

SEP 1 1966



CRA, INC.

WOODWARD NO. 13, 15, 16, 18, 19, & 27-I

DIPMETER REPORT

BRONSON Field

Computer Inventoried



# SCHLUMBERGER WELL SERVICES

A DIVISION OF SCHLUMBERGER TECHNOLOGY CORPORATION

8000 GULF FREEWAY P. O. BOX 2175 HOUSTON, TEXAS 77001

August 25, 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 Wells Nos. 13, 15, 16, 18, 19, and 27-I, Bourbon County, Kansas. 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 discussed below.

Originally we had called the Bartlesville Sand in wells No. 2, 4, 8, and 9 a bar sand because the geometry derived from the dipmeters on them described a curved upper surface. It now appears the Bartlesville Sand in all of the Woodward wells has both a curved upper and lower surface. The dipmeter data on Wells 13, 15, 16, 18, 19, and 27-I all describe the sand as a channel cut and fill system with a curved upper surface. The strike information derived is valid whether the sand system is a bar type or channel cut and fill system. The direction toward thickening sand will vary 180 degrees if the wrong assumption is made. Subsequent drilling has proved that this is a channel cut and fill system.

The following strike and direction of sand thickening were derived assuming the system is a channel cut and fill:

Woodward No. 13 strikes N20W-S20E and thickens S70W.

Woodward No. 15 strikes N10W-S10E and thickens S80W.

Woodward No. 16 strikes N20E-S20W and thickens N70W.

Woodward No. 18 strikes N20E-S20W and thickens N70W.

Woodward No. 19 strikes N20E-S20W and thickens S70E.

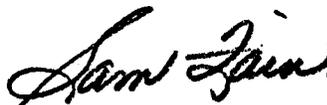
Woodward No. 27-I strikes N20E-S20W and thickens S70E.

Further development should be along a strike direction of N20E.

August 25, 1966

The interpretation 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.

