

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Data Report for Two Seismic-Refraction Profiles Crossing the
Epicentral Region of the 1983 Coalinga, California Earthquakes

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Open-File Report 84-643

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

1. USGS, Menlo Park, California

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INTRODUCTION

Shortly after the May 2, 1983, $M_s=6.5$ earthquake near Coalinga, CA, the U.S. Geological Survey conducted a seismic refraction experiment in the area. The objective of the survey was to derive a detailed velocity model of the upper crust in this region. Such a model would provide further information on the geologic structure of the Coalinga area, as well as provide improved constraints for determining earthquake and aftershock hypocenters.

Two seismic refraction profiles intersecting in the epicentral region of the Coalinga earthquake aftershocks (Figure 1 and Plate 1) were recorded in May and June of 1983. An east-west trending profile extended from the Diablo Range west of Coalinga, across the source region of the aftershocks, and into the San Joaquin Valley near the town of Lemoore, CA. A northwest-southeast trending profile extended from the Diablo Range north of Coalinga, across the source region, and southward along the western edge of the San Joaquin Valley to a point 20 km west of the town of Lost Hills, CA. Figure 1 shows the location of these profiles in relation to the local geology. The geologic setting and a preliminary interpretation of this data are presented by Walter and Mooney (1983).

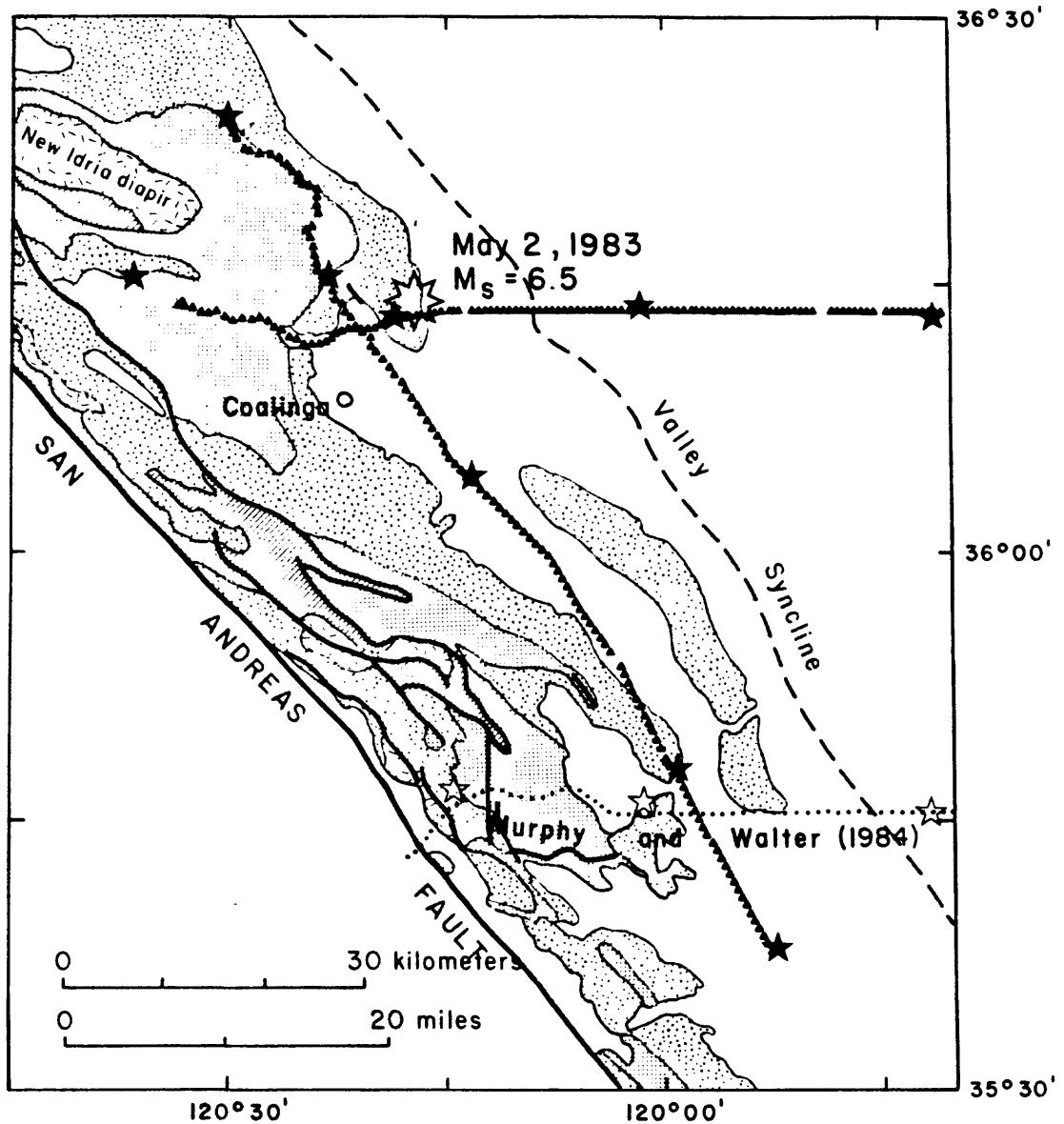
This report is a compilation of the data obtained from the 1983 seismic refraction surveys. A detailed interpretation of this data will be published separately.

DESCRIPTION OF SURVEY

The 1983 Coalinga seismic refraction data supplement seismic refraction data reported by Murphy and Walter (1984) for a survey conducted between Morro Bay, CA and the foothills of the Sierra-Nevada. The Morro Bay refraction survey includes two end-to-end profiles along which eight shotpoints are distributed. The northwest-southeast (NW-SE) Coalinga profile intersects the Morro Bay line at a point 59 km south east of the east-west (E-W) Coalinga profile (Figure 1).

For the E-W Coalinga profile, one-hundred and twenty seismic recorders were deployed along an 83-km long line with shots fired at 4 shotpoint locations (SP 9-12, see Plate 1 and Table 1). For the NW-SE profile, these same instruments were deployed along an 103-km long line with shots fired at 5 shotpoint locations (SP 13-17, see Plate 1 and Table 1). The instrument and shot point locations and elevations were determined to an accuracy of 15 m using USGS 1:24000 topographic maps (Appendix A, Table 1). The shot point number refers to the location of the shot, whereas the shot number refers to the time sequence of the shot. This numbering system is useful for cases where the same shotpoint is fired twice.

The nine shot holes were 20 cm in diameter and had a typical depth of 45 m. The holes were loaded with 2000 to 3200 pounds of ammonium nitrate explosive. The shots were fired automatically by a shooting system described by Healy and others (1982). A signal from a reference clock triggered the



Explanation

- Quaternary and Pleistocene and (or) Pliocene sediments
- Tertiary sedimentary rocks
- Mesozoic Great Valley sequence
- Mesozoic Franciscan assemblage
- Mesozoic ultramafic rocks

Fault

Shotpoint

Seismic recorder location

Fig. 1. Map of the geography and the shotpoint and station locations along the U.S.G.S. Coalinga refraction profiles.

shooting system to fire an electric blasting cap. The cap break, WWVB time code, and the reference clock's IRIG E time code were recorded by a paper strip chart recorder. The cap break was assumed to be instantaneous with the shot detonation; the shot times are accurate to within ± 2 milliseconds. Table 1 lists the time, location, and the amount of explosive loaded (when available) for each shot.

INSTRUMENTATION AND DATA REDUCTION

Seismic Recorders

Each instrument (Healy and others, 1982) contains a 2-hz vertical component geophone. The signal from the geophone is sent through three parallel amplifiers, each with an adjustable gain setting. The three amplified seismic signals, a fixed reference frequency, and a frequency modulated, internally generated time code are recorded as a multiplexed signal in analog form on a cassette tape (Figure 2). Each instrument contains a USGS time code generator (clock) with a memory board that can be programmed for up to ten separate recording times. The response curve for the system peaks at about 20 hz (Figure 3). The instruments are powered by two 6-volt rechargeable batteries.

Before each deployment, field technicians program the recording times and synchronize the clock unit of each instrument with a master reference clock, the same type of clock that triggers the shooting system. After the instruments are retrieved, the clock drift for each instrument is measured relative to the master clock and recorded on data sheets. The master clock, which drifts approximately 1 millisecond a week, is synchronized to a Rubidium standard reference at the USGS Western Regional Headquarters in Menlo Park, CA. The Rubidium clock, accurate to 10^{-10} parts per unit time, is periodically set to an averaged WWVB reference signal.

Data Reduction

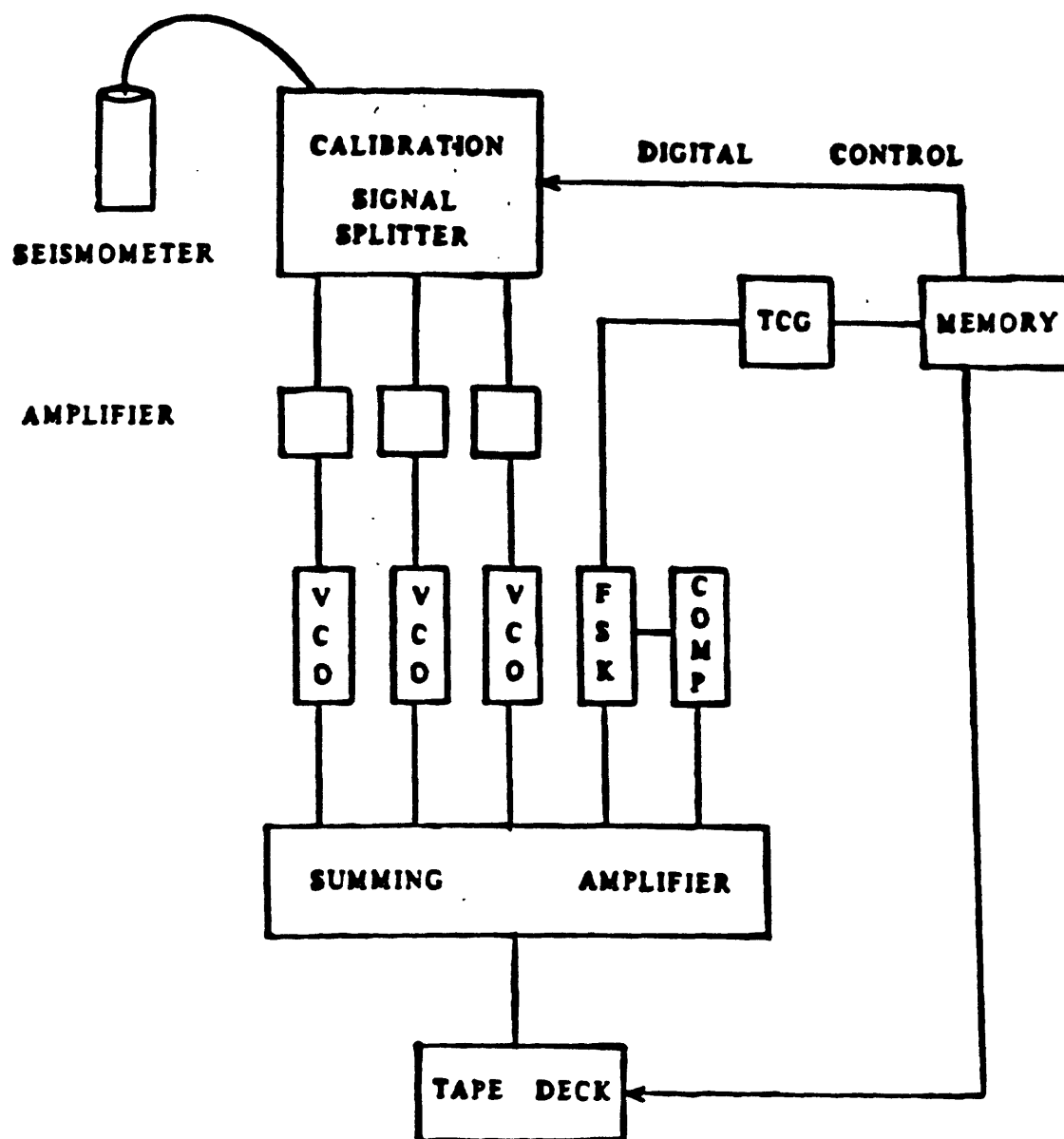
Field technicians complete instrument data sheets that include information on instrument location, amplifier gain settings, clock drifts, and instrument performance. This information is entered into a micro-computer and stored on a floppy disk (Appendix B).

After the instrument and shot data are entered into the computer, the analog seismic data recorded on each cassette are digitized using a micro-computer system. For each shot, the data are digitized for 20 seconds, starting T seconds after shot time:

$$T \text{ (seconds)} = X/6 - 2$$

where X equals the distance between the shot point and the seismic recorder in kilometers. The seismic data are digitized at a sampling rate of 200 samples/sec and are written to floppy disks.

After the seismic data are digitized, the traces are evaluated for data quality. A tape grade code is assigned to each trace (Appendix B). Traces are usually deleted from the record sections where a very large background noise level results in a low signal-to-noise ratio. The final version of digitized data is archived on 9-track magnetic tape.



COMP = COMPENSATION
 FSK = FREQUENCY SHIFT KEYING
 TCG = TIME CODE GENERATOR
 VCO = VOLTAGE-CONTROLLED OSCILLATOR

Figure 2. Schematic diagram of seismic recorders

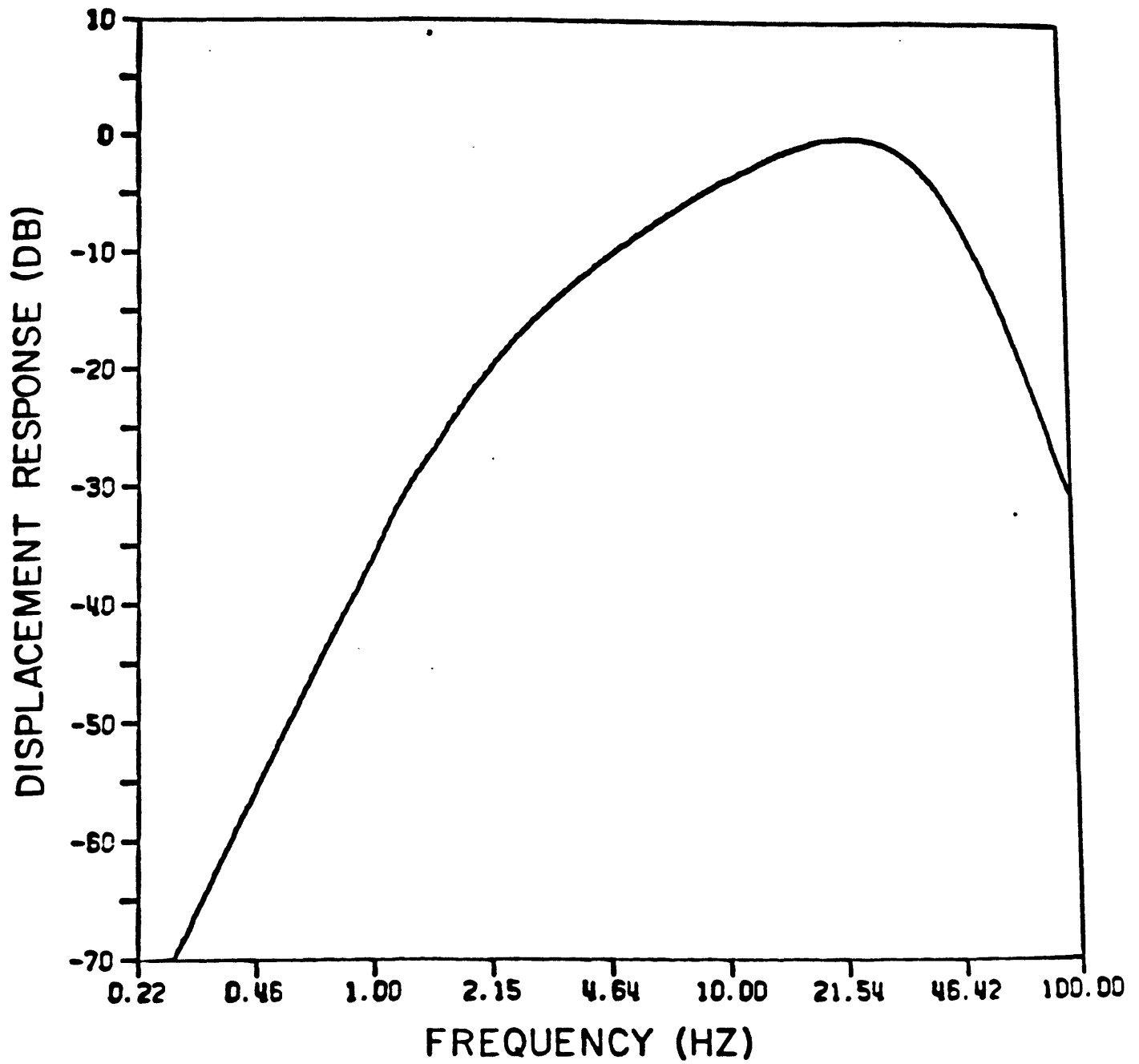


Figure 3. System response curve for cassette recording units with 2 Hz seismometers

First arrival times (Appendix C) are determined by plotting the seismic traces on a computer graphics terminal. Computer generated crosshairs are used to pick the arrival time on each trace. For clear, impulsive first arrivals the times are picked with 10 ms accuracy, but the uncertainty may be as great as 50 ms for more emergent arrivals.

RECORD SECTIONS

The record sections for each shot are presented on Plates 2-10. For each shot, a normalized and a true-amplitude record section are shown. The record sections are plotted with the time reduced by a velocity of 6.0 km/sec; i.e. the time shown for each trace is defined as:

$$T - X/6$$

where T is the absolute elapsed time (seconds) from the shot instant and X is the shot-to-receiver distance (km). Negative distances indicate instrument locations west of the shotpoint on the E-W line, and SE on the NW-SE line. Each record section is plotted at a scale of 5 mm/km for the distance axis and 25 mm/sec for the time axis. The normalized traces are plotted with a uniform maximum amplitude of 7.5 mm.

