NATIONAL GEOPHYSICAL CO., OF CANADA, LTD.

STATISTICAL REPORT

PARTY CHIEF F. E. GANOE PARTY 40

AREA FORT NORMAN PROVINCE NORTHWEST TERRITORIES SUPERVISOR H. C. TIMS

CLIENT AMERADA PETROLEUM CORP. PARTY HEADQUARTERS CAMP CLIENT'S REPRESENTATIVE W. K. RICKEL DATE APRIL 1966

INSTRUCTIONS

1. Prepare one report each month for each area.
2. Record all information in black drawing ink. Make all figures as large as possible, consistent with the space available.
3. Record ALL information requested. Make each report complete within itself.
4. Make one print of each completed form for the party file before sending the original to the Dallas Office.
5. Send the originals to the Dallas Office at the end of each month or at the end of each survey, whichever occurs first. Roll the report—DO NOT FOLD—and place it in a substantial tube securely taped so that it will not be creased or crumpled by rough handling in transit.

Description of Spreads

- CU — Complimentary Unidirectional
- OS — Overlapping Split
- IS — Isolated Split
- IC — Isolated Correlation
- 4-Way — Four-Way Dip
- IR — Isolated Refraction
- CR — Continuous Refraction

Date and Day	Land Description	Remarks
1-		
2-		D-292 & contract drill move camp.
3-		
4-		
5-		Too windy to shoot. Explosives used to locate water.
6-		Too windy to continue shooting.
7-		Contract drill repairs.
8-		Too windy to shoot. Contract drill repairs
9-		Too windy to shoot contract drill repairs
10-		D-292 – 4.0 hrs. repairs in field; standby for redrills.
11-		Complete program
12-		Break camp & start move to Norman Wells.
13-		Destroy 86# Powder & 3 caps. [illegible] lots of #1 composite. Complete move to Norman Wells: Stack equipment.
14- through 31-		

HOLES SHOT

Day	Holes shot
1-	YW 656E, 653W, 657E, 654W, 658E, 655W, 659E, 656W, 660E, 657W, 661E, 658W, 662E, 659W, 663E, 660W, 664E, 661W, 662W
2-	YW 666W, 667W, 665E, 668W, 660AE, 669W, 666E, 674W, 675E, 679W, 676E, 680W, 677E
3-	YW 674E, 677W, 673E, 676W, 672E, 675W, 671E, 674W, 670E, 673W, 669E, 672W, 668E, 671W, 667E, 670W, 681W, 678E, 682W, 679E, 683W, 680E, 681E
4-	YW 685S, 686S, 684N, 687S, 354AN, 688S, 685N, 689S, 686N, 690S, 687N, 691S, 688N, 692S, 689N, 693S, 690N, 691N
5-	
6-	YW 702E, 701E, 704W, 700E, 703W, 707W
7-	YW 695W, 696W, 694E, 697W, 692AE, 698W, 695E, 699W, 696E, 700W, 697E, 701W, 698E, 702W, 699E, 708W, 705E, 709W, 706E, 710W, 707E, 711W, 708E, 712W, 709E, 713W, 710E, 714W, 711E
8-	
9-	
10-	YW 715W, 712E, 716W, 713E, 717W, 714E, 718W, 715E, 719W, 716E, 720W, 717E, 718E, 735N, 736W, 733S, 737N, 734S, 738N, 735S, 739N, 736S, 740N, 737S, 741N, 738S, 742N, 739S, 743N, 740S, 741S
11-	YW 722W, 723W, 721E, 724W, 428AE, 725W, 722E, 726W, 723E, 727W, 724E, 728W, 725E, 729W, 726E, 730W, 727E, 731W, 728E, 732W, 729E, 730E, 779W
12- to 31-	

Item	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	13-	Totals
RECORDING: UNIT NO. R-268														
TYPE														
TYPE OF SPREADS														
PROFILES	19	13	23	18		6	29			31	23			162 PROFILES
NUMBER OF SHOTS	19	14	26	19		7	30			33	23			171 SHOTS
CONTINUOUS COVERAGE	19,000	13,000	23,000	18,000		6,000	29,000			31,000	23,000			162,000 FEET
FIELD TIME	8.0	7.0	9.5	9.3		5.7	11.2			12.5	8.5			71.7 HOURS
NUMBER OF DAYS	1.20	0.95	1.10	1.00		0.75	1.30			1.50	1.05	1.10	0.80	10.75 DAYS
DRIVING TIME	4.0	2.5	1.5	0.7		1.8	1.8			2.5	2.0	11.0	8.0	35.8 HOURS
EXPLOSIVES: RECEIVED				2000										LBS.
USED ON JOB	415	235	410	200	10	55	243			546	132	86		2332 "
ON HAND 1472														1140 "
TRANSFERRED														"
DETONATORS: RECEIVED														CAPS
USED ON JOB	40	31	54	39	8	14	58			67	38	3		352 "
ON HAND 1701														1349 "
TRANSFERRED														"
TAPES: USED	19	15	26	19		7	30			34	23			173 TAPES
ON HAND														
D-292 / W-309: NO. OF HOLES	18		11	10	4	8	5	8	12	2	7			85 HOLES
FOOTAGE	1080		660	600	240	480	300	440	675	120	420			5015 FEET
FIELD TIME	7.5	10.0	8.7	8.5	7.0	8.5	8.5	8.0	9.0	5.0	7.5			88.2 HOURS
NO. OF SHIFTS	1.10	1.00	1.00	1.10	0.90	1.10	1.05	1.00	1.15	0.80	1.00	1.10	0.80	13.10 SHIFTS
DRIVING TIME	3.5		1.3	2.5	2.0	2.5	2.0	2.0	2.5	3.0	2.5	11.0	8.0	42.8 HOURS
D-Sanbity & Baker W-: NO. OF HOLES	18		14	9	6	6	Repairs	Repairs	Repairs	20	Repairs			73 HOLES
FOOTAGE	1080		840	540	360	360				1200				4380 FEET
FIELD TIME	8.0	10.0	8.5	8.5	7.0	9.0				9.0				60.0 HOURS
NO. OF SHIFTS	1.15	1.00	1.00	1.10	0.90	1.15				1.20		1.10	0.80	9.40 SHIFTS
DRIVING TIME	3.5		1.5	2.5	2.0	2.5				3.0		11.0	8.0	34.0 HOURS
D- / W-: NO. OF HOLES														HOLES
FOOTAGE														FEET
FIELD TIME														HOURS
NO. OF SHIFTS														SHIFTS
DRIVING TIME														HOURS
TOTAL FOOTAGE	2160		1500	1180	600	840	300	440	675	1320	420			9395 FEET
TOTAL NO. OF HOLES	36		25	19	10	14	5	8	12	22	7			158 HOLES
BRAN: RECEIVED														FEET
SET														"
RECOVERED														"
ON HAND 2,000														2000 "
DRILLING MUD: RECEIVED														LBS.
USED ON JOB														"
ON HAND 4,000														4000 "
TRANSFERRED														"
HOURS OR MILEAGE														
BITS: INSERT	23		12	18	12	11	4	15	11	9	9			124
BITS: ROCK					1			2						3

Days 14- through 31- contain no entries.