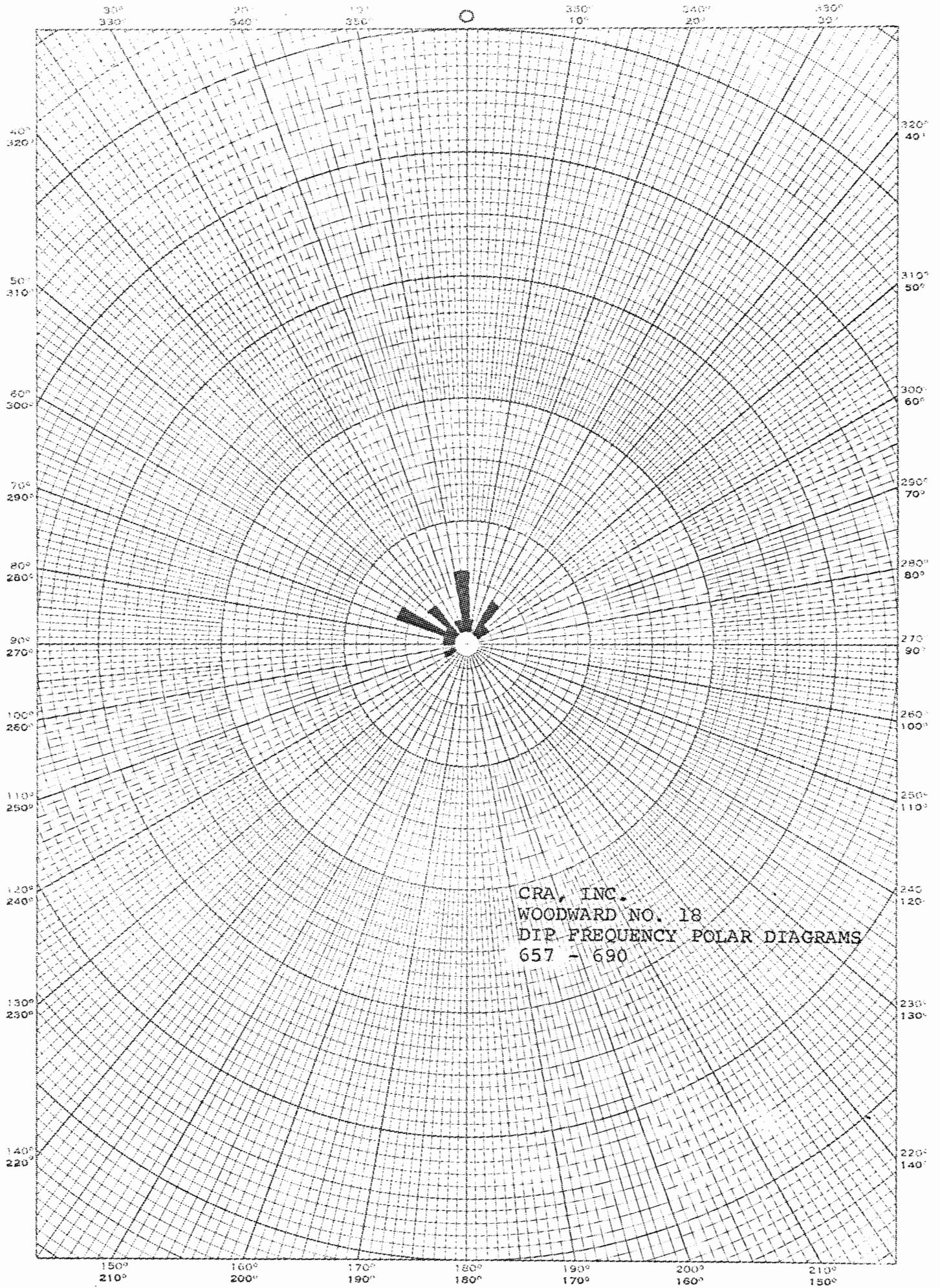


Sam Fain

SF:ep

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

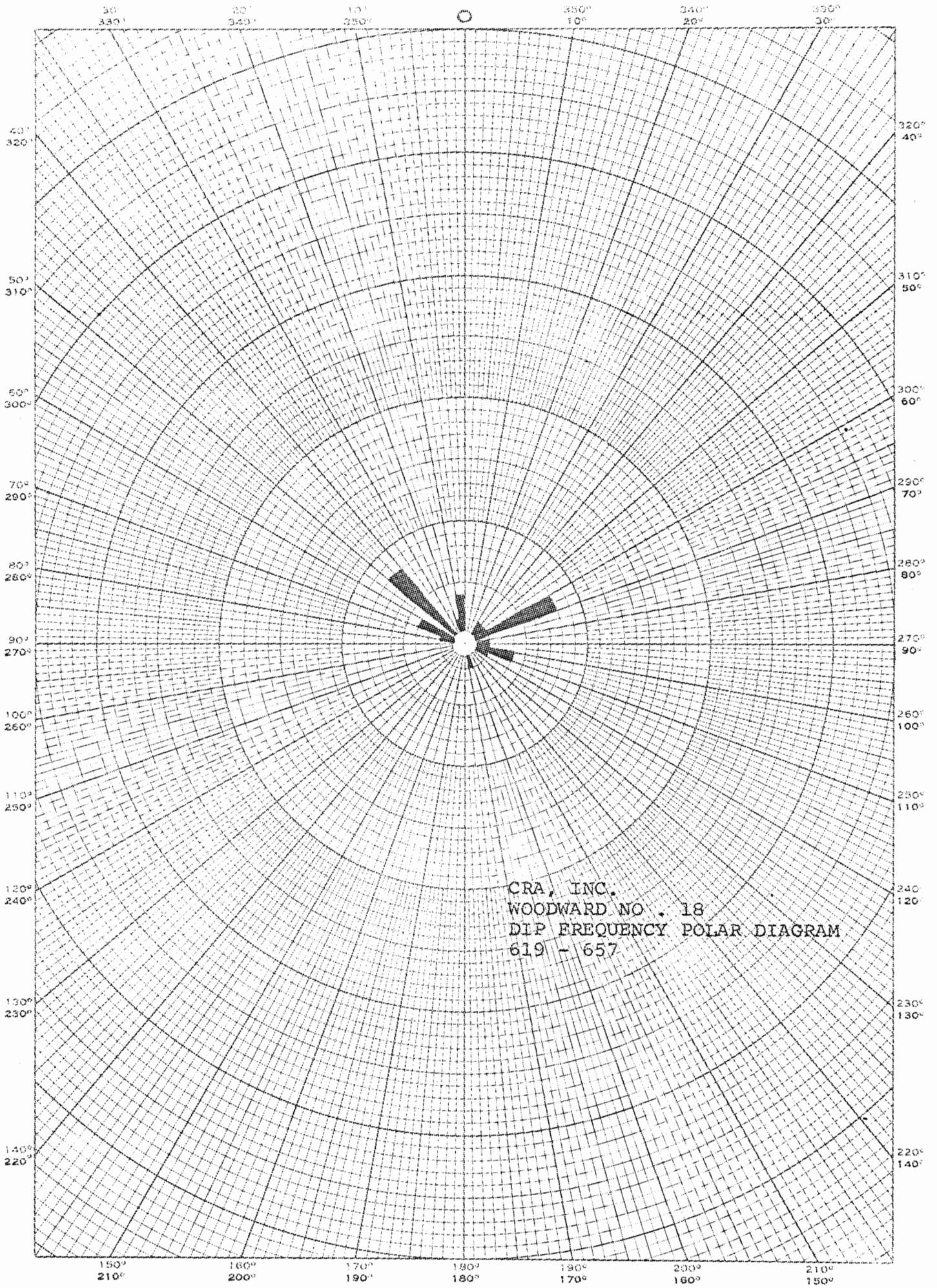
NO. 340-E DIETZEN GRAPH PAPER  
POLAR CO-ORDINATE