For the true-amplitude record sections, the width of each trace represents its actual amplitude after adjustments for instrument gain, distance from the shot point, and shot efficiency. The true amplitude $A(t)$ is computed from the observed amplitude $A_0(t)$ by

$$A(t) = A_0(t)f_a f_d f_s$$

where f_a , f_d , and f_s are multiplicative factors adjusting for the instrument amplifier gain, distance from the shot, and shot efficiency, respectively.

The multiplication factor for amplification is:

$$f_a = 10(\text{dB}/20)$$

where dB is the gain attenuator setting of the selected channel in decibels for each trace. The multiplication factor for distance is:

$$f_d = (\text{Shot-receiver distance})^2$$

The shot efficiency factor, f_s , is an arbitrary scalar multiplier that is inversely proportional to the signal strength of each shot. An optimum value of f_s is one that clearly shows the relative amplitudes of the traces on the true amplitude record sections. The values of f_s chosen for this report are included in Table 1.

Some trace amplitudes were extremely high due to excessive cultural noise, causing these traces to overlap adjacent traces on the true amplitude record sections. Other trace amplitudes were unrealistically low on the true amplitude record sections because of a seismic recorder amplifier problem.

All of these traces were deleted from the true amplitude plots but retained for the normalized plots. There were also cases where a trace was distorted by relatively high frequency noise (30 hz or greater). These traces were left unfiltered on the true amplitude record sections, but were filtered on the normalized record sections using a 1-15 hz bandpass filter. The tape grade code (Appendix B) indicates which traces were affected by the above circumstances.

The signal-to-noise ratio of the data is affected by cultural noise at the recorder sites and by how well the shot energy coupled with the ground at the shotpoint. The signal-to-noise ratio is particularly low for SP 11 (Plate 4) and SP 17 (Plate 7) due possibly to poor shot-ground coupling or incomplete detonation of the explosive. The shot signal rapidly disappears into the background noise past 23 km east of SP 11; no traces beyond 36 km east of SP 11 are plotted. For the SP 17 record sections the shot signal can be seen to only 25 km NW of SP 17. No traces past 50 km NW of SP 17 are plotted on the true amplitude record section due to high noise levels. On the SP 10 record sections (Plate 3), phase arrivals from a small Coalinga aftershock interfere with the shot arrivals 25 km and beyond west of the shotpoint.

Due to an unfortunate misunderstanding in the field, the nearest functioning recorder to SP 12 (location number 719) was placed 6 km away.

Traces 1159 and 1160 (between SP 13 and SP 14) overlapped on three shots for the NW-SE profile. Trace 1160 was deleted from these record sections because it is slightly noisier and because the site is farther off line from the shortest distance between SP 13 and SP 14 (Plate 1). These changes are listed in the tape grade code.

ACKNOWLEDGEMENTS

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Table 1: The Master Shot List contains the shot number, the shot time (using Greenwich Mean Time), the shot location, the size of the explosive charge used (when available), and the shot efficiency factor used for true amplitude record sections (see text).

SHOT NUMBER	DATE	SHOT POINT	LATITUDE	LONGITUDE	SHOT TIME	SIZE (LBS)	EFFICIENCY FACTOR (g_s)
10	MAY 19, 1983	9	36 13.1296	119 41.2106	139 6 30 0.010		.025
11	MAY 19, 1983	10	36 13.7265	120 1.7693	139 6 45 0.010		.05
12	MAY 18, 1983	11	36 13.0776	120 18.7093	138 7 0 0.010		.35
13	MAY 18, 1983	12	36 15.3477	120 36.8655	138 6 45 0.007	2000	.05
14	JUN 30, 1983	14	36 15.4905	120 23.4618	181 6 30 0.007	2000	.2
15	JUN 30, 1983	17	35 37.8504	119 52.5197	181 6 45 0.007	3000	.15
16	JUN 30, 1983	13	36 24.0857	120 30.4820	181 7 0 0.028	3200	.1
17	JUN 30, 1983	15	36 4.2027	120 13.5548	181 7 45 0.010	2000	.8
18	JUN 30, 1983	16	35 47.7596	119 59.1682	181 8 0 0.007	2000	.225

APPENDIX A

Seismic Recorder Locations

Appendix A is a listing of the seismic recorder locations. Included are the location numbers of the seismic recorder sites, the latitude and longitude in degrees, minutes, and seconds, and the elevation of the seismic recorder sites in feet.

U.S.G.S. SEISMIC RECORDER LOCATIONS

COALINGA, CALIFORNIA 1983

LOCATION NUMBER	LATITUDE (DEG,MIN,SEC)	LONGITUDE (DEG,MIN,SEC)	ELEV (FT)
701	36 11 40.4	120 23 44.1	840
702	36 11 40.2	120 24 16.3	840
703	36 11 40.4	120 24 48.9	860
704	36 11 57.2	120 25 18.9	930
705	36 12 4.6	120 25 49.6	930
706	36 12 27.3	120 26 20.4	950
707	36 12 37.4	120 26 50.6	1000
708	36 12 59.1	120 27 18.4	1030
709	36 13 10.1	120 27 54.5	1150
710	36 13 2.4	120 28 25.8	1150
711	36 13 7.0	120 29 6.9	1200
712	36 13 0.4	120 29 44.4	1200
713	36 13 12.1	120 30 17.4	1300
714	36 13 30.7	120 30 52.9	1360
715	36 13 24.9	120 31 26.1	1370
716	36 13 27.6	120 31 56.3	1390
717	36 13 43.2	120 32 31.8	1480
718	36 13 48.3	120 33 6.1	1500
719	36 14 2.3	120 33 14.3	1500
720	36 13 50.4	120 33 30.6	1600
721	36 13 7.0	119 41 15.0	220
722	36 13 31.5	119 40 37.5	220
723	36 13 31.5	119 41 3.0	220
724	36 13 31.5	119 41 27.5	220
725	36 13 32.3	119 41 52.0	220
726	36 13 32.3	119 42 18.0	220
727	36 13 32.3	119 42 42.6	220
728	36 13 32.3	119 43 7.6	220
729	36 13 32.3	119 43 32.1	220
730	36 13 32.3	119 43 57.0	215
731	36 13 32.3	119 44 23.0	215
733	36 13 31.5	119 45 17.4	215
734	36 13 31.9	119 45 43.1	215
735	36 13 32.7	119 46 8.8	215
736	36 13 32.7	119 46 34.3	210
737	36 13 33.5	119 46 57.8	210
738	36 13 33.5	119 47 23.3	210
739	36 13 33.5	119 47 48.4	210
740	36 13 33.5	119 48 12.4	210
741	36 13 30.4	120 15 16.9	550
742	36 13 26.5	120 15 43.4	580
743	36 13 22.6	120 16 7.3	640
744	36 13 19.4	120 16 40.8	770
745	36 13 17.3	120 16 59.8	780
746	36 13 13.3	120 17 25.7	820
747	36 13 8.6	120 17 51.1	825
748	36 13 6.0	120 18 16.5	935
749	36 13 4.3	120 18 43.1	1010
750	36 12 56.7	120 19 10.5	1040
751	36 12 45.4	120 19 31.6	970

U.S.G.S. SEISMIC RECORDER LOCATIONS

COALINGA, CALIFORNIA 1983

LOCATION NUMBER	LATITUDE (DEG,MIN,SEC)	LONGITUDE (DEG,MIN,SEC)	ELEV (FT)
752	36 12 33.4	120 19 54.6	860
753	36 12 32.7	120 20 22.0	850
754	36 12 32.0	120 20 50.2	880
755	36 12 32.4	120 21 17.2	880
756	36 12 32.3	120 21 43.3	890
757	36 12 24.4	120 22 10.6	900
758	36 12 15.6	120 22 35.6	885
759	36 11 59.7	120 22 52.8	846
760	36 11 47.5	120 23 16.6	835
761	36 13 31.9	120 14 42.7	500
762	36 13 32.3	120 14 25.9	485
763	36 13 32.7	120 14 5.2	465
764	36 13 33.1	120 13 9.5	427
765	36 13 32.7	120 12 42.1	424
766	36 13 32.7	120 12 15.1	427
767	36 13 34.0	120 11 50.6	422
768	36 13 34.1	120 11 24.3	417
769	36 13 33.9	120 10 58.1	415
770	36 13 34.2	120 10 34.1	406
771	36 13 34.6	120 10 7.3	402
772	36 13 34.6	120 9 43.2	400
773	36 13 34.6	120 9 18.6	397
774	36 13 34.6	120 8 52.2	393
775	36 13 34.6	120 8 27.3	388
776	36 13 35.0	120 8 1.0	380
777	36 13 35.0	120 7 36.6	375
778	36 13 34.7	120 7 10.3	370
779	36 13 34.7	120 6 45.1	365
780	36 13 35.0	120 6 18.8	
781	36 13 35.3	120 6 15.7	358
782	36 13 35.4	120 5 49.1	352
783	36 13 35.1	120 5 23.5	347
784	36 13 35.8	120 4 57.1	340
785	36 13 35.4	120 4 31.2	333
786	36 13 35.5	120 4 10.8	328
787	36 13 35.6	120 3 42.2	323
788	36 13 35.6	120 3 16.9	318
789	36 13 35.6	120 2 47.8	315
790	36 13 35.6	120 2 14.6	307
791	36 13 41.9	120 1 46.3	297
792	36 13 35.4	120 1 29.9	293
793	36 13 35.4	120 1 4.5	288
794	36 13 35.3	120 0 38.5	285
795	36 13 35.6	120 0 12.4	281
796	36 13 35.8	119 59 45.6	277
797	36 13 35.8	119 59 19.6	273
798	36 13 34.6	119 58 54.3	268

U.S.G.S. SEISMIC RECORDER LOCATIONS

COALINGA, CALIFORNIA 1983

LOCATION NUMBER	LATITUDE (DEG,MIN,SEC)	LONGITUDE (DEG,MIN,SEC)	ELEV (FT)
799	36 13 35.8	119 58 28.4	263
800	36 13 35.8	119 57 56.5	258
801	36 13 35.6	119 57 37.2	255
802	36 13 35.4	119 57 11.1	252
803	36 13 35.3	119 56 45.4	247
804	36 13 34.3	119 56 20.0	245
805	36 13 35.1	119 55 54.8	240
806	36 13 34.2	119 55 29.4	235
807	36 13 35.4	119 55 3.6	232
808	36 13 34.6	119 54 38.4	228
809	36 13 34.5	119 54 16.3	224
810	36 13 35.5	119 53 46.1	220
811	36 13 34.4	119 53 20.2	216
812	36 13 35.4	119 52 54.7	212
813	36 13 33.3	119 52 28.7	209
814	36 13 33.6	119 52 1.5	207
815	36 13 32.5	119 51 36.8	207
816	36 13 34.3	119 51 12.8	205
817	36 13 34.7	119 50 46.4	204
818	36 13 33.5	119 50 20.7	205
819	36 13 33.4	119 49 57.4	206
820	36 13 33.5	119 49 31.7	208
1101	36 24 3.8	120 30 26.9	1210
1102	36 23 52.5	120 29 53.4	1320
1103	36 23 29.2	120 29 42.4	1660
1104	36 23 9.6	120 29 30.1	1675
1105	36 22 34.7	120 28 57.4	1680
1106	36 22 27.9	120 28 35.8	1610
1107	36 22 15.5	120 27 7.2	1120
1108	36 22 19.0	120 27 54.9	1280
1109	36 22 6.0	120 26 33.6	1190
1110	36 21 42.7	120 26 0.1	1429
1111	36 21 18.6	120 25 37.8	1550
1112	36 21 7.6	120 25 10.4	1490
1113	36 20 49.5	120 25 12.9	1590
1114	36 20 36.6	120 24 53.3	1780
1115	36 20 29.3	120 24 26.9	1670
1117	36 20 19.5	120 23 54.2	1540
1118	36 19 55.5	120 23 56.4	1630
1119	36 19 25.6	120 23 58.0	2200
1120	36 18 59.5	120 23 50.9	2530
1121	35 46 28.8	119 58 24.4	510
1122	35 46 54.5	119 58 39.3	515
1123	35 47 20.9	119 58 55.5	515
1124	35 47 45.6	119 59 11.2	515
1125	35 48 6.6	119 59 34.2	515
1126	35 48 30.7	119 59 52.8	520
1127	35 49 5.4	120 0 12.3	528
1128	35 49 33.4	120 0 29.0	528
1129	35 50 3.1	120 0 45.8	525
1130	35 50 28.4	120 1 1.5	540

U.S.G.S. SEISMIC RECORDER LOCATIONS

COALINGA, CALIFORNIA 1983

LOCATION NUMBER	LATITUDE (DEG,MIN,SEC)	LONGITUDE (DEG,MIN,SEC)	ELEV (FT)
1131	35 50 54.1	120 1 17.3	527
1132	35 51 25.8	120 1 34.0	530
1133	35 51 51.0	120 1 52.2	549
1134	35 52 19.0	120 2 10.8	550
1135	35 52 45.6	120 2 24.7	550
1136	35 53 14.0	120 2 40.8	545
1137	35 53 40.1	120 2 54.7	550
1139	35 54 28.7	120 3 39.1	575
1140	35 54 54.8	120 4 1.6	600
1141	36 10 49.0	120 19 20.4	706
1142	36 11 14.0	120 19 49.2	750
1143	36 11 32.3	120 20 10.0	778
1144	36 12 3.0	120 20 10.8	810
1145	36 12 19.2	120 20 45.2	850
1146	36 12 41.5	120 21 13.8	903
1147	36 13 10.2	120 21 33.5	990
1148	36 13 29.0	120 21 56.8	1062
1149	36 13 57.1	120 22 9.6	1190
1150	36 14 12.0	120 22 38.5	1270
1151	36 14 40.1	120 22 49.2	1315
1152	36 15 7.7	120 23 6.1	1390
1153	36 15 27.9	120 23 29.2	1550
1154	36 15 50.2	120 23 53.7	1570
1155	36 16 12.5	120 23 58.0	1760
1156	36 16 37.8	120 24 6.0	1950
1157	36 17 7.1	120 24 11.0	2360
1158	36 17 38.7	120 24 24.5	2957
1159	36 18 2.7	120 24 41.2	3350
1160	36 18 15.2	120 24 16.2	3500
1161	35 55 15.9	120 4 18.4	635
1162	35 55 41.4	120 4 41.7	675
1163	35 56 5.6	120 5 3.3	685
1164	35 56 29.2	120 5 23.4	705
1165	35 56 52.7	120 5 44.2	725
1166	35 57 17.1	120 6 2.0	705
1167	35 57 43.2	120 6 21.0	700
1168	35 58 8.1	120 6 36.8	720
1169	35 58 34.9	120 6 57.2	740
1170	35 59 1.3	120 7 15.6	750
1171	35 59 25.6	120 7 34.1	750
1172	35 59 51.5	120 7 54.7	765
1173	36 0 11.1	120 8 20.3	775
1174	36 0 29.7	120 8 46.2	790
1175	36 0 49.6	120 9 10.9	785
1176	36 1 10.9	120 9 37.2	785
1177	36 1 33.1	120 10 4.6	770
1178	36 1 50.9	120 10 26.3	765
1179	36 2 11.7	120 10 51.1	750
1180	36 2 30.7	120 11 16.5	750

U.S.G.S. SEISMIC RECORDER LOCATIONS

COALINGA, CALIFORNIA 1983

LOCATION NUMBER	LATITUDE (DEG,MIN,SEC)	LONGITUDE (DEG,MIN,SEC)	ELEV (FT)
1181	36 10 22.6	120 18 52.3	665
1182	36 9 56.0	120 18 32.6	635
1183	36 9 31.5	120 18 0.4	615
1184	36 9 5.4	120 17 45.0	605
1185	36 8 38.7	120 17 19.9	605
1186	36 8 13.5	120 16 56.4	600
1187	36 7 49.1	120 16 39.6	600
1188	36 7 22.5	120 16 15.9	600
1189	36 6 56.3	120 15 55.6	600
1190	36 6 30.9	120 15 32.5	595
1191	36 6 4.6	120 15 10.6	598
1192	36 5 37.8	120 15 0.8	610
1193	36 5 16.7	120 14 44.6	625
1194	36 4 56.4	120 14 19.7	638
1195	36 4 36.1	120 13 53.8	647
1196	36 4 13.3	120 13 32.1	655
1197	36 3 54.4	120 13 3.0	680
1198	36 3 32.3	120 12 34.7	705
1199	36 3 12.1	120 12 8.9	725
1200	36 2 52.7	120 11 39.9	635
1201	35 46 3.6	119 58 9.8	498
1202	35 45 36.2	119 57 52.4	489
1203	35 45 8.6	119 57 36.4	480
1204	35 44 41.2	119 57 20.0	480
1205	35 44 15.8	119 57 4.2	478
1206	35 43 49.4	119 56 37.9	478
1207	35 43 24.5	119 56 20.7	480
1208	35 42 58.3	119 56 3.8	499
1209	35 42 32.3	119 55 46.9	520
1210	35 42 4.6	119 55 29.4	526
1211	35 41 38.0	119 55 11.7	540
1212	35 41 12.2	119 54 55.6	562
1213	35 40 46.3	119 54 38.5	575
1214	35 40 22.0	119 54 20.4	590
1215	35 39 53.4	119 54 4.5	612
1216	35 39 28.7	119 53 47.9	637
1217	35 39 3.4	119 53 29.8	640
1218	35 38 36.6	119 53 11.2	650
1219	35 38 11.7	119 52 53.2	660
1220	35 37 44.8	119 52 35.5	665

APPENDIX B

Team Data Sheets

The data sheets contain all the information related to the performance of the seismic recorders. This appendix provides a computer printout of this information as stored on a floppy disk. The recorders are grouped into six teams of twenty instruments. Each set of teams is listed in shot order. The shot time lists the Julian day and the GMT hour, minute, and second. The column headings are as follows:

LOC	- field location number of the seismic recorder unit
DIST (KM)	- distance from the shot point to the recorder location in kilometers
AZIM	- azimuth from the shotpoint to the recorder location measured clockwise from north
UNIT	- I. D. number of the recording unit
CHRON	- time correction in milliseconds for the recorder clock at shot time (calculated from the total drift assuming a linear drift rate)
CHAN	- seismic channel number (1, 2, or 3) which was digitized
C1 C2 C3	- gain attenuator settings (dB) for a given channel
TAPE GRADE	- number that codes the instrument performance, the data quality, and/or the reason for omitting the trace from a record section

DIRECTORY OF TAPE GRADE CODES

- 0 - Seismic record digitized
- 1 - Recorder did not operate; tape did not advance
- 2 - Tape advanced but no signal was recorded
- 3 - Skipped recording time
- 6 - Weak signal; low recording level;
cannot interpret time code
- 7 - Continuous calibration by recorder unit
- 8 - Noise, sinusoidal
- 9 - Noise, spike
- 10 - High frequency noise; trace filtered
for normalized plots (1-15 hz bandpass filter)
- 11 - High amplitude cultural noise;
not used for true amplitude plots
- 12 - High cultural noise; poor signal to noise ratio
- 13 - Defective clock unit
- 17 - Noisy time code record
- 18 - Tape speed incorrect; belt slipped
- 20 - Unit not deployed
- 21 - Geophone disconnected or shorted
- 24 - Late start; missed shot time
- 25 - Geophone response test failed
(usually no seismic signal)
- 26 - One or more seismic channels missing
- 28 - Unit damaged in field
- 29 - Incorrect program time
- 31 - amplifier out of balance;
trace not used for true amplitude plots
- 32 - Crossfeed on time code due to strong seismic signal;
timing accuracy of only +20 milliseconds
- 34 - Trace deleted from record section to prevent
the overlapping of adjacent traces

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 10 TEAM 1
 SHOT POINT 9
 SHOT TIME: 139: 6:30: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	701	63.794	267.6	1	25	1	36	18	62	12
2	702	64.598	267.6	2	-73	1	36	18	62	0/12/11
3	703	65.412	267.6	3	-15	2	36	18	62	0
4	704	66.138	268.1	4	-94	2	36	18	62	0
5	705	66.897	268.3	5	93	2	36	18	62	25/21
6	706	67.648	268.9	6	15	2	36	18	62	0
7	707	68.395	269.2	7	-11	2	36	18	62	0
8	708	69.082	269.8	8	86	2	36	18	62	25/21
9	709	69.981	270.1	9	26	2	36	18	62	0
10	710	70.764	269.9	10	-13	2	36	18	62	0
11	711	71.789	270.0	11	61		36	18	62	1
12	712	72.728	269.8	12	7	2	36	18	62	0
13	713	73.550	270.1	13	-21	2	36	18	62	0
14	714	74.438	270.5	14	140	2	36	18	62	0
15	715	75.265	270.4	15	2	2	36	18	62	0
16	716	76.022	270.5	16	41	2	36	18	82	25/21
17	717	76.911	270.8	17	68	2	36	18	82	0
18	718	77.769	270.9	18	-2	2	36	18	82	12
19	719	77.979	271.2	19	-23	2	36	18	82	0
20	720	78.382	271.0	20	-4		36	18	82	1

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 10 TEAM 2
 SHOT POINT 9
 SHOT TIME: 139: 6:30: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	721	0.064	248.0	21	-13	3	36	18	62	32
2	722	1.142	50.1	22	14	3	36	18	82	0
3	723	0.770	18.2	23	12	3	36	18	82	0
4	724	0.821	333.1	24	-25	3	36	18	82	0
5	725	1.241	307.5	25	-59	3	36	18	62	0
6	726	1.799	294.9	26	4		36	18	62	17
7	727	2.370	288.6	27	-37	3	36	18	62	0
8	728	2.968	284.8	28	18	3	36	18	62	0
9	729	3.564	282.2	29	17	3	36	18	62	0
10	730	4.175	280.4	30	7	3	36	18	62	0
11	731	4.814	279.0	31	12	3	36	18	62	0
12	732			32	7		36	18	62	1
13	733	6.156	276.8	33	-17		36	18	62	1
14	734	6.796	276.3	34	11	3	36	18	62	0
15	735	7.436	275.9	35	-57	3	36	18	62	0
16	736	8.069	275.5	36	-10	3	36	18	62	0
17	737	8.657	275.2	37	-8	2	36	18	62	25/21
18	738	9.290	274.9	38	5		36	18	62	3
19	739	9.915	274.6	39	8	3	36	18	62	0
20	740	10.513	274.3	40	11	3	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 10 TEAM 3
 SHOT POINT 9
 SHOT TIME: 139: 6:30: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	741	51.061	270.8	41	-4		36	18	62	17
2	742	51.723	270.6	42	2	1	36	18	62	0
3	743	52.320	270.5	43	-39	1	36	18	62	0
4	744	53.155	270.4	44	-69	1	36	18	62	0
5	745	53.629	270.3	45	3	1	36	18	62	0
6	746	54.275	270.2	46	2	1	36	18	62	0
7	747	54.909	270.0	47	67	2	36	18	62	0
8	748	55.545	269.9	48	-92		36	18	62	2
9	749	56.210	269.9	49	10	2	36	18	62	0
10	750	56.896	269.7	50	-11	1	36	18	62	0
11	751	57.427	269.3	51	9		36	18	62	1
12	752	58.009	269.0	52	-39	2	36	18	62	0
13	753	58.693	268.9	53	4	2	36	18	62	0
14	754	59.397	268.9	54	-31	1	36	18	62	0
15	755	60.071	269.0	55	-31	2	36	18	62	0
16	756	60.724	269.0	56	-2	2	36	18	62	0
17	757	61.411	268.8	57	-106	2	36	18	62	0
18	758	62.043	268.5	58	-11	2	36	18	62	0
19	759	62.489	268.1	59	-7	2	36	18	62	0
20	760	63.099	267.8	60	-12	2	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 10 TEAM 4
 SHOT POINT 9
 SHOT TIME: 139: 6:30: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	761	50.208	270.8	61	--		36	18	62	1
2	762	49.788	270.9	62	-11	1	36	18	62	0
3	763	49.273	270.9	63	-12	1	36	18	62	0
4	764	47.881	270.9	64	-14	1	36	18	62	0/ 8/10
5	765	47.197	270.9	65	-25	1	36	18	62	0/ 8/10
6	766	46.522	270.9	66	-38	1	36	18	62	0
7	767	45.910	271.0	67	-65	1	36	18	62	0
8	768	45.256	271.0	68	-54	2	36	18	62	0/31
9	769	44.600	271.0	69	-21	1	36	18	62	0
10	770	44.000	271.1	70	1	1	36	18	62	0
11	771	43.331	271.1	71	-70	1	36	18	62	0
12	772	42.730	271.1	72	0	1	36	18	62	0
13	773	42.115	271.1	73	-35	1	36	18	62	0/ 8/10
14	774	41.458	271.1	74	-46	1	36	18	62	0
15	775	40.836	271.2	75	-6		36	18	62	1
16	776	40.179	271.2	76	-25		36	18	62	3
17	777	39.570	271.2	77	-24	1	36	18	62	0
18	778	38.912	271.2	78	-20	1	36	18	62	0
19	779	38.284	271.2	79	-31	1	36	18	62	0
20	780	37.626	271.3	80	-5		36	18	62	25/21

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 10 TEAM 5
 SHOT POINT 9
 SHOT TIME: 139: 6:30: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	781	37.549	271.3	81	-45	1	36	18	62	0
2	782	36.885	271.3	82	-20		36	18	62	17
3	783	36.246	271.3	83	18	1	36	18	62	0
4	784	35.588	271.4	84	17		36	18	62	17
5	785	34.939	271.4	85	-54	1	36	18	62	0
6	786	34.431	271.4	86	0	1	36	18	62	0
7	787	33.716	271.5	87	9	1	36	18	62	0
8	788	33.085	271.5	88	26	1	36	18	82	0
9	789	32.358	271.5	89	12	1	36	18	82	0
10	790	31.530	271.6	90	0	1	36	18	82	0
11	791	30.828	272.0	91	5		36	18	82	6
12	792	30.414	271.6	92	5	2	36	18	82	25/21
13	793	29.781	271.6	93	-12	1	36	18	82	0
14	794	29.131	271.7	94	13	1	36	18	82	0
15	795	28.479	271.7	95	28	1	36	18	82	0
16	796	27.810	271.8	96	9	1	36	18	62	0
17	797	27.162	271.8	97	19	1	36	18	62	0
18	798	26.528	271.8	98	11	1	36	18	62	0
19	799	25.884	271.9	99	9	1	36	18	62	0
20	800	25.087	272.0	100	11	3	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 10 TEAM 6
 SHOT POINT 9
 SHOT TIME: 139: 6:30: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	801	24.605	272.0	101	31	3	36	18	62	0
2	802	23.954	272.0	102	17	2	36	18	62	25/21
3	803	23.312	272.1	103	26	3	36	18	62	0
4	804	22.677	272.1	104	-5	3	36	18	62	0
5	805	22.048	272.2	105	26	3	36	18	62	0
6	806	21.413	272.2	106	-26	2	36	18	62	25/21
7	807	20.772	272.3	107	-126	2	36	18	62	25/21
8	808	20.141	272.4	108	14		36	18	62	25/21
9	809	19.589	272.4	109	7	3	36	18	62	0
10	810	18.837	272.6	110	40	3	36	18	62	0
11	811	18.191	272.6	111	11	3	36	18	62	25/21
12	812	17.554	272.8	112	-27	2	36	18	62	25/21
13	813	16.902	272.7	113	-8	3	36	18	62	0
14	814	16.226	272.8	114	-5	3	36	18	62	0
15	815	15.607	272.8	115	-2	3	36	18	62	0
16	816	15.012	273.1	116	17		36	18	62	6
17	817	14.354	273.3	117	-28	3	36	18	62	0
18	818	13.712	273.3	118	-16	3	36	18	62	0
19	819	13.131	273.4	119	-7	3	36	18	62	0
20	820	12.489	273.6	120	2	3	36	18	62	7/25/21

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

21

SHOT NUMBER 11 TEAM 1
 SHOT POINT 10
 SHOT TIME: 139: 6:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	701	33.139	263.4	1	25	1	36	18	62	12
2	702	33.939	263.6	2	-73	1	36	18	62	0/12/11
3	703	34.749	263.7	3	-15	1	36	18	62	0
4	704	35.439	264.7	4	-94	1	36	18	62	0
5	705	36.183	265.2	5	93	2	36	18	62	25/21
6	706	36.897	266.3	6	15	1	36	18	62	0
7	707	37.631	266.9	7	-11	1	36	18	62	0
8	708	38.294	267.9	8	87	2	36	18	62	25/21
9	709	39.183	268.5	9	26	2	36	18	62	0
10	710	39.972	268.2	10	-13	2	36	18	62	0/31
11	711	40.992	268.4	11	61		36	18	62	1
12	712	41.937	268.2	12	7	1	36	18	62	0
13	713	42.749	268.7	13	-21	1	36	18	62	0
14	714	43.626	269.5	14	140	1	36	18	62	0
15	715	44.456	269.3	15	2	2	36	18	62	0
16	716	45.211	269.4	16	41	2	36	18	82	25/21
17	717	46.093	270.0	17	69	2	36	18	82	0
18	718	46.950	270.2	18	-2	2	36	18	82	12
19	719	47.155	270.7	19	-23	2	36	18	82	0
20	720	47.562	270.3	20	-4		36	18	82	1

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 11 TEAM 2
 SHOT POINT 10
 SHOT TIME: 139: 6:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	721	30.768	92.1	21	-13	1	36	18	62	0
2	722	31.685	90.7	22	14	1	36	18	82	0
3	723	31.048	90.7	23	12	1	36	18	82	0
4	724	30.436	90.7	24	-25	1	36	18	82	0
5	725	29.824	90.7	25	-59	1	36	18	62	0
6	726	29.176	90.7	26	4		36	18	62	17
7	727	28.562	90.7	27	-37	1	36	18	62	0
8	728	27.938	90.7	28	18	1	36	18	62	0
9	729	27.326	90.7	29	17	1	36	18	62	0
10	730	26.702	90.7	30	7	1	36	18	62	0
11	731	26.054	90.8	31	12	1	36	18	62	0
12	732			32	7		36	18	62	1
13	733	24.696	90.9	33	-17		36	18	62	1
14	734	24.054	90.9	34	11	1	36	18	62	0
15	735	23.413	90.8	35	-57	1	36	18	62	0
16	736	22.776	90.8	36	-10	1	36	18	62	0
17	737	22.188	90.8	37	-8		36	18	62	25/21
18	738	21.552	90.8	38	5		36	18	62	3
19	739	20.925	90.9	39	8	1	36	18	62	0
20	740	20.326	90.9	40	11	1	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

22

SHOT NUMBER 11 TEAM 3
 SHOT POINT 10
 SHOT TIME: 139: 6:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	741	20.252	268.8	41	-4		36	18	62	17
2	742	20.917	268.6	42	2	1	36	18	62	0
3	743	21.517	268.3	43	-39	1	36	18	62	0
4	744	22.356	268.1	44	-69	1	36	18	62	0
5	745	22.833	268.0	45	3	1	36	18	62	0
6	746	23.483	267.7	46	2	1	36	18	62	0
7	747	24.123	267.4	47	67	1	36	18	62	0
8	748	24.762	267.3	48	-93		36	18	62	2
9	749	25.428	267.3	49	10	1	36	18	62	0
10	750	26.124	266.8	50	-11	1	36	18	62	0
11	751	26.671	266.1	51	9		36	18	62	1
12	752	27.272	265.5	52	-39	1	36	18	62	0
13	753	27.956	265.5	53	4	1	36	18	62	0
14	754	28.659	265.6	54	-31	1	36	18	62	0
15	755	29.330	265.7	55	-31	1	36	18	62	0
16	756	29.981	265.8	56	-2	1	36	18	62	0
17	757	30.680	265.4	57	-107	1	36	18	62	0
18	758	31.326	265.0	58	-11	1	36	18	62	0
19	759	31.800	264.2	59	-7	1	36	18	62	0
20	760	32.433	263.7	60	-13	1	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 11 TEAM 4
 SHOT POINT 10
 SHOT TIME: 139: 6:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	761	19.397	268.9	61	--		36	18	62	1
2	762	18.977	268.9	62	-12	3	36	18	62	0
3	763	18.461	269.0	63	-12	3	36	18	62	0
4	764	17.068	268.9	64	-14	3	36	18	62	0
5	765	16.385	268.8	65	-25	3	36	18	62	0
6	766	15.711	268.8	66	-38	3	36	18	62	0
7	767	15.097	268.9	67	-65	3	36	18	62	0
8	768	14.443	268.8	68	-54	3	36	18	62	0
9	769	13.788	268.8	69	-21	3	36	18	62	0
10	770	13.187	268.7	70	1	3	36	18	62	0
11	771	12.518	268.7	71	-70	3	36	18	62	0
12	772	11.916	268.7	72	0	3	36	18	62	0
13	773	11.302	268.6	73	-35	3	36	18	62	0
14	774	10.644	268.5	74	-47	3	36	18	62	0
15	775	10.023	268.4	75	-6		36	18	62	1
16	776	9.365	268.4	76	-25		36	18	62	3
17	777	8.756	268.3	77	-24	3	36	18	62	0
18	778	8.100	268.1	78	-20	3	36	18	62	0
19	779	7.471	267.9	79	-31	3	36	18	62	0
20	780	6.814	267.8	80	-5		36	18	62	25/21

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

23

SHOT NUMBER 11 TEAM 5
 SHOT POINT 10
 SHOT TIME: 139: 6:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	781	6.737	267.8	81	-45	3	36	18	62	0
2	782	6.072	267.6	82	-20		36	18	62	17
3	783	5.435	267.2	83	18	3	36	18	62	0
4	784	4.775	267.1	84	17	3	36	18	62	0
5	785	4.129	266.5	85	-54	3	36	18	62	0
6	786	3.621	266.0	86	0	3	36	18	62	0
7	787	2.908	265.2	87	9	3	36	18	62	0
8	788	2.280	263.8	88	26	3	36	18	62	0
9	789	1.559	260.9	89	12	3	36	18	62	0
10	790	0.752	250.8	90	0	3	36	18	62	0
11	791	0.053	183.0	91	5		36	18	62	6
12	792	0.477	121.9	92	5	3	36	18	62	0
13	793	1.069	103.6	93	-12		36	18	62	3
14	794	1.708	98.6	94	13	3	36	18	62	0
15	795	2.355	96.0	95	29	3	36	18	62	0
16	796	3.021	94.6	96	10	3	36	18	62	0
17	797	3.667	93.8	97	19	3	36	18	62	0
18	798	4.302	93.7	98	11	3	36	18	62	0
19	799	4.944	92.8	99	9	3	36	18	62	0
20	800	5.740	92.4	100	11	3	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 11 TEAM 6
 SHOT POINT 10
 SHOT TIME: 139: 6:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	801	6.222	92.3	101	31	3	36	18	62	0
2	802	6.873	92.1	102	17	2	36	18	62	0/25/31
3	803	7.515	92.0	103	26	3	36	18	62	0
4	804	8.150	92.0	104	-5		36	18	62	24
5	805	8.780	91.7	105	26	3	36	18	62	0
6	806	9.414	91.8	106	-26	2	36	18	62	25/21
7	807	10.056	91.4	107	-127	2	36	18	62	25/21
8	808	10.687	91.5	108	14	2	36	18	62	25/21
9	809	11.239	91.4	109	7	3	36	18	62	0
10	810	11.992	91.2	110	40	3	36	18	62	0
11	811	12.638	91.3	111	11	3	36	18	62	0
12	812	13.276	91.1	112	-27	2	36	18	62	25/21
13	813	13.927	91.3	113	-8	3	36	18	62	7
14	814	14.603	91.2	114	-5	3	36	18	62	0
15	815	15.223	91.3	115	-2	3	36	18	62	0
16	816	15.819	91.0	116	17		36	18	62	6
17	817	16.479	91.0	117	-28	3	36	18	62	0
18	818	17.120	91.0	118	-16	3	36	18	62	0
19	819	17.703	91.0	119	-7	3	36	18	62	0
20	820	18.346	91.0	120	2	3	36	18	62	7/25/21

