

CRA, INC.

WOODWARD NO. 6, 8, AND 9

DIPMETER REPORT

Computer Inventoried



SCHLUMBERGER WELL SURVEYING CORPORATION

HOUSTON, TEXAS

January 17, 1966

PLEASE REPLY TO:
SUITE 1120 WICHITA PLAZA BLDG.
WICHITA, KANSAS 67202

CRA, Inc.
Box 445
Wellington, Kansas

Gentlemen:

This report is intended to summarize our interpretation of the Continuous Dipmeter Surveys ran on your Woodward No. 6, 8, and 9. Included in this report is the graphic presentation of dip calculations, the tabular presentation of dip calculations and a series of dip frequency polar diagrams the interpretation of which is below.

Woodward No. 6

The Bartlesville Sand (interval 590-655) is missing in this well. Dip patterns indicate this well is on the southeast side of the bar which strikes N60E-S60W. This strike indicates the sand may thin or possibly pinch out on the south end of the bar. Another explanation might be a thinning of the bar near this location. This location definitely limits the width of the bar sand.

Woodward No. 8

The Bartlesville Sand from 618-654 is a bar sand striking N30E-S30W with thicker sand to the S60E of this well. Since the width of the bar is undetermined, a strike location is recommended with only slight preference toward the axis of the bar.

Woodward No. 9

The Bartlesville Sand from 651-678 is a bar sand striking N15W-S15E with thicker sand to the N75E of this well.

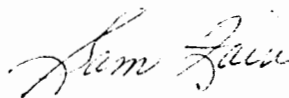
A map is also included in this report. This map contains the strikes and arrows toward thicker sands on all of the wells. In the case where no sand is present the arrows point in the direction of the sand bar. It is readily apparent that No. 6 Woodward is the only well on the east (or SE) side of the bar system. Extreme care must be

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exercised in developing this project as the width of the system is not defined. The sediments were transported from east (or SE) to west (or NW) and the western side of the bar will probably be the steeper side. Recommended locations are NE-SE-NW of Sec. 13-25S-21E and NW-NW-SE of Sec. 12-25S-21E. These locations are strike wells to No. 9 Woodward and No. 8 Woodward respectively and slightly toward thicker sand to account for the curvature of the bar system.

