-65

Send	23	12	34	23	12	45	34	23	12	45	34	23
Rec.	→	→		→	→	→	→	→	→	→	→	→
Time	1000	306	1000	100	100	1000	300	100	30	300	100	30
DC-1	321 321	106.5 104.5	980 478	98.4 96.5	45.2 47.2	484 480	120 121	36.8 37.0	22.5 22.3	108 105	40.3 40.6	14.9 15.2
DC-2	321	106.5 104.5	482 480	98.8 96.4	45.2 47.2	483 481	120 121	37.2 36.6	22.5 22.3	107 105 107.5	40.3 40.6	15.0 15.2
Σ												
DC-3				97.8		483		37.2				14.9 15.2
Dc-4												
Σ												
DC-AV	642	211.0	960	195.2	92.4	964	241	73.9	44.8	215.5	80.9	30.1
AC-1	294	98.0	440	91.8	43.8	440	110	34.8	20.9	100	34.0	14.1
AC-2	294	98.0	440	91.8	43.8	440	110	34.8	20.9	100	38.0	14.1
Σ	588	196.0	880	183.6	87.6	880	220	69.6	41.8	200	76.0	28.2
S. P.	-17.0 →		-16.9			-0.9						
AC-N	.15 →		.04			.05						

all sp Rev

center 1 +20 (Rev) all

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: SHL Line: 1-A SW Int.Cal _____ Date: 6-11-85

Send	45	12	23	34	45			Col				
Rec.	→											
Time	30	100	100	100	30							
DC-1	27.3 30.5	69.6 69.8	37.4 36.4	31.2 31.0	20.4 20.1			154 156	155 157			
DC-2	27.2 30.6	70.1 69.0	37.3 36.4	30.8 31.0	20.1 20.2			154 156	155 157			
Σ												
DC-3	26.9	70.1 68.2	37.0 36.6	30.8 31.4	20.1							
Dc-4	30.7 26.8	70.0 69.6										
Σ								310	312	OK		
DC-AV	57.7	138.6	73.6	62.0	40.3							
AC-1	26.6	63.8	34.0	28.8	18.5			144				
AC-2	26.6	63.8	34.0	28.8	18.5			146	292			
Σ	53.2	127.6	68.0	57.6	37.0			290				
S. P.	+9.9	-7.2										
AC-N	.1-.2	.1-.2										

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S + H Line: 1-A SW½ 500 Int.Cal _____ Date: 6-10-75

Send	34	45	23	34	45	12	23	34	45	12	23	34
Rec.	12	→	23	→	→	3-4	→	→	→	→	→	
Time	1030	300	1200	300	100	1300	300	100	100	300	100	100
DC-1	539 539	179 179	~~427~~ 430	~~201~~ 202	91.1 92.5	320 321	121 119	77.2 76.5	40.0 39.3	~~134~~ ~~135~~	66.4 67.8	49.6 47.8
DC-2	539	179	430 430	202 202	90.3 92.9	320	121	77.2 76.5	40.0 39.3	~~135~~ 134	66.4 67.5	49.6 47.2
Σ												
DC-3					90.9 92.4					132 133	66.4 67.5	49.4 47.4
Dc-4										133	66.4	
Σ												
DC-AV	1078	358	860	404	183.5	641	240	153.7	79.3	266	134.0	97.0
AC-1	502	167	395	187	87.8	295	111	73.0	37.8	122	62.4	45.8
AC-2	502	167	395	187	87.8	295	111	73.0	37.8	121	62.4	45.6
Σ	1004	334	790	374	175.6	590	222	146.0	75.6	243	124.8	91.2
S. P.	-10.5		-8.5			-1.6						
AC-N	-.04		.05-.1			~.08						

0-1 +5.3 (all Norm)

INDUCED POLARIZATION SENDER NOTES

Project: S + H Line: #1A 500' Dipole Date: 6-10-65

Send	34	45	23	34	45	12	23	34	45			
Receive												
Time												
Range												
Current	5	5	5	5	5	3	5	5	5			
Send	12	23	34	45	12	23	34	45			Cal	
Receive											3-4	
Time											3,	
Range												
Current	3	5	5	5	3	5	5	5				

over

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project SHH Line 3 SW½ Field date 6-8-65 Data page_____ Comp. date 6-14-65 Comp by KH

(A) Send	34	45	23	34	45	12	23	34	45	12	23	34
(B) Receive	12	→	23	→	→	3-4	→	→	→	4-5	→	→
(C) n separation Range	300	100	300	100	30	100	100	30	30	100	100	100
(D) I	4	4	2	3	4	2	2	3	4	2	2	3
(E) Vdc (avg)	348	100.2	212.0	77.2	53.3	182.2	70.1	47.8	30.7	191.8	105.4	78.1
(F) DCcal 1.000												
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	262	303	318	389	400	272	421	478	461	1150	1580	1560
(I) Vac Σ	322	94.4	194.0	88.8	48.8	168.8	65.2	43.2	27.8	176.2	97.6	70.8
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	938	969	938	969	948	969	—	948	—	969	—	
(M) ρ dc/ρac=ExL/K	1.013	1.030	1.026	1.007	1.037	1.046	1.041	1.049	1.048	1.053	1.048	1.070
(N) PFE=(M-1)(10^2)	1.3	3.0	2.6	0.7	3.7	4.6	4.1	4.9	4.8	5.3	4.8	7.0
(O) MCF=(M-1)(10^5)/H	5	10	8	2	9	17	10	10	10	5	3	4

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	45	12	23	34	45			Ccl				
(B) Receive	→	5-6	→	→	→							
(C) n separation	30	100	100	100	30			300				
(D) I	4	2	2	3	4			3				
(E) Vdc (avg)	56.1	158.0	90.5	69.0	50.6			330				
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	105	30	60	105	168							
(H) ρ dc=ExFxGx10^3/D	1540	2370	2720	2420	2100							
(I) Vac Σ	50.6	143.8	83.4	62.0	45.0			310				
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	948	969	—	—	948							
(M) ρdc/ρac =ExL/K	1.052	1.064	1.052	1.079	1.053							
(N) PFE=(M-1)(10^2)	5.2	6.4	5.2	7.9	5.3							
(O) MCF=(M-1)(10^5)/H	3	3	2	3	3							

1000 947
300 938
100 969
30 948
1.7
3 951

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project SH Line 3 NE½ Field date 6-8-65 Data page_____ Comp. date 6-14-65 Comp by KB

(A) Send	23	12	34	23	12	45	34	23	12	45	34	23
(B) Receive	1-2	→	2-3	→	→	5-4	→	→	→	4-5	→	→
(C) ~~n separation~~ Range	100	30	300	30	30	300	30	10	10	30	30	3
(D) I	2	2	4	2	2	4	4	2	2	4	4	2
(E) Vdc (avg)	152.5	50.9	320	45.1	20.8	215.5	55.2	12.18	6.82	53.7	22.3	6.31
(F) DCcal 1.000	→	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	228	305	240	271	311	162	178	183	204	161	167	172
(I) Vac Σ	144.0	42.8	294	42.2	19.60	199.0	56.6	11.52	6.42	52.0	21.1	5.96
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	969	948	938	948	→	938	948	→	→	→	→	951
(M) ρ dc/ρac=ExL/K	1.028	1.010	1.021	1.015	1.007	1.032	.992	1.001	1.009	980	1.002	1.008
(N) PFE=(M-1)(10^2)	2.8	1.0	2.1	1.5	0.7	3.2	-0.8	0.1	0.9	-2.0	0.2	0.8
(O) MCF=(M-1)(10^5)/H	12	3	9	11	2	20	-4	1	4	-12	1	5

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	12	45	34	23	12		Cal					
(B) Receive	→	5-6	→	→	→							
(C) n separation	3	30	10	3	3							
(D) I	2	4	4	2	2		3					
(E) Vdc (avg)	4.07	21.0	11.75	37.2	259		324					
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	105	30	60	105	168							
(H) ρ dc=ExFxGx10^3/D	214	158	176	195	218							
(I) Vac Σ	3.86	19.8	11.13	3.50	2.46		304					
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	→	948	→	951	→							
(M) ρdc/ρac =ExL/K	1.004	1.006	1.002	1.011	1.002							
(N) PFE=(M-1)(10^2)	0.4	0.6	0.2	1.1	0.2							
(O) MCF=(M-1)(10^5)/H	2	4	1	6	1							

INDUCED POLARIZATION - RECEIVER NOTES

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Project: S+H Line: 3 NE½ Int.Cal _____ Date: 6-8-65

Send	23	12	34	23	12	45	34	23	12	4-5	34	23
Rec.	1-2	→	23	→	→	3-4	→	→	→	4-5	→	→
Time	100	30	300	30	30	300	30	10	10	30	30	3
DC-1	22.8 24.7	24.5 26.4	160 160	22.2 22.9	10.1 10.7	107.5 108.0	29.4 29.8	6.32 5.84	3.39 3.42	22.9 22.8	11.3 11.0	3.14 3.17
DC-2	28.0 24.6	24.6 26.3	160	22.2 22.9	10.1 10.7	107.5 108.0	29.4 29.8	6.36 5.86	3.38 3.50	22.9 22.8	11.2 11.1	3.14 3.17
Σ												
DC-3	28.2 24.2	24.4 26.6			10.1			6.30 5.88	3.32 3.49		11.3 11.0	
Dc-4		24.5 26.4						6.30	3.34 3.47			
Σ												
DC-AV	152.5	50.9	320	45.1	20.8	215.5	59.2	12.18	6.82	53.7	22.3	6.31
AC-1	71.9	23.9	147	21.1	9.80	99.5	27.8	5.76	3.21	26.0	10.55	2.98
AC-2	72.1	23.9	147	21.1	9.80	99.5	27.8	5.76	3.21	26.0	10.55	2.98
Σ	144.0	47.8	294	42.2	19.60	199.0	55.6	11.52	6.42	52.0	21.1	5.96
S. P.	-12.1	→	-12.9	→	→	-10.8	→	→	→			
AC-N	.66	→	.03	→	→	.03	→	→	→			

INDUCED POLARIZATION SENDER NOTES

Project: S-H Line: A3 N Date: 6-9-65

Send	23	12	34	23	12	45	34	23	12			
Receive	→	→	→	→	→	→	→	→	→			
Time												
~~Range~~ Volts	700	700	800	700	700	800	800	700	700			
Current	2	2	4	2	2	4	4	2	2			
Send	45	34	23	12	45	34	23	12			Cal	
Receive	→	→	→	→	→	→	→	→			3-4	
Time											3.	
Range												
Current	4	4	2	2	4	4	2	2				

INDUCED POLARIZATION - RECEIVER NOTES PAGE 11

Project: S+H Line: 3 SW½ Int.Cal Date:

Send	34	45	23	34	45	12	23	34	45	12	23	34
Rec.	12	→	2-3		→	3-4			→	4-5		
Time	300	100	300	100	30	100	100	30	30	100	100	100
DC-1	104 104	50.0 50.2	105.5 106.5	49.0 48.0	27.2 26.0	90, 091.4 90.6	35.1 34.8	24.4 23.4	14.7 16.0	95.4 96.4	52.3 53.1	39.0 38.6
DC-2	104	50.0 50.2	1.05.5 106.6	49.4 48.2	27.3 25.9	91.4 92.2	35.5 34.6	24.4 23.4	16.0 14.7	96.4 95.6	52.4 53.0	39.8 38.4
Σ												
DC-3				48.8 48.2	27.5 25.8	90.4 91.0	35.5 34.7		16.0	96.2 95.6		35.8
Dc-4						91.8 91.0				91.2		
Σ												
DC-AV	348	100.2	212.0	97.2	53.3	182.2	70.1	47.8	30.7	191.8	105.4	78.1
AC-1	161	47.1	97.0	44.4	24.4	94.4	32.6	21.6	13.9	88.1	48.8	35.4
AC-2	161	47.2	97.0	44.4	24.4	94.4	32.6	21.6	13.9	88.1	48.8	35.4
I Σ	322	94.4	194.0	88.8	48.8	188.8	65.2	43.2	27.8	176.2	97.6	70.8
S. P.	-16.1	→	+11.9			-8.0						
AC-N	.04		.05			.05						

Internal ACN ~.015

INDUCED POLARIZATION - RECEIVER NOTES PAGE 12

Project: S+H Line: 3 SW½ Int.Cal Date:

Send	45	12	23	34	45			Col				
Rec.	→	5-6			→							
Time	30	100	100	100	30							
DC-1	27.5 28.5	78.0 80.1	45.3 45.2	34.6 34.2	24.2 26.2			16.8 16.2		25.2 26.0		
DC-2	27.3 28.9	79.3 79.4	45.3 45.3	34.4 35.2	24.0 26.0			16.8 16.3		24.3 26.5		
Σ												
DC-3	27.5 28.7	78.6 79.2	45.2	34.0 35.2	24.5 26.2			16.7		24.4 26.6		
Dc-4		78.8		33.7	24.5 25.5			16.0		23.7		
Σ												
DC-AV	56.1	158.0	90.5	69.0	50.6							
AC-1	25.3	71.9	41.7	31.2	22.5			15.5				
AC-2	25.3	71.9	41.7	31.6	22.5			15.5				
Σ	50.6	143.8	83.4	62.0	45.0			31.0				
S. P.	-1.9	-35.9										
AC-N	.11	.15										

INDUCED POLARIZATION SENDER NOTES

Project: SH Line: #3 S Date: 6-8-65

Send	34	45	23	34	45	12	23	34	45			
Receive	→	→	→	→	→	→	→	→	→			
Time												
Range												
Current	4	4	2	3	4	2	2	3	4			
Send	1 2	23	34	45	12	23	34	45			Cal	
Receive	→	→	→	→	→	→	→	→			3-4	
Time											3.	
Range												
Current	2	2	3	4	2	2	3	4				

INDUCED POLARIZATION - RECEIVER NOTES

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Project: SH #4 Line: 3NE½ Int.Cal ____ Date: 6-8-65

Send	12	45	34	23	12			cal				
Rec.	→	5-6	→	→	→							
Time	3	30	10	3	3							
DC-1	1.99 2.08	10.3 10.7	6.46 5.34	1.85 1.88	1.26 1.35			160 164				
DC-2	1.96 2.06	10.2 10.4	1.45 5.28	1.83 1.89	1.22 1.40			160 164				
Σ												
DC-3	2.00 2.05	10.2	6.50 5.23	1.84	1.17 1.44							
Dc-4	2.00 2.08				1.14							
Σ	2.00 2.08											
DC-AV	4.07	21.0	11.75	37.2	259			324				
AC-1	1.93	9.90	5.56	1.75	1.23			152				
AC-2	1.93	9.90	5.57	1.75	1.23			1523				
Σ	3.86	19.80	11.13	3.50	2.46			304				
S. P.	42.0	-28.0										
AC-N	.03	.03										