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 12 TEAM 1
 SHOT POINT 11
 SHOT TIME: 138: 7: 0: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	701	7.967	251.0	1	14	1	36	18	62	0/12/11
2	702	8.734	252.7	2	-42	1	36	18	62	0/12/11
3	703	9.514	254.2	3	-9	1	36	18	62	0
4	704	10.116	258.1	4	-53	1	36	18	62	13
5	705	10.827	260.2	5	53	2	36	18	62	25/21
6	706	11.494	264.3	6	8	2	36	18	62	25/21
7	707	12.219	266.1	7	-7	2	36	18	62	0
8	708	12.887	269.2	8	49	2	36	18	62	25/21
9	709	13.787	270.7	9	15	2	36	18	62	0
10	710	14.568	269.7	10	-8	2	36	18	62	0
11	711	15.593	270.3	11	35		36	18	62	0
12	712	16.532	269.5	12	4	2	36	18	62	0
13	713	17.356	270.8	13	-12	2	36	18	62	0
14	714	18.259	272.5	14	80	2	36	18	62	0
15	715	19.080	271.9	15	1	2	36	18	62	0
16	716	19.838	272.0	16	23	2	36	18	82	25/21
17	717	20.745	273.3	17	39	2	36	18	82	0
18	718	21.610	273.6	18	0	2	36	18	82	0
19	719	21.843	274.7	19	-13	2	36	18	82	0
20	720	22.224	273.6	20	-2		36	18	82	1

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 12 TEAM 2
 SHOT POINT 11
 SHOT TIME: 138: 7: 0: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	721	56.136	89.9	21	-8		36	18	62	20
2	722	57.076	89.2	22	8	1	36	18	82	12
3	723	56.440	89.2	23	7	1	36	18	82	12
4	724	55.828	89.2	24	-14	1	36	18	82	12
5	725	55.216	89.1	25	-33	2	36	18	62	12
6	726	54.568	89.1	26	2		36	18	62	17
7	727	53.954	89.1	27	-21	2	36	18	62	12
8	728	53.330	89.1	28	10	2	36	18	62	12
9	729	52.718	89.1	29	9	2	36	18	62	12
10	730	52.094	89.1	30	4	2	36	18	62	12
11	731	51.446	89.1	31	6	2	36	18	62	12
12	732			32	4		36	18	62	1
13	733	50.088	89.1	33	-10		36	18	62	12
14	734	49.445	89.0	34	6	2	36	18	62	12
15	735	48.805	89.0	35	-32	1	36	18	62	12
16	736	48.168	89.0	36	-6	1	36	18	62	12
17	737	47.581	88.9	37	-5	2	36	18	62	25/21
18	738	46.945	88.9	38	3	1	36	18	62	12
19	739	46.318	88.9	39	4	1	36	18	62	12
20	740	45.719	88.9	40	6	2	36	18	62	12

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

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SHOT NUMBER 12 TEAM 3
 SHOT POINT 11
 SHOT TIME: 138: 7: 0: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	741	5.197	81.2	41	-3		36	18	62	17
2	742	4.524	81.5	42	1	2	36	18	62	0/31
3	743	3.916	81.9	43	-21	3	36	18	62	0
4	744	3.075	81.5	44	-38	3	36	18	62	0
5	745	2.596	81.4	45	1	3	36	18	62	0
6	746	1.938	82.1	46	1	3	36	18	62	0
7	747	1.292	84.6	47	37	3	36	18	62	0
8	748	0.652	86.4	48	-51		36	18	62	2
9	749	0.019	230.6	49	5	3	36	18	62	0
10	750	0.740	250.7	50	-6	3	36	18	62	0
11	751	1.360	244.2	51	5		36	18	62	25/21
12	752	2.041	241.9	52	-22	3	36	18	62	0
13	753	2.672	248.4	53	2	1	36	18	62	0
14	754	3.343	252.5	54	-17	1	36	18	62	0
15	755	3.988	255.6	55	-17	1	36	18	62	0
16	756	4.623	257.6	56	0	1	36	18	62	0
17	757	5.342	256.6	57	-59	3	36	18	62	0
18	758	6.014	255.4	58	-6	1	36	18	62	0
19	759	6.564	252.2	59	-4	1	36	18	62	0
20	760	7.248	250.8	60	-7	1	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 12 TEAM 4
 SHOT POINT 11
 SHOT TIME: 138: 7: 0: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	761	6.049	82.0	61	--		36	18	62	1
2	762	6.467	82.4	62	-7	1	36	18	62	0
3	763	6.980	82.9	63	-7	1	36	18	62	0
4	764	8.365	84.0	64	-9	1	36	18	62	0
5	765	9.044	84.5	65	-15	1	36	18	62	0/ 8/10
6	766	9.716	84.9	66	-22	1	36	18	62	0/ 8/10
7	767	10.329	85.0	67	-37	1	36	18	62	0/ 8/10
8	768	10.982	85.3	68	-31	1	36	18	62	0
9	769	11.635	85.6	69	-12	1	36	18	62	0
10	770	12.234	85.7	70	0	1	36	18	62	0
11	771	12.903	85.9	71	-40	1	36	18	62	0
12	772	13.503	86.1	72	0	1	36	18	62	0
13	773	14.116	86.2	73	-20	1	36	18	62	0
14	774	14.773	86.4	74	-27	1	36	18	62	0
15	775	15.393	86.6	75	-4		36	18	62	1
16	776	16.050	86.7	76	-15	1	36	18	62	0
17	777	16.659	86.8	77	-14	1	36	18	62	0/ 8/10
18	778	17.314	86.9	78	-12	2	36	18	62	0
19	779	17.942	87.0	79	-18	2	36	18	62	25/21
20	780	18.600	87.1	80	-3		36	18	62	25/21

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 12 TEAM 5
 SHOT POINT 11
 SHOT TIME: 138: 7: 0: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	781	18.677	87.1	81	-18	1	36	18	62	0
2	782	19.341	87.2	82	-8	2	36	18	62	0
3	783	19.978	87.3	83	7	2	36	18	62	0
4	784	20.638	87.3	84	6	2	36	18	62	0
5	785	21.285	87.4	85	-21	2	36	18	62	0
6	786	21.793	87.5	86	0	2	36	18	62	0
7	787	22.508	87.6	87	3	2	36	18	62	0
8	788	23.138	87.6	88	10	2	36	18	82	0
9	789	23.865	87.7	89	5	2	36	18	82	0
10	790	24.693	87.8	90	0	2	36	18	82	0
11	791	25.408	87.4	91	2		36	18	82	6
12	792	25.808	87.9	92	2	2	36	18	82	0/10
13	793	26.442	87.9	93	-5	2	36	18	82	0/10
14	794	27.091	88.0	94	5	2	36	18	82	0/10
15	795	27.744	88.0	95	11	2	36	18	82	0/10
16	796	28.413	88.1	96	4	1	36	18	62	0/10
17	797	29.061	88.1	97	7	2	36	18	62	0/10
18	798	29.692	88.2	98	4	2	36	18	62	0/10
19	799	30.339	88.2	99	3	2	36	18	62	0/10
20	800	31.135	88.2	100	4	2	36	18	62	0/10

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 12 TEAM 6
 SHOT POINT 11
 SHOT TIME: 138: 7: 0: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	801	31.617	88.3	101	17	2	36	18	62	0/10
2	802	32.268	88.3	102	10	2	36	18	62	25/21
3	803	32.910	88.4	103	14	2	36	18	62	0/10
4	804	33.543	88.4	104	-3		36	18	62	24
5	805	34.175	88.4	105	15	2	36	18	62	0/10
6	806	34.807	88.5	106	-15	2	36	18	62	25/21
7	807	35.452	88.5	107	-72	2	36	18	62	7
8	808	36.081	88.5	108	8	2	36	18	62	25/21
9	809	36.633	88.6	109	4	2	36	18	62	12
10	810	37.388	88.5	110	23	1	36	18	62	12
11	811	38.032	88.6	111	6		36	18	62	12
12	812	38.671	88.6	112	-16	2	36	18	62	25/21
13	813	39.319	88.7	113	-4		36	18	62	7/25/21
14	814	39.996	88.7	114	-3	2	36	18	62	12
15	815	40.614	88.8	115	0	2	36	18	62	12
16	816	41.213	88.7	116	9		36	18	62	6
17	817	41.873	88.7	117	-16	2	36	18	62	12
18	818	42.513	88.8	118	-9	2	36	18	62	12
19	819	43.095	88.8	119	-4	2	36	18	62	12
20	820	43.739	88.8	120	1	2	36	18	62	7/25/21

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 13 TEAM 1
 SHOT POINT 12
 SHOT TIME: 138: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	701	20.816	109.0	1	14	1	36	18	62	0/12
2	702	20.060	109.8	2	-41	1	36	18	62	0/12
3	703	19.292	110.6	3	-9	1	36	18	62	0
4	704	18.412	109.9	4	-53	1	36	18	62	13
5	705	17.613	110.1	5	52	2	36	18	62	25/21
6	706	16.653	108.7	6	8	2	36	18	62	25/21
7	707	15.839	108.5	7	-7	1	36	18	62	0
8	708	14.973	107.0	8	49	2	36	18	62	25/21
9	709	14.012	106.7	9	15	1	36	18	62	0
10	710	13.339	108.7	10	-7	1	36	18	62	0
11	711	12.325	109.6	11	34	1	36	18	62	0
12	712	11.520	112.1	12	4	1	36	18	62	0
13	713	10.622	111.9	13	-12	3	36	18	62	0
14	714	9.585	110.7	14	79	3	36	18	62	0
15	715	8.887	113.7	15	1	3	36	18	62	0
16	716	8.164	115.3	16	23	1	36	18	82	0
17	717	7.158	114.9	17	39	1	36	18	82	0
18	718	6.319	116.9	18	0	1	36	18	82	0
19	719	5.950	114.0	19	-13	1	36	18	82	0
20	720	5.748	119.0	20	-2		36	18	82	1

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 13 TEAM 2
 SHOT POINT 12
 SHOT TIME: 138: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	721	83.231	92.8	21	-8		36	18	62	20
2	722	84.127	92.3	22	8	1	36	18	82	12
3	723	83.492	92.3	23	6	1	36	18	82	12
4	724	82.883	92.3	24	-14	1	36	18	82	12
5	725	82.272	92.3	25	-33	2	36	18	62	0/12
6	726	81.626	92.3	26	2		36	18	62	17
7	727	81.013	92.4	27	-20	2	36	18	62	0
8	728	80.392	92.4	28	10	2	36	18	62	0
9	729	79.970	92.4	29	9	2	36	18	62	0
10	730	79.347	92.4	30	4	2	36	18	62	0
11	731	78.699	92.4	31	6	2	36	18	62	0
12	732			32	4		36	18	62	1
13	733	77.344	92.5	33	-10		36	18	62	12
14	734	76.701	92.5	34	6	2	36	18	62	0
15	735	76.060	92.5	35	-32	2	36	18	62	0
16	736	75.424	92.5	36	-6	2	36	18	62	0
17	737	74.836	92.5	37	-5	2	36	18	62	25/21
18	738	74.201	92.6	38	3	1	36	18	62	12
19	739	73.575	92.6	39	4	1	36	18	62	12
20	740	72.976	92.6	40	6	2	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 13 TEAM 3
 SHOT POINT 12
 SHOT TIME: 138: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	741	32.516	96.0	41	-3		36	18	62	17
2	742	31.870	96.4	42	1	2	36	18	62	0/31
3	743	31.290	96.7	43	-21	1	36	18	62	0
4	744	30.473	97.1	44	-38	1	36	18	62	12
5	745	30.011	97.3	45	1	1	36	18	62	0
6	746	29.386	97.7	46	1	2	36	18	62	0
7	747	28.779	98.1	47	36	2	36	18	62	0
8	748	28.162	98.5	48	-50		36	18	62	2
9	749	27.512	98.8	49	5	1	36	18	62	0
10	750	26.875	99.5	50	-6	1	36	18	62	0
11	751	26.417	100.4	51	5	1	36	18	62	0
12	752	25.923	101.5	52	-21	1	36	18	62	0
13	753	25.258	101.8	53	2	1	36	18	62	0
14	754	24.575	102.2	54	-17	1	36	18	62	0
15	755	23.914	102.5	55	-17	1	36	18	62	0
16	756	23.277	102.9	56	0	1	36	18	62	0
17	757	22.672	103.9	57	-58	1	36	18	62	0
18	758	22.134	104.9	58	-6	1	36	18	62	0
19	759	21.855	106.5	59	-4	1	36	18	62	0
20	760	21.398	107.9	60	-7	1	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 13 TEAM 4
 SHOT POINT 12
 SHOT TIME: 138: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	761	33.360	95.8	61	--		36	18	62	1
2	762	33.777	95.7	62	-7	1	36	18	62	0
3	763	34.289	95.6	63	-7	1	36	18	62	0
4	764	35.673	95.3	64	-9	1	36	18	62	0
5	765	36.355	95.3	65	-15	1	36	18	62	12
6	766	37.027	95.2	66	-22	1	36	18	62	12
7	767	37.633	95.0	67	-37	1	36	18	62	0
8	768	38.285	94.9	68	-31	1	36	18	62	0
9	769	38.938	94.9	69	-12	1	36	18	62	0
10	770	39.535	94.8	70	0	1	36	18	62	0
11	771	40.201	94.7	71	-40	1	36	18	62	0
12	772	40.801	94.6	72	0	1	36	18	62	0
13	773	41.413	94.5	73	-20	1	36	18	62	0
14	774	42.069	94.5	74	-27	1	36	18	62	0
15	775	42.689	94.4	75	-4		36	18	62	1
16	776	43.343	94.3	76	-15	1	36	18	62	0
17	777	43.951	94.3	77	-14	1	36	18	62	0
18	778	44.607	94.2	78	-12	1	36	18	62	0
19	779	45.234	94.1	79	-18	2	36	18	62	25/21
20	780	45.889	94.1	80	-3		36	18	62	25/21