DATE AND DAY	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	13-	14-	15-	16-	17-	18-	19-	20-	21-	22-	23-	24-	25-	26-	27-	28-	29-	30-	31-	
EXTRA UNITS	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total

SKETCH OF TYPICAL SPREAD

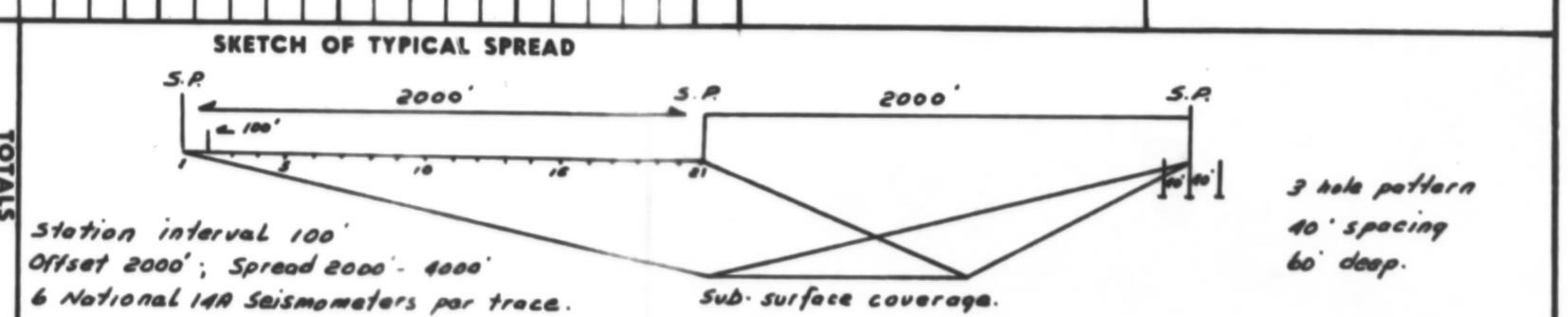

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FIGURE II C

NATIONAL GEOPHYSICAL CO., OF CANADA, LTD. — STATISTICAL REPORT

PARTY CHIEF F. E. GANOE PARTY 40

AREA FORT NORMAN PROVINCE NORTHWEST TERRITORIES SUPERVISOR H. C. TIMS

CLIENT AMERADA PETROLEUM CORP. PARTY HEADQUARTERS CLIENT'S REPRESENTATIVE W. K. RICKEL DATE MARCH 1966

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Date and Day	Land Description	Remarks
1		National driller ill. Contract drill repairs.
2		Contract drill wait on new personnel. 20 hrs. haul water.
3		Work on radios
6		Camp Move.
7		R-268 Wait for re-drill
9		25° below zero. 20 M.P.H. Winds
10		R-268 - 20 hrs. repairs in field
11		28° below zero. 25 M.P.H. Winds. Drills wait on cats to repair creek crossing
15		Drills stuck at Little Bear River - wait on cats.
16		Camp Move 18 miles. Contract drill 7.5 hrs. Camp move.
18		Drills wait on cats.
19		R-268 wait on cats and drills.
20		Drills waiting on cats
21		Drills & recorder waiting on cats.
22		Heavy snowdrifts, R-268 wait on cats. Drills wait on cats; winching on line.
29		Camp move
30		R-268 wait on re-drill

Description of Spreads: CU Complimentary Unidirectional; OS Overlapping Split; IS Isolated Split; IC Isolated Correlation; 4-Way Four-Way Dip; IR Isolated Refraction; CR Continuous Refraction

HOLES SHOT (station numbers by day, 1–31): [illegible]