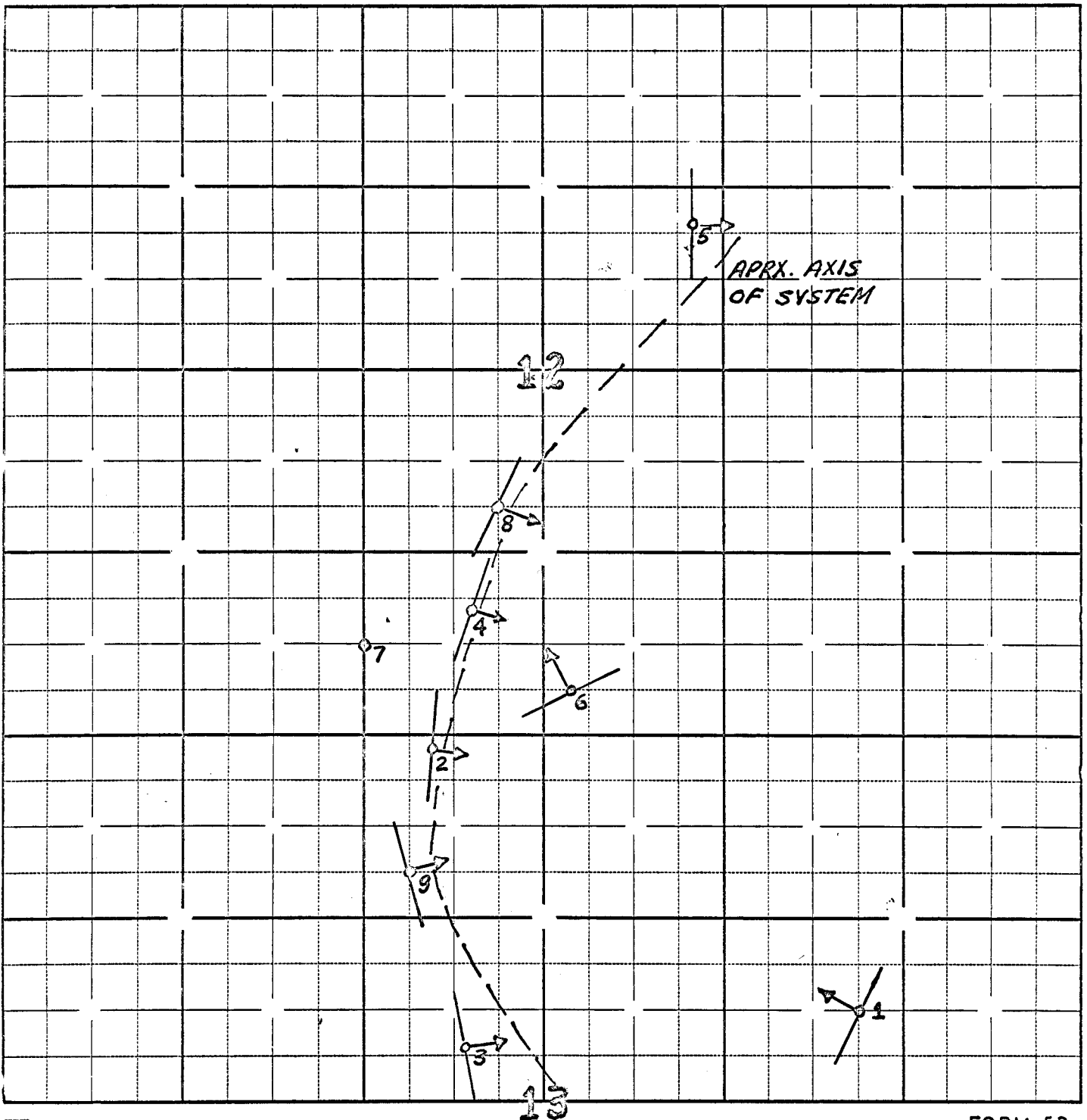
The interpretations of Dipmeter logs and the geological conclusions which are discussed in this report represent our best judgment. Nevertheless, since all interpretations and the conclusions reached are based on inferences from electrical and other measurements, as well as geological data which necessarily includes the consideration of some unproven factors, we must advise you that we cannot and do not guarantee their accuracy or correctness and shall not be liable or responsible, except in the case of willful negligence on our part, for any loss, costs, damages or expenses that may be incurred or sustained from such interpretations or the geological conclusions set out in this report.

Thank you for calling Schlumberger on these wells. If we can be of further assistance, please feel free to call on us at any time.