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 13 TEAM 5
 SHOT POINT 12
 SHOT TIME: 138: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	781	45.965	94.1	81	-17	1	36	18	62	0
2	782	46.628	94.0	82	-8	1	36	18	62	0
3	783	47.266	94.0	83	7	1	36	18	62	0
4	784	47.922	93.9	84	6	1	36	18	62	0
5	785	48.569	93.8	85	-21	1	36	18	62	0
6	786	49.076	93.8	86	0	2	36	18	62	0
7	787	49.789	93.7	87	3	1	36	18	62	0
8	788	50.419	93.7	88	10	2	36	18	82	0
9	789	51.145	93.6	89	4	1	36	18	82	0
10	790	51.971	93.6	90	0	1	36	18	82	0
11	791	52.666	93.3	91	2		36	18	82	6
12	792	53.085	93.5	92	2	1	36	18	82	0
13	793	53.718	93.5	93	-5	1	36	18	82	0
14	794	54.367	93.4	94	5	1	36	18	82	0
15	795	55.018	93.4	95	11	1	36	18	82	0
16	796	55.685	93.3	96	4	1	36	18	62	12
17	797	56.332	93.3	97	7	1	36	18	62	0
18	798	56.967	93.3	98	4	1	36	18	62	0
19	799	57.609	93.2	99	3	1	36	18	62	0
20	800	58.404	93.2	100	4	1	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 13 TEAM 6
 SHOT POINT 12
 SHOT TIME: 138: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	801	58.886	93.2	101	17	1	36	18	62	0
2	802	59.536	93.1	102	10	2	36	18	62	25/21
3	803	60.178	93.1	103	14	2	36	18	62	0
4	804	60.813	93.1	104	-3		36	18	62	24
5	805	61.441	93.0	105	15	2	36	18	62	0
6	806	62.076	93.0	106	-15	2	36	18	62	25/21
7	807	62.716	93.0	107	-71	2	36	18	62	0
8	808	63.347	93.0	108	8	2	36	18	62	25/21
9	809	63.898	92.9	109	4	2	36	18	62	0
10	810	64.649	92.9	110	23	1	36	18	62	12
11	811	65.296	92.9	111	6	2	36	18	62	0
12	812	65.932	92.8	112	-16	2	36	18	62	25/21
13	813	66.584	92.9	113	-4		36	18	62	7
14	814	67.259	92.8	114	-3	2	36	18	62	12
15	815	67.879	92.8	115	0	2	36	18	62	0
16	816	68.474	92.7	116	9		36	18	62	6
17	817	69.132	92.7	117	-16	2	36	18	62	0
18	818	69.774	92.7	118	-9	2	36	18	62	0
19	819	70.355	92.7	119	-4	2	36	18	62	0
20	820	70.998	92.7	120	1	2	36	18	62	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 14 TEAM 1
 SHOT POINT 14
 SHOT TIME: 181: 6:30: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1101	18.992	326.6	1	17	2	36	18	68	0
2	1102	18.248	328.2	2	-32	2	36	18	68	0
3	1103	17.493	327.7	3	9	2	36	18	68	0
4	1104	16.820	327.5	4	-16	2	36	18	68	0
5	1105	15.474	327.9	5	55	2	36	18	48	25/21
6	1106	15.015	329.2	6	10		36	18	48	1
7	1107	13.660	336.4	7	-20	1	36	18	48	0
8	1108	14.275	332.2	8	82	1	36	18	48	0
9	1109	13.073	339.2	9	15	1	36	18	48	25
10	1110	12.116	341.7	10	-4	1	36	18	48	0
11	1111	11.242	343.2	11	68		36	18	48	6/ 9/17
12	1112	10.733	346.2	12	7	1	36	18	48	0
13	1113	10.209	345.1	13	21	1	36	18	48	0
14	1114	9.706	347.3	14	85	1	36	18	48	0
15	1115	9.361	350.9	15	1	1	36	18	48	0
16				16	--		36	18	48	20
17	1117	8.964	355.8	17	42	1	36	18	48	0
18	1118	8.233	355.0	18	4	2	36	18	48	0/31
19	1119	7.319	354.1	19	43	1	36	18	48	0
20	1120	6.502	354.9	20	14	1	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 14 TEAM 2
 SHOT POINT 14
 SHOT TIME: 181: 6:30: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1121	65.539	144.9	21	-5	1	36	18	68	12
2	1122	64.676	144.8	22	10	2	36	18	68	0
3	1123	63.774	144.7	23	19	2	36	18	68	12
4	1124	62.924	144.6	24	-14	2	36	18	68	0
5	1125	62.064	144.7	25	5	2	36	18	68	0
6	1126	61.186	144.6	26	6	1	36	18	68	0/26
7	1127	60.032	144.4	27	-13	2	36	18	68	0/12/10
8	1128	59.085	144.3	28	10	2	36	18	48	0/12/10
9	1129	58.097	144.1	29	12	2	36	18	48	0
10	1130	57.233	143.9	30	5	2	36	18	48	0
11	1131	56.360	143.8	31	9	2	36	18	48	0
12	1132	55.337	143.5	32	1	2	36	18	48	0
13	1133	54.430	143.4	33	10	2	36	18	48	0
14	1134	53.457	143.3	34	5	2	36	18	48	0
15	1135	52.592	143.1	35	-40	2	36	18	48	12
16	1136	51.650	142.8	36	-3	2	36	18	48	6/ 9
17	1137	50.799	142.6	37	29	2	36	18	48	12
18	1138			38	--		36	18	48	28
19	1139	48.930	142.6	39	7	2	36	18	48	0
20	1140	47.949	142.5	40	6	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 14 TEAM 3
 SHOT POINT 14
 SHOT TIME: 181: 6:30: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1141	10.624	144.5	41	--		36	18	48	6
2	1142	9.581	145.3	42	4	1	36	18	48	0
3	1143	8.821	146.0	43	-27	1	36	18	48	0
4	1144	8.041	142.3	44	-27	3	36	18	48	0
5	1145	7.130	145.3	45	3	3	36	18	48	0
6	1146	6.161	147.1	46	-71	3	36	18	48	0
7	1147	5.153	146.4	47	26	3	36	18	48	0
8	1148	4.352	148.6	48	-55	3	36	18	48	0
9	1149	3.451	145.6	49	3	3	36	18	68	0
10	1150	2.684	152.8	50	0	3	36	18	68	0
11	1151	1.799	147.7	51	17	3	36	18	68	0
12	1152	0.860	141.1	52	0	3	36	18	68	0
13	1153	0.061	218.8	53	3	3	36	18	88	0
14	1154	0.911	314.7	54	-17	3	36	18	68	0
15	1155	1.527	330.3	55	-8		36	18	68	3
16	1156	2.314	335.6	56	3	3	36	18	68	0
17	1157	3.198	340.2	57	-53	1	36	18	68	0/26
18	1158	4.230	340.4	58	-6	3	36	18	48	0/18
19	1159	5.068	338.8	59	-4	3	36	18	48	0
20	1160	5.250	346.7	60	-8	3	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 14 TEAM 4
 SHOT POINT 14
 SHOT TIME: 181: 6:30: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1161	47.178	142.4	61	13	2	36	18	48	0
2	1162	46.199	142.4	62	12	2	36	18	48	0
3	1163	45.276	142.4	63	10	2	36	18	48	0
4	1164	44.394	142.3	64	13	2	36	18	48	0/25
5	1165	43.502	142.3	65	1	2	36	18	48	0
6	1166	42.633	142.2	66	-4	2	36	18	48	0
7	1167	41.704	142.0	67	-14	2	36	18	48	0
8	1168	40.857	141.8	68	-14	2	36	18	48	0
9	1169	39.894	141.6	69	7	2	36	18	48	0
10	1170	38.967	141.4	70	19	2	36	18	48	0
11	1171	38.096	141.2	71	-9	2	36	18	48	0
12	1172	37.149	141.1	72	17	2	36	18	48	0
13	1173	36.275	141.3	73	-7	2	36	18	48	0
14	1174	35.425	141.5	74	-15	2	36	18	48	0
15	1175	34.559	141.7	75	13	2	36	18	48	0
16	1176	33.635	141.9	76	-10	2	36	18	48	0
17	1177	32.674	142.1	77	2		36	18	48	3
18	1178	31.906	142.2	78	3	1	36	18	48	0
19	1179	31.020	142.4	79	17	2	36	18	48	0
20	1180	30.169	142.7	80	14	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 14 TEAM 5
 SHOT POINT 14
 SHOT TIME: 181: 6:30: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1181	11.695	144.0	81	-10	1	36	18	48	0
2	1182	12.647	144.4	82	--		36	18	48	17
3	1183	13.733	143.5	83	15	1	36	18	48	0
4	1184	14.609	144.1	84	17	1	36	18	48	0
5	1185	15.643	144.0	85	-47	1	36	18	48	0
6	1186	16.618	144.0	86	-66	1	36	18	48	0
7	1187	17.473	144.3	87	--	1	36	18	48	0
8	1188	18.484	144.3	88	145		36	18	48	1
9	1189	19.436	144.5	89	13	1	36	18	48	0
10	1190	20.409	144.4	90	5	2	36	18	48	25/21
11	1191	21.386	144.5	91	6	1	36	18	48	0
12	1192	22.204	145.2	92	8	1	36	18	48	0
13	1193	22.967	145.3	93	-13	1	36	18	68	0
14	1194	23.839	144.9	94	13	1	36	18	68	0/25
15	1195	24.724	144.5	95	28	1	36	18	68	0
16	1196	25.609	144.5	96	-27		36	18	68	1
17	1197	26.509	143.9	97	10	2	36	18	68	0
18	1198	27.477	143.6	98	18	2	36	18	68	0
19	1199	28.363	143.3	99	7	1	36	18	68	0/12
20	1200	29.276	142.8	100	11	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 14 TEAM 6
 SHOT POINT 14
 SHOT TIME: 181: 6:30: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1201	66.384	145.1	101	19	2	36	18	48	0/12
2	1202	67.327	145.2	102	4	2	36	18	48	0/12
3	1203	68.256	145.3	103	6	2	36	18	48	0/12
4	1204	69.186	145.4	104	0	2	36	18	48	0/12
5	1205	70.057	145.5	105	16	2	36	18	48	0/12
6	1206	71.099	145.5	106	-11		36	18	48	25/21
7	1207	71.977	145.5	107	-71	2	36	18	48	0/12
8	1208	72.885	145.6	108	10		36	18	48	25/21
9	1209	73.787	145.7	109	2	2	36	18	48	0/12
10	1210	74.739	145.8	110	24	2	36	18	48	0/25/12
11	1211	75.668	145.8	111	8	2	36	18	48	0/12
12	1212	76.553	145.9	112	-3	2	36	18	48	0/12/11
13	1213	77.454	146.0	113	-7	2	36	18	48	0
14	1214	78.330	146.0	114	3	2	36	18	48	0/12
15	1215	79.288	146.1	115	-4	2	36	18	48	12
16	1216	80.208	146.2	116	10	2	36	18	48	0/12
17	1217	81.111	146.2	117	9	2	36	18	48	12
18	1218	82.060	146.3	118	8		36	18	48	12
19	1219			119	1		36	18	48	1
20	1220	83.890	146.4	120	2	2	36	18	48	12

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 15 TEAM 1
 SHOT POINT 17
 SHOT TIME: 181: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1101	102.793	326.3	1	17	2	36	18	68	0/10/11
2	1102	102.041	326.6	2	-32	2	36	18	68	0/10/11
3	1103	101.289	326.5	3	9		36	18	68	3
4	1104	100.617	326.4	4	-16	2	36	18	68	0/12/11
5	1105	99.268	326.5	5	55	2	36	18	48	0/25/11
6	1106	98.798	326.7	6	10		36	18	48	1
7	1107	97.278	327.7	7	-20	2	36	18	48	0/12/11
8	1108	98.010	327.1	8	83	2	36	18	48	0/12/11
9	1109	96.585	328.0	9	15	2	36	18	48	0/25/11
10	1110	95.533	328.2	10	-4	2	36	18	48	0/12/11
11	1111	94.610	328.2	11	68		36	18	48	6/ 9/17
12	1112	93.961	328.5	12	7	2	36	18	48	0/12/11
13	1113	93.520	328.3	13	21		36	18	48	17/ 9
14	1114	92.924	328.4	14	85	2	36	18	48	0/12/11
15	1115	92.389	328.7	15	1	2	36	18	48	0/12/11
16				16	--		36	18	48	20
17	1117	91.706	329.0	17	43	2	36	18	48	0/12/11
18	1118	91.102	328.7	18	4	2	36	18	48	0/12/11
19	1119	90.336	328.4	19	43	2	36	18	48	0/12/11
20	1120	89.557	328.2	20	14	2	36	18	48	0/12/11

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 15 TEAM 2
 SHOT POINT 17
 SHOT TIME: 181: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1121	18.261	330.9	21	-5	1	36	18	68	0/ 8
2	1122	19.134	331.1	22	10	2	36	18	68	0
3	1123	20.046	331.2	23	19	1	36	18	68	0/ 8
4	1124	20.903	331.2	24	-14	2	36	18	68	0
5	1125	21.748	330.7	25	5	2	36	18	68	0
6	1126	22.626	330.6	26	6	1	36	18	68	0/26
7	1127	23.797	330.9	27	-13	2	36	18	68	0
8	1128	24.756	331.0	28	10	2	36	18	48	0
9	1129	25.759	331.2	29	12	2	36	18	48	0
10	1130	26.634	331.2	30	5	2	36	18	48	0
11	1131	27.519	331.3	31	9	2	36	18	48	0
12	1132	28.562	331.5	32	1	2	36	18	48	0
13	1133	29.475	331.4	33	10	2	36	18	48	0
14	1134	30.458	331.4	34	5	2	36	18	48	0
15	1135	31.344	331.6	35	-40	2	36	18	48	0
16	1136	32.306	331.7	36	-3		36	18	48	6/ 9
17	1137	33.179	331.8	37	29	2	36	18	48	0/12
18	1138			38	--		36	18	48	28
19	1139	35.029	331.4	39	7	2	36	18	48	0/12
20	1140	36.005	331.2	40	6	2	36	18	48	0/12

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 15 TEAM 3
 SHOT POINT 17
 SHOT TIME: 181: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1141	73.107	326.5	41	--		36	18	48	1
2	1142	74.147	326.4	42	4	2	36	18	48	0/12/11
3	1143	74.905	326.3	43	-27	2	36	18	48	0/12/11
4	1144	75.705	326.7	44	-27	2	36	18	48	0/ 8/11
5	1145	76.596	326.3	45	3	3	36	18	48	0/12/11
6	1146	77.566	326.2	46	-72	2	36	18	48	0/12/11
7	1147	78.573	326.2	47	26	2	36	18	48	0/12/11
8	1148	79.379	326.1	48	-55	2	36	18	48	0/12/11
9	1149	80.336	326.3	49	3	2	36	18	68	0/12/11
10	1150	81.120	326.0	50	0	1	36	18	68	12
11	1151	81.989	326.2	51	17		36	18	68	1
12	1152	82.931	326.3	52	0	2	36	18	68	0/12/11
13	1153	83.770	326.2	53	3	2	36	18	88	0/12/11
14	1154	84.682	326.1	54	-17	2	36	18	68	0/12/11
15	1155	85.313	326.3	55	-9	2	36	18	68	25/21
16	1156	86.075	326.5	56	3	2	36	18	68	0/12/11
17	1157	86.898	326.7	57	-53	2	36	18	68	12
18	1158	87.900	326.9	58	-6	2	36	18	48	0/18/11.
19	1159	88.748	327.0	59	-4	2	36	18	48	0/12/11
20	1160	88.733	327.4	60	-8	2	36	18	48	34

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 15 TEAM 4
 SHOT POINT 17
 SHOT TIME: 181: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1161	36.776	331.1	61	13	2	36	18	48	0/12
2	1162	37.747	330.9	62	12	2	36	18	48	0/12
3	1163	38.664	330.8	63	10	2	36	18	48	0/12
4	1164	39.543	330.6	64	13	2	36	18	48	0/25
5	1165	40.430	330.5	65	1	2	36	18	48	0/12
6	1166	41.306	330.5	66	-4	2	36	18	48	0/12
7	1167	42.242	330.4	67	-14	2	36	18	48	0/12
8	1168	43.103	330.5	68	-14	1	36	18	48	12
9	1169	44.072	330.4	69	7	2	36	18	48	0/12
10	1170	45.010	330.4	70	20	2	36	18	48	0/12
11	1171	45.887	330.4	71	-9	2	36	18	48	0/12
12	1172	46.837	330.3	72	17	2	36	18	48	0/12
13	1173	47.682	330.0	73	-8	2	36	18	48	0/12
14	1174	48.502	329.7	74	-15	2	36	18	48	0/12
15	1175	49.346	329.4	75	13	2	36	18	48	0/12
16	1176	50.247	329.2	76	-10	2	36	18	48	0/12/11
17	1177	51.187	328.9	77	2	1	36	18	48	0/12/11
18	1178	51.939	328.7	78	3	3	36	18	48	0/12/11
19	1179	52.810	328.5	79	17	2	36	18	48	0/12/11
20	1180	53.642	328.2	80	14	2	36	18	48	0/12/11

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 15 TEAM 5
 SHOT POINT 17
 SHOT TIME: 181: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1181	72.041	326.6	81	-10	2	36	18	48	0/12/11
2	1182	71.086	326.6	82	--		36	18	48	17
3	1183	70.011	326.8	83	15	2	36	18	48	0/12/11
4	1184	69.128	326.7	84	17	2	36	18	48	0/12/11
5	1185	68.096	326.7	85	-48	2	36	18	48	0/12/11
6	1186	67.123	326.8	86	-67	1	36	18	48	0/12/11
7	1187	66.264	326.8	87	--	2	36	18	48	0/12/11
8	1188	65.254	326.8	88	146		36	18	48	1
9	1189	64.301	326.8	89	13	2	36	18	48	0/12/11
10	1190	63.329	326.8	90	5	2	36	18	48	25/21
11	1191	62.351	326.8	91	6	2	36	18	48	0/12/11
12	1192	61.525	326.6	92	8	1	36	18	48	0
13	1193	60.762	326.6	93	-13	2	36	18	68	0/12/11
14	1194	59.895	326.8	94	13	2	36	18	68	25
15	1195	59.016	327.0	95	28	2	36	18	68	0/12/11
16	1196	58.133	327.0	96	-28		36	18	68	1
17	1197	57.247	327.3	97	10	2	36	18	68	0/12/11
18	1198	56.291	327.6	98	18	2	36	18	68	0/12/11
19	1199	55.418	327.8	99	7	1	36	18	68	0/12/11
20	1200	54.526	328.1	100	11	1	36	18	48	0/12/11

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 15 TEAM 6
 SHOT POINT 17
 SHOT TIME: 181: 6:45: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1201	17.406	330.7	101	19	1	36	18	48	0
2	1202	16.456	330.6	102	4	1	36	18	48	0
3	1203	15.516	330.4	103	6	1	36	18	48	0
4	1204	14.579	330.1	104	0	1	36	18	48	0
5	1205	13.701	329.9	105	16	1	36	18	48	0
6	1206	12.669	330.7	106	-11	2	36	18	48	25/21
7	1207	11.788	330.7	107	-72	1	36	18	48	0
8	1208	10.874	330.6	108	10		36	18	48	25/21
9	1209	9.967	330.4	109	2	1	36	18	48	0
10	1210	9.009	330.2	110	24	1	36	18	48	0/25
11	1211	8.076	330.0	111	8	3	36	18	48	0
12	1212	7.185	329.6	112	-3	3	36	18	48	0
13	1213	6.281	329.3	113	-7	3	36	18	48	0
14	1214	5.405	329.4	114	3	3	36	18	48	0
15	1215	4.441	328.1	115	-4	3	36	18	48	0
16	1216	3.578	327.3	116	10	3	36	18	48	0
17	1217	2.675	326.5	117	9	3	36	18	48	0
18	1218	1.728	324.3	118	8	3	36	18	48	0
19	1219	0.845	319.0	119	1		36	18	48	1
20	1220	0.221	209.5	120	2	3	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 16 TEAM 1
 SHOT POINT 13
 SHOT TIME: 181: 7: 0: 0.028

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1101	0.065	128.7	1	17	3	36	18	68	0
2	1102	0.968	113.7	2	-33	3	36	18	68	0
3	1103	1.605	133.7	3	9	3	36	18	68	0
4	1104	2.254	139.4	4	-16	3	36	18	68	0
5	1105	3.603	140.7	5	56	3	36	18	48	0/25
6	1106	4.115	136.7	6	10		36	18	48	1
7	1107	6.059	123.9	7	-21	3	36	18	48	0
8	1108	5.044	130.5	8	84	3	36	18	48	0
9	1109	6.919	122.1	9	15	3	36	18	48	25
10	1110	8.012	123.2	10	-5	3	36	18	48	0
11	1111	8.887	125.3	11	69		36	18	48	6/ 9/17
12	1112	9.643	124.6	12	7	1	36	18	48	0
13	1113	9.920	127.4	13	21	1	36	18	48	0
14	1114	10.550	127.5	14	86	1	36	18	48	0
15	1115	11.211	126.4	15	1	1	36	18	48	0
16				16	--		36	18	48	20
17	1117	12.051	125.3	17	43	1	36	18	48	0
18	1118	12.448	128.2	18	4	2	36	18	48	0/31
19	1119	13.008	131.5	19	43	2	36	18	48	0
20	1120	13.682	133.5	20	14	1	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 16 TEAM 2
 SHOT POINT 13
 SHOT TIME: 181: 7: 0: 0.028