UNIT NO. R-268

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals
RECORDING — PROFILES	10	15	16	14	16	8	21	20	26	9	19	12	23	15	18		14	26		20	13		24	20	11	17	22	19	3	22	26	479 PROFILES
NUMBER OF SHOTS	12	17	22	15	21	10	25	21	29	12	20	13	23	17	18		14	26		21	15		24	23	11	17	22	19	3	25	26	521 SHOTS
CONTINUOUS COVERAGE	10,000	15,000	16,000	14,000	16,000	8,000	21,000	20,000	26,000	9,000	19,000	12,000	23,000	15,000	18,000		14,000	26,000		20,000	13,000		24,000	20,000	11,000	17,000	22,000	19,000	3,000	22,000	26,000	479,000 FEET
FIELD TIME	6.5	8.8	10.0	9.5	9.5	6.0	10.0	9.5	10.5	4.0	9.0	6.5	9.0	7.8	9.8	11.0	9.5	9.8		7.7	5.3		8.6	8.6	7.3	7.3	7.0	9.0	3.0	10.5	9.5	238.5 HOURS
NUMBER OF DAYS	0.85	1.05	1.20	1.00	1.15	1.00	1.20	1.10	1.20	0.60	1.05	0.70	1.10	1.08	1.22	1.10	1.15	1.15		1.00	.80		1.10	1.15	1.15	1.00	1.00	1.20	1.00	1.13	1.15	30.58 DAYS
DRIVING TIME	2.0	1.7	2.0	0.5	2.0	4.0	2.0	1.5	1.5	2.0	1.5	1.5	2.0	3.0	2.2		2.0	1.7		2.3	2.7		2.5	2.0	4.2	2.7	3.0	3.0	7.0	0.8	2.0	67.3 HOURS
EXPLOSIVES — RECEIVED																																LBS.
USED ON JOB	108¾	81¼	130½	80	225	225	480	240	310	220	328	400	715	400	360		280	450		245	100		380	515	200	300	400	380	25	310	525	8213.25 "
ON HAND 9,685½																																1472.25 "
TRANSFERRED																																
DETONATORS — RECEIVED																																CAPS
USED ON JOB	25	25	27	18	28	26	48	41	60	25	52	28	50	34	36		27	41		26	2		47	47	21	34	44	25	5	45	53	992 "
ON HAND 2,693																																1701 "
TRANSFERRED																																"
TAPES — USED	12	17	23	15	21	10	26	22	29	13	22	15	24	18	18		15	26		21	15		24	24	12	17	22	20	3	25	26	535 TAPES
ON HAND																																
D-292 W-309 — NO. OF HOLES	2	9	12	8	10	8	14	12	8	6		7	8	6	3		11	5	1	7	9	3	8	12	12	12	12	6	7	14	10	242 HOLES
FOOTAGE	120	660	720	510	600	480	840	720	480	360		420	480	360	180		660	300	60	420	565	180	480	720	720	720	720	360	420	840	600	14,695 FEET
FIELD TIME	2.0	9.0	8.0	7.8	8.5	8.0	9.5	9.3	8.0	7.0		9.0	9.0	7.5	6.0	11.0	8.8	8.0	6.0	8.0	7.2	8.0	7.5	8.3	8.0	8.8	8.8	4.5	4.5	8.0	7.0	231.0 HOURS
NO. OF SHIFTS	0.30	1.13	1.08	1.05	1.18	1.15	1.05	1.08	1.10	0.80		1.15	1.15	1.05	1.25	1.10	1.10	1.00	0.80	1.05	1.15	1.10	1.20	1.28	1.25	1.25	1.15	0.70	1.03	1.10	1.12	31.90 SHIFTS
DRIVING TIME	1.0	2.3	2.8	2.7	2.3	3.5	1.0	1.5	3.0	1.0		2.5	2.5	3.0	6.5		2.2	2.0	2.0	2.5	4.3	3.0	4.5	4.5	4.5	3.7	2.7	2.5	5.8	3.0	4.2	88.0 HOURS
D-Garrity & Baker W. — NO. OF HOLES	Garrity		9	7	12	12	14	14	12	6	wait on cat	10	10	8	8	6	7	5	1	7	10	5	8	8	11	10	6	6	16	16	13	249 HOLES
FOOTAGE			540	420	720	720	840	840	720	360		600	600	480	180	360	420	300	60	420	600	300	480	480	660	600	360	360	960	840	780	14,940 FEET
FIELD TIME			7.5	8.0	8.0	8.0	9.5	9.3	8.0	4.5		9.0	9.0	7.5	6.0	2.5	8.0	8.0	6.0	8.0	7.2	8.0	7.5	8.5	8.0	7.5	8.0	4.0	7.5	7.5	7.5	208.0 HOURS
NO. OF SHIFTS		0.30	0.85	1.05	1.10	1.10	1.05	1.08	1.10	0.86		1.15	1.15	1.15	1.25	0.25	1.10	1.00	0.80	1.05	1.15	1.10	1.20	1.30	1.25	1.15	1.10	0.80	1.10	1.05	1.15	29.73 SHIFTS
DRIVING TIME		2.0	1.0	2.5	2.0	2.0	1.0	1.5	3.0	4.0		2.5	2.5	3.0	6.5	1.0	3.0	2.0	2.0	2.5	4.3	3.0	4.5	4.5	4.5	1.5	3.0	4.0	3.5	3.0	4.0	89.3 HOURS
D- W- — NO. OF HOLES / FOOTAGE / FIELD TIME / NO. OF SHIFTS / DRIVING TIME																																HOLES / FEET / HOURS / SHIFTS / HOURS
TOTAL FOOTAGE	120	660	1260	930	1320	1200	1680	1560	1200	720	—	1020	1080	840	360	360	1080	600	120	840	1165	480	960	1200	1380	1320	1080	720	1380	1680	1380	29,635 FEET
TOTAL NO. OF HOLES	2	9	21	15	22	20	28	26	20	12	—	17	18	14	5	6	18	10	2	14	19	8	16	20	23	22	18	12	23	28	23	491 HOLES
BRAN — RECEIVED / SET / RECOVERED																																FEET
ON HAND 2,000																																
DRILLING MUD — RECEIVED / USED ON JOB																																LBS.
ON HAND 2,000																																
EXTRA UNITS	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total
HOURS OR MILEAGE																																
BITS — INSERT	1	8	3	4	6	5	5	9	12	4	—	8	10	8	6	4	15	7	2	9	14	4	11	18	14	15	19	6	23	20	21	284
ROCK														1	2	1	1				1											7

SKETCH OF TYPICAL SPREAD

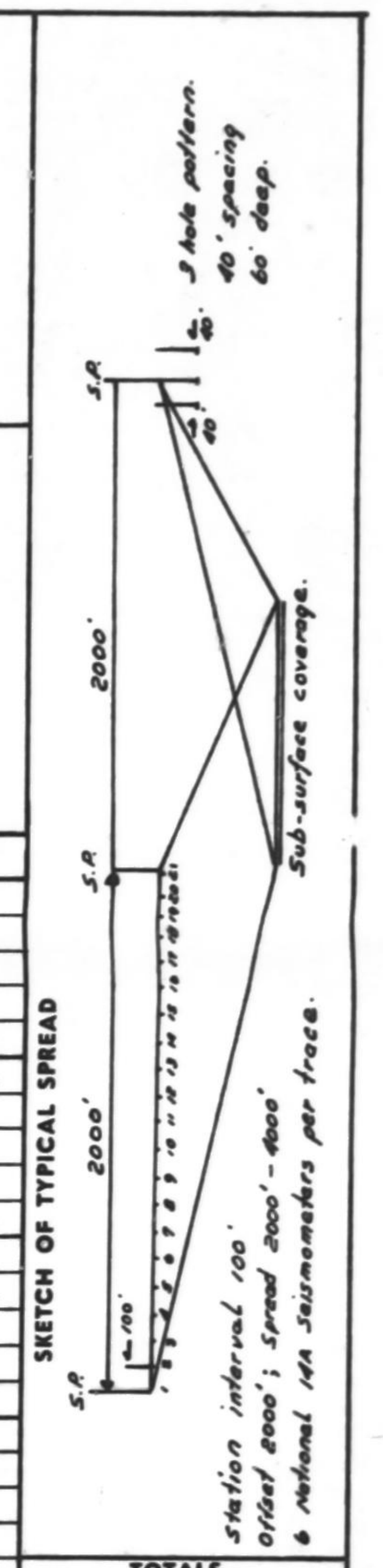

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FIGURE II B

NATIONAL GEOPHYSICAL CO., OF CANADA, LTD.