Sam Fain

Township 25S, Range 21E, County BOURBON, State KANSAS

NUMBERS ARE WELL NO.
ARROWS INDICATE SAND THICKENING DIRECTION
LINES INDICATE SAND STRIKE DIRECTION



JOB NO. 514

SCHLUMBERGER WELL SURVEYING CORPORATION
CONTINUOUS DIPMETER CALCULATIONS

CRA, INC.
WOODWARD NO. 9
BOURBON COUNTY, KANSAS

DEPTH	DIP	DIP AZM	DIP BRG	DEV	DEV AZM
401	3.3	253	S 73 W	0.0	73
403	6.1	189	S 9 W	0.0	78
405	3.3	318	N 42 W	0.0	78
407	4.4	318	N 42 W	0.0	78
408	3.2	263	S 83 W	0.0	83
410	1.1	143	S 37 E	0.0	83
411	3.2	26	N 26 E	0.0	86
413	3.9	342	N 18 W	0.0	88
417	1.9	353	N 7 W	0.0	83
419	2.8	4	N 4 E	0.0	83
421	1.9	293	N 67 W	0.0	83
423	1.1	263	S 83 W	0.0	83
425	1.1	143	S 37 E	0.0	83
427	2.2	323	N 37 W	0.0	83
428	1.9	288	N 72 W	0.0	78
429	1.9	293	N 67 W	0.0	83
431	1.1	23	N 23 E	0.0	83
433	0.0			0.0	78
434	1.1	78	N 78 E	0.0	78
437	1.1	68	N 68 E	0.0	68
439	2.8	37	N 37 E	0.0	78
441	2.8	359	N 1 W	0.0	78
443	1.1	78	N 78 E	0.0	78
445	4.7	55	N 55 E	0.0	78
447	2.8	44	N 44 E	0.0	63
449	1.1	108	S 72 E	0.0	48
450	2.2	48	N 48 E	0.0	48
451	5.7	187	S 7 W	0.0	48
454	1.9	198	S 18 W	0.0	48
457	5.0	239	S 59 W	0.0	48
458	4.7	251	S 71 W	0.0	48
459	5.0	157	S 23 E	0.0	48
461	2.9	245	S 65 W	0.0	46
463	1.9	318	N 42 W	0.0	48
464	1.1	348	N 12 W	0.0	48
465	2.9	307	N 53 W	0.0	48
466	1.9	318	N 42 W	0.0	48
468	2.2	288	N 72 W	0.0	48
469	2.2	228	S 48 W	0.0	48
471	1.9	198	S 18 W	0.0	48
473	8.9	336	N 24 W	0.0	48
475	5.4	348	N 12 W	0.0	48