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1121	84.641	145.3	21	-5	1	36	18	68	12
2	1122	83.776	145.2	22	10	2	36	18	68	0
3	1123	82.872	145.1	23	19	1	36	18	68	0/12
4	1124	82.020	145.0	24	-14	2	36	18	68	0
5	1125	81.160	145.1	25	5	2	36	18	68	0
6	1126	80.281	145.1	26	6	1	36	18	68	0/26
7	1127	79.074	144.9	27	-14	2	36	18	68	0
8	1128	78.126	144.8	28	10	2	36	18	48	0
9	1129	77.136	144.7	29	12	2	36	18	48	0
10	1130	76.271	144.6	30	5	2	36	18	48	0
11	1131	75.395	144.5	31	10	2	36	18	48	0
12	1132	74.370	144.3	32	1	2	36	18	48	0
13	1133	73.461	144.2	33	11	2	36	18	48	0
14	1134	72.486	144.1	34	5	2	36	18	48	0
15	1135	71.618	144.0	35	-40	2	36	18	48	0
16	1136	70.672	143.8	36	-4		36	18	48	6/ 9
17	1137	69.818	143.7	37	30	2	36	18	48	0
18	1138			38	--		36	18	48	28
19	1139	67.949	143.7	39	7	2	36	18	48	0
20	1140	66.967	143.7	40	6	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 16 TEAM 3
 SHOT POINT 13
 SHOT TIME: 181: 7: 0: 0.028

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1141	29.673	145.8	41	--		36	18	48	1
2	1142	28.633	146.1	42	4	1	36	18	48	0
3	1143	27.874	146.4	43	-27	1	36	18	48	0
4	1144	27.079	145.3	44	-27	1	36	18	48	0
5	1145	26.183	146.2	45	3	1	36	18	48	0
6	1146	25.215	146.7	46	-72	1	36	18	48	0
7	1147	24.207	146.5	47	26	1	36	18	48	0
8	1148	23.403	146.9	48	-56	1	36	18	48	0
9	1149	22.504	146.4	49	3	1	36	18	68	0
10	1150	21.724	147.3	50	0	1	36	18	68	0/ 8
11	1151	20.852	146.6	51	17		36	18	68	1
12	1152	19.910	146.3	52	0	1	36	18	68	0
13	1153	19.072	146.7	53	3	2	36	18	88	0
14	1154	18.163	147.1	54	-17	2	36	18	68	0
15	1155	17.530	146.2	55	-9		36	18	68	25/21
16	1156	16.772	145.3	56	3	2	36	18	68	0
17	1157	15.964	143.8	57	-53	1	36	18	68	0
18	1158	14.981	142.7	58	-6	1	36	18	48	0/18
19	1159	14.141	142.2	59	-4	1	36	18	48	0
20	1160	14.238	139.3	60	-8	1	36	18	48	34

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 16 TEAM 4
 SHOT POINT 13
 SHOT TIME: 181: 7: 0: 0.028

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1161	66.195	143.6	61	13	2	36	18	48	0
2	1162	65.216	143.6	62	12	2	36	18	48	0
3	1163	64.292	143.6	63	10	2	36	18	48	0
4	1164	63.410	143.6	64	14	2	36	18	48	0/25
5	1165	62.518	143.6	65	1	2	36	18	48	0
6	1166	61.646	143.5	66	-4	2	36	18	48	0
7	1167	60.715	143.4	67	-14	2	36	18	48	0
8	1168	59.864	143.3	68	-15	2	36	18	48	0
9	1169	58.898	143.2	69	7	2	36	18	48	0
10	1170	57.967	143.1	70	20	2	36	18	48	0
11	1171	57.093	143.0	71	-9	2	36	18	48	0
12	1172	56.144	142.9	72	17		36	18	48	7
13	1173	55.274	143.1	73	-8	2	36	18	48	0/12
14	1174	54.429	143.3	74	-15	2	36	18	48	0
15	1175	53.566	143.4	75	14	2	36	18	48	0
16	1176	52.647	143.6	76	-10	2	36	18	48	0
17	1177	51.690	143.7	77	2		36	18	48	3
18	1178	50.925	143.9	78	3	2	36	18	48	0
19	1179	50.042	144.0	79	18	2	36	18	48	0
20	1180	49.195	144.2	80	15	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 16 TEAM 5
 SHOT POINT 13
 SHOT TIME: 181: 7: 0: 0.028

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1181	30.741	145.6	81	-11	1	36	18	48	0
2	1182	31.695	145.7	82	--		36	18	48	17
3	1183	32.775	145.2	83	15	1	36	18	48	0
4	1184	33.655	145.5	84	17	1	36	18	48	0/12/11
5	1185	34.688	145.4	85	-48	1	36	18	48	0
6	1186	35.662	145.3	86	-67	1	36	18	48	0/ 8
7	1187	36.519	145.5	87	--	1	36	18	48	0
8	1188	37.530	145.4	88	147		36	18	48	1
9	1189	38.483	145.5	89	13	1	36	18	48	0
10	1190	39.455	145.4	90	5		36	18	48	25/21
11	1191	40.433	145.5	91	6	2	36	18	48	0
12	1192	41.255	145.8	92	8	2	36	18	48	0
13	1193	42.018	145.9	93	-13	2	36	18	68	0
14	1194	42.888	145.6	94	13	2	36	18	68	0/25
15	1195	43.771	145.4	95	28	2	36	18	68	0
16	1196	44.655	145.3	96	-28		36	18	68	1
17	1197	45.550	145.0	97	10	2	36	18	68	0
18	1198	46.514	144.8	98	18	2	36	18	68	0
19	1199	47.397	144.6	99	7		36	18	68	12
20	1200	48.304	144.3	100	11	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 16 TEAM 6
 SHOT POINT 13
 SHOT TIME: 181: 7: 0: 0.028

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1201	85.488	145.4	101	19		36	18	48	0
2	1202	86.433	145.5	102	4		36	18	48	12
3	1203	87.365	145.6	103	6		36	18	48	0
4	1204	88.296	145.7	104	0		36	18	48	0
5	1205	89.169	145.7	105	16	2	36	18	48	0
6	1206	90.211	145.7	106	-11		36	18	48	25/21
7	1207	91.090	145.7	107	-72	2	36	18	48	0
8	1208	92.000	145.8	108	10		36	18	48	25/21
9	1209	92.903	145.9	109	2	2	36	18	48	0
10	1210	93.857	145.9	110	24	2	36	18	48	0/25
11	1211	94.787	146.0	111	8	2	36	18	48	0
12	1212	95.674	146.0	112	-3	2	36	18	48	0/12
13	1213	96.576	146.1	113	-7	2	36	18	48	0/12
14	1214	97.453	146.1	114	3	2	36	18	48	0/12/11
15	1215	98.412	146.2	115	-4	2	36	18	48	0/12/11
16	1216	99.275	146.3	116	10	2	36	18	48	0/12/11
17	1217	100.178	146.3	117	9	2	36	18	48	0/12/11
18	1218	101.127	146.3	118	8		36	18	48	8/12
19	1219	102.017	146.4	119	1		36	18	48	1
20	1220	102.956	146.4	120	2	2	36	18	48	12

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 17 TEAM 1
 SHOT POINT 15
 SHOT TIME: 181: 7:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1101	44.606	325.4	1	17	2	36	18	68	0/12/11
2	1102	43.847	326.1	2	-33	2	36	18	68	0/12/11
3	1103	43.098	325.8	3	9	2	36	18	68	0
4	1104	42.427	325.7	4	-17	2	36	18	68	0
5	1105	41.078	325.8	5	57	2	36	18	48	0/25
6	1106	40.604	326.3	6	10		36	18	48	1
7	1107	39.091	328.7	7	-21	2	36	18	48	0
8	1108	39.815	327.3	8	85	2	36	18	48	0
9	1109	38.410	329.5	9	16		36	18	48	25/21
10	1110	37.368	330.1	10	-5	2	36	18	48	0
11	1111	36.449	330.2	11	70		36	18	48	6/ 9/17
12	1112	35.815	330.9	12	7	2	36	18	48	0
13	1113	35.361	330.4	13	21	2	36	18	48	0
14	1114	34.774	330.8	14	88	2	36	18	48	0
15	1115	34.260	331.5	15	1	2	36	18	48	0
16				16	--		36	18	48	20
17	1117	33.607	332.5	17	44	2	36	18	48	0
18	1118	32.981	331.8	18	4	2	36	18	48	0/25/31.
19	1119	32.192	331.0	19	44	2	36	18	48	0
20	1120	31.404	330.6	20	14	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 17 TEAM 2
 SHOT POINT 15
 SHOT TIME: 181: 7:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1121	39.918	145.2	21	-5		36	18	68	12
2	1122	39.054	145.0	22	11	2	36	18	68	0/ 8
3	1123	38.152	144.8	23	20		36	18	68	12
4	1124	37.302	144.6	24	-14	2	36	18	68	0
5	1125	36.442	144.7	25	5	2	36	18	68	0
6	1126	35.564	144.7	26	6		36	18	68	12
7	1127	34.410	144.3	27	-14	2	36	18	68	0
8	1128	33.464	144.0	28	10	2	36	18	48	0
9	1129	32.477	143.7	29	12	2	36	18	48	0
10	1130	31.615	143.4	30	5	2	36	18	48	0
11	1131	30.743	143.1	31	10		36	18	48	6/ 9
12	1132	29.724	142.7	32	1	2	36	18	48	0
13	1133	28.818	142.4	33	11	2	36	18	48	0
14	1134	27.848	142.1	34	5	2	36	18	48	0
15	1135	26.989	141.6	35	-41	2	36	18	48	0
16	1136	26.053	141.1	36	-4		36	18	48	6/ 9
17	1137	25.209	140.6	37	30	2	36	18	48	0
18	1138			38	--		36	18	48	28
19	1139	23.342	140.4	39	7	2	36	18	48	0
20	1140	22.363	140.2	40	6	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 17 TEAM 3
 SHOT POINT 15
 SHOT TIME: 181: 7:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1141	14.998	324.6	41	--		36	18	48	1
2	1142	16.042	324.1	42	4	2	36	18	48	0
3	1143	16.805	323.8	43	-28	2	36	18	48	0
4	1144	17.590	325.6	44	-28	2	36	18	48	0
5	1145	18.492	324.3	45	3	2	36	18	48	0
6	1146	19.469	323.7	46	-74	2	36	18	48	0
7	1147	20.472	324.1	47	27	2	36	18	48	0
8	1148	21.283	323.7	48	-57	2	36	18	48	0
9	1149	22.172	324.4	49	3		36	18	68	12
10	1150	22.969	323.6	50	0		36	18	68	12
11	1151	23.826	324.3	51	18		36	18	68	1
12	1152	24.763	324.7	52	0	2	36	18	68	0
13	1153	25.605	324.4	53	4	2	36	18	88	0
14	1154	26.520	324.2	54	-18	2	36	18	68	0
15	1155	27.141	324.9	55	-9		36	18	68	25/21
16	1156	27.897	325.5	56	3	2	36	18	68	12
17	1157	28.713	326.3	57	-55	1	36	18	68	25/21/26
18	1158	29.712	326.8	58	-6	2	36	18	48	0/18
19	1159	30.559	326.9	59	-4	2	36	18	48	0
20	1160	30.548	328.3	60	-8	2	36	18	48	34

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 17 TEAM 4
 SHOT POINT 15
 SHOT TIME: 181: 7:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1161	21.596	139.9	61	14		36	18	48	0
2	1162	20.619	139.8	62	13	2	36	18	48	0
3	1163	19.697	139.6	63	10	2	36	18	48	0
4	1164	18.819	139.3	64	14	2	36	18	48	0/25
5	1165	17.931	139.1	65	1		36	18	48	25/21
6	1166	17.069	138.5	66	-4	2	36	18	48	0
7	1167	16.151	137.9	67	-14	2	36	18	48	0
8	1168	15.319	137.1	68	-15	2	36	18	48	0
9	1169	14.369	136.3	69	7	2	36	18	48	0/ 8
10	1170	13.460	135.4	70	20	1	36	18	48	0/ 8
11	1171	12.606	134.5	71	-9	1	36	18	48	0/ 8
12	1172	11.680	133.5	72	17	1	36	18	48	0
13	1173	10.797	133.5	73	-8	1	36	18	48	0
14	1174	9.934	133.7	74	-16	1	36	18	48	0
15	1175	9.062	133.5	75	14	1	36	18	48	0
16	1176	8.132	133.4	76	-10	1	36	18	48	0
17	1177	7.164	133.2	77	2	1	36	18	48	0
18	1178	6.391	132.9	78	3	1	36	18	48	0
19	1179	5.500	132.4	79	18	1	36	18	48	0
20	1180	4.636	132.4	80	15	3	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 17 TEAM 5
 SHOT POINT 15
 SHOT TIME: 181: 7:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1181	13.928	325.1	81	-11	1	36	18	48	0
2	1182	12.975	324.8	82	--		36	18	48	17
3	1183	11.894	325.8	83	16	1	36	18	48	0
4	1184	11.014	325.1	84	17	1	36	18	48	0
5	1185	9.980	325.4	85	-49	1	36	18	48	0
6	1186	9.007	325.7	86	-69	1	36	18	48	0
7	1187	8.149	325.1	87	--	3	36	18	48	0
8	1188	7.138	325.3	88	151		36	18	48	1
9	1189	6.186	324.9	89	14	1	36	18	48	0
10	1190	5.213	325.1	90	6		36	18	48	25/21
11	1191	4.235	324.9	91	6	3	36	18	48	0
12	1192	3.428	320.3	92	8	3	36	18	48	0
13	1193	2.674	318.1	93	-14	3	36	18	68	0
14	1194	1.791	319.6	94	13	3	36	18	68	0/25
15	1195	0.898	325.1	95	29	3	36	18	68	0
16	1196	0.046	38.7	96	-28		36	18	68	1
17	1197	0.935	125.8	97	10	3	36	18	68	0
18	1198	1.913	130.0	98	18	3	36	18	68	0
19	1199	2.810	131.3	99	7	1	36	18	68	0
20	1200	3.749	130.8	100	11	3	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 17 TEAM 6
 SHOT POINT 15
 SHOT TIME: 181: 7:45: 0.010

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1201	40.763	145.4	101	20	2	36	18	48	0
2	1202	41.706	145.6	102	4		36	18	48	6
3	1203	42.637	145.8	103	6	2	36	18	48	0
4	1204	43.567	145.9	104	0	2	36	18	48	0
5	1205	44.440	146.1	105	16	2	36	18	48	0
6	1206	45.481	146.0	106	-12		36	18	48	25/21
7	1207	46.359	146.0	107	-74	2	36	18	48	12
8	1208	47.269	146.2	108	10		36	18	48	25/21
9	1209	48.171	146.3	109	2	2	36	18	48	12
10	1210	49.125	146.4	110	25	2	36	18	48	12/25
11	1211	50.054	146.5	111	8	2	36	18	48	12
12	1212	50.941	146.6	112	-3	2	36	18	48	12
13	1213	51.843	146.7	113	-7	2	36	18	48	12
14	1214	52.719	146.7	114	2	2	36	18	48	12
15	1215	53.678	146.9	115	-4	2	36	18	48	12
16	1216	54.540	147.0	116	10	2	36	18	48	12
17	1217	55.443	147.0	117	9	2	36	18	48	12
18	1218	56.392	147.1	118	8		36	18	48	12
19	1219	57.281	147.1	119	1		36	18	48	1
20	1220	58.221	147.2	120	2	2	36	18	48	12

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 18 TEAM 1
 SHOT POINT 16
 SHOT TIME: 181: 8: 0: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1101	81.975	325.0	1	18	2	36	18	68	0/12/10
2	1102	81.213	325.4	2	-33	2	36	18	68	0/12/10
3	1103	80.464	325.2	3	9	2	36	18	68	0
4	1104	79.743	325.2	4	-17	2	36	18	68	0
5	1105	78.393	325.2	5	57	2	36	18	48	0/25
6	1106	77.914	325.5	6	10		36	18	48	1
7	1107	76.359	326.7	7	-21	2	36	18	48	0
8	1108	77.111	326.0	8	86	2	36	18	48	0
9	1109	75.656	327.1	9	16	2	36	18	48	25/21
10	1110	74.598	327.3	10	-5	2	36	18	48	0
11	1111	73.675	327.4	11	70		36	18	48	6/ 9/17
12	1112	73.019	327.7	12	7	2	36	18	48	0
13	1113	72.584	327.4	13	22		36	18	48	17/ 9
14	1114	71.985	327.6	14	88	2	36	18	48	0
15	1115	71.443	327.9	15	1	2	36	18	48	0
16				16	--		36	18	48	20
17	1117	70.752	328.3	17	44	2	36	18	48	0
18	1118	70.155	328.0	18	4	2	36	18	48	25/21
19	1119	69.399	327.5	19	44	2	36	18	48	0
20	1120	68.627	327.3	20	14	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 18 TEAM 2
 SHOT POINT 16
 SHOT TIME: 181: 8: 0: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1121	2.631	154.1	21	-5	3	36	18	68	0
2	1122	1.755	153.8	22	11	3	36	18	68	0
3	1123	0.843	154.2	23	20	3	36	18	68	0
4	1124	0.029	272.5	24	-14	3	36	18	68	0
5	1125	0.886	317.0	25	5	3	36	18	68	0
6	1126	1.758	322.4	26	6	3	36	18	68	0
7	1127	2.914	327.6	27	-14	3	36	18	68	0
8	1128	3.870	329.2	28	10	3	36	18	48	0
9	1129	4.872	330.5	29	12	3	36	18	48	0
10	1130	5.746	330.9	30	5	3	36	18	48	0
11	1131	6.631	331.2	31	10		36	18	48	6/ 9
12	1132	7.675	331.9	32	1	3	36	18	48	0
13	1133	8.588	331.7	33	11	3	36	18	48	0
14	1134	9.570	331.7	34	5	3	36	18	48	0
15	1135	10.457	332.2	35	-42	3	36	18	48	0
16	1136	11.419	332.4	36	-4		36	18	48	6/ 9
17	1137	12.293	332.7	37	31	1	36	18	48	0
18	1138			38	--		36	18	48	28
19	1139	14.141	331.5	39	7	1	36	18	48	0
20	1140	15.117	331.1	40	7	1	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 18 TEAM 3
 SHOT POINT 16
 SHOT TIME: 181: 8: 0: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1141	52.318	324.6	41	--		36	18	48	1
2	1142	53.362	324.4	42	4	2	36	18	48	0/12
3	1143	54.125	324.3	43	-28	2	36	18	48	0/12
4	1144	54.908	324.9	44	-28	2	36	18	48	0/12
5	1145	55.812	324.5	45	3	2	36	18	48	12
6	1146	56.788	324.3	46	-75	2	36	18	48	12
7	1147	57.792	324.4	47	27	2	36	18	48	12
8	1148	58.603	324.3	48	-57	2	36	18	48	12
9	1149	59.492	324.5	49	3	1	36	18	68	12
10	1150	60.288	324.2	50	0	1	36	18	68	12
11	1151	61.146	324.5	51	18		36	18	68	1
12	1152	62.083	324.6	52	0	2	36	18	68	12
13	1153	62.925	324.5	53	4	2	36	18	88	12
14	1154	63.840	324.4	54	-18	2	36	18	68	0/12
15	1155	64.461	324.7	55	-9	2	36	18	68	25/21
16	1156	65.214	325.0	56	3	2	36	18	68	0/12
17	1157	66.025	325.3	57	-55	1	36	18	68	12
18	1158	67.019	325.6	58	-6	2	36	18	48	0/18
19	1159	67.864	325.6	59	-4	2	36	18	48	0
20	1160	67.831	326.2	60	-8	2	36	18	48	34