STATISTICAL REPORT

PARTY CHIEF F.F. GANOE PARTY 40

AREA FORT NORMAN PROVINCE NORTHWEST TERRITORIES SUPERVISOR H.C. TIMS

CLIENT AMERADA PETROLEUM CORP. PARTY HEADQUARTERS CAMP CLIENT'S REPRESENTATIVE W.K. RICKEL DATE FEBRUARY, 1966

INSTRUCTIONS

1. Prepare one report each month for each area.
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5. Send the originals to the Dallas Office at the end of each month or at the end of each survey, whichever occurs first. Roll the report—DO NOT FOLD—and place it in a substantial tube securely taped so that it will not be creased or crumpled by rough handling in transit.

Date and Day	LAND DESCRIPTION	REMARKS
1-		Convoy drive from Enterprise to Fort Simpson / Drive all night
2-		Arrive Fort Simpson P.M. Set up Camp.
3-		Arrange for repairs & parts for Trailer hitches
4-		Maintenance in Ft Simpson / to Trailer hitches.
5-		Complete repairs to / Trailer hitches.
6-		Leave Fort Simpson in A.M. / Camp en route, 90 mi north
7-		Proceed to Wrigley / Drive all night
8-		Arrive Wrigley in A.M. Set up camp & repairs.
9-		Depart Wrigley in A.M. Arrive Mile 180 in P.M. Set up Camp.
10-		Repairs at Mile 180 Radio Ft. Norman & wait on parts
11-		Plane arrive with parts in A.M. repairs & leave: Drive all night / Arrive Blackwater, pick-up gas from Plane drop: leave / Camp 16 miles north of Blackwater.
12-		Depart campsite in A.M. Drive all night.
13-		Drive all night
14-		Arrive Fort Norman in A.M. Set-up camp & repairs
15-		Leave Fort Norman in A.M. Arrive Prospect in P.M.
16-		Complete camp setup
17-		Surveyors to field / Experimental Shooting Noise Spread.
18-		Equipment repairs / Experimental Shooting
19-		Equipment repairs / Experimental Shooting
20-		Equipment repairs / 3.0 hrs. equipment repairs in field.
21-		
22-		
23-		
24-		
25-		
26-		
27-		Repairs D-292
28-		
29-		
30-		
31-		

Description of Spreads

CU Complimentary Unidirectional; OS Overlapping Split; IS Isolated Split; IC Isolated Correlation; 4-Way Four-Way Dip; IR Isolated Refraction; CR Continuous Refraction

HOLES SHOT (Y.W.)

17-	18-	19-	20-	21-	22-	23-	24-	25-	26-	27-	28-
351E	354W	352 E/W	356E	355E	403S	399S	360E	385E	409N	352W	367W
354W	351E	251E	357W	357 E/W	402 N/S	396N	363W	388W	406S	393E	370E
354W	351 E/W	353 E/W		358 E/W	401N	395N	383W	389W	407S	368E	371E
351E				356E	400N	398S	361E	386E	410N	351W	368W
				359 E/W	399N	397S	362E	387E	411N	350W	369W
				357E	402S	394N	384W	390W	408S	365E	372E
				358E	401S	362A N	385W	391W	409S	366E	373E
				360 E/W	398S	396S	363E	388E	412N	393W	370W
				361 E/W	397N	395S	383E	389E	413N	364W	371W
				359E	400S	404N	386W	392W	410S	367E	374E
						405N	387W	390E	411S	368E	375E
						394S	388E		414N	365W	372W
						362A S			415N	366W	373W
						406N			412S	369E	376E
						407N			413S	352E	
						404S			416N	355W	
						405S			417N	356W	
						408N			418S	353E	
										354E	
										357W	

Days 1–16

Item	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	13-	14-	15-	16-
RECORDING — UNIT NO. R-268																
TYPE																
TYPE OF SPREADS																
PROFILES																
NUMBER OF SHOTS																
CONTINUOUS COVERAGE																
FIELD TIME																10.0
NUMBER OF DAYS	1.60	1.45	1.00	1.00	1.40	1.50	1.60	1.20	1.00	1.40	1.85	1.50	2.25	1.60	1.25	1.00
DRIVING TIME	16.0	14.5	10.0	10.0	14.0	15.0	16.0	12.0	10.0	14.0	18.5	15.0	22.5	16.0	12.5	
EXPLOSIVES — RECEIVED 10,450																
USED ON JOB																
ON HAND																
TRANSFERRED																
DETONATORS — RECEIVED 3,040																
USED ON JOB																
ON HAND																
TRANSFERRED																
TAPES — USED																
ON HAND																
D-292 NO. OF HOLES																
FOOTAGE																
FIELD TIME																10.0
NO. OF SHIFTS	1.60	1.45	1.00	1.00	1.40	1.50	1.60	1.20	1.00	1.40	1.85	1.50	2.25	1.60	1.25	1.00
W-309 DRIVING TIME	16.0	14.5	10.0	10.0	14.0	15.0	16.0	12.0	10.0	14.0	18.5	15.0	22.5	16.0	12.5	
D- Garrity & Baker NO. OF HOLES																
FOOTAGE																
FIELD TIME																10.0
NO. OF SHIFTS	1.60	1.45	1.00	1.00	1.40	1.50	1.60	1.20	1.00	1.40	1.85	1.50	2.25	1.60	1.25	1.00
W- DRIVING TIME	16.0	14.5	10.0	10.0	14.0	15.0	16.0	12.0	10.0	14.0	18.5	15.0	22.5	16.0	12.5	
D- NO. OF HOLES																
FOOTAGE																
FIELD TIME																
NO. OF SHIFTS																
W- DRIVING TIME																
TOTAL FOOTAGE																
TOTAL NO. OF HOLES																
BRAN — RECEIVED 2,200#																
SET																
RECOVERED																
ON HAND																
DRILLING MUD — RECEIVED 4,000#																
USED ON JOB																
ON HAND																
TRANSFERRED																
DATE AND DAY	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	13-	14-	15-	16-
EXTRA UNITS	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total
HOURS OR MILEAGE																
BITS — INSERT																
ROCK																