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project S-H Line #4N Field date _____ Data page 1 Comp. date _____ . Comp by _____

(A) Send		23	12	34	23	12	45	34	23	12			
(B) Receive		1-2	→	2-3	→	→	3-4	→	→	→			
(C) n separation		100	30	300	30	30	300	100	10	10			
(D) I	3	2	2	6	2	2	6	6	2	2			
(E) Vdc (avg)	22	116.8	49.7	363	38.0	21.2	236	63.7	9.65	6.30			
(F) DCcal		1.00											
(G) Kn x 10^{-3}	1	3	12	3	12	30	3	12	30	60			
(H) ρ dc=ExFxGx10^3/D		175	299	182	228	317	118	127	145	189			
(I) Vac Σ	3	116.6	47.0	340	35.8	20.0	224	60.6	9.18	5.98			
(J) AC noise x 2													
(K) Vac(corr) = $\sqrt{I^2 - J^2}$													
(L) AC-DC cal.	1	.966	.945	935	.945	.945	.935	.966	.945	.945			
(M) ρ dc/ρac=ExL/K		1.020	1.000	1.000	1.003	1.002	.985	1.015	.993	.995			
(N) PFE=(M-1)(10^2)		2.0	0.0	0.0	0.3	0.2	-1.5	1.5	-0.7	-0.5			
(O) MCF=(M-1)(10^5)/H		11	0	0	1	1	—	1	—	—			
							-12		-5	-3			

Project _____ Line _____ Field date _____ Data page 2 Comp. date _____ Comp by _____

(A) Send		45	34	23	12	45	34	23	12				
(B) Receive		4-5	→	→	→	5-6							
(C) n separation		100	30	3	3	30	10	3	3				
(D) I	3	6	6	2	2	6	6	2	2				
(E) Vdc (avg)	22	70.2	28.7	5.77	4.16	32.6	19.65	4.20	3.37				
(F) DCcal		1.00											
(G) Kn x 10^{-3}	1	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D		140	143	173	218	188	197	220	283				
(I) Vac Σ	3	67.8	27.2	5.44	3.52	35.6	18.56	4.08	3.08				
(J) AC noise x 2													
(K) Vac (corr) = $\sqrt{I^2 - J^2}$													
(L) AC-DC cal.	1	.966	.945	.948	.948	.945	.945	.948	.948				
(M) ρdc/ρac =ExL/K		1.000	.997	1.008	1.009	1.000	1.001	.977	1.039				
(N) PFE=(M-1)(10^2)		0.0	-0.3	0.8	0.9	0.0	0.1	-2.7	3.9				
(O) MCF=(M-1)(10^5)/H		0	—	5	4	0	1	—	1				
			-2				-14						

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project S-H Line #4 S" Field date 6-10-65 Data page 1 Comp. date _____ . Comp by _____

(A) Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	45			
(B) Receive	1-25W →		23 →			34 →						
(C) ~~n separation~~	(1) 300	100	100	100	30	100	100	100	30			
(D) I 3	6.	5.	2.	6.	5.	2.	2.	6.	5			
(E) Vdc (avg) 2 2	421	124.5	129.5	145.5	55.5	166.0	67.6	96.4	41.8			
(F) DCcal	1.00											
(G) Kn x 10^{-3} 1	3	12	3	12	30	3	12	30	60			
(H) ρ dc=ExFxGx10^3/D	211	299	194	291	333	250	405	482	502			
(I) Vac Σ 3	392	119.2	122.0	137.4	51.4	156.6	63.5	90.0	38.2			
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal. 1	.935	.966	.966	.966	.945	.966	.966	.966	.945			
(M) ρ dc/ρac=ExL/K	1.005	1.009	1.026	1.015	1.022	1.024	1.030	1.035	1.034			
(N) PFE=(M-1)(10^2)	0.5	0.9	2.6	1.5	2.2	2.4	3.0	3.5	3.4			
(O) MCF=(M-1)(10^5)/H	1	3	13	5	7	10	7	7	7			

Project _____ Line _____ Field date _____ Data page 2 Comp. date _____ Comp by _____

(A) Send	1-2	2-3	3-4	45	1-2	2-3	3-4	45				
(B) Receive	45 →				5-6 →							
(C) ~~n separation~~ Range 3	300	100	300	100	100	30	100	30				
(D) I	2	2	6	5	2	2	6	5				
(E) Vdc (avg) 2 2	318.	175.1	261.	120.8	87.1	51.4	78.4	44.7				
(F) DCcal	1.00											
(G) Kn x 10^{-3} 1	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	1910	2620	2610	2540	1310	1540	1370	1505				
(I) Vac Σ 3	300	162.0	236	110.0	81.6	46.6	72.4	41.0				
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal. 1	.935	.966	.935	.966	.966	.945	.966	.945				
(M) ρdc/ρac =ExL/K	.990	1.046	1.045	1.060	1.031	1.100	1.048	1.090				
(N) PFE=(M-1)(10^2)	-1.0	4.6	4.5	6.0	3.1	10.0	4.8	9.0				
(O) MCF=(M-1)(10^5)/H	—	2	2	2	2	6	3	6				

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INDUCED POLARIZATION - RECEIVER NOTES PAGE ②

Project: 5214 Line: 4 SW½ Int.Cal ____ Date: 6-9-65

Send	4-5	12	23	34	45			Cal				
Rec.	→	5-6	→	→	→							
Time	100	120	30	100	30							
DC-1	57.4 62.4	44.1 43.0	24.5 26.3	39.0 39.6	22.6 22.0			15.8 15.6				
DC-2	58.2 62.2	44.1 43.0	25.2 26.0	38.8 39.2	22.7 22.2			15.8 15.6				
Σ												
DC-3	57.7 63.2		25.6 25.9	39.2 39.4	22.7 22.3							
Dc-4	57.8 64.0		25.6	39.0	22.5 22.2							
Σ	56.8							31.4				
DC-AV	120.8	87.1	51.4	78.4	44.7							
AC-1	55.0	40.8	23.3	36.2	20.5			146-7	145			
AC-2	55.0	40.8	23.3	36.2	20.5			146-7				
Σ	110.0	81.6	46.6	72.4	41.0			292				
S. P.	-26.4	+20.5										
AC-N	.3-.5	.1-.3										

INDUCED POLARIZATION - RECEIVER NOTES PAGE ①

Project: 5214 Line: 4 SW½ Int.Cal ____ Date: 6-9-65

Send	34	45	23	34	45	12	23	34	45	12	23	34
Rec.	1-2	→	23	→	→	34	→	→	→	4-5	→	→
Time	300	100	100	100	30	100	100	100	30	300	100	300
DC-1	211 210	55.8 65.0	64.1 64.9	73.2 72.3	27.5 28.0	83.0 83.0	33.8 33.9	47.6 48.6	21.3 20.6	160 159	87.0 87.0	133 128
DC-2	212 209	59.2 64.8	64.0 64.1	73.4 72.3	27.5 28.3	82.8 83.2	33.4 34.1	47.8 48.6	20.8 20.7	159 155	85.2 90.2	133 128
Σ												
DC-3	212	59.6 65.4	64.2 64.3	73.0	27.1	82.9	33.8 34.0	48.0 48.2	21.3 20.7	159	85.0 89.8	
Dc-4			64.1		28.3 27.4		33.6		21.2 20.7 21.1			
Σ												
DC-AV	421	124.5	129.5	145.5	55.5	166.0	67.6	96.4	41.8	318.	175.1	261
AC-1	191	59.6	61.0	68.7	25.7	78.3	31.8	45.0	19.1	150	81.0	118
AC-2	196	59.6	61.0	68.7	25.7	78.3	31.7	45.0	19.1	150	81.0	118
Σ	392	119.2	122.0	137.4	51.4	156.6	63.5	90.0	38.2	300	162.0	236
S. P.	+65.6		-20.7			+13.0						
AC-N	.05		.06			+12						

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INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S+H Line: 4NE½ Int.Cal _____ Date: _____

Send	12	45	34	23	12		cal					
Rec.	3-5	5-6	→		→							
Time	3	30	10	3	3							
DC-1	2.19 1.98	21.6 16.0	9.76 9.60	2.90 1.82	1.68 281 1.72 144		153 152					
DC-2	2.15 1.98	21.5 16.1	10.16 9.40	2.48 1.65	1.54 295 1.42 137		153 152					
Σ				2.58								
DC-3	2.20 1.96	21.6 15.9	10.22 9.46	1.67 2.64	1.38 290 1.59 138							
Dc-4	2.20 1.96	21.7			1.24 294 2.26 155							
Σ												
DC-AV	4.16	37.6	19.65	4.20	2.37		305					
AC-1	1.96	17.8	9.28	2.04	1.54		144					
AC-2	1.96	17.8	9.28	2.04	1.54		144					
Σ	3.92	35.6	18.56	4.08	3.08		288					
S. P.	-4.2	-32.5										
AC-N	.03	.04										

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INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: S+H Line: 4NE½ Int.Cal 50-6 Date: 6-10-65

Send	23	12	34	23	12	4-5	34	23	12	45	34	23
Rec.	12	→	2-3		→	3-4			→	4-5		
Time	100	30	300	30	30	300	100	10	10	100	30	3
DC-1	[illegible] [illegible]	24.5 25.2	18.2 18.1	18.8 19.3	10.0 11.0	11.7 12.0	33.2 36.0	5.78 666 3.94 301	3.38 396 2.77 228	34.1 36.1	13.7 15.0	2.84 2.94
DC-2	[illegible] [illegible]	24.7 25.2	18.1 18.2	18.7 19.1	10.2 11.1	11.2 11.9	31.9 31.9	5.90 274 3.92	3.58 4.00 2.62	34.1 36.1	13.7 15.1	2.80 2.83
Σ												
DC-3	58.6 59.4	24.2 25.4	18.2 18.1	18.9 18.9	10.1 11.2	11.8 11.8	31.0 32.0	5.94 3.50	3.78 2.48		13.6 15.1	2.85 2.94
Dc-4	58.0	24.6 25.1		19.0 19.0	9.9 11.2	11.9	30.8 32.4	5.56 3.14	3.92 2.42			2.83 2.95
Σ				19.0								
DC-AV	116.8	48.7	36.3	38.0	21.2	23.6	63.7	9.65	6.30	70.2	28.7	5.77
AC-1	55.8	23.5	17.0	17.9	10.0	11.2	30.3	4.59	2.99	33.9	13.6	2.72
AC-2	55.8	23.5	17.0	17.9	10.0	11.2	30.3	4.59	2.99	33.9	13.6	2.72
Σ	111.6	47.0	34.0	35.8	20.0	22.4	60.6	9.18	5.98	67.8	27.2	5.44
S. P.	+25.1	→	+37			-23.1	→		→			
AC-N	.03-.1	→	.04			.04	→		→			

INDUCED POLARIZATION SENDER NOTES

6-10-65

Project: S-H Line: #4 S Date: 6-9-65

Send	34	45	23	34	45	12	23	34	45			
Receive	→		→		→		→					
Time												
Range												
Current	6	5	2	6	5	2	2	6	5			
Send	12	23	34	45	12	23	34	45				6/10/65
Receive	→		→		→		→				Cal	Cal
Time											3 4	3 4
Range											3.	3.
Current	2	2	6	5	2	2	6	5				

INDUCED POLARIZATION SENDER NOTES

Project: S-H Line: #4 N Date: 6-10-65

Send	23	12	34	23	12	45	34	23	12			
Receive	→		→		→		→					
Time												
Range												
Current	2	2	6	2	2	6	6	2	2			
Send	45	34	23	12	45	34	23	12				
Receive	→		→		→		→					
Time												
Range												
Current	6	6	2	2	6	6	2	2				

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project SHA Line 6 SW½ Field date 6-11-65 Data page_____ Comp. date 6-15-65. Comp by KH

(A) Send	34	45	23	34	45	12	23	34	45		Cal	
(B) Receive	1-2	→	2-3	→	→	3-4	→	→	→			
(C) n separation	300	100	100	100	30	300	101	30	30		300	
(D) I	2	4	1	2	4	2	1	2	4		3A	
(E) Vdc (avg)	236	110.4	155.1	62.5	43.3	390	62.7	39.5	33.6		320	
(F) DCcal												
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60			
(H) ρ dc=ExFxGx10^3/D	354	332	465	375	332	685	752	592	504			
(I) Vac Σ	21.8	103.6	139.6	59.0	39.7	35.6	58.4	36.4	30.8		301	
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	940	971	→	→	950	940	971	950	→			
(M) ρ dc/ρac=ExL/K	1.019	1.035	1.080	1.029	1.037	1.031	1.043	1.026	1.038			
(N) PFE=(M-1)(10^2)	1.9	3.5	8.0	2.9	3.7	3.1	4.8	2.6	3.8			
(O) MCF=(M-1)(10^5)/H	5	11	17	8	12	5	6	4	8			

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	12	23	34	45	12	23	34	45				
(B) Receive	4-5	→	→	→	5-6	→	→	→				
(C) n separation	300	10	30	30	300	30	30	30				
(D) I	2	1	2	4	2	1	2	4				
(E) Vdc (avg)	343	62.5	46.3	43.2	236	45.6	33.6	32.1				
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	2060	1890	1390	1130	3540	2740	1850	1350				
(I) Vac Σ	315.0	58.0	42.8	39.6	216	41.6	30.8	28.8				
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	940	950	→	→	940	950	→	→				
(M) ρdc/ρac =ExL/K	1.024	1.030	1.028	1.038	1.028	1.041	1.038	1.023				
(N) PFE=(M-1)(10^2)	2.4	3.0	2.8	3.8	2.8	4.1	3.8	2.3				
(O) MCF=(M-1)(10^5)/H	1	2	2	3	1	2	2	2				

14
17
38

300 940
100 971
30
10 950

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project SAH Line 6NE½ Field date 6-11-65 Data page_____ Comp. date 6-15-65. Comp by KH

(A) Send	23	12	34	23	12	45	34	23	12		Cal	
(B) Receive	12	→	23	→	→	34	→	→	→			
(C) n separation Range	100	30	100	30	10	100	30	3	10		300	
(D) I	1	2	2	1	2	4	2	1	2			
(E) Vdc (avg)	93.4	55.9	115.0	21.1	18.75	138.4	21.2	62.2	61.8		305	
(F) DCcal	→	→	→	→	→	→	→	→	→			
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60			
(H) ρ dc=ExFxGx10^3/D	280	335	357	253	281	104	127	187	185			
(I) Vac Σ	88.6	52.1	11.35	19.6	17.38	132.4	20.4	5.84	5.75		287	
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	971	950	971	950	—	971	950	953	950			
(M) ρ dc/ρac=ExL/K	1.035	1.020	1.019	1.023	1.026	1.015	1.002	1.017	1.021			
(N) PFE=(M-1)(10^2)	3.5	2.0	1.9	2.3	2.6	1.5	0.2	1.7	2.1			
(O) MCF=(M-1)(10^5)/H	13	6	5	9	9	14	1	9	11			