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 18 TEAM 4
 SHOT POINT 16
 SHOT TIME: 181: 8: 0: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1161	15.889	330.9	61	14	1	36	18	48	0
2	1162	16.860	330.4	62	13	2	36	18	48	0
3	1163	17.778	330.1	63	10	2	36	18	48	0
4	1164	18.658	329.9	64	14	2	36	18	48	0/25
5	1165	19.546	329.6	65	1	2	36	18	48	25/21
6	1166	20.422	329.6	66	-4	2	36	18	48	0
7	1167	21.358	329.6	67	-15	2	36	18	48	0
8	1168	22.219	329.7	68	-15	2	36	18	48	0
9	1169	23.188	329.7	69	7	2	36	18	48	0
10	1170	24.126	329.7	70	20	2	36	18	48	0
11	1171	25.004	329.6	71	-9	1	36	18	48	12
12	1172	25.954	329.5	72	17	2	36	18	48	0
13	1173	26.803	329.0	73	-8	2	36	18	48	0
14	1174	27.628	328.5	74	-16	2	36	18	48	0
15	1175	28.476	328.1	75	14	2	36	18	48	0
16	1176	29.383	327.6	76	-10	2	36	18	48	0
17	1177	30.329	327.2	77	2		36	18	48	3
18	1178	31.086	326.9	78	3	2	36	18	48	0
19	1179	31.962	326.6	79	18	2	36	18	48	0
20	1180	32.801	326.3	80	15	2	36	18	48	0

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 18 TEAM 5
 SHOT POINT 16
 SHOT TIME: 181: 8: 0: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1181	51.248	324.7	81	-11	2	36	18	48	0/12
2	1182	50.295	324.6	82	--		36	18	48	17
3	1183	49.212	324.9	83	16	2	36	18	48	0
4	1184	48.334	324.7	84	17	2	36	18	48	0
5	1185	47.299	324.7	85	-49	2	36	18	48	0
6	1186	46.325	324.8	86	-69	1	36	18	48	12
7	1187	45.469	324.7	87	--	2	36	18	48	0/12
8	1188	44.458	324.7	88	152		36	18	48	1
9	1189	43.506	324.6	89	14	2	36	18	48	0
10	1190	42.533	324.6	90	6		36	18	48	25/21
11	1191	41.555	324.6	91	6	2	36	18	48	0/12
12	1192	40.740	324.2	92	8	2	36	18	48	0/12
13	1193	39.978	324.1	93	-14	2	36	18	68	0/12
14	1194	39.105	324.3	94	13	2	36	18	68	0/25
15	1195	38.218	324.6	95	29	2	36	18	68	0
16	1196	37.333	324.6	96	-29		36	18	68	1
17	1197	36.436	325.0	97	10	2	36	18	68	0
18	1198	35.472	325.3	98	18	2	36	18	68	0
19	1199	34.591	325.6	99	8		36	18	68	12
20	1200	33.690	326.1	100	11	2	36	18	48	0/ 8

FIELD DATA TABLE, COALINGA, CALIFORNIA 1983

SHOT NUMBER 18 TEAM 6
 SHOT POINT 16
 SHOT TIME: 181: 8: 0: 0.007

	LOC	DIST(KM)	AZIM	UNIT	CHRON	CHAN	C1	C2	C3	TAPE GRADE
1	1201	3.488	154.3	101	20	3	36	18	48	0
2	1202	4.438	153.9	102	4		36	18	48	3
3	1203	5.380	154.1	103	6	3	36	18	48	0
4	1204	6.320	154.0	104	0	1	36	18	48	0
5	1205	7.199	153.9	105	16	3	36	18	48	0
6	1206	8.221	152.3	106	-12		36	18	48	25/21
7	1207	9.101	152.1	107	-74	3	36	18	48	0
8	1208	10.016	152.1	108	10		36	18	48	25/21
9	1209	10.923	152.1	109	2	1	36	18	48	0/12
10	1210	11.882	152.2	110	25	1	36	18	48	0/25
11	1211	12.815	152.1	111	8	1	36	18	48	0
12	1212	13.707	152.2	112	-3	3	36	18	48	0
13	1213	14.612	152.2	113	-7	1	36	18	48	0
14	1214	15.487	152.0	114	2	1	36	18	48	0
15	1215	16.456	152.2	115	-4	1	36	18	48	0
16	1216	17.321	152.1	116	10	1	36	18	48	0
17	1217	18.223	152.0	117	9	1	36	18	48	0
18	1218	19.174	151.9	118	9	1	36	18	48	12
19	1219	20.063	151.8	119	1		36	18	48	1
20	1220	21.005	151.8	120	2	1	36	18	48	0

APPENDIX C

First Arrival Times

Appendix C is a listing of the first arrival times picked off of the record sections. Included are: shotpoint number, recorder site location number, absolute and reduced ($T - X/6$) travel times, and the distance (km) and azimuth (deg) of the recorder from the shotpoint.

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
-----	-----	-----	-----	-----	-----
9	723	0.495	0.367	0.770	18.163
9	722	0.742	0.551	1.142	50.145
9	721	0.018	0.008	0.064	247.989
9	724	0.483	0.346	0.821	333.068
9	725	0.700	0.494	1.241	307.542
9	727	1.314	0.919	2.370	288.598
9	728	1.634	1.140	2.968	284.756
9	729	1.939	1.345	3.564	282.247
9	730	2.230	1.535	4.175	280.431
9	731	2.522	1.719	4.814	279.034
9	734	3.361	2.228	6.796	276.282
9	735	3.621	2.382	7.436	275.927
9	736	3.830	2.485	8.069	275.460
9	739	4.476	2.823	9.915	274.581
9	740	4.585	2.833	10.513	274.320
9	819	5.053	2.864	13.131	273.447
9	818	5.149	2.864	13.712	273.311
9	817	5.246	2.854	14.354	273.315
9	815	5.445	2.844	15.607	272.803
9	814	5.548	2.844	16.226	272.814
9	813	5.661	2.844	16.902	272.668
9	811	5.875	2.844	18.191	272.586
9	810	5.963	2.823	18.837	272.599
9	809	6.108	2.844	19.589	272.407
9	805	6.518	2.844	22.048	272.189
9	804	6.603	2.823	22.677	272.068
9	803	6.729	2.844	23.312	272.082
9	801	6.892	2.800	24.550	0.000
9	800	6.974	2.792	25.087	271.973
9	799	7.127	2.813	25.884	271.913
9	798	7.203	2.782	26.528	271.783
9	797	7.309	2.782	27.162	271.823
9	796	7.407	2.772	27.810	271.780
9	795	7.559	2.813	28.479	271.724
9	794	7.668	2.813	29.131	271.671
9	793	7.797	2.833	29.781	271.638
9	790	8.109	2.854	31.530	271.557
9	789	8.257	2.864	32.358	271.517
9	788	8.419	2.905	33.085	271.484
9	787	8.524	2.905	33.716	271.460
9	786	8.695	2.956	34.431	271.421
9	785	8.800	2.977	34.939	271.397
9	783	9.049	3.008	36.246	271.332
9	781	9.307	3.049	37.549	271.292
9	779	9.450	3.069	38.284	271.242
9	778	9.606	3.121	38.912	271.222
9	777	9.705	3.110	39.570	271.216
9	774	10.081	3.172	41.458	271.144
9	773	10.197	3.180	42.100	0.000
9	772	10.324	3.203	42.730	271.110
9	771	10.475	3.253	43.331	271.095
9	770	10.577	3.243	44.000	271.100
9	769	10.677	3.243	44.600	271.033
9	768	10.776	3.233	45.256	271.027

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
-----	-----	-----	-----	-----	-----
10	818	5.964	3.110	17.120	91.044
10	819	6.020	3.069	17.703	91.018
10	740	6.385	2.997	20.326	90.900
10	739	6.485	2.997	20.925	90.900
10	736	6.742	2.946	22.776	90.845
10	735	6.828	2.926	23.413	90.822
10	734	6.894	2.885	24.054	90.858
10	731	7.206	2.864	26.054	90.765
10	730	7.284	2.833	26.702	90.746
10	729	7.374	2.820	27.326	90.729
10	728	7.479	2.823	27.938	90.713
10	727	7.583	2.823	28.562	90.698
10	725	7.784	2.813	29.824	90.668
10	724	7.865	2.792	30.437	90.700
10	721	7.920	2.792	30.768	92.101
10	723	7.936	2.761	31.048	90.686
10	722	8.001	2.720	31.685	90.673
10	790	0.497	0.372	0.752	250.820
10	789	0.919	0.659	1.559	260.876
10	788	1.316	0.936	2.280	263.775
10	787	1.636	1.151	2.908	265.165
10	786	1.960	1.356	3.621	266.046
10	785	2.188	1.500	4.129	266.497
10	784	2.470	1.674	4.775	267.119
10	783	2.744	1.839	5.435	267.241
10	781	3.259	2.136	6.737	267.814
10	779	3.556	2.310	7.471	267.899
10	778	3.783	2.433	8.100	268.063
10	777	3.985	2.525	8.757	268.272
10	774	4.546	2.772	10.644	268.514
10	773	4.686	2.803	11.302	268.601
10	772	4.840	2.854	11.916	268.673
10	771	4.981	2.895	12.518	268.737
10	770	5.124	2.926	13.187	268.747
10	769	5.275	2.977	13.788	268.753
10	768	5.404	2.997	14.443	268.838
10	767	5.575	3.059	15.097	268.879
10	766	5.729	3.110	15.711	268.774
10	765	5.851	3.121	16.385	268.825
10	764	5.996	3.151	17.068	268.912
10	763	6.341	3.264	18.461	268.957
10	762	6.447	3.285	18.977	268.949
10	742	6.802	3.315	20.917	268.553
10	743	7.014	3.428	21.517	268.281
10	745	7.254	3.449	22.833	267.963
10	746	7.352	3.438	23.483	267.721
10	747	7.459	3.438	24.123	267.440
10	749	7.635	3.397	25.428	267.268
10	750	7.714	3.360	26.124	266.830
10	752	8.056	3.511	27.272	265.452
10	754	8.277	3.501	28.659	265.582
10	758	8.692	3.471	31.326	265.035
10	759	8.763	3.463	31.800	264.219
10	760	8.859	3.453	32.433	263.663

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
-----	-----	-----	-----	-----	-----
10	703	9.131	3.339	34.749	263.729
10	704	9.226	3.319	35.439	264.690
10	706	9.374	3.225	36.897	266.347
10	707	9.465	3.194	37.631	266.893
10	709	9.723	3.192	39.183	268.491
10	712	10.020	3.031	41.937	268.180
10	713	10.196	3.071	42.749	268.697
10	714	10.269	2.998	43.626	269.480
10	715	10.368	2.958	44.456	269.258
10	717	10.629	2.947	46.093	269.985
10	719	10.775	2.916	47.155	270.699
11	747	0.664	0.449	1.292	84.600
11	746	0.920	0.597	1.939	82.106
11	745	1.286	0.854	2.596	81.390
11	744	1.602	1.090	3.075	81.474
11	743	1.865	1.213	3.916	81.860
11	742	2.095	1.341	4.524	81.461
11	762	2.742	1.664	6.467	82.429
11	763	2.889	1.726	6.980	82.890
11	764	3.332	1.940	8.350	0.000
11	765	3.550	2.050	9.000	0.000
11	766	3.745	2.126	9.716	84.898
11	767	3.934	2.213	10.329	84.976
11	768	4.074	2.244	10.982	85.262
11	769	4.193	2.254	11.635	85.564
11	770	4.529	2.490	12.234	85.726
11	771	4.710	2.560	12.903	85.893
11	772	4.750	2.500	13.503	86.076
11	773	4.914	2.562	14.116	86.247
11	774	5.106	2.644	14.773	86.414
11	776	5.462	2.787	16.050	86.657
11	777	5.645	2.870	16.650	0.000
11	778	5.765	2.879	17.314	86.934
11	781	6.044	2.931	18.677	87.106
11	782	6.206	2.982	19.341	87.191
11	783	6.312	2.982	19.979	87.308
11	784	6.687	3.240	20.680	0.000
11	785	6.827	3.280	21.285	87.448
11	786	6.912	3.280	21.793	87.501
11	787	7.123	3.372	22.508	87.568
11	792	8.042	3.741	25.808	87.895
11	793	8.138	3.731	26.441	87.946
11	794	8.246	3.731	27.091	88.000
11	795	8.314	3.690	27.743	88.032
11	796	8.374	3.638	28.413	88.064
11	797	8.461	3.618	29.061	88.107
11	798	8.583	3.650	29.600	0.000
11	799	8.633	3.577	30.339	88.187
11	800	8.766	3.577	31.135	88.233
11	801	8.857	3.587	31.617	88.273
11	803	8.990	3.505	32.910	88.358
11	805	9.098	3.403	34.174	88.426
11	749	0.001	-0.003	0.019	230.557

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
-----	-----	-----	-----	-----	-----
11	750	0.362	0.238	0.740	250.700
11	752	1.051	0.710	2.041	241.867
11	753	1.309	0.864	2.672	248.389
11	754	1.575	1.018	3.343	252.454
11	755	1.806	1.141	3.987	255.574
11	756	2.035	1.264	4.623	257.560
11	757	2.287	1.400	5.320	0.000
11	758	2.451	1.449	6.014	255.448
11	759	2.635	1.541	6.564	252.234
11	760	2.841	1.633	7.248	250.834
11	701	3.023	1.695	7.968	250.988
11	702	3.109	1.654	8.734	252.662
11	703	3.219	1.633	9.514	254.168
11	707	3.665	1.628	12.219	266.059
11	709	4.100	1.803	13.787	270.698
11	710	4.302	1.874	14.568	269.727
11	711	4.545	1.946	15.593	270.264
11	712	4.691	1.936	16.532	269.542
11	713	4.829	1.936	17.356	270.753
11	714	4.969	1.926	18.259	272.523
11	715	5.075	1.895	19.080	271.874
11	717	5.352	1.895	20.745	273.282
11	718	5.497	1.895	21.610	273.565
11	719	5.566	1.926	21.844	274.663
12	719	1.758	0.767	5.950	114.000
12	718	1.815	0.762	6.319	116.900
12	717	1.985	0.792	7.158	114.900
12	716	2.204	0.844	8.165	115.300
12	715	2.386	0.905	8.887	113.714
12	714	2.615	1.018	9.585	110.739
12	713	2.799	1.028	10.622	111.947
12	712	3.041	1.120	11.520	112.078
12	711	3.216	1.161	12.325	109.559
12	710	3.477	1.254	13.339	108.658
12	709	3.640	1.305	14.012	106.715
12	707	4.068	1.428	15.839	108.546
12	703	4.900	1.685	19.292	110.618
12	702	5.134	1.791	20.060	109.800
12	701	5.237	1.770	20.800	0.000
12	760	5.405	1.839	21.398	107.903
12	759	5.522	1.880	21.855	106.483
12	758	5.558	1.869	22.134	104.947
12	757	5.709	1.931	22.672	103.878
12	756	5.810	1.931	23.277	102.893
12	755	5.977	1.992	23.914	102.538
12	754	6.129	2.033	24.576	102.229
12	753	6.305	2.095	25.258	101.839
12	752	6.395	2.074	25.923	101.482
12	751	6.472	2.070	26.410	0.000
12	750	6.554	2.074	26.875	99.515
12	749	6.629	2.044	27.512	98.802
12	747	6.881	2.085	28.779	98.142
12	746	6.972	2.074	29.386	97.689

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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12	745	7.117	2.115	30.011	97.292
12	743	7.525	2.310	31.290	96.687
12	742	7.643	2.331	31.870	96.352
12	762	8.085	2.456	33.777	95.685
12	763	8.180	2.465	34.289	95.580
12	768	9.065	2.684	38.285	94.931
12	769	9.099	2.609	38.938	94.859
12	772	9.500	2.700	40.801	94.602
12	773	9.633	2.731	41.414	94.534
12	774	9.763	2.751	42.069	94.463
12	776	10.016	2.792	43.343	94.316
12	777	10.145	2.820	43.950	0.000
12	778	10.234	2.800	44.607	94.206
12	781	10.531	2.870	45.965	94.061
12	782	10.631	2.860	46.628	93.997
12	783	10.728	2.850	47.265	93.954
12	784	11.052	3.060	47.950	0.000
12	784	10.984	2.997	47.922	93.900
12	785	11.165	3.070	48.569	93.837
12	786	11.237	3.058	49.076	93.794
12	787	11.346	3.048	49.789	93.734
12	788	11.413	3.010	50.419	93.690
12	790	11.676	3.014	51.971	93.580
12	792	11.819	2.971	53.085	93.510
12	793	12.084	3.131	53.718	93.469
12	794	12.202	3.141	54.367	93.429
12	795	12.325	3.156	55.018	93.381
12	797	12.383	3.000	56.300	0.000
12	798	12.596	3.102	56.967	93.297
12	799	12.722	3.120	57.609	93.222
12	800	12.655	2.921	58.404	93.178
12	801	12.684	2.870	58.886	93.159
12	803	12.762	2.733	60.178	93.100
12	805	12.950	2.710	61.441	93.041
12	807	13.131	2.679	62.716	92.970
12	809	13.290	2.640	63.898	92.941
12	811	13.431	2.548	65.296	92.900
12	817	13.916	2.394	69.132	92.713
12	818	13.962	2.333	69.774	92.719
12	819	14.059	2.333	70.355	92.698
12	820	14.112	2.279	70.998	92.670
12	740	14.363	2.200	72.976	92.599
12	736	14.625	2.054	75.424	92.533
12	735	14.683	2.000	76.100	0.000
12	734	14.783	2.000	76.700	0.000
12	731	15.058	1.950	78.650	0.000
12	730	15.125	1.900	79.350	0.000
12	729	15.273	1.945	79.970	92.398
12	728	15.250	1.850	80.400	0.000
12	727	15.417	1.914	81.013	92.361
13	1101	0.029	0.018	0.065	128.741
13	1102	0.448	0.287	0.968	113.673
13	1103	0.704	0.437	1.605	133.698