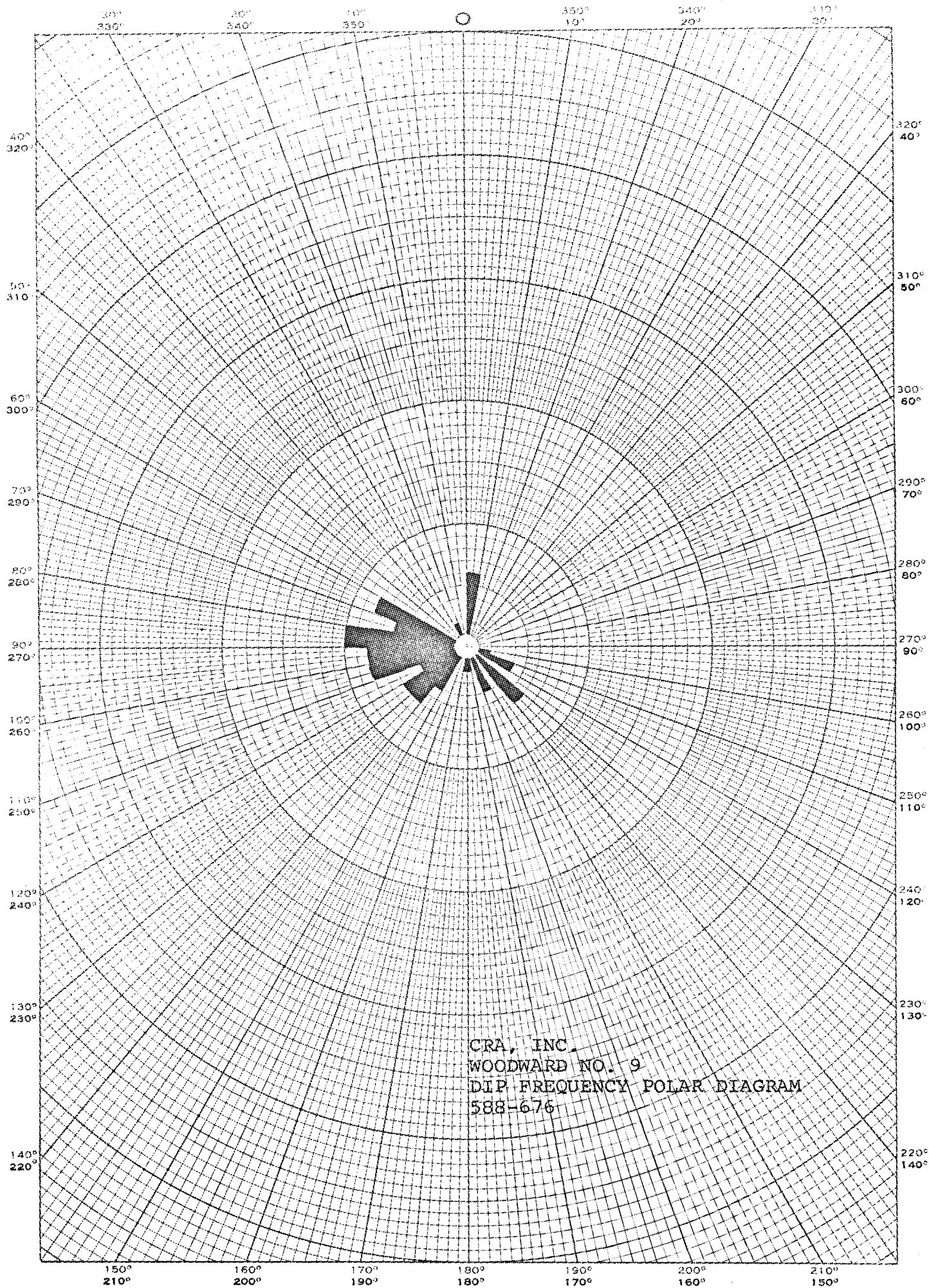
479	3.8	318	N 42 W	0.0	48
481	3.3	288	N 72 W	0.0	48
483	6.5	288	N 72 W	0.0	48
485	6.9	324	N 36 W	0.0	38
489	14.4	298	N 62 W	0.0	43
492	1.1	43	N 43 E	0.0	43
494	5.0	354	N 6 W	0.0	43
495	3.9	329	N 31 W	0.0	43
497	1.9	313	N 47 W	0.0	43
499	3.9	329	N 31 W	0.0	43
501	5.0	349	N 11 W	0.0	38
503	1.1	343	N 17 W	0.0	43
504	1.9	13	N 13 E	0.0	43
507	3.9	324	N 36 W	0.0	38
509	1.1	338	N 22 W	0.0	38
511	1.9	68	N 68 E	0.0	38
512	1.9	8	N 8 E	0.0	38
513	1.9	66	N 66 E	0.0	36
515	1.1	333	N 27 W	0.0	33
517	3.3	328	N 32 W	0.0	28
519	2.9	9	N 9 E	0.0	28
520	2.9	9	N 9 E	0.0	28
521	1.1	28	N 28 E	0.0	28
523	1.1	28	N 28 E	0.0	28
525	2.2	328	N 32 W	0.0	28
527	2.2	28	N 28 E	0.0	28
529	1.1	328	N 32 W	0.0	28
530	0.0			0.0	28
532	1.9	358	N 2 W	0.0	28
534	1.1	28	N 28 E	0.0	28
536	5.0	339	N 21 W	0.0	28
537	2.2	328	N 32 W	0.0	28
539	1.9	298	N 62 W	0.0	28
541	2.9	287	N 73 W	0.0	28
543	3.3	268	S 88 W	0.0	28
545	2.9	42	N 42 E	0.0	23
546	1.1	23	N 23 E	0.0	23
547	1.1	83	N 83 E	0.0	23
549	0.0			0.0	23
553	1.9	53	N 53 E	0.0	23
555	2.2	83	N 83 E	0.0	23
556	1.9	108	S 72 E	0.0	18
557	1.9	108	S 72 E	0.0	18
559	1.9	353	N 7 W	0.0	23
563	3.8	108	S 72 E	0.0	18
565	0.0			0.0	18
567	1.1	18	N 18 E	0.0	18
568	1.1	78	N 78 E	0.0	18
570	3.3	258	S 78 W	0.0	18
572	2.9	234	S 54 W	0.0	13
573	2.2	308	N 52 W	0.0	8
575	1.9	278	N 82 W	0.0	8
577	1.1	308	N 52 W	0.0	8
580	2.2	308	N 52 W	0.0	8
581	1.9	278	N 82 W	0.0	8
583	1.9	278	N 82 W	0.0	8
584	2.2	68	N 68 E	0.0	8