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by 941

(A) Send	45	34	23	12	45	34	23	12				
(B) Receive	45	→	→	→	56	→	→	→				
(C) n separation	30	10	3	3	30	3	3	3				
(D) I	4	2	1	2	4	1	1	2				
(E) Vdc (avg)	38.4	9.49	3.41	4.14	22.4	3.60	2.84	3.62				
(F) DCcal	→	→	→	→	→	→	→	→				
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	115	142	205	212	168	216	298	304				
(I) Vac Σ	36.6	9.12	3.21	3.82	21.8	33.6	2.66	3.36				
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	950	—	953	—	950	953	—	—				
(M) ρdc/ρac =ExL/K	.997	.988	1.012	1.008	9.77	1.021	1.019	1.028				
(N) PFE=(M-1)(10^2)	-0.3	-1.2	1.2	0.8	-2.3	2.1	1.9	2.8				
(O) MCF=(M-1)(10^5)/H	-3	-8	6	4	-14	10	6	9				

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: 5+H Line: 6 NE½ Int.Cal _____ Date: 6-11-65

Send	23	12	34	23	12	45	34	23	12	cal		
Rec.	12	→	23	→	→	34	→	→	→			
Time	100	30	100	30	10	100	30	3	10			
DC-1	44.9 44.4 49.4 48.8	29.0 28.8 27.7 27.8	60.0 59.6	9.50 11.6	9.47 9.46 9.29	69.0 69.4	10.6 10.6	3.05 3.20	3.14 3.04	154 141		
DC-2	44.2 44.1 48.2	28.5 28.4 27.1	59.8 59.2	9.5 11.7	9.50 9.20	69.0 69.0	10.6 10.6	3.06 3.05	3.16 3.03	154 141		
Σ												
DC-3	44.2 49.2	28.7 27.0	60.6 58.8	9.5 11.7	9.53 9.24	69.4 69.4		3.16 3.05	3.09 3.07			
Dc-4	44.2 49.2	28.7 27.0	59.9 58.7	9.4 11.7	9.50 9.26				3.14			
Σ												
DC-AV	93.4	55.9	119.0	21.1	18.75	138.4	21.2	6.22	3.18			
AC-1	44.3	26.1	56.7	9.80	8.68	66.2	10.2	2.92	2.88	305		
AC-2	44.3	26.0	56.9	9.80	8.70	66.2	10.2	2.92	2.87	154		
Σ	88.6	52.1	113.5	19.6	17.38	132.4	20.4	5.84	5.75	143		
S. P.	-14.5	→	+0.4	→	→	+4.3	→	→	→	287		
AC-N	.02	→	.015 .02	→	→	.02	→	→	→			

all Rev.

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: 5+H Line: 6 NE½ Int.Cal _____ Date: 6-11-65

Send	45	34	23	12	45	34	23	12				
Rec.	4-5	→	→	→	5-6	→	→	→				
Time	30	10	3	3	30	3	3	3				
DC-1	19.7 19.2	4.27 5.25	1.66 1.77 1.71 1.67	2.08 2.06 1.94	11.1 12.0	1.76 1.50 1.79 2.05	1.33 1.56 1.52 1.25	2.17 2.18 1.55 1.41				
DC-2	19.3 19.2	4.18 5.30	1.67 1.72	2.08 1.99	10.9 11.2	1.80 1.49 1.82	1.31 1.53 1.55	2.15 2.24 1.43				
Σ												
DC-3	19.3 19.0	4.17 5.39	1.72 1.70	2.05 1.96	10.7 11.4	1.67 1.99	1.33 1.45	2.17 1.41				
Dc-4	19.5	4.17	1.76 1.65	2.07 1.97	10.6	1.60 2.05	1.47 1.37	2.18 1.42				
Σ												
DC-AV	38.4	9.49	3.41	4.04	22.4	3.60	2.84	3.62				
AC-1	18.3	4.56	1.61	1.91	10.9	1.68-9	1.33	1.68-5				
AC-2	18.3	4.56	1.61	1.91	10.9	1.68	1.33	1.68				
Σ	36.6	9.12	3.21	3.82	21.8	3.36	2.66	3.36				
S. P.	-16.1	→	→	→	-0.8	→	→	→				
AC-N	.02	→	→	→	.02	→	→	→				

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S-H Line: #6 N Int.Cal _____ Date: 6-11-65

Send												
Rec.												
Time												
DC-1	23	12	34	23	12	45	34	23	12		CA/	
DC-2	1	2	2	1	2	4	2	1.	2		4-5	
Σ											3.	
DC-3	45	34	23	12	45	34	23	12				
Dc-4	4	2	1	2	4	1	1	2				
Σ												
DC-AV												
AC-1												
AC-2												
Σ												
S. P.												
AC-N												

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S-H Line: #6 S Int.Cal _____ Date: 6-11-65

Send												
Rec.												
Time												
DC-1	34	45	23	34	45	12	23	34	45		CA/	
DC-2	2	4	1.	2.	4	2	1.	2	4		45	
Σ											3.	
DC-3	12	23	34	45	12	23	34	45				
Dc-4	2	1	2	4	2	1	2	4				
Σ												
DC-AV												
AC-1												
AC-2												
Σ												
S. P.												
AC-N												

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S+H Line: 6 SW½ Int.Cal 50.8 Date: 6-11-78

Send	34	45	23	34	45	12	23	34	45		Cal	
Rec.	12	→	23		→	34			→		4-5	
Time	300	100	100	100	30	300	100	30	30			
DC-1	118 118	54.8 52.6	77.9 77.2	29.2 33.4	22.3 21.0	197 193	34.4 28.0	19.2 20.2	17.7 16.0		160 160	
DC-2	118	55.2 55.1	78.0 77.1	29.0 33.4	22.4 20.9	196 194	34.8 27.6	19.5 20.0	17.5 16.1		160	
Σ												
DC-3		55.0	78.0	29.4	22.2	197	35.4 27.6	19.5 20.0	17.7 15.7			
Dc-4							35.4					
Σ												
DC-AV	236	110.4	155.1	62.5	43.3	390	62.7	39.5	33.6			
AC-1	109	51.8	69.8	29.5	19.8	178	29.2	18.2	15.4			
AC-2	109	51.8	69.8	29.5	19.9	178	29.2	18.2	15.4		150	
Σ	218	103.6	139.6	59.0	9.7	356	58.4	36.4	30.8		151	
S. P.	+0.7	→	-30.4	→								
AC-N	.06	—	.07-.12	→		.08-.15	→					

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S+H Line: 6 SW½ Int.Cal _____ Date: 6-11-78

Send	12	23	34	45	12	23	34	45				
Rec.	4-5			→	5-6			→				
Time	300	100	30	30	300	30	30	30				
DC-1	170 172	31.0 31.8	22.3 24.0	21.3 21.7	117 119	22.3 23.2	~~15.6~~ 17.7	17.1 15.0			22.1- 22.2-	
DC-2	171 172	31.2 31.6	22.2 24.2	21.5 21.4	117 118	22.1 23.8	16.4 17.3	17.2 14.7			21.9- 22.4-	-8
Σ					118						22.2-	5
DC-3	171	31.4 31.8	21.9 24.4	21.7 21.8		21.7 24.2	16.2 17.6	17.7 14.5			21.5- 22.4-	
Dc-4		30.8 32.2		21.4 21.8			16.0	17.0 15.4				
Σ												
DC-AV	343	62.5	46.3	43.2	236	45.6	33.6	32.1		32.1 24.1 33		
AC-1	157.5	29.0	21.4	19.8	108	20.8	15.4	14.4				
AC-2	157.5	29.0	21.4	19.8	108	20.8	15.4	14.4				
Σ	315.0	58.0	42.8	39.6	216	41.6	30.8	28.8				
S. P.	-14.3	→		→	-0.5	→		→				
AC-N	.15-.38	→		→	.15-.4	→		→				

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project S+H Line 8 SW½ Field date 6-11-65 Data page _____ Comp. date 6-15-65 Comp by RCH

(A) Send	34	45	23	34	45	12	23	34	45			
(B) Receive	12	→	23	→	→	34	→	→	→			
(C) n separation	300	30	300	100	30	300	300	100	30			
(D) I	7	5	6	7	5	5	6	7	5			
(E) Vdc (avg)	317.5	51.5	541	104.5	25.8	436	254	65.0	20.1			
(F) DCcal 1.000												
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60		304	
(H) ρ dc=ExFxGx10^3/D	136	124	271	180	155	262	508	278	242			
(I) Vac Σ	296	48.5	518	98.8	24.3	396	234	61.2	18.9		384	
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	935	945	935	966	945	935	—	966	945			
(M) ρ dc/ρac=ExL/K	1.062	1.004	1.043	1.023	1.003	1.031	1.015	1.038	1.007			
(N) PFE=(M-1)(10^2)	0.2	0.4	4.3	2.3	0.3	3.1	1.5	3.8	0.7			
(O) MCF=(M-1)(10^5)/H	1	3	16	13	2	12	3	14	3			

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

(A) Send	12	23	34	45								
(B) Receive	4-5	→	→	→								
(C) n separation	100	100	30	10								
(D) I	3	6	7	5								
(E) Vdc (avg)	134.9	107.5	32.0	11.46								
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	115								
(H) ρ dc=ExFxGx10^3/D	539	537	274	241								
(I) Vac Σ	124.0	97.7	25.4	10.52								
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	966	—	945	—								
(M) ρdc/ρac =ExL/K	1.051	106.2	1.029	1.030								
(N) PFE=(M-1)(10^2)	5.1	6.2	2.9	3.0								
(O) MCF=(M-1)(10^5)/H	10	11	11	12								

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S+H Line 8 NE ½ Field date 6-11-65 Data page_____ Comp. date 6-15-65 Comp by KH

(A) Send	23	12	34	23	12	45	34	23	12			
(B) Receive	12	→	23	→	→	34	→	→	→		cal	
(C) ~~n separation~~ Max	300	30	110	100	10	100	30	30	10			
(D) I	6	3	7	6	3	5	7	6	3			
(E) Vdc (avg)	192	30.8	131.4	69.8	16.01	130.8	53.6	40.0	10.63		336	
(F) DCcal 1.000	→	→	→	→	→	→	→	→	→			
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60		286	
(H) ρ dc=ExFxGx10^3/D	96.0	123	56.5	139	160	78.4	91.9	200	211			
(I) Vac Σ	179.0	28.4	125.2	66.6	15.40	125.0	51.2	37.8	9.96			
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	935	945	966	—	945	966	945	—	—			
(M) ρ dc/ρac=ExL/K	1.003	1.025	1.014	1.021	.984	1.011	991	1.001	1.009			
(N) PFE=(M-1)(10^2)	0.3	2.5	1.4	2.1	-1.6	1.1	-0.9	0.1	0.9			
(O) MCF=(M-1)(10^5)/H	3	20	25	15	-10	14	-10	1	4			

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	45	34	23	12								
(B) Receive	45	→	→	→								
(C) n separation	30	30	10	3								
(D) I	5	7	6	3								
(E) Vdc (avg)	37.3	19.8	17.60	5.10								
(F) DCcal	→	→	→	→								
(G) Kn x 10^{-3}	12	30	60	105								
(H) ρ dc=ExFxGx10^3/D	90.0	84.7	176	178								
(I) Vac Σ	35.5	18.86	16.56	4.74								
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	—	—	—	948								
(M) ρdc/ρac =ExL/K	9.93	995	1.006	1.020								
(N) PFE=(M-1)(10^2)	-0.7	-0.5	0.6	2.0								
(O) MCF=(M-1)(10^5)/H	-8	-6	3	11								

935
966
945
948

8SW½

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S-H Line: #8 N Int.Cal _____ Date: 6-1-65

Send												
Rec.												
Time												
DC-1	23	12	34	23	12	45	34	23	12		CAL	
DC-2	6	3	7	6	3	5	7	6	3		4-5	
Σ											3.	
DC-3	45	34	23	12	45	34	23	12				
Dc-4	5	7	6	3								
Σ												
DC-AV												
AC-1												
AC-2												
Σ												
S. P.												
AC-N												

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: S-H Line: #8 SW½ Int.Cal _____ Date: _____

Send												
Rec.												
Time												
DC-1	34	45	23	34	45	12	23	34	45		CAL	
DC-2	7	5	6	7	5	3	6	7	5		4-5	
Σ												
DC-3	12	23	34	45							3	
Dc-4	3	6	7	5								
Σ												
DC-AV												
AC-1												
AC-2												
Σ												
S. P.												
AC-N												

8 SW½

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: SHH Line: 8 NE½ Int.Cal _____ Date: 6-1-65

Send	23	12	34	23	12	45	34	23	12		cal	
Rec.	1-2	→	23	→	→	3-4	→	→	→			
Time	300	30	100	100	10	100	80	30	10			
DC-1	97.0 65.0	15.5 15.2	66.4 65.0	34.0 35.8	8.26 8.24	66.0 64.7	28.2 25.4	21.5 18.6	5.33 5.27		154 152	
DC-2	97.0	15.5 15.3	66.4 65.0	34.0 35.5	8.20 8.36	66.5 64.0	28.2 25.4	21.5 18.5	5.38 5.26		154 152	
Σ												
DC-3		15.5 15.3		33.9	8.20	66.7 64.3	28.3	21.3 18.5	5.35 5.22		154 152	
Dc-4						66.6		21.5 18.6	5.40			
Σ												
DC-AV	192	30.8	131.4	69.8	16.81	130.8	53.6	40.0	10.63		306	
AC-1	89.5	14.2	62.6	33.0	7.70	62.5	25.6	18.9	4.98		506	
AC-2	89.5	14.2	62.6	33.0	7.70	62.5	25.6	18.9	4.98		479	
Σ	179.0	28.4	125.2	66.0	15.40	125.0	51.2	37.8	9.96		143	
S. P.	-18.1	→	+3.1	→	→	-6.3	→	→	→		286	
AC-N	.02	→	.08	→	→	.03	→	→	→			

cal mv

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: SHH Line: 8 NE½ Int.Cal _____ Date: _____