Days 17–31 and Totals

Item	17-	18-	19-	20-	21-	22-	23-	24-	25-	26-	27-	28-	29-	30-	31-	TOTALS
RECORDING — UNIT NO. R-268																
TYPE																
TYPE OF SPREADS																
PROFILES	4	4	5	2	15	11	18	12	11	18	20	14				134 PROFILES
NUMBER OF SHOTS	4	6	6	5	16	12	20	12	11	20	23	15				150 SHOTS
CONTINUOUS COVERAGE	4.000	4.000	5.000	2.000	15.000	11.000	18.000	12.000	11.000	18.000	20.000	14.000				134.000 FEET
FIELD TIME	3.7	3.7	4.2	2.2	10.0	10.0	10.5	7.0	6.5	10.0	10.5	6.0				94.3 HOURS
NUMBER OF DAYS	0.40	0.40	0.45	0.25	1.05	1.10	1.15	0.80	0.80	1.15	1.15	0.75				32.05 DAYS
DRIVING TIME	0.3	0.3	0.3	0.3	0.5	1.0	1.0	1.0	1.5	1.5	1.0	1.5				226.2 HOURS
EXPLOSIVES — RECEIVED 10,450																LBS.
USED ON JOB	22	28¾	19	13¾	51¼	53¾	88¾	60	55	92¼	163¾	116¼				764½ "
ON HAND																9,685½ "
TRANSFERRED																"
DETONATORS — RECEIVED 3,040																CAPS
USED ON JOB	8	7	8	8	20	22	49	12	11	62	83	57				347 "
ON HAND																2,693 "
TRANSFERRED																"
TAPES — USED	15	7	6	5	16	12	20	12	12	20	24	15				164 USED
ON HAND																"
D-292 NO. OF HOLES	2	5	2	6	4	6	8	12	11	3	12	10				81 HOLES
FOOTAGE	200	300	360	360	240	420	510	720	780	180	720	600				5390 FEET
FIELD TIME	7.5	7.5	9.0	6.5	5.0	7.5	9.0	7.0	9.5	2.5	9.0	8.5				98.5 HOURS
NO. OF SHIFTS	0.80	0.80	0.95	0.75	0.60	0.85	1.00	0.90	1.05	0.35	1.10	1.00				32.75 SHIFTS
W-309 DRIVING TIME	0.5	0.5	0.5	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.5				229.0 HOURS
D- Garrity & Baker NO. OF HOLES	2	5	2	5	6	11	12	12	18	18	12					103 HOLES
FOOTAGE	200	300	360	360	540	680	720	720	1080	1080	720					6760 FEET
FIELD TIME	7.5	6.5	0.90	6.5	9.0	9.5	9.0	7.0	9.5	8.5	7.0					99.0 HOURS
NO. OF SHIFTS	0.80	0.70	1.00	0.75	1.00	1.05	1.00	0.90	1.05	1.05	0.90					32.80 SHIFTS
W- DRIVING TIME	0.5	0.5	1.0	1.0	1.0	1.0	1.0	2.0	1.0	2.0	2.0					229.0 HOURS
D- NO. OF HOLES																HOLES
FOOTAGE																FEET
FIELD TIME																HOURS
NO. OF SHIFTS																SHIFTS
W- DRIVING TIME																HOURS
TOTAL FOOTAGE	400	600	720	720	780	1,100	1230	1440	1860	1260	1440	600				12,150 FEET
TOTAL NO. OF HOLES	4	10	4	11	10	17	20	24	29	21	24	10				184 HOLES
BRAN (CASING) — RECEIVED 2,200#																FEET
SET																"
RECOVERED																"
ON HAND																2000 "
DRILLING MUD — RECEIVED 4,000#																LBS.
USED ON JOB																"
ON HAND																4000 "
TRANSFERRED																"
DATE AND DAY	17-	18-	19-	20-	21-	22-	23-	24-	25-	26-	27-	28-	29-	30-	31-	
EXTRA UNITS	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total	Unit No.	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total
HOURS OR MILEAGE																
BITS — INSERT		4	6	5	5	5	10	8	8	4	10	4				69
ROCK			1	1		3	2		3	1	2	3				16

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FIGURE II A

1-6-5-24

Same as 1-6-5-22

Seismic Operations Report

FORT NORMAN AREA
Northwest Territories, Canada
to
AMERADA PETROLEUM CORPORATION
BY
National Geophysical Co., Ltd.

SEISMIC OPERATION REPORT

on the

F O R T N O R M A N A R E A

Northwest Territories, Canada

Submitted to

AMERADA PETROLEUM CORPORATION

By

NATIONAL GEOPHYSICAL COMPANY OF CANADA, LIMITED

Party No. 40

National Geophysical Co. of Canada Ltd.

PREFACE

This report covers the operational aspects of the Seismic Survey conducted in the Fort Norman Area, Northwest Territories, for Amerada Petroleum Corporation during the months of February, March and April, 1966 by National Geophysical Company of Canada, Limited, Party No. 40.

A complete statistical summary is included.

The survey was conducted over a period of 48.88 days between February 17th and April 11th, 1966.

FIGURES

Figure I	Location Map (Campsites noted)
Figure II a,b,c	Statistical Reports
Figure III	Spread Arrangement Diagram
Figure IV	National 26A Amplifier Curves

