

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geos... Inc. Client: COCORP

DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C.	LINE NO. 1	PAGE 1 of 53
AREA Kansas	TOPO MAP Lancaster 7 1/2'	STATE Kansas	COUNTY Atchison	TWP 5S	RANGE 19E	PPM
PARTY MANAGER L.O. DAVIS						

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS
														Y	X	
II				6°30'						1142.0				460,020	2,757,880	→ scaled
	233		258°35' - 180°	6.5°	+4.7	-	+4.7	+4.7	1146.7		BS	+20	+232			driveway (north) el. 1142
	233				+5.9	TH	-1.2	+4.7			BS					
π	0				54	-		-5.4		1141.3	π	0	0	460,040	2,758,112	
-25	385		83°31'	6.5°	46	-		-4.6		1142.1		0	+385	460,040	2,758,497	station -25*
-25	385				65	TH	+1.9	-4.6								* noise study only
π										1102.0				459,900	2,753,085	→ scaled
	2135		82°29.6' + 180°	+6.5°	+4.8	89°20'	-24.8	-20.0	(20.1)		BS	-38	-2135+2			road (south) el. 1102.0
	2135				+7.1	89°16'	-27.3	-20.2	1081.9		BS					
1	1980		82°10.4'	+6.5°	1.7	89°20'	+23.0	+21.3		1103.2		+46	+1979	459,908	2,752,931	paved road
2	1760		"	"	4.5	89°20'	+20.5	+16.0		1097.9		+41	+1760	459,903	2,752,712	↓
3	1540		"	"	13.1	89°20'	+17.9	+4.8		1086.7		+36	+1540	459,898	2,752,492	
4	1320		"	"	9.1	-		-9.1		1072.8		+31	+1320	459,893	2,752,272	361.21
5	1100		"	"	34	91°-	-19.2	-22.6		1059.3		+25	+1100	459,887	2,752,052	
6	880		"	"	12.7	91°-	-15.4	-28.1		1053.8		+20	+880	459,882	2,751,832	
7	660		"	"	13.3	91°20'	-15.4	-28.7		1053.2		+15	+660	459,877	2,751,612	
8	440		"	"	14.8	91°20'	-10.2	-25.0		1056.9		+10	+440	459,872	2,751,392	
9	220		"	"	11.8	91°-	-3.8	-15.6		1066.3		+5	+220	459,867	2,751,172	
10	0				54	-		-5.4		1076.5	π	0	0	459,862	2,750,952	
11	220		262°24'	+6.5°	1.9	89°-	+3.8	+1.9		1083.8		-6	-220	459,856	2,750,732	

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DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C.	LINE NO. 1	PAGE 2
AREA Kansas	TOPO MAP Lancaster	STATE Kansas	COUNTY Atchison	TWP 5S	RANGE 19E/18E	PPM
				PARTY MANAGER L.O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTting DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									10819					
12	490		262° 24'	+6.5°	24	89°-	+7.7	+5.3		1087.2		-11	-496	459,851 2,750,512
13	660		" "	"	06	89°-	+11.5	+10.9		1092.8		-17	-660	459,845 2,750,292
14	880	879	" "	"	8.3	88°-	+30.7	+22.4		1104.3		-22	-879	459,840 2,750,073
15	1100	1099	" "	"	4.5	88°-	+38.4	+33.9		1115.8		-28	-1099	459,834 2,749,853
16	1320	1319	" "	"	5.9	88°-	+46.0	+40.1		1122.0		-34	-1319	459,828 2,749,633
17	1540	1539	262° 24'	+6.5°	12.0	88°-	+53.7	+41.7			TP	-39	-1539+2	459,823 2,749,415
17	1540				14.8	87°54'	+56.4	+41.6		1123.5	TP			
	2860		82° 18.7' +180°	+6.5°	+7.5	-		+7.5	1131.0		BS	-59	-2859+2	
	2860				+14.2	89°52'	-6.7	+7.5			BS			
18	2640		82° 18.7'	+6.5°	6.4	-		-6.4		1124.6		+55	+2639	459,819 2,749,197
19	2420		" "	"	10.9	-		-10.9		1120.7		+50	+2919	459,814 2,748,977
20	2200		" "	"	7.0	84	-11.0	-18.0		1113.0		+46	+2200	459,810 2,748,758
21	1980		" "	"	11.2	84	-9.9	-21.1		1109.9		+41	+1980	459,805 2,748,538
22	1760		" "	"	12.6	84	-8.8	-21.4		1109.6		+37	+1760	459,801 2,748,318
TP	1720		82° 39.3'	+6.5°	13.0	84	-8.6	-21.6		1109.4		+25	+1720	459,789 2,748,278 T-rd (south) elev. 1109'
23	1540		82° 18.7'	+6.5°	8.2	90°40'	-17.9	-26.1		1104.9		+32	+1540	459,796 2,748,098
24	1320		" "	"	12.6	91°-	-23.0	-35.6		1095.4		+27	+1320	459,791 2,747,878
25	1100	1099	" "	"	3.9	92°-	-38.4	-42.3		1088.7		+23	+1099	459,787 2,747,657
26	880	879	" "	"	11.1	92°-	-30.7	-41.8		1089.2		+18	+879	459,782 2,747,437
27	660		" "	"	12.7	92°-	-23.0	-35.7		1095.3		+14	+660	459,778 2,747,218