Send	45	34	23	12	45	34	23	12				
Rec.	4-5	→		→	5-6	→	→	→				
Time	30	30	10	3								
DC-1	16.9 26.5	10.3 9.5	9.00 8.58	2.45 2.54								
DC-2	16.6 26.7	10.3 9.5	9.60 8.62	2.50 2.57								
Σ												
DC-3	16.6 20.8	10.2 9.6	8.58 8.63	2.55 2.51 2.58								
Dc-4												
Σ												
DC-AV	37.3	19.8	17.60	5.10								
AC-1	17.75	9.40	8.28	2.37								
AC-2	17.75	9.40	8.28	2.37								
Σ	35.5	18.80	16.56	4.74								
S. P.	-5.0	→	→	→								
AC-N	.08	→	→	→								

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: ST 12 Line: 8 SW ½ Int.Cal 50.0 Date: 6-11-65

Send	12	23	34	45								
Rec.	45	→	→	→								
Time	100	100	30	10								
DC-1	68.0 67.0	54.0 53.9	15.6 15.9 16.2 16.5	5.97 5.66								
DC-2	68.4 66.6	54.0 53.2	15.4 16.1 16.3 16.2	5.82 5.53								
Σ												
DC-3	67.6 66.6	54.0 53.4	15.5 15.7 16.4 16.1	5.95 5.58								
Dc-4		54.0 53.6	15.6 15.9 16.5 16.0	5.82 5.44								
Σ												
DC-AV	134.9	107.5	32.0	11.46								
AC-1	62.0	48.8	14.7	5.24								
AC-2	62.0	48.9	14.7	5.26								
Σ	124.0	97.7	29.4	10.52								
S. P.	+25.9											
AC-N	.07-.15											

Internal AC N ~ .01

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: ST 14 Line: 8 SW ½ Int.Cal _____ Date: 6-11-65

Send	34	45	23	34	45	12	23	34	45		Cal	
Rec.	→	→	23	→	→	34	→	→	→			
Time	300	30	300	100	30	300	300	100	30			
DC-1	160 158	26.4 25.2	268 273	56.4 47.9	12.8 12.2 13.0	217 219	127 127	32.8 32.2	10.1 10.0		153 151	
DC-2	159 158	26.3 25.2	268 272	56.6 47.9	12.5 13.2	217 219	128 127	32.5 32.8	10.2 10.0		153 151	
Σ												
DC-3	160	26.4 25.1	267 275	57.0 46.8	12.4 13.5	217 219	127	32.2 33.0	10.2 9.9			
Dc-4				47.4 47.2	12.4 13.6							
Σ												
DC-AV	317.5	51.5	541	104.5	25.8	436	254	65.0	20.1		304	
AC-1	148	24.85	259	49.4	12.15	198	117	30.6	9.45			
AC-2	148	24.35	259	49.4	12.15	198	117	30.6	9.45		142	
Σ	296	48.5	518	98.8	24.3	396	234	61.2	18.9		142	
S. P.	+17.3	→	-279			+19.6					284	
AC-N	.08	→	.07			.11						

I NE ½

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: I & H Line: 1 N½-½ Inc.Cal _____ Date: _____

Send	23	12	34	23	12	45	34	23	12		Col	
Rec.	12	23										
Time	300	100	300	100	30	300	100	30	30			
DC-1	174 174	74.4 73.2	206 205	33.2 34.0	21.5 22.9	308 308	56.8 59.1	14.4 15.0	11.5 11.3		150 151	
DC-2	174	73.0 74.1	205 205	33.0 34.2	21.4 23.0	306 305	56.7 59.3	14.3 15.1	11.4 11.6		150 151	
Σ		73.2	205	32.9								
DC-3					21.5	308 305	55.7	14.4 14.6	11.2			
Dc-4								14.8				
Σ												
DC-AV	348	147.3	410	67.2	44.4	613	111.59	29.4	22.8		301	
AC-1	160	70.1	192	32.0	21.0	285	55.7	13.8	10.75		143	
AC-2	160	70.1	192	32.0	21.0	285	55.7	13.8	10.75		143	
Σ	320	140.2	384	64.0	42.0	570	111.7	27.6	21.5		286	
S. P.	-8.2		-34.0			-9.5						
AC-N	.05		.03			.02						

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: _____ Line: 1 5½ Inc.Cal _____ Date: _____

Send	1/2	2/3	3/4	4/5	1/2	2/3	3/4	4/5				
Rec.	4/5	2/3			5-6							
Time	300	100	100	30	300	100	100	30				
DC-1	169 170	42.8 42.4	32.3 320 32.1	24.0 23.1	131 131	37.9 36.5	32.6 31.4	23.2 25.2		85.2	64.4	
DC-2	171 170	42.8 42.2	32.7 32.6	24.0 23.0	131	37.2 37.2	32.0 31.4	23.8 25.0		85.2 85.0 85.1	64.4 64.5	17
Σ										84.5	64.7 65.1	3
DC-3	170	42.9 42.6	32.1 33.0	24.0		37.6 37.4	32.1 31.0	23.8 25.0		85.1	65.1 65.3	16.0
Dc-4		43.1	32.1 33.2								65.2	63.4 63.4
Σ										74.4		63.5
DC-AV	340	85.1	65.0	47.0	262	74.2	63.5	48.8		73.7	11	63.1
AC-1	155	40.0	30.3	21.7	118	34.2	29.4	22.3		74.4 74.2 74.4		54
AC-2	155	40.0	30.3	21.7	118	34.2	29.4	22.3				5
Σ	310	80.0	60.6	43.4	236	68.2	58.8	44.6				
S. P.	+4.5				-18.4							
AC-N	.02				.68							

INE-½

N 50° E

INDUCED POLARIZATION SENDER NOTES

Project: S-H Line: 1 S Date: 6-3-65

Send	34	45	23	34	45	12	23	34	45			
Receive	→	→	→	→	→	→	→	→	→			
Time												
Range												
Current	5	8	4	5	8	4	4	5	8			
Send	12	23	34	45	12	23	34	45			CAL	
Receive	→	→	→	→	→	→	→	→			3-4	
Time											3. @500	
Range												
Current	4	4	5	8	4	4	5	8				

INDUCED POLARIZATION SENDER NOTES

Project: S-H Line: 1 N Date: 6-3-65

Send	2-3	1-2	34	2-3	1-2	45	34	23	12			
Receive	→	→	→	→	→	→	→	→	→			
Time												
Range												
Current	4	4	5	4	4	7	5	4	4			
Send	45	34	23	12	45	34	23	12			CAL	
Receive	→	→	→	→	→	→	→	→			2-3	
Time											3.	
Range												
Current	7	5	4	4	7	5	4	4				

1NE ½

INDUCED POLARIZATION - RECEIVER NOTES PAGE_____

Project:_____ Line:_____ Int.Cal_____ Date:_____

Send	45	34	23	12	45	34	23	12				
Rec.	→			→	→			→				
Time	100	30	10	10	30	10	3	3				
DC-1	66.2 65.8	19.2 19.2	5.68 6.06	5.19 5.08	17.0 19.5	7.40 6.81	2.56 2.57	2.41 2.56				
DC-2	66.1 66.0	19.3 19.1	5.61 6.12	5.18 6.06	16.9 19.5	7.78 6.58	2.60 2.55	2.43 2.56				
Σ	65.7											
DC-3			5.58 6.19	5.20 5.06	17.0 19.4	7.60 6.58	2.61 2.53	2.42 2.60				
Dc-4					17.0 19.5	7.52 6.68	2.65 2.50	2.38 2.60				
Σ												
DC-AV	131.9	38.4	11.72	10.26	35.45	14.26	5.15	4.99				
AC-1	62.8	18.0	5.50	4.80	17.2	6.70	2.43	2.35				
AC-2	62.8	18.0	5.50	4.80	17.2	6.70	2.43	2.35				
Σ	125.6	36.0	11.00	9.60	34.4	13.40	4.86	4.70				
S. P.	+9.9				-.158							
AC-N	.02				.025							

INDUCED POLARIZATION - RECEIVER NOTES PAGE_____

Project:_____ Line: 1 5½ Int.Cal_____ Date: 6-3-65

Send	3/4	4/5	2/3	3/4	4/5	1/2	2/3	3/4	4/5		Cal.	3/4
Rec.	12	→	23	→	→	34	→	→	→		3A	
Time	1000	300	300	300	100	1000	100	100	100			
DC-1	392 394	146 148	254 257	110 108	56.1 58.1	500 502	100.0 102.0	63.1 62.2	38.1 39.0		152 155	
DC-2	394 394	146 148	255 257	110 107	57.1	501 501	100.0 102.0	63.8 62.0	38.0 38.8		152 155	
Σ											614	
DC-3			255	110				63.4 62.0	38.9 38.8			
Dc-4									38.0			
Σ											307	
DC-AV	788	294	512	217.5	114.1	1002	202.0	125.6	76.9			
AC-1	363	137	235	101	54.2	458	94.0	58.0	36.0		147	
AC-2	364	137	235	101	54.2	458	94.0	58.0	36.0		147	
Σ	727	274	470	202	108.2	916	188.0	116.0	72.0		294	
S. P.	-12.2		-1.5			-0.7						
AC-N	.05		.12			.06						

Internal ACN .01

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S&H Cyprus Line 2 - NE 2 500' Field date 6/11/65 Data page_____ Comp. date 6/12/65. Comp by C.S.L.

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
(B) Receive	0-.5NE	.5-1.0NE	→	1.0-1.5NE	→	→	1.5-2.0NE	→	→	→	2.0-2.5NE	→
(C) n separation	1	1	2	1	2	3	1	2	3	4	2	3
(D) I	1400	→	→	→	→	→	800	1400	→	1000	800	1400
(E) Vdc (avg)	404	405	135.8	412	130.3	58.1	250	114.1	49.3	18.2	75.3	45.6
(F) DCcal USED	.506	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	1.5	6	1.5	6	15	1.5	6	15	30	6	15
(H) ρ dc=ExFxGx10^3/D	219	219	295	223	283	314	237	247	267	276	285	247
(I) Vac Σ	394	394	132.5	400	127.3	56.7	244	111.8	48.2	17.8	73.7	44.6
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal. USED	1.000	→	→	→	→	→	→	→	→	→	→	→
(M) ρ dc/ρac=ExL/K	1.026	1.027	1.024	1.030	1.024	1.023	1.024	1.021	1.022	1.022	1.021	1.022
(N) PFE=(M-1)(10^2)	2.6	2.7	2.4	3.0	2.4	2.3	2.4	2.1	2.2	2.2	2.1	2.2
(O) MCF=(M-1)(10^5)/H	12	12	8	13	8	7	10	9	8	8	7	9

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	2-3	1-2	4-5	3-4	2-3	1-2		CAL				
(B) Receive	→	→	2.5-3.0NE	→	→	→		3-4				
(C) n separation	4	5	3	4	5	6				DC cal	= $\frac{I_{DC}}{10 \times V_{DC}}$ Cal	
(D) I	1400	1000	800	1400	1400	1000		500				
(E) Vdc (avg)	24.0	10.39	34.0	24.8	14.53	6.76		98.9				
(F) DCcal	→	→	→	→	→	→		.506				
(G) Kn x 10^{-3}	30	52.5	15	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	260	276	323	268	276	297						
(I) Vac Σ	23.5	10.20	33.4	24.2	14.13	6.64		98.8		AC-DC	Cal = $\frac{V_{AC\ cal}}{V_{DC\ Cal}}$	
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	→	→	→	→	→	→		.999				
(M) ρdc/ρac =ExL/K	1.021	1.019	1.018	1.025	1.029	1.019						
(N) PFE=(M-1)(10^2)	2.1	1.9	1.8	2.5	2.9	1.9						
(O) MCF=(M-1)(10^5)/H	8	7	6	9	11	6						

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S&H Cyprus Line 2 SW ½ 500'a Field date 6/11/65 Data page_____ Comp. date 6/12/65 . Comp by J.E.S

	1	2	3									
(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
(B) Receive	0-0.5 SW	← 0.5-	1.0 SW →	←	1.0-1.5 SW	→	←	1.5-2.0 SW		→	← 2.0-	2.5 SW
(C) n separation	1	1	2	1	2	3	1	2	3	4	2	3
(D) I	800	1400	800	1400	→	800	1000	1400	→	800	1000	1400
(E) Vdc (avg)	218	380	77.3	425	134.2	37.2	436	104	80.5	26.3	169	96.0
(F) DCcal	0.507	→										
(G) Kn x 10^{-3}	1.5	1.5	6	1.5	6	15	1.5	6	15	30	6	15
(H) ρ dc=ExFxGx10^3/D	207	206	294	231	292	354	332	421	437	500	514	521
(I) Vac Σ	213	370	75.7	416	131.8	36.8	426	100	79.2	25.8	166	93.2
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	0.996	→										
(M) ρ dc/ρac=ExL/K	1.019	1.023	1.017	1.017	1.014	1.007	1.019	1.017	1.012	1.015	1.014	1.026
(N) PFE=(M-1)(10^2)	1.9	2.3	1.7	1.7	1.4	0.7	1.9	1.7	1.2	1.5	1.4	2.6
(O) MCF=(M-1)(10^5)/H	9	11	6	7	5	2	6	4	3	3	3	5

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	3-4	4-5	1-2	2-3	3-4	4-5		CAL				
(B) Receive	→	→	←	2.5-	3.0 SW	→		2-3				
(C) n separation	4	5	3	4	5	6						
(D) I	1400	800	1000	1400	→	800		500				
(E) Vdc (avg)	46.5	15.6	63.0	41.0	21.7	8.69		98.7				
(F) DCcal	0.507	→				→		0.507				
(G) Kn x 10^{-3}	30	52.5	15	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	505	519	479	445	413	462						
(I) Vac Σ	44.9	15.3	60.2	39.5	20.0	8.30		98.3				
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	0.996	→				→		0.996				
(M) ρdc/ρac =ExL/K	1.031	1.016	1.042	1.034	1.034	1.043						
(N) PFE=(M-1)(10^2)	3.1	1.6	4.2	3.4	3.4	4.3						
(O) MCF=(M-1)(10^5)/H	6	3	9	8	8	9						

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project S&H Cyprus Line 2-NE½ 500'a Field date 6/11/65 Data page _____ Comp. date 6/12/65 . Comp by J.E.S.