CRA, INC.  
WOODWARD NO. 18  
DIP FREQUENCY POLAR DIAGRAMS  
657 - 690

C. E. DIETZSEN GRAPHIC CO.  
MADE IN U. S. A.

C. E. DIETZSEN GRAPHIC CO.  
POLAR CO-ORDINATE



CRA, INC.  
WOODWARD NO. 18  
DIP FREQUENCY POLAR DIAGRAM  
619 - 657

JOB NO. 60

SCHLUMBERGER WELL SURVEYING CORPORATION  
CONTINUOUS DIPMETER CALCULATIONS

CRA, INC.  
WOODWARD NO. 18  
BOURBON COUNTY, KANSAS

DEPT	DIP	DIP AZM	DIP BRG	DEV	DEV AZM
403	3.2	122	S 58 E	0.8	28
405	4.1	133	S 47 E	0.8	28
406	3.4	160	S 20 E	0.8	23
407	2.8	178	S 2 E	0.8	28
409	7.0	344	N 16 W	0.8	23
410	7.8	30	N 30 E	0.8	18
411	5.4	354	N 6 W	0.7	23
413	2.7	103	S 77 F	0.7	23
414	1.6	59	N 59 F	0.7	23
415	0.5			0.7	23
416	0.5			0.7	23
417	1.2	15	N 15 E	0.7	23
418	1.7	184	S 4 W	0.7	28
419	2.8	174	S 6 E	0.7	18
421	1.4	92	S 88 E	0.7	33
423	0.5			0.6	33
424	2.1	145	S 35 E	0.6	28
425	2.0	114	S 66 E	0.6	33
427	1.6	28	N 28 E	0.6	28
428	4.4	197	S 17 W	0.6	33
429	2.5	160	S 20 E	0.6	30
430	1.5	241	S 61 W	0.6	21
431	1.4	334	N 26 W	0.6	23
432	1.6	16	N 16 E	0.6	23
433	2.3	39	N 39 E	0.6	28
434	0.5			0.6	28
436	1.6	14	N 14 E	0.6	28
437	0.6	208	S 28 W	0.6	28
439	0.5			0.6	23
441	1.3	59	N 59 E	0.6	23
443	2.1	42	N 42 E	0.7	23
445	0.9	123	S 57 E	0.7	23
448	3.2	75	N 75 E	0.6	28
449	1.4	84	N 84 E	0.6	28
451	1.6	47	N 47 E	0.6	13
453	2.4	90	E	0.6	28
456	2.2	60	N 60 E	0.6	36
457	1.6	41	N 41 E	0.5	28
459	0.6	50	N 50 E	0.5	23
461	9.5	124	S 56 E	0.5	28
462	11.7	114	S 66 E	0.5	18
464	5.2	238	S 58 W	0.5	28
465	3.2	252	S 72 W	0.5	28