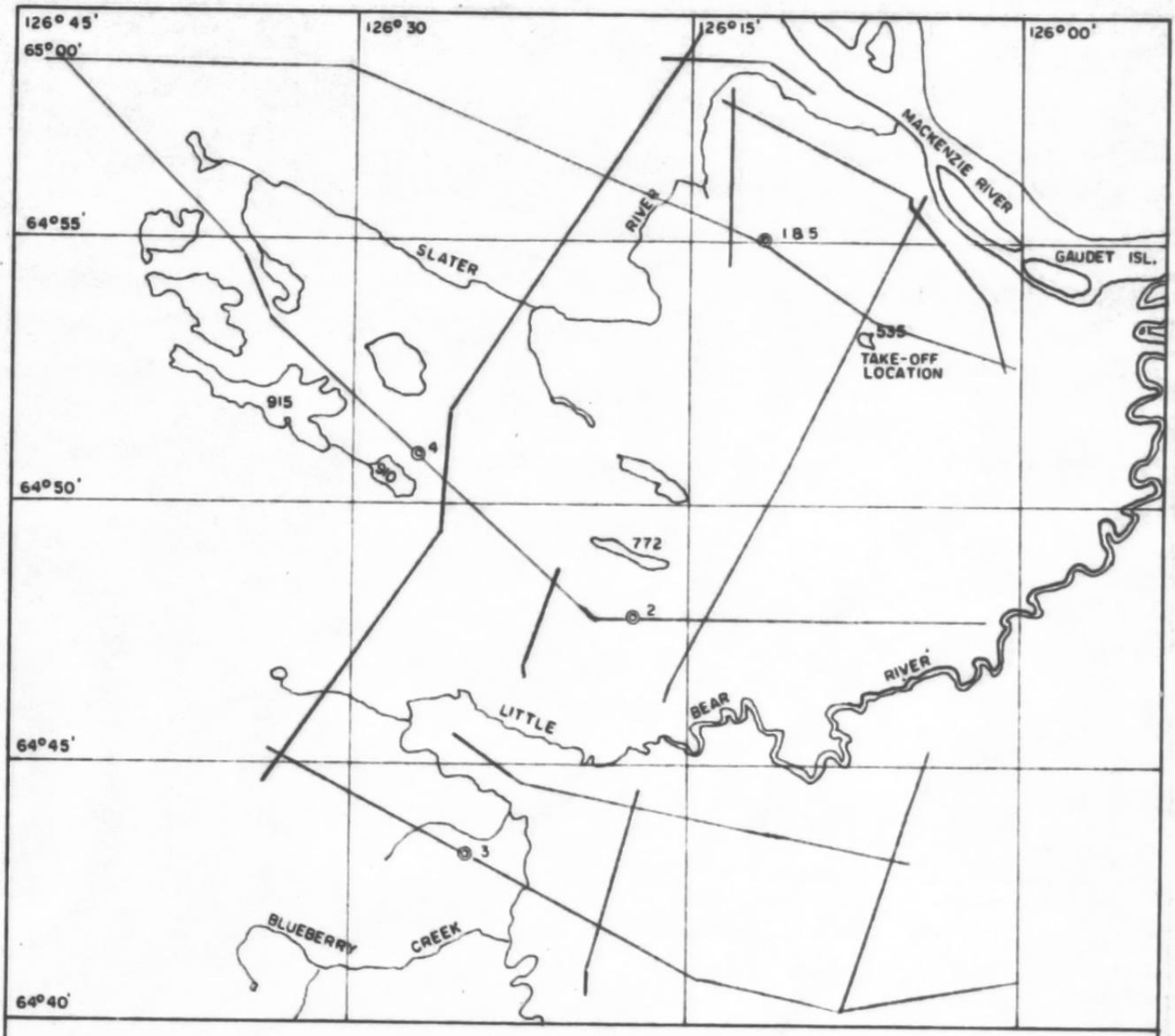

FIGURE NO. I

LOCATION MAP

FORT NORMAN AREA

NORTHWEST TERRITORIES, CANADA

NATIONAL GEOPHYSICAL COMPANY OF CANADA, LTD.

SCALE: 1" = 4 MILES

SEISMIC OPERATION REPORT

on the

F O R T N O R M A N A R E A

Northwest Territories

LOCATION OF AREA

PROVINCE:

Northwest Territories, Canada

PARTY HEADQUARTERS:

Headquarters were in a wheeled trailer camp located at various points throughout the prospect. Refer to Figure I for detailed locations.

DETAILED LOCATION:

The area of operation for the Fort Norman Prospect extended from Longtitude 126°00, Latitude 64°40' to Longtitude 126°45', Latitude 65°00. Refer to Figure I.

ACCESSIBILITY:

From camp the lines of program were accessible via bulldozed trails.

STATISTICAL DATA

SUMMARY:

Party Number	40
Date of beginning of survey	February 17, 1966
Date of completion of survey	April 11, 1966
Total number of recording days	48.88
Total number of profiles shot	-775
Average profiles per recording day	15.86
Total number of shots	842
Average shots per profile	1.09
Total explosives used (pounds)	11,309
Average charge per profile (pounds)	14.59
Average charge per shot	13.43
Total number of drilling shifts (2 drills)	100.68
Average shifts per recording day	2.06
Total number of holes drilled	833
Average holes drilled per shift	8.27
Average holes drilled per recording day	17.04
Total footage drilled (feet)	51,180
Average hole depth (feet)	60

COMMENTS:

The above statistics are based on a 10 hour shift for the recorder or drills and includes driving time; however, it does not include move time into and out of the prospect.

The complete statistical record for the survey is submitted as Figure II a, b, c.

TOPOGRAPHY

MAXIMUM ELEVATION:

YW 578 the most southern shotpoint with an elevation of 1378 feet.

MINIMUM ELEVATION:

YW 403 located in the extreme northeastern corner of the prospect with an elevation of 222 feet.

DESCRIPTION:

The prospect was located in the MacKenzie River Valley with the elevations generally increased in a southwesterly direction throughout the area. The main topographic feature was the Little Bear River which cut through the southeastern portion of the area.

The area was bordered to the north by the MacKenzie River and to the south by the MacKenzie Mountain Range. A network of deeply incised rivers and streams connected the two.

DRAINAGE:

Numerous small rivers and streams drained north and east into the MacKenzie River which was the most significant drainage feature in the area.

SURFACE CONDITIONS

GEOLOGICAL DATA:

The geological age of the surface material is the Cretaceous Formation which consists of shale, sandstone and small amounts of coal.

GENERAL:

Surface conditions were generally good due to the frost in the muskeg areas. Operational difficulties were encountered in crossing the Little

Bear River and some of the smaller streams.

MOBIL EQUIPMENT

COMPANY	UNIT NO.	FUNCTION
National	S-427	Party Chief Pick-up
National	R-268	Recording Unit
National	E-215	Explosives Unit
National	E-218	Explosives Unit
National	G-405	Cable Unit
National	D-292	Drill
National	W-309	Water Truck
National	S-312	Survey Unit
Shaw Rentals		Supply Van
Wright Rentals		Winch Truck
Garritty & Baker		Drill
Garritty & Baker		Water Truck
Calgary Exploration Services, Ltd.		Fuel Truck
Calgary Exploration Services, Ltd.		D-7E Dozer
Calgary Exploration Services, Ltd.		D-7E Dozer

FIELD OPERATIONS

CAMP:

The camp was rented from Alberta Trailer Sales of Calgary and consisted of seven wheeled trailer units and a twin diesel power plant which was rented from Wright Industrials. The various units composing the camp were as follows:

1 Kitchen-Diner	1 Utility
1 Office	1 Shop
3 Bunk	1 Power Unit (2 15KW)

The camp sustained considerable damage during the initial move into the prospect. It was concluded that with the possible exception of the diner and utility, the remaining units were not constructed to withstand this type of long off-highway haul.

CATERING:

National Geophysical Company of Canada, Ltd., catered for supplying food and camp personnel. The camp personnel included a cook, a cook's helper and a camp attendant. Bedding, kitchen utensils etc. were supplied by Amerada Petroleum Corporation.