	2	1	3									
(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
(B) Receive	0-0.5NE	← 0.5 –	1.0 NE →	← 1.0	– 1.5 NE	→	←	1.5 –	2.0 NE –	→	← 2.0 –	2.5 NE
(C) n separation	1	1	2	1	2	3	1	2	3	4	2	3
(D) I	1400	→	→	→	→	→	800	1400	→	1000	800	1400
(E) Vdc (avg)	404	405	135.8	412	130.3	58.1	250	114.1	40.3	18.2	75.3	45.6
(F) DCcal	0.506	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	1.5	6	1.5	6	15	1.5	6	15	30	6	15
(H) ρ dc=ExFxGx10^3/D	219	219	295	223	283	314	237	248	268	276	286	248
(I) Vac Σ	394	304	132.5	400	127.3	56.7	244	111.8	48.2	17.8	73.7	44.6
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.000	used										
(M) ρ dc/ρac=ExL/K	1.025	1.028	1.025	1.030	1.024	1.025	1.024	1.021	1.023	1.022	1.022	1.022
(N) PFE=(M-1)(10^2)	2.5	2.8	2.5	3.0	2.4	2.5	2.4	2.1	2.3	2.2	2.2	2.2
(O) MCF=(M-1)(10^5)/H	12	12	8	13	8	8	10	8	9	8	7	9

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

(A) Send	2-3	1-2	4-5	3-4	2-3	1-2		CAL				
(B) Receive	→	→	←	2.5 –	3.0 NE	→		3-4				
(C) n separation	4	5	3	4	5	6						
(D) I	1400	1000	800	1400	1400	1000		500				
(E) Vdc (avg)	24.0	10.39	34.0	24.8	14.53	6.76		98.9				
(F) DCcal	0.506	→	→	→	→	→		0.506				
(G) Kn x 10^{-3}	30	52.5	15	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	260	276	323	269	276	297						
(I) Vac Σ	23.5	10.20	33.4	24.2	14.13	6.64		98.8				
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.000	used						0.999				
(M) ρdc/ρac =ExL/K	1.021	1.019	1.018	1.025	1.028	1.018						
(N) PFE=(M-1)(10^2)	2.1	1.9	1.8	2.5	2.8	1.8						
(O) MCF=(M-1)(10^5)/H	8	7	6	9	10	6						

INDUCED POLARIZATION SENDER NOTES

Project: S & H Line: II Date: 6-11-65

Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Receive	0-.5NE	.5-1 NE	→	1-1.5 NE	→	→	1.5-2 NE	→	→	→	2-2.5 NE	—
Time												
Range												
Current	1400	1400	1400	1400	1400	1400	800	1400	1400	1000	800	1400
Send	2-3	1-2	4-5	3-4	2-3	1-2		3-4				
Receive	→	→	2.5-3 NE	→	→	→		CAL				
Time												
Range												
Current	1400	1000	800	1400	1400	1000		500				

INDUCED POLARIZATION - RECEIVER NOTES

PAGE 1

Int. Cal _____ Date: 6/11/65

Project: S & H Cyprus Line: 2 500'a NE

Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Rec.	0-.5NE	.5-1.0NE	→	1.0-1.5NE	→	→	1.5-2.0NE	→	→	→	2.0-2.5NE	→
~~Range~~	300	300	100	300	100	100	300	100	30	30	100	100
~~Time~~												
DC-1	202 202	203	67.9	206	66.1	28.0	123	56.5 58.0 57.9 58.0	25.5 23.7	9.3 8.2	38.6 36.7	24.3 21.0
DC-2	202 202	203	68.0	206	64.2	30.1	127	57.9 58.0 56.0 56.0	23.7 23.7	9.0 8.9	36.7 38.7	21.0 24.5
Σ	404 405	406	135.9	412	130.3	58.1	250	114.0 114.2 112.9 114.0	49.2 49.0	18.3 18.1	75.3 75.4	45.17 45.5
DC-3	202 201	203 202	68.0 67.8	206	64.2	30.1	127	56.0 58.0	23.6 25.6	9.0 8.9	38.6 36.6	24.5 23.4
Dc-4	201 201	202 202	67.8 67.8	206	66.1	28.0	123	58.0 56.0	25.6 23.8	9.2 9.3	36.6 38.5	21.1 24.0
Σ	403 403	404 404	135.8 135.8	412	130.3	58.1	250	114.0 114.0	49.2 49.4	18.2 18.2	75.2 75.2	45.4 45.4
DC-AV	404	405	135.8	412	130.3	58.1	250	114.1	49.3	18.2	75.3	45.6
AC-1	197	197	66.2	200	63.6	28.4	122	56.0	24.1	8.9	36.8	22.3
AC-2	197	197	66.3	200	67.7	28.3	122	55.8	24.1	8.9	36.9	22.83
Σ	394	394	132.5	400	127.3	56.7	244	111.8	48.2	17.8	73.7	44.6
S. P.	+7	-7	→	0	→	→	-12	→	→	→	-10	—
AC-N	.03	.05	→	.06	→	→	.15	→	→	→	.06	—
I.C.	97	97	→	97	→	→	97	→	→	→	97	—

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INDUCED POLARIZATION - RECEIVER NOTES

Pa. 2

Project: S&H Line: 2 500' @ NE Int. Cal Date: 6/10/65

Send	2-3	1-2	4-5	3-4	2-3	1-2		CAL				
Rec.	→	→	2.5-7.0 NE	→	→	→						
Time	30	10	30	30	10	10		7.4				
Range								100				
DC-1	12.8 11.1	5.45 4.83	16.2 15.2	10.7 13.8	7.20 7.03	3.23 3.2 3.15 3.2		49.6 49.5				
DC-2	11.1 12.5	4.95 5.15	18.2 15.4	11.1 10.9	7.43 6.97	3.52 3.6 3.10 3.0		49.5 49.4				
Σ	23.9	10.40 10.40	33.4 33.6	24.1 24.7	14.63 14.40	6.75 6.84 6.63 6.58		99.1 98.9				
DC-3	12.8 11.2	5.59 4.75	15.4 18.7	10.9 12.9	6.97 7.65	3.10 3.30 3.48 3.62		49.4 49.4				
Dc-4	11.3 12.8	4.77 5.64	18.7 15.2	12.9 10.8	7.65 6.82	3.48 3.62 3.30 3.22		49.4 49.5				
Σ	24.1 24.0	10.36 10.39	34.7 33.9	24.8 24.7	14.62 14.47	6.58 6.92 6.78 6.84		98.8 98.9				
DC-AV	24.0	10.39	34.0	24.8	14.53	6.76		98.9				
AC-1	11.7	5.10	16.7	12.2	7.06	3.32		49.4				
AC-2	11.8	5.10	16.7	12.0	7.07	3.32		49.4				
Σ	23.5	10.28	33.4	24.2	14.13	6.64		98.8				
S. P.	→	→	-4	→	→	→						
AC-N	→	→	.05	→	→	→						
I.C.	→	→	97	→	→	→						

INDUCED POLARIZATION SENDER NOTES

Project: S&H Line: 7 Date: 6-11-65

Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Receive	SW 0-.5	SW 5-1	→	SW 1-1.5	→	→	SW 1.5-2	→	→	→	SW 2-2.5	—
Time												
Range												
Current	800	1400	800	1400	1400	800	1000	1400	1400	800	1000	1400

Send	3-4	4-5	1-2	2-3	3-4	4-5		2-3				
Receive	→	→	SW 2.5-3	→	→	→		CAL				
Time												
Range												
Current	1400	800	1000	1400	1400	800		500				

INDUCED POLARIZATION SURVEY

Strong and Harris Claims Area
Johnson - Dragoon

COCHISE COUNTY, ARIZONA

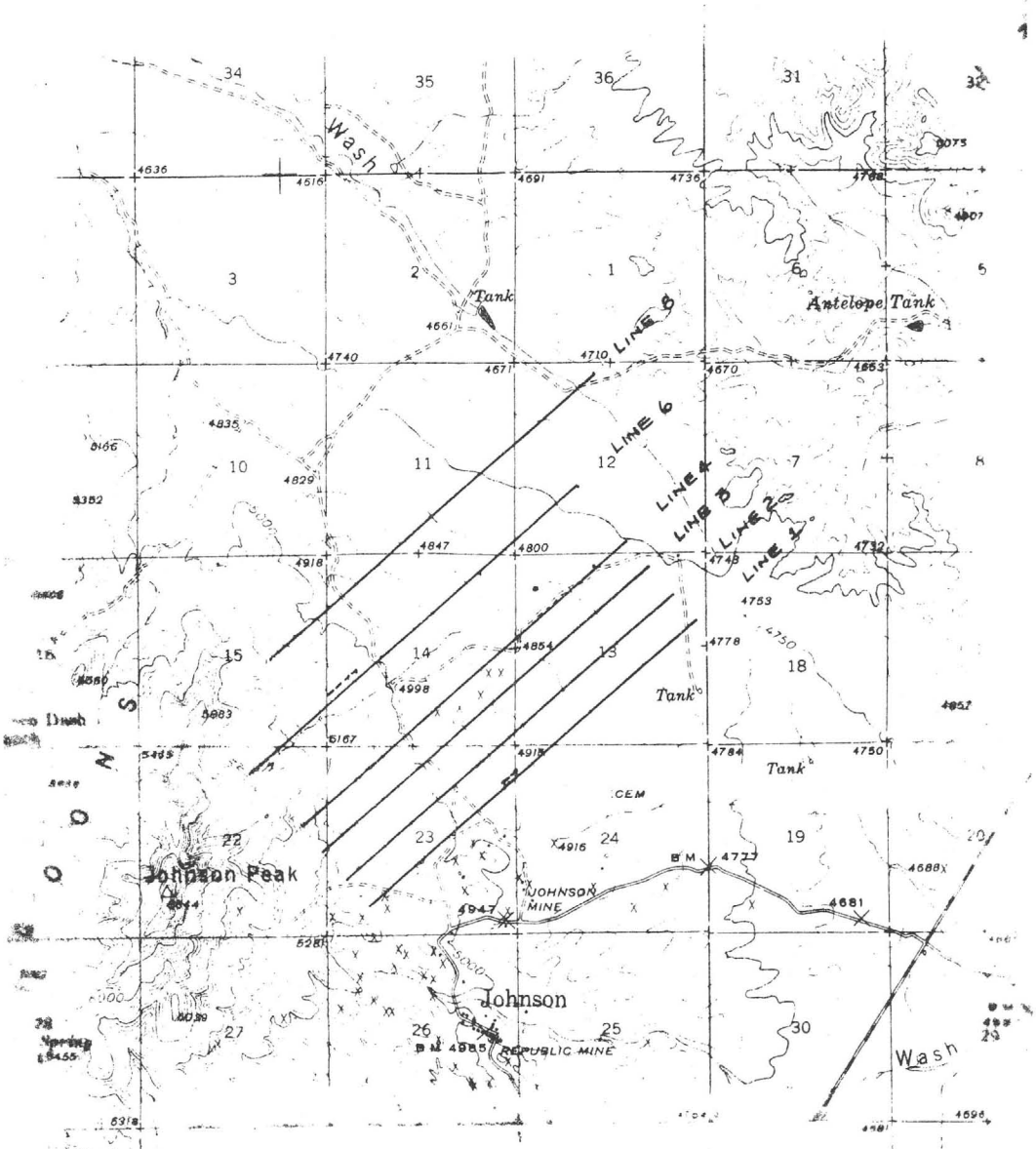
for

CYPRUS MINES CORPORATION

May - June 1965

by

HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona



INDEX MAP
Induced Polarization Survey
Strong - Harris Project
T 15 S - R 22 E
CYPRUS MINES CORPORATION

--- indicates anomalous zone

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In Pocket:

I. P. Line Location Map

Sectional Data Sheets:
- Line 1 - 1A
- Line 2 - 2A
- Line 3
- Line 4
- Line 6
- Line 8

INTRODUCTION

Upon the request of Mr. K. K. Welker, Chief Geologist, Cyprus Mines Corporation, Heinrichs Geoexploration Company conducted and completed an Induced Polarization Survey on the Strong and Harris Claims Area, Johnson-Dragoon, Cochise County Arizona, between May 27 and June 11, 1965.

A total of eight spreads were run, six on 1,000 ft. dipole spacing and two on 500 ft. spacing for a total of 81,000 ft. or 14.9 miles of line survey and 55,000 ft. or 10.9 miles of sub-surface data plot points. With the exception of Line 2, which was run on 1.0 cps. and .05 cps the data was taken at 3.0 cps and .05 cps, dual frequency I. P., dipole-dipole or "Eltran" technique.

The data is presented on Sectional data sheets, one for each spread. A plan map is included to show the location of the lines and the surface projection of the interpreted anomalism.

GEOEX personnel assigned to this project were Mr. C. S. Ludwig, Sr. Geophysicist; Mr. H. K. Henson, Crew Chief; John Beeler, R. Palmer, R. Montierth, F. Johnson, J. Skaggs, technical assistants.

CONCLUSIONS AND RECOMMENDATIONS

1. The most interesting anomalism that appears in this survey is between stations 0.5 and 1.0 SW on Line 1. This is very weak but could be of interest if it were caused by a narrow body. At least one drill hole to 500 ft. is recommended between these points.

2. Some information on depth to bedrock was obtained. On Line 2 in the vicinity of 2.0 NE the depth appears to be in the vicinity of 200 ft. Line 6, in the area of about 2.0 NE bedrock appears to be about 500 - 1,000 ft. deep.

Lateral effects complicate the remainder of the lines to such an extent that it is difficult to reliably determine the depth to bedrock.

3. A very strong high resistivity zone cuts across the entire area on the southwest edge.

4. Depending on land availability, one or more spreads on 500 ft. or 250 ft. dipoles are recommended to the southeast of Line 1 to delineate or further detail the effects noted and this is especially recommended if any drilling in this area locates significant sulfides.

A very weak anomalous zone appears between 2.0 SW and 3.0 SW on Line 6. Further geophysics consisting of I. P. on 250 ft. or 500 ft. dipoles, electromagnetics or self potential (S. P.) is recommended in this area to better define and evaluate the zone.

It must be stated that the large spacing necessary for this type of preliminary and deep reconnaissance is not overly resolving if the expected bodies are relatively small zones because these can be badly affected by geometric dilution. (See "Basis of the I. P. Method" included in this report.)

INTERPRETATION

Lines 1 and 1A (1,000 ft. and 500 ft. dipoles respectively). The anomalism on 1A shows the zone best as a resistivity low and an MCF high from 0.5SW to 1.0 SW. The zone producing the anomaly is likely somewhat narrower than this. There appears to be a change of character between Lines 1 and 2 because the high resistivity contact noted on Line 2 to the southwest appears distorted on Line 1.

Lines 2 and 2A: No anomalism noted on these lines. The contact to the southwest is located approximately at 4.0 SW.

Line 3: The contact noted on Line 2 is approximately at 4.0 SW on this line as well.

Line 4: The contact is about 4.0 SW on this line.

Line 6: The contact is still in the vicinity of 4.0 SW. There is an extremely weak sulfide indication on this line between 2.0 SW and 3.0 SW.