466	2.2	238	S	58	W	0.5	18
467	5.2	238	S	58	W	0.5	28
471	7.5	248	S	68	W	0.0	158
472	3.3	216	S	38	W	0.0	158
473	3.3	278	N	82	W	0.0	158
474	2.9	79	N	79	E	0.0	158
475	1.1	98	S	82	E	0.0	158
476	1.1	153	S	27	E	0.0	153
477	1.9	63	N	63	E	0.0	153
478	1.9	303	N	57	W	0.0	153
479	1.1	273	N	87	W	0.0	153
480	2.2	33	N	33	E	0.0	153
483	29.4	288	N	72	W	0.0	153
486	5.8	297	N	63	W	0.0	158
487	5.7	308	N	52	W	0.0	158
488	3.9	292	N	68	W	0.0	158
489	5.7	248	S	68	W	0.0	158
491	7.6	120	S	60	E	0.0	158
493	5.8	57	N	57	E	0.0	158
495	3.3	213	S	33	W	0.0	153
498	7.6	71	N	71	E	0.0	153
499	1.9	303	N	57	W	0.0	153
501	3.3	213	S	33	W	0.0	153
503	1.1	28	N	28	E	0.0	148
505	2.9	42	N	42	E	0.0	143
506	1.1	78	N	78	E	0.0	138
507	1.9	48	N	48	E	0.0	138
508	2.2	78	N	78	E	0.0	138
511	2.9	32	N	32	E	0.0	133
512	9.9	60	N	60	E	0.0	131
515	1.1	71	N	71	E	0.0	131
517	3.9	54	N	54	E	0.0	128
518	1.9	38	N	38	E	0.0	128
519	2.9	49	N	49	E	0.0	128
520	3.3	68	N	68	E	0.0	128
521	3.9	54	N	54	E	0.0	128
523	3.9	52	N	52	E	0.0	126
525	2.9	39	N	39	E	0.0	118
527	2.2	53	N	53	E	0.0	113
528	2.9	29	N	29	E	0.0	108
529	2.9	2	N	2	E	0.0	103
531	2.9	57	N	57	E	0.0	98
533	2.2	31	N	31	E	0.0	91
535	2.2	28	N	28	E	0.0	88
537	1.9	348	N	12	W	0.0	78
539	3.9	4	N	4	E	0.0	78
541	2.9	359	N	1	W	0.0	78
543	1.1	8	N	8	E	0.0	68
544	2.2	8	N	8	E	0.0	68
545	1.9	333	N	27	W	0.0	63
546	1.9	328	N	32	W	0.0	58
547	1.1	358	N	2	W	0.0	58
549	1.9	28	N	28	E	0.0	58
551	1.1	351	N	9	W	0.0	51
555	3.3	348	N	12	W	0.0	48
557	1.1	43	N	43	E	0.0	43
559	1.9	13	N	13	E	0.0	43