SURVEY NOTES-HIGH RESOLUTION DATA

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10/24/79		G. Cotcamp		R. Turner		6834		GWC		1	3					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Lancaster		Kansas	Atchison		5S	18E								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS
														Y	X	
									1131.0							
28	440		82°18.7'	+6.5°	10.2	92°-	-15.3	-25.5		1105.5		+9	+440	459,773	2,746,998	
29	220		"	"	10.3	91°-	-3.8	-14.1		1116.9		+5	+220	459,769	2,746,778	
30	0				54	-		-5.4		1125.6	X	0	0	459,764	2,746,558	
31	220		262°4.4'	+6.3°	0.2	-		-0.2		1130.8		-6	-220	459,758	2,746,338	
32	440		"	"	0.1	TH	+2.2	+2.1		1133.1		-12	-440	459,752	2,746,118	
33	660		"	"	9.0	89°-	+11.5	+2.5		1133.5		-19	-660	459,745	2,745,898	
34	880		"	"	13.8	89°-	+15.4	+1.6		1132.6		-25	-880	459,739	2,745,678	
35	1100		"	"	11.1	89°30'	+9.6	-1.5		1129.5		-31	-1100	459,733	2,745,458	
36	1320		262°4.4'	+6.3°	13.8	89°40'	+7.7	-6.1		1124.9	TP	-37.2	-1319.2	459,725	2,745,241	
36	1320				14.5	89°38'	+8.4	-6.1			TP					
	2640		82°6.5' +180°	+6.3°	+10.6	TH	-13.2	-2.6	1122.3		BS	-73.2	-2639.2			
	2640				+5.3	89°50'	-7.7	-2.4			BS					
37	2420		82°6.5'	+6.3°	14.4	TH	+12.1	-2.3		1120.0		+67	+2419	459,717	2,745,023	
38	2200		"	"	14.4	TH	+11.0	-3.4		1118.9		+61	+2199	459,711	2,744,803	
39	1980		"	"	11.2	TH	+9.9	-1.3		1121.0		+55	+1979	459,705	2,744,583	
40	1860		"	"	7.1	TH	+8.8	+1.7		1124.0		+49	+1759	459,699	2,744,363	
41	1540		"	"	2.7	-		-2.7		1119.6		+43	+1539	459,693	2,744,143	
42	1320		"	"	10.5	-		-10.5		1111.8		+37	+1319	459,687	2,743,923	
43	1100		"	"	14.7	BH	-5.5	-20.2		1102.1		+31	+1100	459,681	2,743,704	
44	880		"	"	10.3	91°-	-15.4	-25.7		1096.6		+24	+880	459,674	2,743,484	

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DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWI	LINE NO. 1	PAGE 5
AREA Kansas	TOPO MAP LANCASTER/EFFINGHAM	STATE Kansas	COUNTY Atchison	TWP 5 S.	RANGE 18 E.	PPM
				PARTY MANAGER L.O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTting DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1103.3					
61	490		261°54.2'	+6.3°	8.5	92°-	-15.3	-23.8		1079.5		-14	-440	459,562 2,739,749 Effingham Quad
62	660		" "	"	8.8	92°-	-23.0	-31.8		1071.5		-21	-660	459,555 2,739,529 ↓
63	880	879	" "	"	6.3	92°-	-30.7	-37.0		1066.3		-28	-878	459,548 2,739,311
64	1100	1099	" "	"	4.1	92°-	-38.4	-42.5		1060.8		-34	-1098	459,542 2,739,091
65	1320	1319	261°54.2'	+6.3°	13.2	91°30'	-34.5	-47.7		1055.6	TP	-41	-1318+2	459,535 2,738,873
65	1320				5.5	91°50'	-42.2	-47.7			TP			
	2200	2199	82°16.2'+180°	+6.3°	+14.5	91°20'	+51.2	+65.7	1121.3		BS	-55	-2198+2	
	2200				+8.2	91°30'	+57.6	+65.8			BS			
66	1980	1979	82°16.2'	+6.3°	13.0	91°30'	-51.8	-64.8		1056.5		+49	+1978	459,529 2,738,655
67	1760	1759	" "	"	14.5	91°30'	-46.1	-60.6		1060.7		+49	+1758	459,524 2,738,435
68	1540	1539	" "	"	11.0	91°30'	-40.3	-51.3		1070.0		+38	+1538	459,518 2,738,215
69	1320	1319	" "	"	13.4	91°30'	-34.5	-47.9		1073.4		+33	+1319	459,513 2,737,996
70	1100	1099	" "	"	7.3	92°-	-38.4	-45.7		1075.6		+27	+1099	459,507 2,737,776
71	1030	1029	82°57'	+6.3°	7.9	92°-	-35.9	-43.8		1077.5		+13	+1029	459,493 2,737,706 459,495+ 2,737,700(s) Trd (South) elev. 1077
71	880	879	82°16.2'	+6.3°	8.0	92°-	-30.7	-38.7		1082.6		+22	+879	459,502 2,737,556
72	660		" "	"	6.5	92°-	-23.0	-29.5		1091.8		+16	+660	459,496 2,737,337
73	440		" "	"	12.2	91°-	-7.7	-19.9		1101.4		+11	+440	459,491 2,737,117
74	220		" "	"	10.1	-	-	-10.1		1111.2		+5	+220	459,485 2,736,897
75	0				5.4	-	-	-5.4		1115.9	π	0	0	459,480 2,736,677
76	220		262°19.2'	+6.1°	4.1	-	-	-4.1		1117.2		-6	-220	459,474 2,736,457