Line 8: No anomalism is noted on this line. Bedrock is shallower to the southwest and becomes deep (more than 500 ft.) to the northeast. There is a subsurface feature at about 1.5 SW which may possibly be a fault.

Respectfully submitted,
HEINRICHS GEOEXPLORATION COMPANY

Walter E. Heinrichs, Jr.
President & General Manager

June 22, 1965
P. O. Box 5671
Tucson, Arizona

Cyprus S. Project

March 28, 1968

Heinrichs Geoexploration Company
800 West Grant Road
Tucson, Arizona.

Gentlemen:

This letter will serve as authorization for you to disclose geophysical data acquired by your Company on the Strong and Harris claims, Johnson Camp Arizona for Cyprus Mines Corporation to authorized personnel of Continental Exploration Company.

Yours truly,

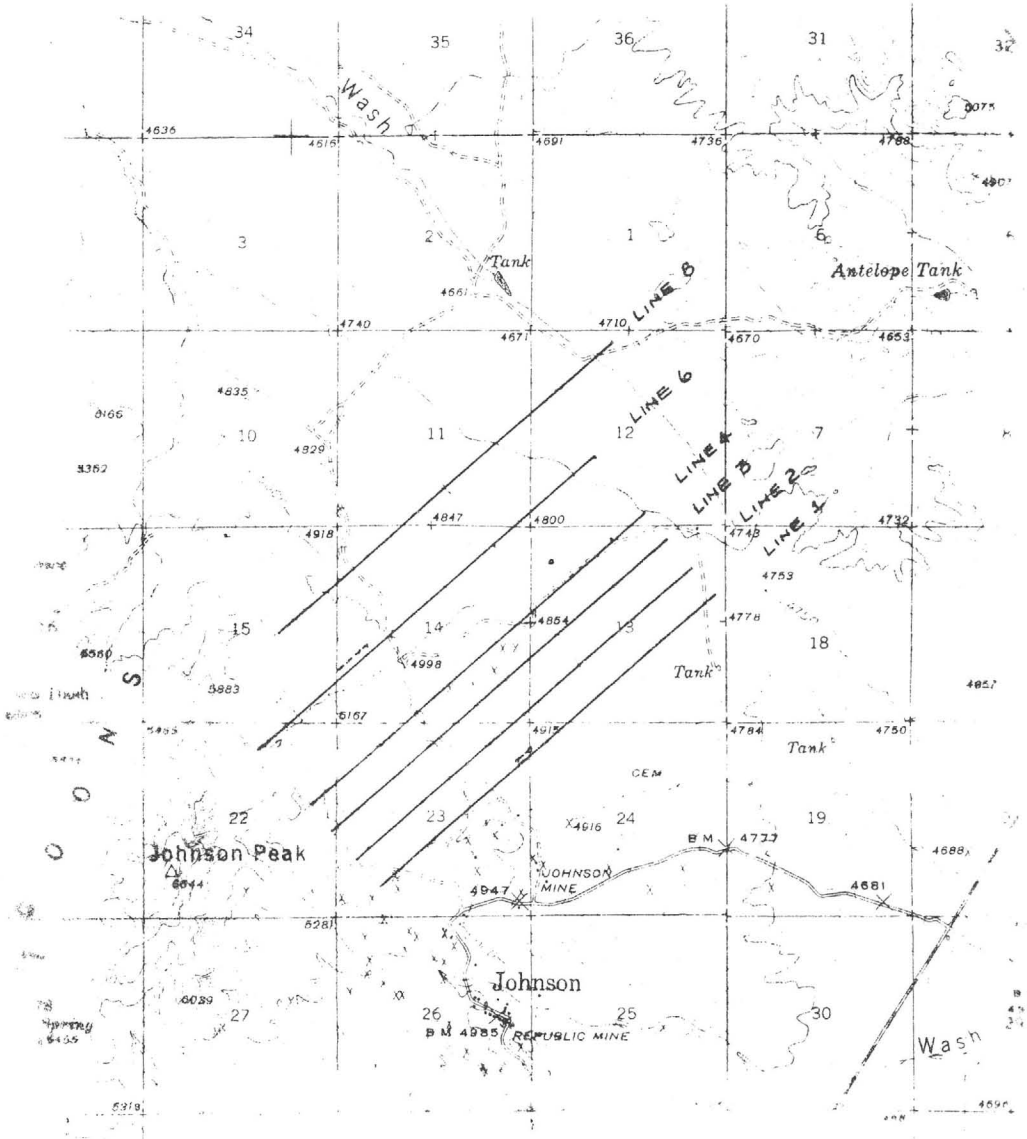
Henry T. Eyrich

HENRY T. EYRICH
Regional Manager, Exploration

HTE/ccc
cc: CCC

Note- carbon signed in case data needed before original arrives by mail.

623-0578



INDEX MAP
Induced Polarization Survey
Strong - Harris Project
T 15 S - R 22 E
CYPRUS MINES CORPORATION

--- indicates anomalous zone

Cyprus S.F. Project

March 26, 1968

Heinrichs Geoexploration Company
808 West Grant Road
Tucson, Arizona.

Gentlemen:

This letter will serve as authorization for you to disclose geophysical data acquired by your Company on the Strong and Harris claims, Johnson Camp Arizona for Cyprus Mines Corporation to authorized personnel of Continental Exploration Company.

Yours truly,

Henry T. Eyrich

HENRY T. EYRICH
Regional Manager, Exploration

HTE/ht
cc: CCG

Note- carbon signed in case data needed before original arrives by mail.

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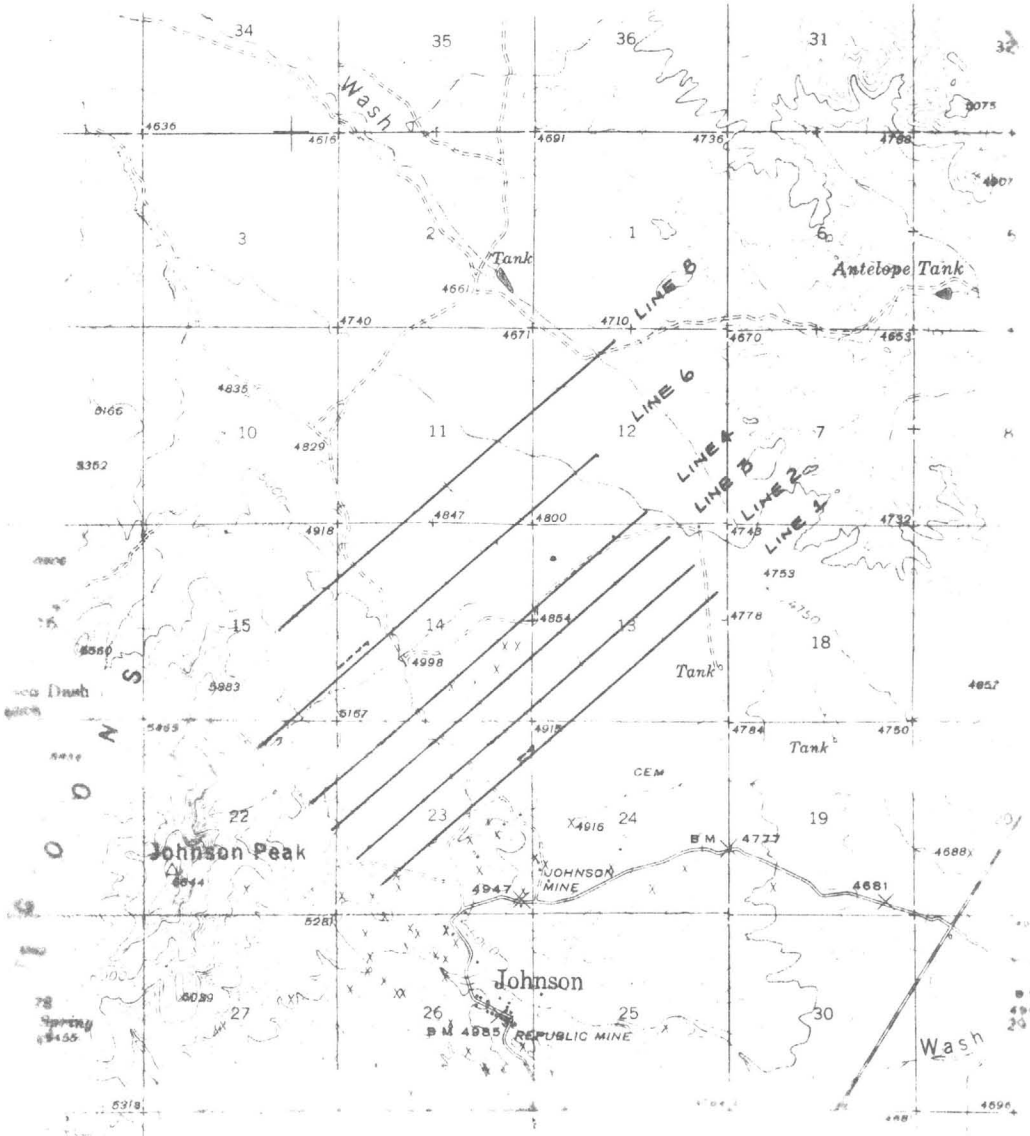
13 14 15S 22



INDEX MAP
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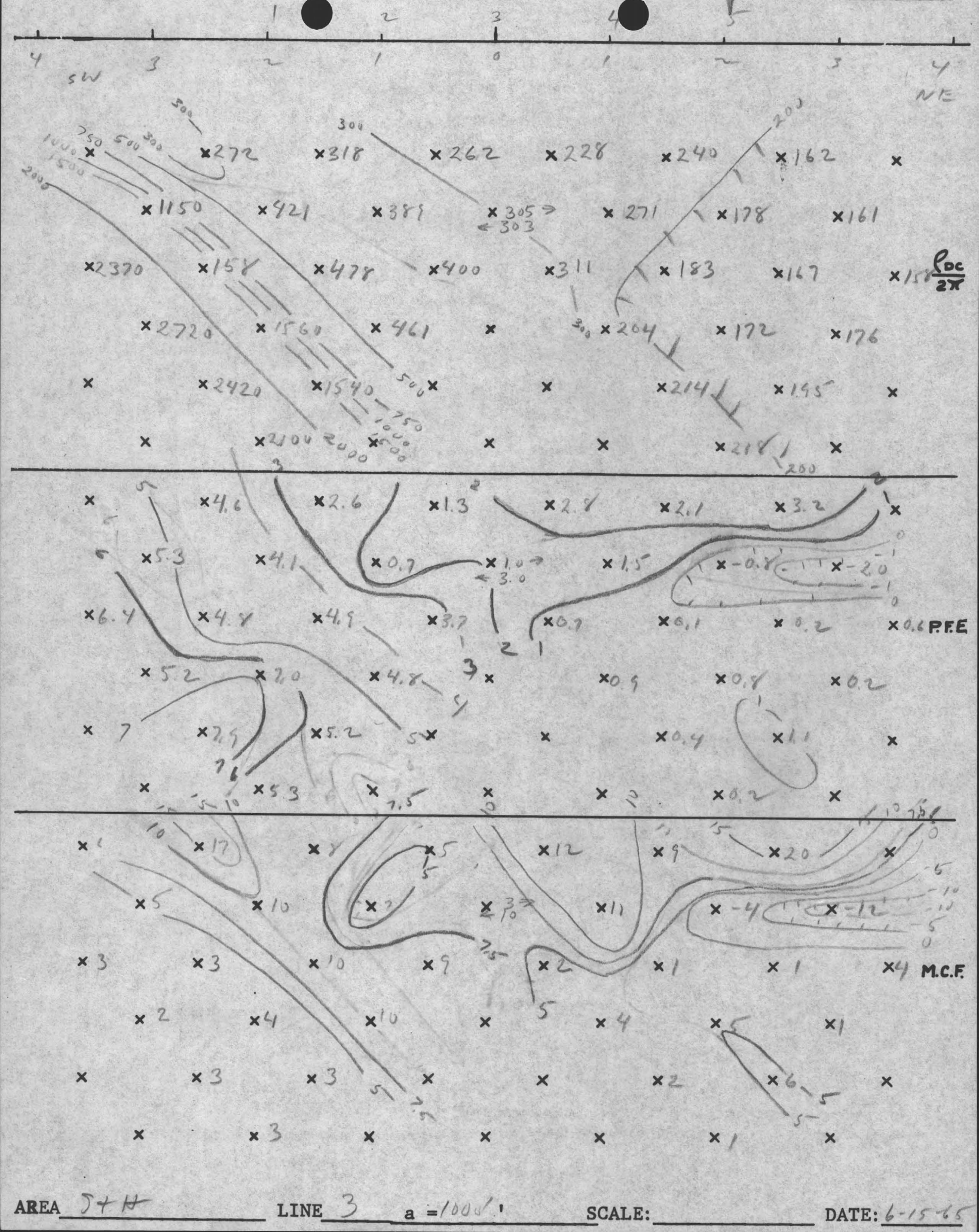
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N 40°W