560	3.3	43	N	43	E	0.0	43
562	3.9	350	N	10	W	0.0	36
563	3.3	328	N	32	W	0.0	28
564	6.1	309	N	51	W	0.0	18
565	5.0	307	N	53	W	0.0	18
566	3.9	332	N	28	W	0.0	18
568	6.0	309	N	51	W	0.0	18
569	3.9	272	N	88	W	0.0	18
571	3.9	282	N	78	W	0.0	28
573	2.2	338	N	22	W	0.0	38
575	3.3	106	S	74	E	0.0	46
577	1.9	138	S	42	E	0.0	48
578	1.1	228	S	48	W	0.0	48
579	3.3	288	N	72	W	0.0	48
580	1.1	343	N	17	W	0.0	43
582	2.2	338	N	27	W	0.0	38
583	1.1	38	N	38	E	0.0	38
584	1.9	8	N	8	E	0.0	38
586	5.4	338	N	22	W	0.0	38
587	3.3	338	N	22	W	0.0	38
588	2.2	338	N	22	W	0.0	38
589	2.2	338	N	22	W	0.0	38
590	2.9	327	N	33	W	0.0	46
591	1.9	16	N	16	E	0.0	46
592	3.3	346	N	14	W	0.0	46
593	1.9	18	N	18	E	0.0	48
595	9.3	114	S	66	E	0.0	48
597	6.8	124	S	56	E	0.0	48
599	14.0	165	S	15	E	0.0	53
601	2.9	72	N	72	E	0.0	53
602	2.9	72	N	72	E	0.0	53
603	1.9	203	S	23	W	0.0	53
604	2.2	173	S	7	E	0.0	53
605	3.9	217	S	37	W	0.0	51
606	7.6	231	S	51	W	0.0	51
607	5.1	220	S	40	W	0.0	51
609	10.1	168	S	12	E	0.0	53
611	13.4	309	N	51	W	0.0	53
613	12.6	359	N	1	W	0.0	63
615	7.9	349	N	11	W	0.0	63
619	7.7	48	N	48	E	0.0	48
620	5.5	51	N	51	E	0.0	51
625	15.1	95	S	85	E	0.0	53
627	16.4	100	S	80	E	0.0	53
629	21.5	103	S	77	E	0.0	58
633	20.4	81	N	81	E	0.0	78
635	17.0	64	N	64	E	0.0	58
637	5.1	69	N	69	E	0.0	58
639	5.4	353	N	7	W	0.0	53
640	5.0	64	N	64	E	0.0	53
641	6.9	37	N	37	E	0.0	53
642	4.0	67	N	67	E	0.0	53
643	2.2	113	S	67	E	0.0	53
645	1.1	351	N	9	W	0.0	51
646	1.9	318	N	42	W	0.0	48
647	3.8	318	N	42	W	0.0	48
648	1.1	163	S	17	E	0.0	43

649	1.9	313	N 47 W	0.0	43
651	4.0	297	N 63 W	0.0	43
652	3.8	313	N 47 W	0.0	43
653	1.1	346	N 14 W	0.0	46
655	4.4	283	N 77 W	0.0	43
656	4.0	297	N 63 W	0.0	43
657	4.6	338	N 22 W	0.0	38
658	2.2	38	N 38 E	0.0	38
659	3.4	8	N 8 E	0.0	8
660	3.0	314	N 46 W	0.0	333
663	1.9	298	N 62 W	0.0	328
664	1.9	358	N 2 W	0.0	328
665	1.9	358	N 2 W	0.0	328
667	3.0	309	N 51 W	0.0	328
675	2.9	32	N 32 E	0.0	313
677	2.2	58	N 58 F	0.0	298
679	1.1	298	N 62 W	0.0	298
681	1.1	351	N 9 W	0.0	291
683	1.1	48	N 48 E	0.0	288
684	1.1	348	N 12 W	0.0	288
685	1.9	316	N 44 W	0.0	286
686	11.1	296	N 64 W	0.0	286
687	4.0	274	N 86 W	0.0	288
688	3.3	288	N 72 W	0.0	288
690	4.0	240	S 60 W	0.0	286
691	1.9	198	S 18 W	0.0	288
693	0.0			0.0	286
694	1.1	46	N 46 E	0.0	286
695	2.2	283	N 77 W	0.0	283
696	3.3	223	S 43 W	0.0	283
697	2.2	226	S 46 W	0.0	286
699	4.0	214	S 34 W	0.0	288
701	9.8	228	S 48 W	0.0	288
703	1.1	48	N 48 E	0.0	288
704	2.9	247	S 67 W	0.0	288
705	1.1	288	N 72 W	0.0	288
706	1.1	288	N 72 W	0.0	288
707	4.4	228	S 48 W	0.0	288
711	2.9	247	S 67 W	0.0	288
713	2.9	247	S 67 W	0.0	288
715	4.8	265	S 85 W	0.0	288
717	2.9	269	S 89 W	0.0	288
718	1.9	198	S 18 W	0.0	288
719	2.9	327	N 33 W	0.0	286
720	5.9	327	N 33 W	0.0	286