The quality of the catering was good, the meat, canned goods and other non-perishables were taken up on the initial move into the site and were stored in two collapsable sheet metal sheds. Regular supply runs were made to Norman Wells to obtain fresh produce and other supplies which were shipped Air Freight from Edmonton.

MOVE:

The initial move into the prospect was accomplished by moving camp and equipment overland in convoy, a total distance of 1270 miles encompassing an eighteen day period.

The convoy departed from Edmonton, Alberta on January 29th, 1966 with the camp and 12 seismic vehicles. At Enterprise, N.W.T. the initial convoy was joined by three diesel trucks and trailers, two explosives trucks and one heated van and one fuel truck making a total of 19 vehicles and 34 men.

The convoy left Enterprise on February 1st and proceeded to Fort Simpson and then north utilizing CNT's telephone line right of way along the MacKenzie River to Fort Norman. At Fort Norman the convoy crossed the MacKenzie River and proceeded to the work area via dozed trails to campsite No. 1.

Insufficient time and/or effort was spent on the road as it was very rough with many steep hills which necessitated the towing of all units. The condition of the road was the main contributor to the damages which the camp sustained, also it was responsible for the excessive move time. During some periods, the convoy averaged one mile per hour. Several short moves were made during the course of the survey, the same method of moving camp was employed and no particular problems were encountered.

CAMP LOCATION:

Several campsites were established throughout the prospect, for detailed locations refer to Figure I.

BULLDOZING:

The bulldozing was contracted to Calgary Exploration Services, Ltd. who also contracted to maintain the supply road and furnish the fuel for the winter's operation. They supplied 2-D-7E caterpillars, 1 road patrol and one fuel truck. The entire program required the dozing of new lines. This presented no particular problem as the equipment was large enough to readily handle the growth of timber.

The job performance of the contractor was considered adequate. Some delay was experienced due to lack of line ahead of the crew, and at one juncture it was necessary to put an extra shift to enable the dozers to get ahead. The quality of the lines on a whole was poor, in some cases causing excessive driving time.

SURVEYING:

All shot points and stations were located by chained measurements. Shotpoints were spaced at 2000 ft. intervals, with station intervals of 100 ft. The standard method of shooting was 2000 ft. spreads shot from a 2000 ft. offset. A spread diagram arrangement is included as Figure III.

Horizontal control was maintained by the use of compass bearings with frequent checks and adjustments to major topographic features.

DRILLING:

Drilling conditions were good and no difficulty was encountered in moving along most of the lines with standard truck mounted drills.

In general the project shotpoints consisted of two hole patterns with 80 ft. spacing. However, some three hole patterns with 40 ft. spacing and some single hole locations were used. All holes were drilled to a depth of 60 ft. Air drilling was used throughout and a typical shot hole log would be:

0 - 15 Clay
15 - 60 Shale

Shot holes were plugged in the manner prescribed by Amerada Petroleum Corporation.

EXPERIMENTAL SHOOTING:

Prior to production shooting a 0 - 6000 foot noise spread was recorded on Line 1. Amerada's noise spread procedure consisted of recording from a single geophone per trace at a trace spacing of 100 ft. at distances from 0 - 6000 ft. from a single hole shotpoint.

From this information and subsequent production shots it was decided to use a 2000 ft. spread with a 2000 ft. offset with 6 National 14A geophones per trace and multiple holes where drilling permitted.

RECORDING:

INSTRUMENTATION:

Amplifiers	Type: National 26A series Number used: 21 Circuit: I (unmixed)
Tape System	Techno AM
Seismometers	National 14A - 8 cycles per/sec. - 300 ohms Number used: 126 In groups of: 6 per trace at 20 ft. intervals Number of recording traces: 21 (2 cables)

FIELD TECHNIQUE:

Spreads	Type: 2000 ft. offset, 2000 ft. - 4000 ft. spread
Shotpoints	2 holes in line with spread at 80 ft. spacing

GENERAL:

Throughout the project an offset spread technique was employed. Recording in this manner made it essential for efficient operations to use radio communications between the recorder and the shooter. The radios were designed in such a manner that the time break and uphole times were recorded on separate traces. A comparison between Amerada and National instruments indicated that they were 180 degrees out of phase. All National field tapes were stamped "Reversed Polarity" in order that the reversal could be corrected in Amerada's playback center.

The recording procedure consisted of obtaining a "Monitor" record from each shot while the same information was being recorded simultaneously

on the Techno tape. The record filter setting was AH-GH (13-24-90)

13 low cut frequency at 50% response
24 peak frequency at 100%
90 high cut frequency at 50% response

At 70% response-low cut at approximately 20 cycles/sec.
At 70% response-high cut at approximately 84 cycles/sec.

Playback records were made from all tapes using a filter setting of BH-GH (19-35-91). The response characteristics of the National 26A amplifier is included as Figure IV.

OFFICE

COMMUNICATIONS:

Communications with Norman Wells was maintained by means of a single sideband radio unit leased from Canadian Marconi Company.

Frequent contact was made through CNT's monitoring system in Norman Wells with Amerada's Calgary office.

As well as its use for daily production reports, the radio telephone was used in ordering supplies and parts and in sending and receiving messages of a general nature.

DATA PRESENTATION

All field records (monitors & playbacks) were timed and labelled with all pertinent information. Blue line prints were made of each monitor

record and retained on the crew. Magnetic tapes and the original monitor record and playback records were forwarded at regular intervals to Amerada's Calgary office.

REPORTS

Various reports were submitted during the progress of the survey. The following is a comprehensive list of these:

1. Weekly Production Report
2. Daily Bulldozing Time Sheets
3. Daily Shooters Logs
4. Daily Observers Reports
5. Individual Survey Spread & Location Sheets (these formed part of the record labels)
6. Monthly Statistical Reports

CONCLUSION

It was generally felt that the primary objectives of the survey were accomplished.

Due to the rigorous nature of the move into the area several minor repairs were necessary to both camp and truck equipment during the first days of the operation. Once these were corrected the performance of the crew was considered good. Several breaks in continuity were necessary due to the difficulties encountered in traversing the Little

Bear River.