AREA J+H LINE 3 a = 1000' SCALE: DATE: 6-15-65

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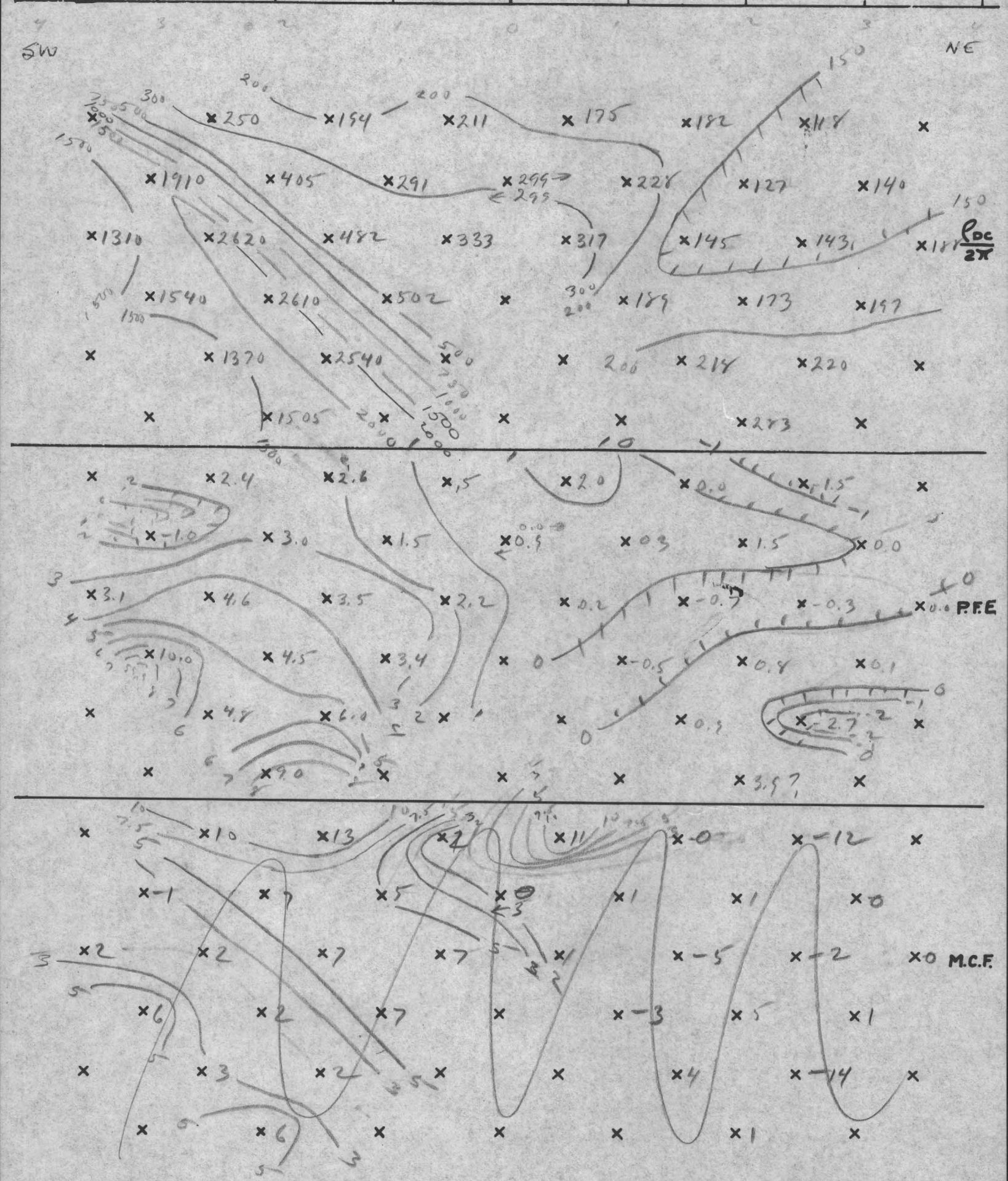
N 40°W



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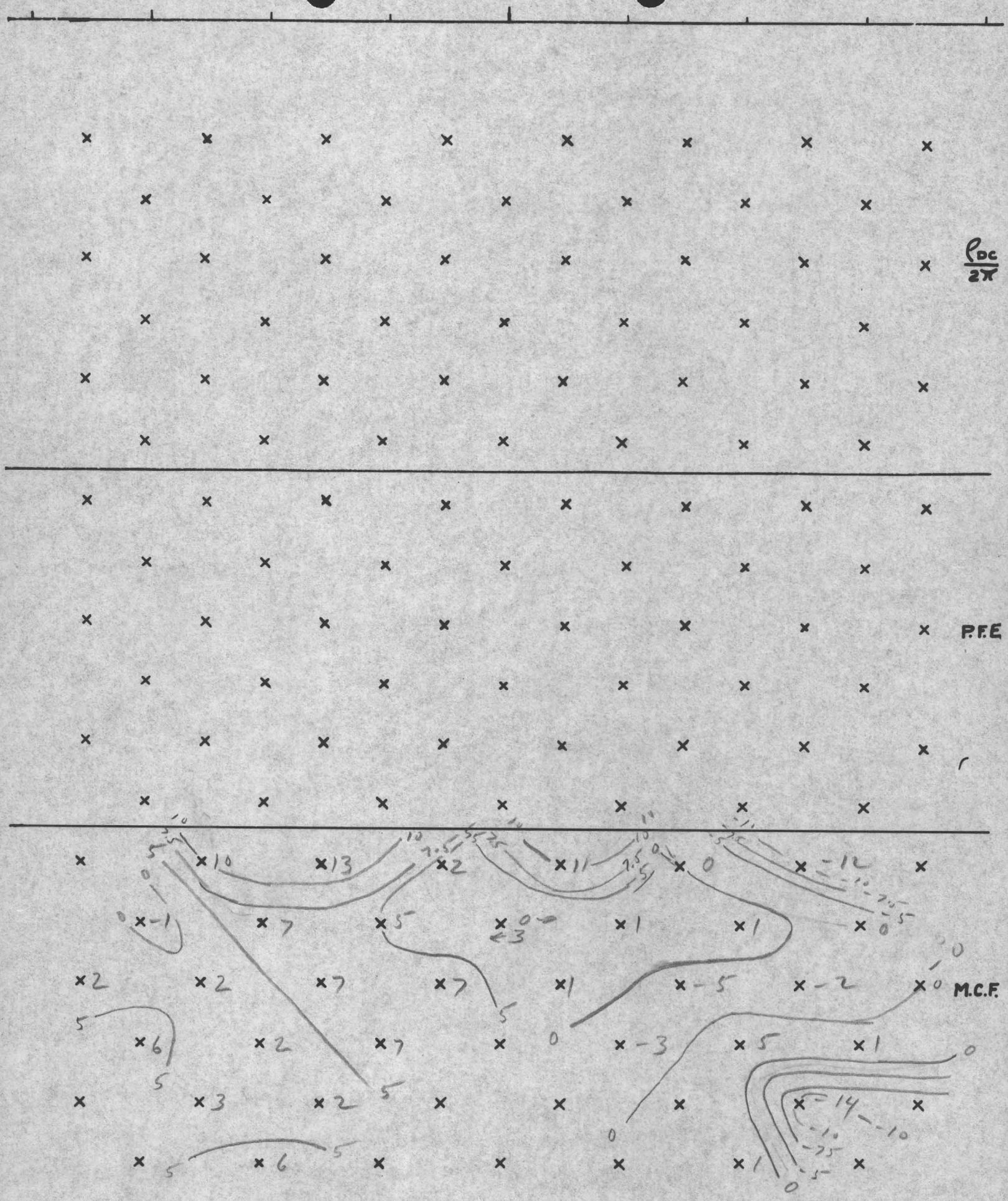

AREA_____ LINE_____ a = ' SCALE:_____ DATE:_____

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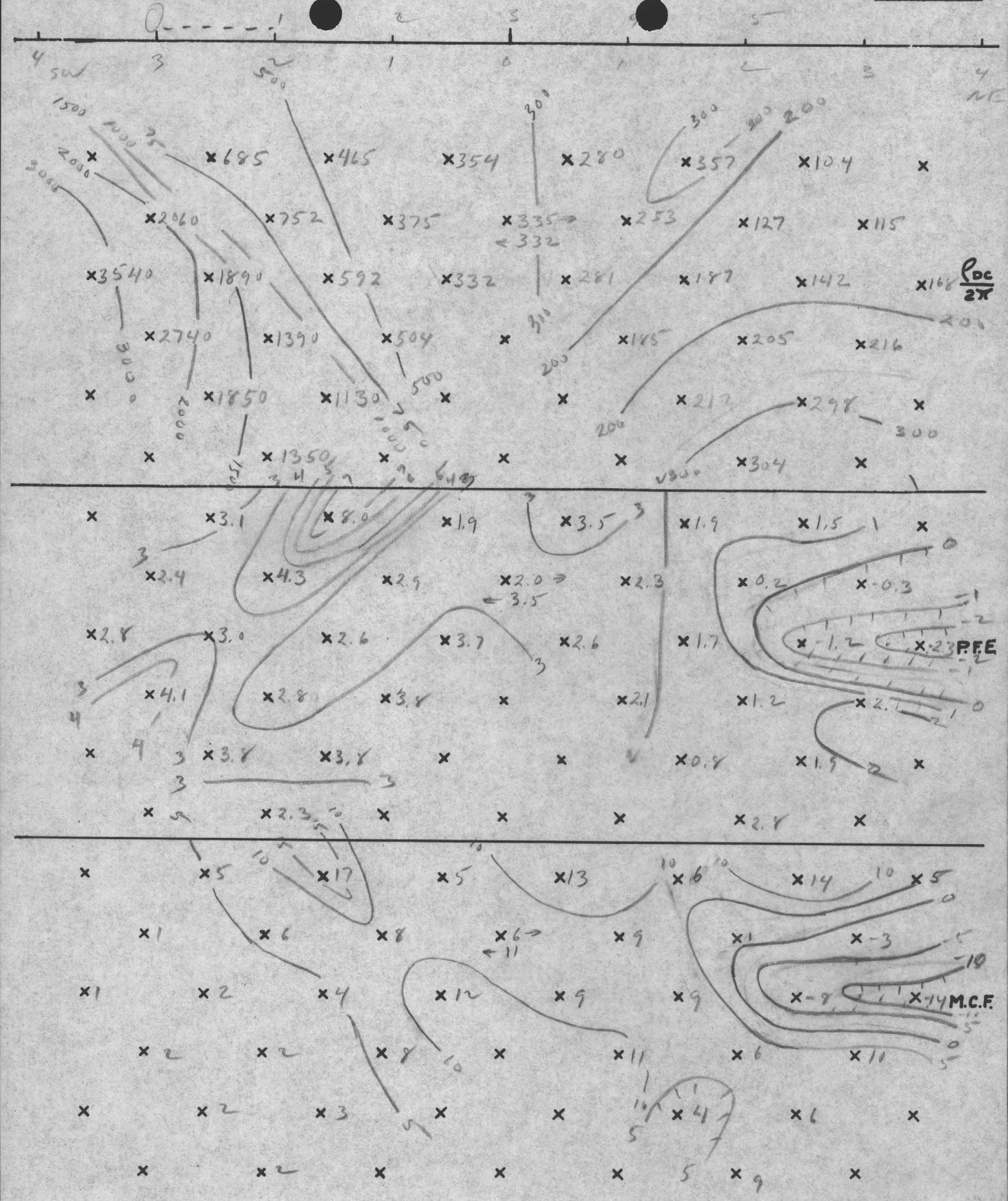

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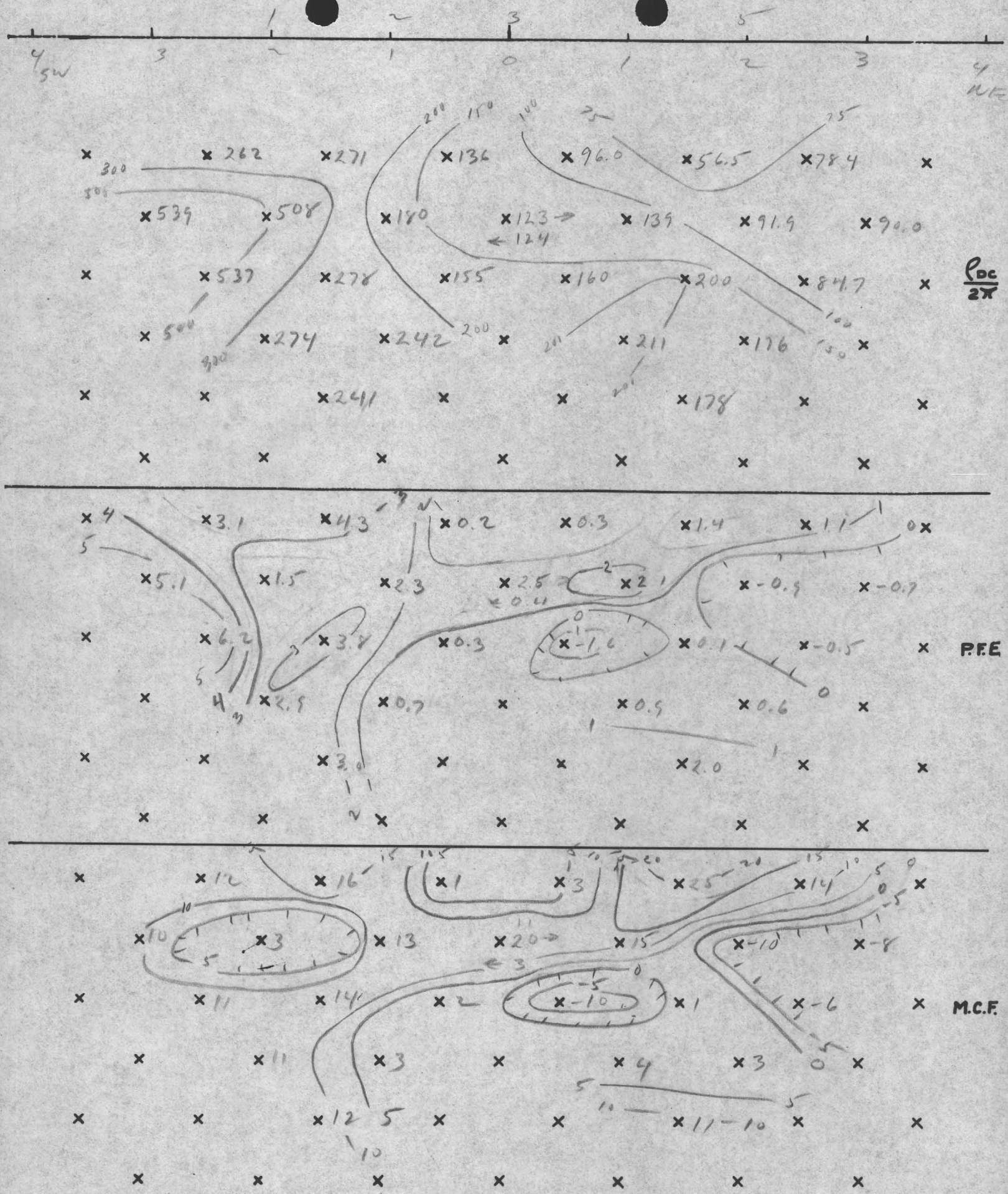