585	2.9	109	S 71 E	0.0	8
587	1.1	68	N 68 E	0.0	8
588	2.9	54	N 54 E	0.0	13
591	2.2	8	N 8 E	0.0	8
592	2.2	8	N 8 E	0.0	8
594	1.1	8	N 8 E	0.0	8
595	3.9	294	N 66 W	0.0	8
597	5.4	248	S 68 W	0.0	8
599	4.7	211	S 31 W	0.0	8
603	3.9	284	N 76 W	0.0	358
605	4.7	270	W	0.0	353
607	0.0			0.0	338
609	2.9	237	S 57 W	0.0	338
610	2.9	230	S 50 W	0.0	331
611	3.8	238	S 58 W	0.0	328
613	5.7	298	N 62 W	0.0	328
615	7.5	298	N 62 W	0.0	328
617	6.6	298	N 62 W	0.0	333
621	8.2	278	N 82 W	0.0	331
623	8.2	278	N 82 W	0.0	331
625	6.8	257	S 77 W	0.0	333
627	6.1	264	S 84 W	0.0	333
629	9.3	274	N 86 W	0.0	328
633	6.1	259	S 79 W	0.0	328
635	15.4	282	N 78 W	0.0	328
637	12.1	277	N 83 W	0.0	328
639	12.0	268	S 88 W	0.0	328
640	8.3	261	S 81 W	0.0	328
641	5.5	268	S 88 W	0.0	328
643	4.8	245	S 65 W	0.0	328
645	4.0	222	S 42 W	0.0	328
646	2.9	189	S 9 W	0.0	328
647	5.1	257	S 77 W	0.0	328
649	4.0	254	S 74 W	0.0	328
653	1.1	218	S 38 W	0.0	278
655	6.9	139	S 41 E	0.0	243
657	7.2	110	S 70 E	0.0	238
658	5.1	102	S 78 E	0.0	233
659	4.0	224	S 44 W	0.0	238
662	2.2	113	S 67 E	0.0	233
664	3.8	138	S 42 E	0.0	228
665	6.9	142	S 38 E	0.0	218
667	8.8	148	S 32 E	0.0	208
669	4.8	171	S 9 E	0.0	208
671	1.9	228	S 48 W	0.0	198
672	3.8	288	N 72 W	0.0	198
673	3.8	168	S 12 E	0.0	198
674	2.2	138	S 42 E	0.0	198
676	8.7	332	N 28 W	0.0	193
679	2.9	332	N 28 W	0.0	193
681	2.2	238	S 58 W	0.0	178
683	3.8	258	S 78 W	0.0	168
684	4.4	288	N 72 W	0.0	168
685	1.1	108	S 72 E	0.0	168
687	1.1	223	S 43 W	0.0	163
688	3.8	133	S 47 E	0.0	163
689	4.8	66	N 66 E	0.0	163

691	4.0	57	N	57	E	0.0	163
692	5.8	62	N	62	E	0.0	163
693	3.3	43	N	43	E	0.0	163
695	3.8	188	S	8	W	0.0	158
697	4.0	239	S	59	W	0.0	133
698	1.1	193	S	13	W	0.0	133
699	2.2	73	N	73	E	0.0	133
701	2.2	73	N	73	E	0.0	133
702	0.0					0.0	138
703	2.2	198	S	18	W	0.0	138
705	1.9	113	S	67	E	0.0	143
707	4.4	83	N	83	E	0.0	143
709	3.3	59	N	59	E	0.0	138
711	3.3	73	N	73	E	0.0	133
712	3.8	103	S	77	E	0.0	133
713	3.3	133	S	47	E	0.0	133
714	3.8	103	S	77	E	0.0	133

EUGENE DIETZEN CO.
MADE IN U. S. A.