NATIONAL GEOPHYSICAL COMPANY
OF CANADA, LIMITED

F.E. Ganoe - Party Chief

H.C. Tims - Supervisor

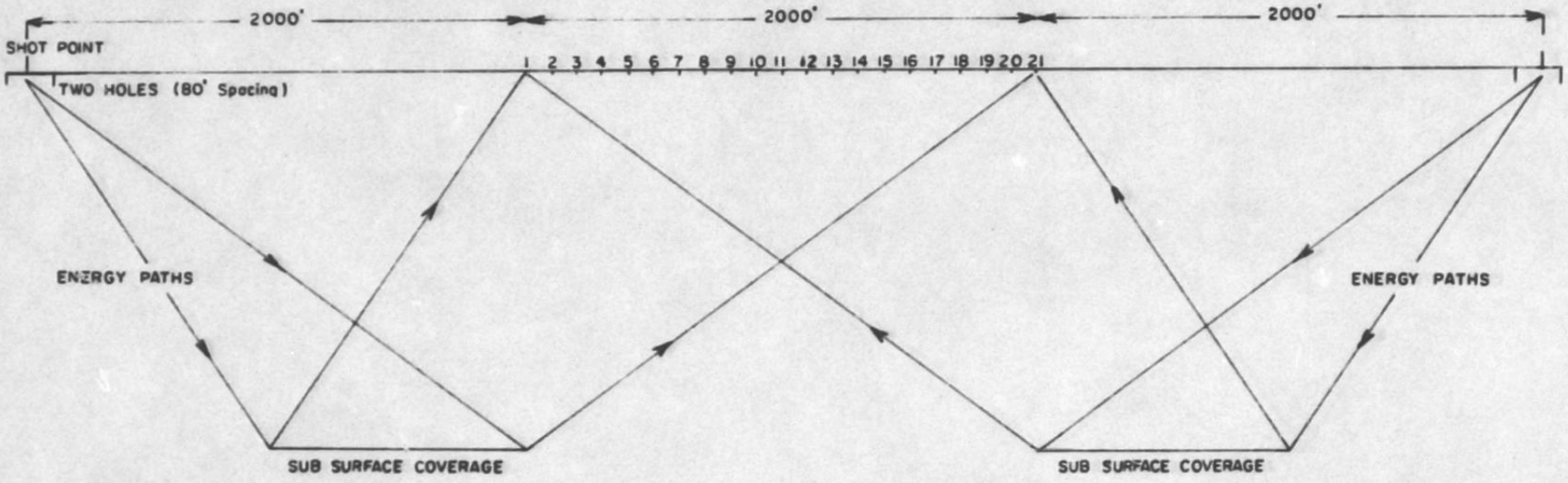

FIGURE NO III

STATION INTERVAL 100'

OFFSET 2000': SPREAD 2000'-4000'

6 NATIONAL 14A SEISMOMETERS PER TRACE

SPREAD ARRANGEMENT

FORT NORMAN AREA

NORTHWEST TERRITORIES, CANADA

NATIONAL GEOPHYSICAL COMPANY OF CANADA, LTD.

K&E SEMI-LOGARITHMIC 46 5492
3 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

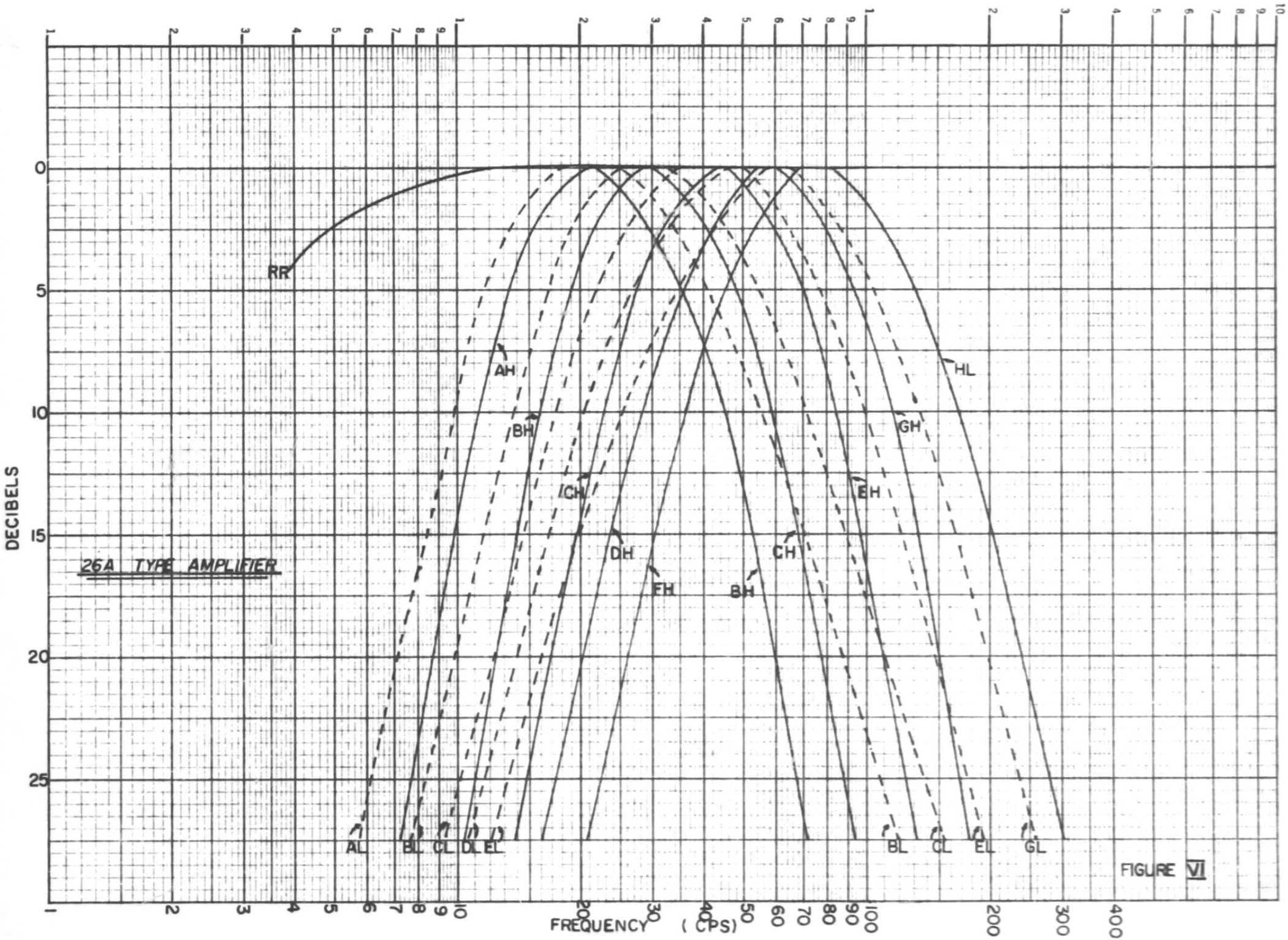

FIGURE VI