AREA S+H LINE 8 a = 1000' SCALE: 1" = 1100' DATE: 6-15-65

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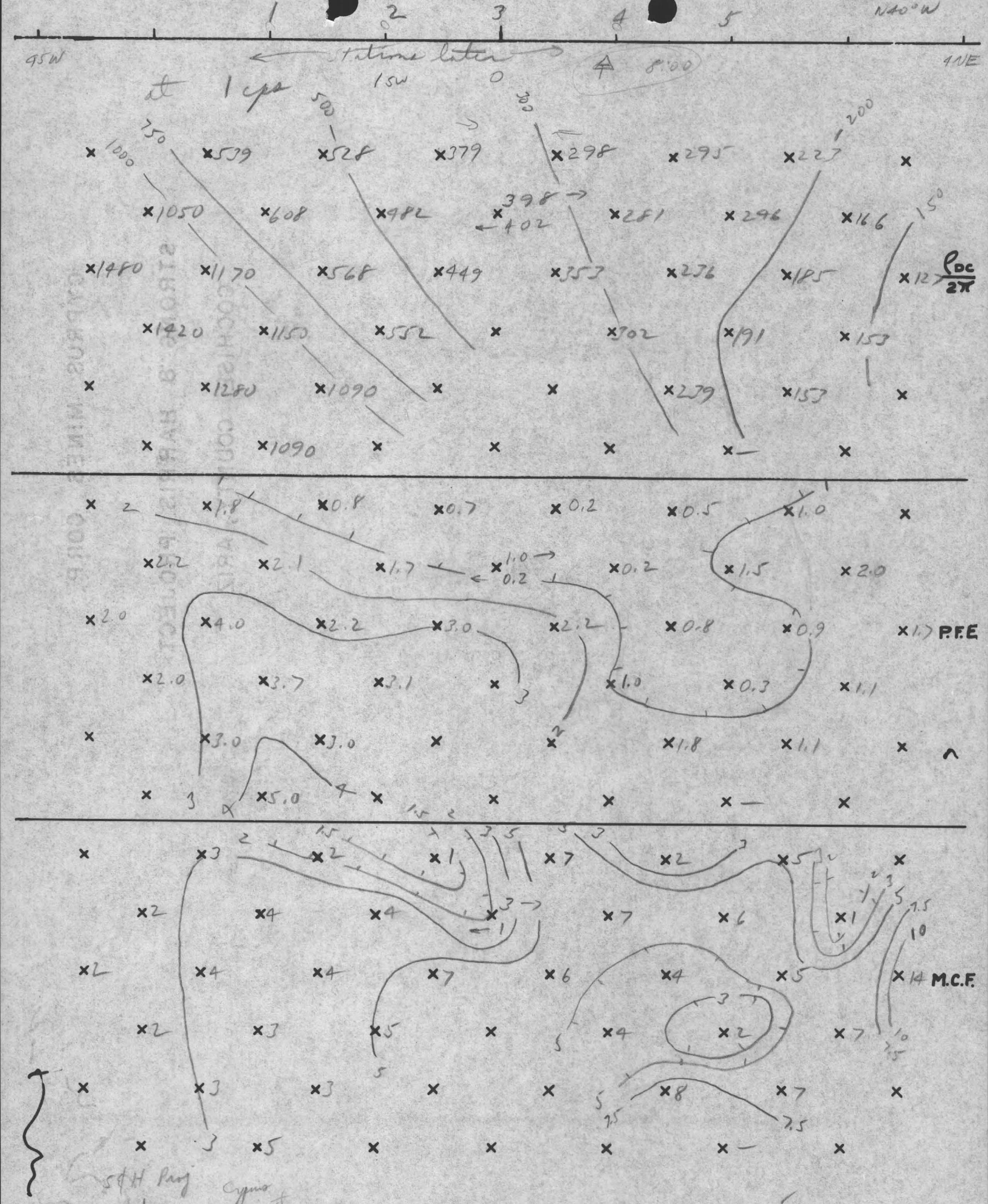

AREA Strong & Harris LINE 2 a = 1000' SCALE: 1" = 1000' DATE: 6/3/65

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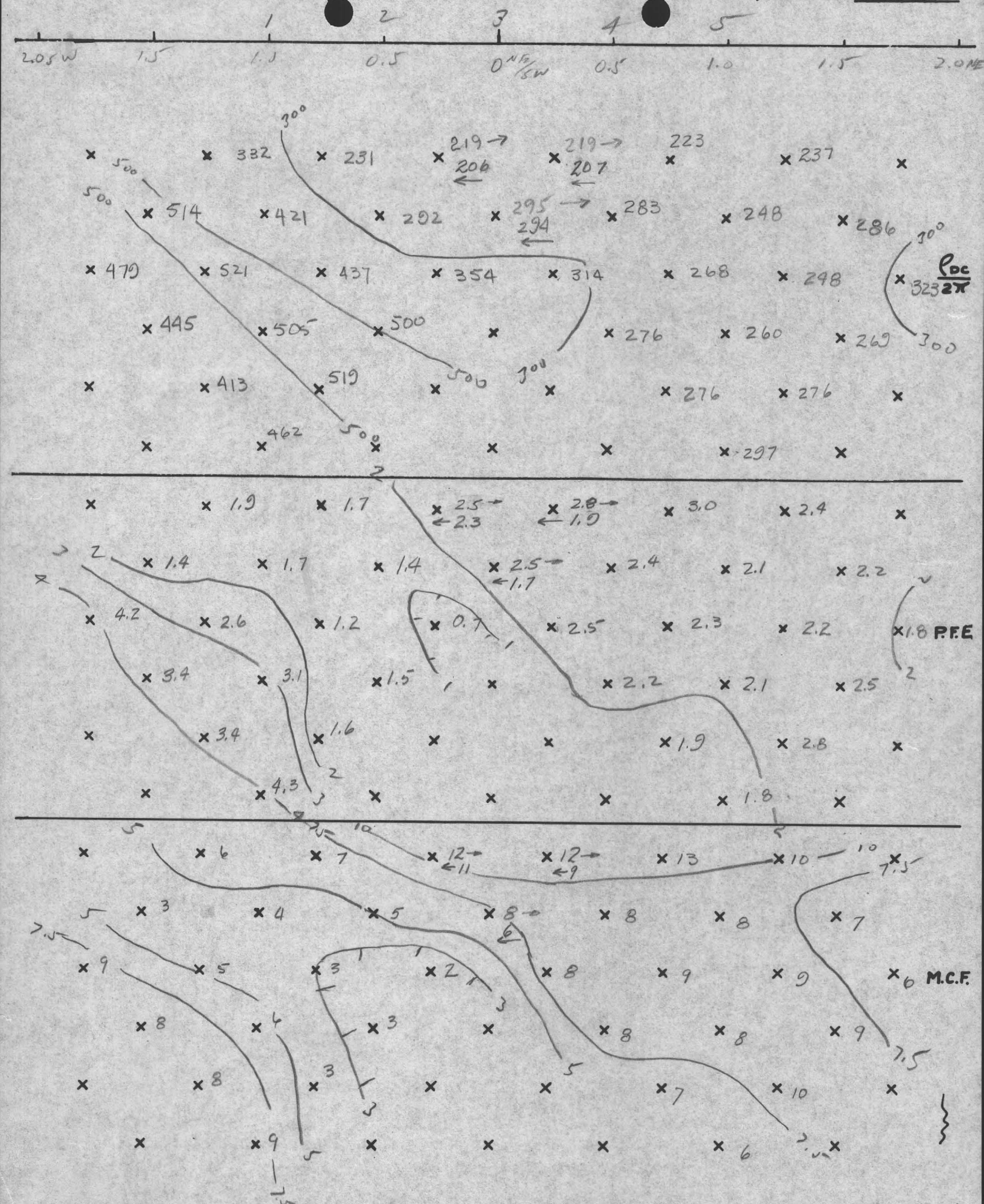

AREA 581-1 Cyprus LINE 2A a = 500' SCALE: 1" = 500' DATE: 6/14/65

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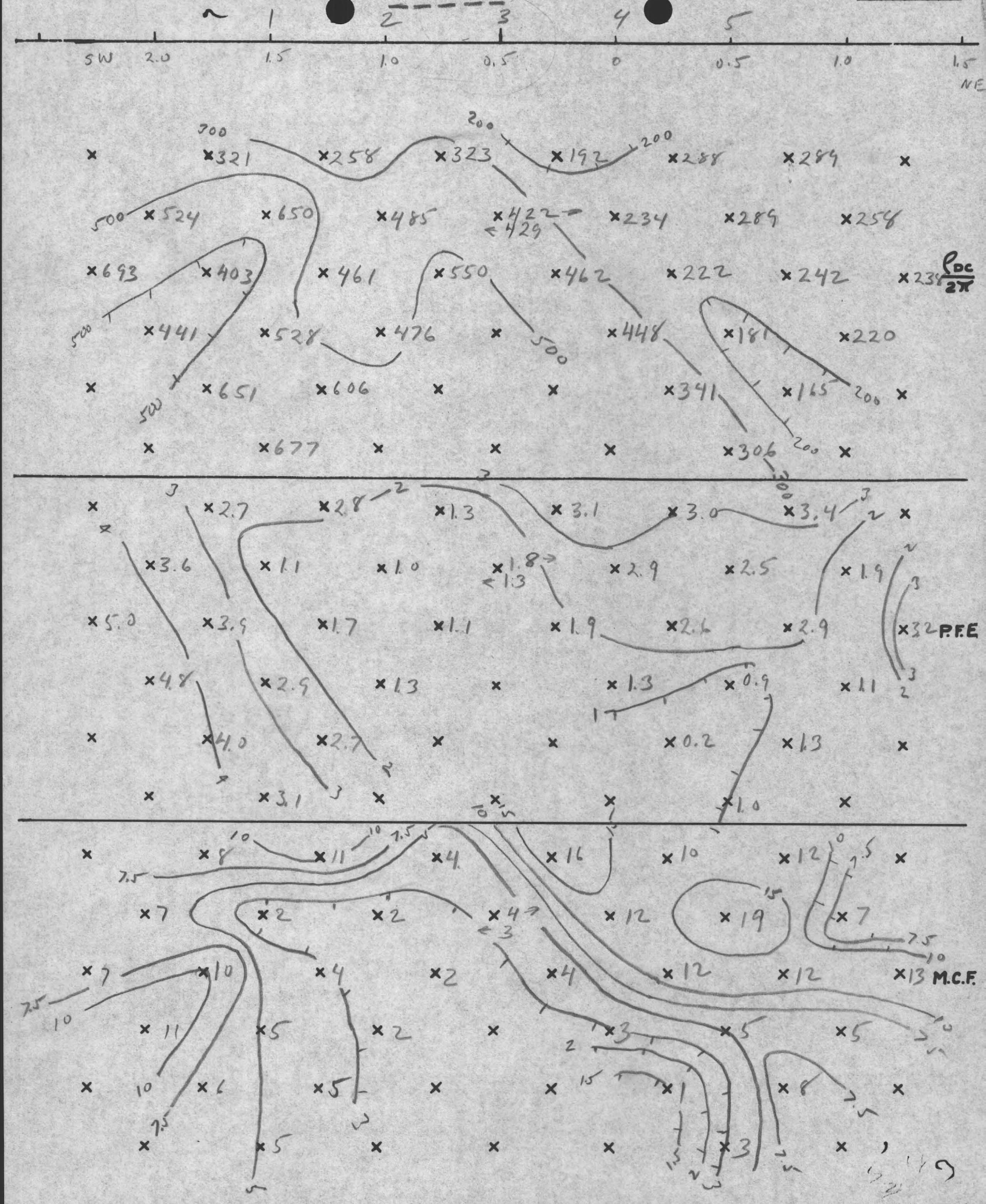

AREA S+H LINE A a = 500' SCALE: 1" = 500 DATE: 6/14/65

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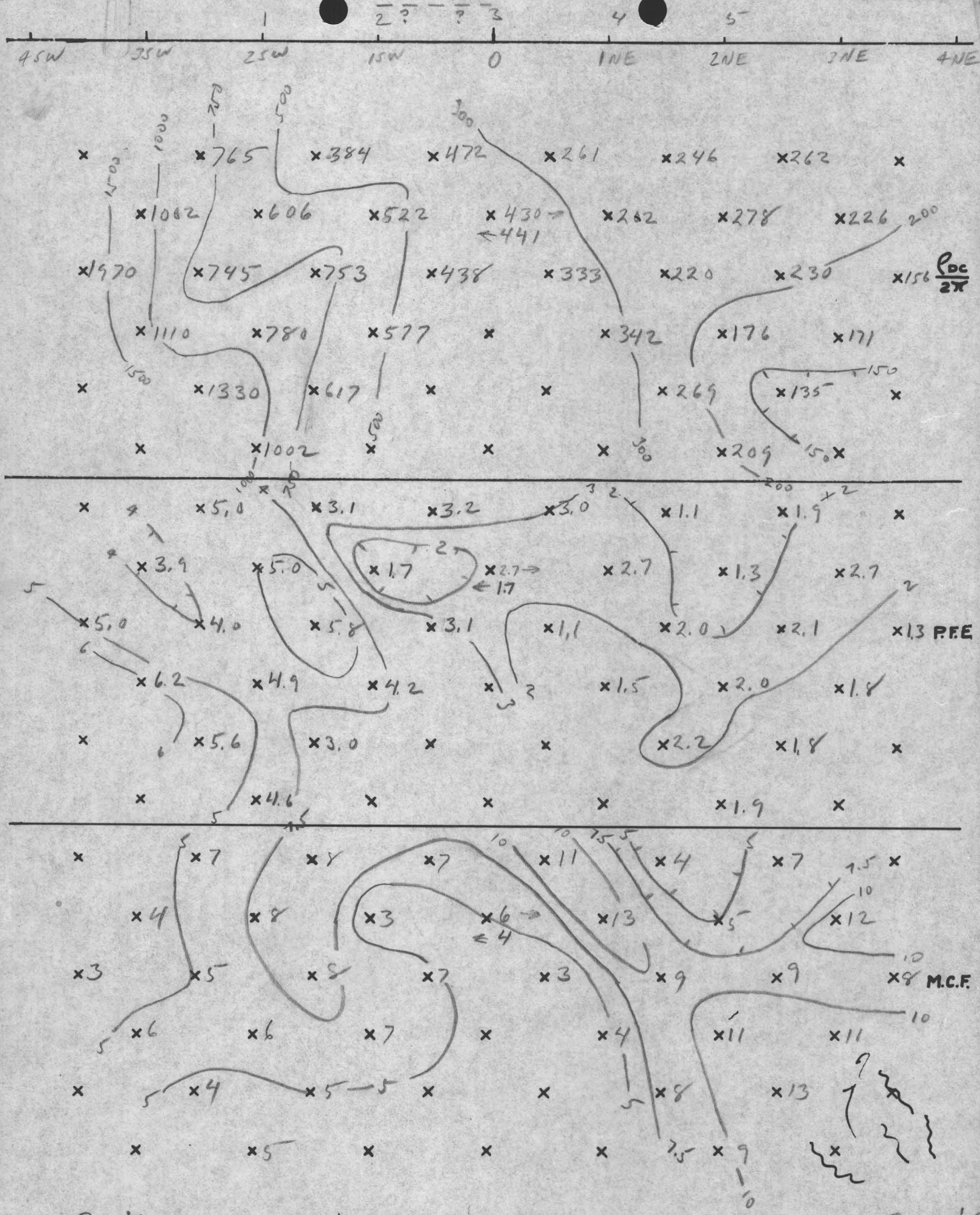

AREA S+H LINE 1 a = 1000' SCALE: DATE: June 5 66