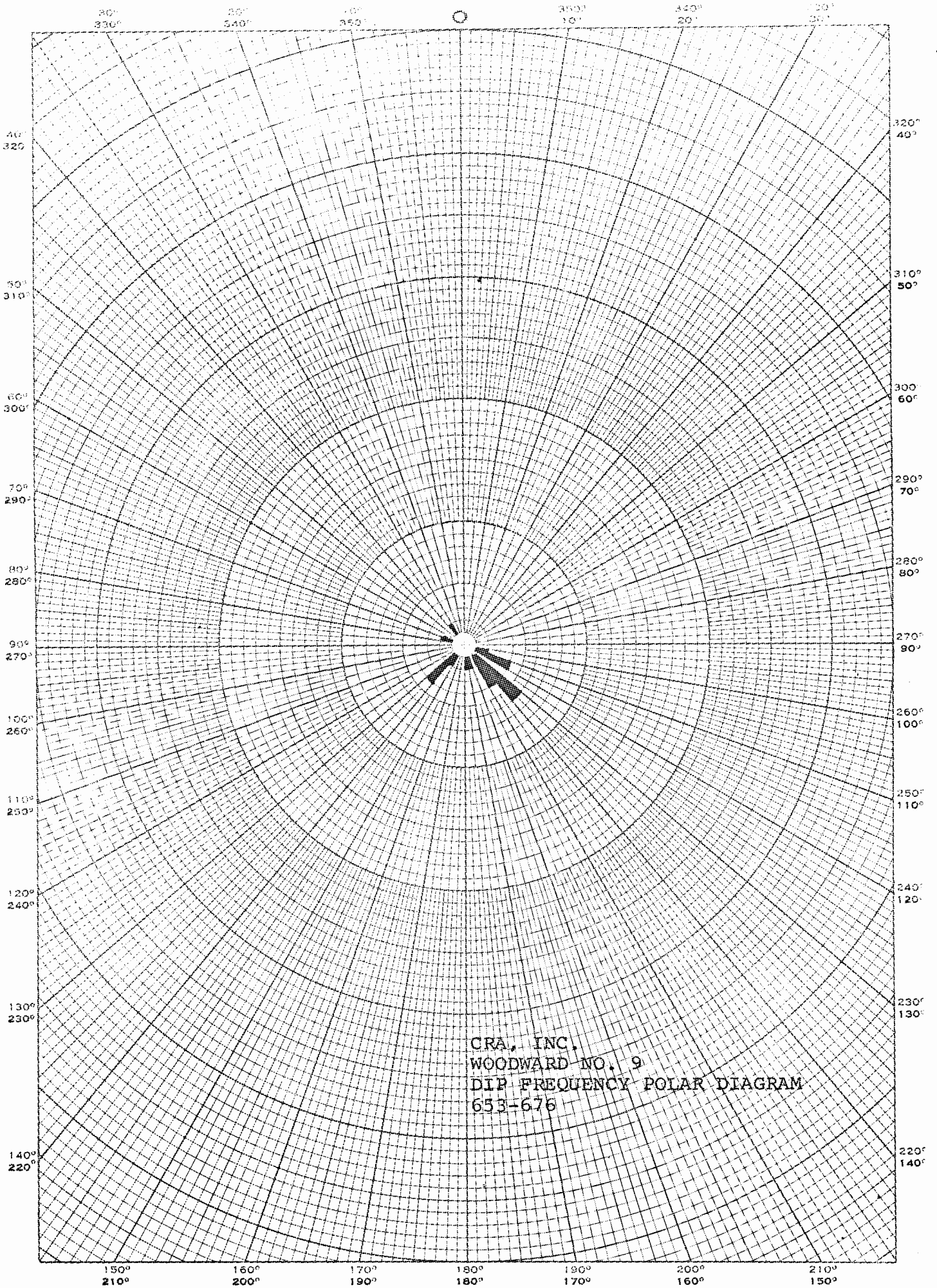
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