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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13	1104	0.904	0.529	2.254	139.392
13	1105	1.250	0.650	3.603	140.720
13	1108	1.698	0.858	5.044	130.451
13	1107	2.035	1.025	6.059	123.910
13	1109	2.282	1.129	6.919	122.064
13	1110	2.556	1.221	8.012	123.233
13	1112	2.892	1.285	9.643	124.580
13	1113	2.926	1.273	9.920	127.400
13	1114	3.072	1.314	10.550	127.500
13	1115	3.205	1.337	11.211	126.392
13	1117	3.368	1.360	12.051	125.255
13	1118	3.400	1.325	12.448	128.176
13	1119	3.545	1.377	13.008	131.479
13	1120	3.663	1.383	13.682	133.508
13	1159	4.114	1.758	14.141	142.187
13	1158	4.272	1.775	14.981	142.658
13	1157	4.389	1.729	15.964	143.823
13	1156	4.536	1.740	16.772	145.298
13	1154	4.814	1.786	18.163	147.128
13	1153	5.058	1.879	19.073	146.714
13	1152	5.220	1.902	19.910	146.304
13	1150	5.898	2.277	21.724	147.306
13	1149	6.074	2.323	22.504	146.394
13	1148	6.201	2.300	23.403	146.917
13	1147	6.386	2.352	24.207	146.509
13	1146	6.658	2.456	25.215	146.683
13	1145	6.877	2.513	26.183	146.203
13	1144	7.067	2.554	27.079	145.281
13	1143	7.234	2.589	27.874	146.357
13	1142	7.395	2.623	28.633	146.114
13	1181	7.925	2.802	30.741	145.562
13	1183	8.311	2.848	32.775	145.200
13	1184	8.396	2.787	33.654	145.500
13	1185	8.651	2.869	34.688	145.400
13	1186	8.854	2.910	35.662	145.300
13	1187	8.997	2.910	36.519	145.500
13	1189	9.345	2.931	38.482	145.500
13	1191	9.629	2.890	40.433	145.455
13	1192	9.735	2.859	41.255	145.800
13	1193	9.842	2.839	42.018	145.900
13	1194	9.981	2.833	42.888	145.600
13	1195	10.062	2.767	43.771	145.400
13	1178	11.264	2.777	50.925	143.854
13	1176	11.880	3.105	52.647	143.564
13	1175	12.033	3.105	53.566	143.416
13	1174	12.177	3.105	54.429	143.279
13	1173	12.348	3.136	55.274	143.095
13	1171	12.918	3.403	57.093	143.012
13	1170	13.064	3.403	57.967	143.091
13	1169	13.219	3.403	58.898	143.207
13	1168	13.380	3.403	59.864	143.290
13	1167	13.522	3.403	60.715	143.422
13	1166	13.605	3.331	61.646	143.512
13	1165	13.720	3.300	62.518	143.593

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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13	1164	13.868	3.300	63.410	143.603
13	1163	14.015	3.300	64.292	143.625
13	1162	14.169	3.300	65.216	143.632
13	1161	14.332	3.300	66.195	143.627
13	1140	14.430	3.269	66.967	143.667
13	1139	14.563	3.239	67.949	143.685
13	1135	15.195	3.259	71.618	143.988
13	1134	15.227	3.146	72.486	144.146
13	1133	15.338	3.095	73.461	144.244
13	1132	15.500	3.105	74.370	144.316
13	1131	15.609	3.044	75.395	144.482
13	1130	15.725	3.013	76.271	144.585
13	1129	15.930	3.074	77.136	144.680
13	1128	15.962	2.941	78.126	144.817
13	1127	16.120	2.941	79.074	144.929
13	1126	16.321	2.941	80.281	145.080
13	1125	16.427	2.900	81.160	145.110
13	1124	16.703	3.033	82.020	145.038
13	1122	16.996	3.033	83.776	145.205
13	1201	17.199	2.951	85.488	145.397
13	1203	17.471	2.910	87.365	145.600
13	1204	17.595	2.879	88.296	145.700
13	1205	17.741	2.879	89.169	145.737
13	1207	18.082	2.900	91.090	145.729
13	1209	18.343	2.859	92.903	145.854
13	1210	18.589	2.946	93.857	145.924
13	1211	18.775	2.977	94.787	146.000
13	1213	19.140	3.044	96.576	146.100
14	1154	0.431	0.280	0.911	314.685
14	1156	0.967	0.581	2.314	335.572
14	1157	1.235	0.702	3.198	340.229
14	1158	1.586	0.881	4.230	340.418
14	1159	1.783	0.938	5.068	338.772
14	1160	1.924	1.049	5.250	346.668
14	1120	2.097	1.013	6.502	354.889
14	1119	2.279	1.060	7.319	354.066
14	1118	2.489	1.117	8.233	355.014
14	1117	2.704	1.210	8.964	355.778
14	1115	2.814	1.254	9.361	350.923
14	1114	2.920	1.302	9.706	347.282
14	1113	3.099	1.397	10.209	345.100
14	1112	3.195	1.406	10.733	346.189
14	1110	3.725	1.706	12.116	341.718
14	1109	3.913	1.735	13.073	339.217
14	1107	4.011	1.735	13.660	336.374
14	1108	4.096	1.717	14.275	332.163
14	1104	4.596	1.792	16.820	327.494
14	1103	4.783	1.867	17.493	327.708
14	1102	4.897	1.856	18.248	328.189
14	1101	5.062	1.896	18.992	326.598
14	1153	0.054	0.044	0.061	218.757
14	1152	0.468	0.324	0.860	141.100
14	1151	0.922	0.622	1.799	147.668

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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14	1150	1.305	0.858	2.684	152.767
14	1149	1.612	1.037	3.451	145.596
14	1148	1.906	1.181	4.352	148.578
14	1147	2.183	1.324	5.153	146.399
14	1146	2.485	1.458	6.161	147.133
14	1145	2.769	1.581	7.130	145.307
14	1144	3.023	1.683	8.041	142.298
14	1143	3.184	1.714	8.821	145.967
14	1142	3.367	1.770	9.581	145.269
14	1181	3.853	1.904	11.695	143.970
14	1183	4.321	2.032	13.733	143.457
14	1184	4.467	2.032	14.609	144.125
14	1185	4.732	2.124	15.643	144.029
14	1187	5.149	2.237	17.473	144.298
14	1189	5.569	2.329	19.436	144.459
14	1191	6.314	2.750	21.386	144.488
14	1192	6.517	2.817	22.205	145.214
14	1193	6.609	2.781	22.967	145.308
14	1194	6.745	2.772	23.838	144.934
14	1195	6.876	2.755	24.724	144.539
14	1197	7.209	2.791	26.509	143.911
14	1198	7.396	2.817	27.477	143.555
14	1200	7.733	2.854	29.276	142.818
14	1180	7.942	2.914	30.169	142.709
14	1179	8.084	2.914	31.020	142.429
14	1178	8.268	2.950	31.906	142.247
14	1176	8.612	3.006	33.636	141.876
14	1175	8.776	3.017	34.559	141.692
14	1174	8.973	3.069	35.425	141.522
14	1173	9.160	3.114	36.275	141.283
14	1172	9.342	3.150	37.149	141.094
14	1170	9.634	3.140	38.967	141.402
14	1169	9.769	3.121	39.894	141.613
14	1168	9.980	3.171	40.857	141.772
14	1167	10.121	3.171	41.704	141.995
14	1166	10.286	3.181	42.633	142.156
14	1165	10.441	3.191	43.502	142.300
14	1164	10.631	3.232	44.394	142.340
14	1163	10.763	3.217	45.276	142.396
14	1162	10.937	3.237	46.199	142.431
14	1161	11.033	3.171	47.178	142.448
14	1140	11.235	3.244	47.949	142.523
14	1139	11.388	3.233	48.930	142.571
14	1134	12.025	3.115	53.457	143.290
14	1133	12.187	3.115	54.430	143.439
14	1132	12.338	3.115	55.337	143.548
14	1131	12.509	3.115	56.360	143.784
14	1130	12.654	3.115	57.233	143.932
14	1129	12.798	3.115	58.097	144.069
14	1128	12.850	3.003	59.085	144.260
14	1127	13.018	3.013	60.032	144.416
14	1124	13.634	3.146	62.924	144.583
14	1122	14.079	3.300	64.676	144.811
14	1201	14.364	3.300	66.384	145.069

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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14	1202	14.521	3.300	67.326	145.175
14	1203	14.604	3.228	68.256	145.306
14	1204	14.800	3.269	69.186	145.421
14	1205	14.884	3.208	70.057	145.518
14	1207	15.224	3.228	71.977	145.513
14	1209	15.557	3.259	73.787	145.676
14	1210	15.757	3.300	74.739	145.766
14	1211	16.014	3.403	75.668	145.838
14	1212	16.120	3.362	76.553	145.920
14	1213	16.271	3.362	77.454	145.987
14	1214	16.386	3.331	78.330	146.016
14	1216	16.627	3.259	80.208	146.189
15	1195	0.486	0.336	0.898	325.100
15	1194	0.946	0.647	1.791	319.600
15	1193	1.370	0.924	2.674	318.100
15	1192	1.675	1.104	3.428	320.300
15	1191	2.020	1.314	4.235	324.900
15	1189	2.755	1.724	6.186	324.900
15	1187	3.447	2.089	8.149	325.100
15	1186	3.692	2.191	9.007	325.700
15	1185	3.901	2.237	9.980	325.400
15	1184	4.150	2.314	11.014	325.100
15	1183	4.432	2.450	11.894	325.800
15	1181	4.822	2.500	13.928	325.100
15	1142	5.203	2.530	16.042	324.100
15	1143	5.424	2.623	16.805	323.800
15	1144	5.698	2.767	17.590	325.600
15	1145	5.869	2.787	18.492	324.300
15	1146	6.215	2.970	19.469	323.700
15	1147	6.259	2.847	20.472	324.100
15	1148	6.431	2.883	21.283	323.700
15	1152	6.863	2.736	24.763	324.700
15	1153	7.014	2.746	25.605	324.400
15	1154	7.115	2.695	26.520	324.200
15	1159	7.921	2.828	30.559	326.900
15	1107	9.384	2.869	39.091	328.700
15	1108	9.474	2.839	39.815	327.300
15	1105	9.767	2.921	41.078	325.800
15	1104	10.023	2.951	42.427	325.700
15	1197	0.596	0.440	0.935	125.800
15	1198	1.069	0.750	1.913	130.000
15	1199	1.436	0.967	2.810	131.300
15	1200	1.852	1.227	3.749	130.800
15	1180	2.219	1.446	4.636	132.400
15	1179	2.559	1.642	5.500	132.400
15	1178	2.825	1.760	6.391	132.900
15	1177	3.079	1.885	7.164	133.200
15	1176	3.405	2.050	8.132	133.400
15	1175	3.685	2.175	9.062	133.500
15	1174	3.916	2.260	9.934	133.700
15	1173	4.122	2.322	10.797	133.500
15	1172	4.335	2.388	11.680	133.500
15	1168	5.126	2.573	15.319	137.100

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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15	1167	5.315	2.623	16.151	137.900
15	1166	5.508	2.663	17.069	138.500
15	1164	5.939	2.803	18.819	139.300
15	1163	6.096	2.813	19.698	139.600
15	1162	6.299	2.863	20.618	139.800
15	1161	6.503	2.904	21.596	139.900
15	1140	6.602	2.874	22.363	140.200
15	1135	7.702	3.204	26.989	141.600
15	1134	7.823	3.182	27.848	142.100
15	1133	7.934	3.131	28.818	142.400
15	1132	8.065	3.112	29.724	142.700
15	1130	8.323	3.054	31.615	143.400
15	1127	8.840	3.105	34.410	144.300
15	1125	9.281	3.208	36.442	144.700
15	1124	9.486	3.269	37.302	144.600
15	1122	9.830	3.320	39.054	145.000
15	1201	10.104	3.310	40.763	145.400
15	1203	10.468	3.362	42.637	145.800
15	1204	10.674	3.413	43.567	145.900
15	1205	10.748	3.341	44.440	146.100
16	1124	0.054	0.049	0.029	272.500
16	1125	0.440	0.292	0.886	317.000
16	1126	0.931	0.638	1.758	322.400
16	1127	1.263	0.777	2.914	327.600
16	1128	1.641	0.996	3.870	329.200
16	1129	1.981	1.169	4.872	330.500
16	1130	2.271	1.314	5.746	330.900
16	1132	2.823	1.544	7.674	331.900
16	1133	3.045	1.613	8.588	331.700
16	1134	3.318	1.723	9.570	331.700
16	1135	3.512	1.769	10.457	332.200
16	1137	3.957	1.908	12.293	332.700
16	1139	4.438	2.081	14.141	331.500
16	1140	4.658	2.138	15.117	331.100
16	1161	4.948	2.300	15.889	330.900
16	1162	5.191	2.381	16.860	330.400
16	1163	5.390	2.427	17.778	330.100
16	1166	6.315	2.911	20.422	329.600
16	1167	6.540	2.981	21.358	329.600
16	1168	6.730	3.027	22.219	329.700
16	1169	6.915	3.050	23.188	329.700
16	1170	7.117	3.096	24.126	329.700
16	1172	7.491	3.165	25.954	329.500
16	1173	7.656	3.188	26.803	329.000
16	1174	7.793	3.188	27.628	328.500
16	1175	7.981	3.235	28.476	328.100
16	1176	8.236	3.339	29.383	327.600
16	1178	8.431	3.250	31.086	326.900
16	1179	8.658	3.331	31.962	326.600
16	1180	8.844	3.377	32.801	326.300
16	1200	9.015	3.400	33.690	326.100
16	1198	9.289	3.377	35.472	325.300
16	1197	9.450	3.377	36.436	325.000

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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16	1195	9.677	3.308	38.218	324.600
16	1194	9.814	3.296	39.105	324.300
16	1193	9.959	3.296	39.978	324.100
16	1192	10.080	3.290	40.740	324.200
16	1191	10.257	3.331	41.556	324.600
16	1189	10.572	3.320	43.506	324.600
16	1181	11.964	3.423	51.248	324.700
16	1142	12.358	3.464	53.362	324.400
16	1143	12.526	3.505	54.125	324.300
16	1144	12.646	3.495	54.908	324.900
16	1114	15.164	3.167	71.985	327.600
16	1112	15.306	3.136	73.019	327.700
16	1110	15.559	3.126	74.598	327.300
16	1109	15.725	3.115	75.656	327.100
16	1107	15.832	3.105	76.359	326.700
16	1108	15.936	3.085	77.111	326.000
16	1105	16.119	3.054	78.393	325.200
16	1104	16.262	2.972	79.743	325.200
16	1103	16.383	2.972	80.464	325.200
16	1102	16.507	2.972	81.213	325.400
16	1101	16.563	2.900	81.975	325.000
16	1123	0.425	0.285	0.843	154.200
16	1122	0.808	0.515	1.755	153.800
16	1121	1.196	0.758	2.631	154.100
16	1201	1.558	0.977	3.488	154.300
16	1203	2.231	1.335	5.380	154.100
16	1204	2.561	1.508	6.320	154.000
16	1205	2.788	1.589	7.199	153.900
16	1207	3.348	1.831	9.101	152.100
16	1209	3.811	1.990	10.923	152.100
16	1210	4.075	2.094	11.882	152.200
16	1211	4.253	2.117	12.815	152.100
16	1212	4.477	2.192	13.707	152.200
16	1213	4.685	2.250	14.612	152.200
16	1214	4.900	2.319	15.487	152.000
16	1216	5.460	2.573	17.321	152.100
16	1217	5.662	2.625	18.223	152.000
16	1220	6.099	2.598	21.005	151.800

17	1220	0.280	0.244	0.221	209.453
17	1218	1.080	0.792	1.728	324.333
17	1217	1.515	1.069	2.675	326.532
17	1216	1.873	1.277	3.578	327.300
17	1215	2.225	1.485	4.441	328.100
17	1214	2.616	1.715	5.405	329.400
17	1213	2.912	1.865	6.281	329.300
17	1212	3.294	2.096	7.185	329.600
17	1211	3.454	2.108	8.076	329.996
17	1210	3.690	2.188	9.009	330.161
17	1209	3.827	2.165	9.967	330.410
17	1207	4.165	2.200	11.788	330.678
17	1205	4.660	2.377	13.701	329.930
17	1204	4.807	2.377	14.579	330.128
17	1203	5.009	2.423	15.516	330.353

SHOT POINT	RECORDER LOCATION	TRAVEL TIME (REAL)	TRAVEL TIME (T-X/6)	DISTANCE	AZIMUTH
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17	1202	5.218	2.475	16.456	330.603
17	1201	5.405	2.504	17.406	330.715
17	1124	6.236	2.752	20.903	331.243
17	1125	6.365	2.740	21.748	330.732
17	1126	6.529	2.758	22.626	330.619
17	1127	6.683	2.717	23.797	330.854