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Geosource Inc.

DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWI	LINE NO. 1	PAGE 4
AREA Kansas	TOPO MAP Lancaster	STATE Kansas	COUNTY Atchison	TWP 5 s.	RANGE 18E	PPM
					PARTY MANAGER L.O. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1122.3					
45	660		82° 6.5'	+6.3°	15.0	91° -	-11.5	-26.5		1095.8		+18	+660	459,668 2,743,264
46	440		" "	"	14.2	91° -	-7.7	-21.9		1100.4		+12	+440	459,662 2,742,044
TP	381		83° 45'	+6.3°	12.7	91° -	-6.6	-19.3		1103.0		0	+381	459,650 2,742,985 459,645 + 2,742,980 (S) T-rd (south) elev. 1103'
47	220		82° 6.5'	+6.3°	12.9	-	-	-12.9		1109.4		+6	+220	459,656 2,742,824
48	0				5.4	-	-	-5.4		1116.9	TP	0	0	459,650 2,742,604
49	220		262° 6.6'	+6.3°	1.7	-	-	-1.7		1120.6		-6	-220	459,644 2,742,384
50	440		" "	"	1.9	-	-	-1.9		1120.4		-12	-440	459,638 2,742,164
51	660		" "	"	1.6	-	-	-1.6		1120.7		-18	-660	459,632 2,741,944
52	880		" "	"	3.8	-	-	-3.8		1118.5		-24	-880	459,626 2,741,724
53	1100		262° 6.6'	+6.3°	12.0	-	-	-12.0			TP	-31	-1100 + 2	459,619 2,741,506
53	1100				10.8	90° 4'	-1.3	-12.1		1110.2	TP			
	1320		81° 51.2' + 180°	+6.3°	+4.7	89° 30'	-11.5	-6.8			BS	-43	-1319 + 2	
	1320				+3.1	89° 34'	-10.0	-6.9	1103.3		BS			
54	1100		81° 51.2'	+6.3°	2.2	-	-	-2.2		1101.1		+35	+1099	459,611 2,741,288
55	880		" "	"	7.1	-	-	-7.1		1096.2		+28	+880	459,604 2,741,069
56	660		" "	"	7.1	-	-	-7.1		1096.2		+21	+660	459,597 2,740,849
57	440		" "	"	4.1	-	-	-4.1		1099.2		+14	+440	459,590 2,740,629
58	220		" "	"	0.9	-	-	-0.9		1102.4		+7	+220	459,583 2,740,409
59	0				5.4	-	-	-5.4		1097.9	TP	0	0	459,576 2,740,189
60	220		261° 54.2'	+6.3°	13.6	-	-	-13.6		1089.7		-7	-220	459,569 2,739,969 ↑ Lancaster quad

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Geosource Inc.

DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 6
AREA Kansas	TOPO MAP EFFINGHAM	STATE Kansas	COUNTY Atchison	TWP 5 s.	RANGE 18 E	PPM
			PARTY MANAGER L.O. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1121.3					
77	440		262° 19.2'	+6.1°	1.1	-		-1.1		1120.2		-12	-440	459,468 2,736,237
78	660		" "	"	6.3	89°-	+11.5	+5.2		1126.5		-18	-660	459,462 2,736,017
79	880		" "	"	4.6	89°-	+15.4	+10.8		1132.1		-24	-880	459,456 2,735,777
80	1100		" "	"	6.6	89°-	+19.2	+12.6		1133.9		-30	-1100	459,450 2,735,577
81	1320		" "	"	9.8	89°-	+23.0	+13.2		1134.5		-36	-1320	459,444 2,735,357
82	1540		262° 19.2'	+6.1°	12.7	89°-	+26.9	+14.2		1135.5	TP	-42	-1539	459,438 2,735,138
82	1540				8.2	89°0'	+22.4	+14.2			TP			
	1760		82° 21' +180°	+6.1°	+1.5	-		+1.5	1137.0		BS	-48	-1759	
	1760				+10.3	TH	-8.8	+1.5			BS			
83	1540		82° 21'	+6.1°	2.2	-		-2.2		1134.8		+42	+1539	459,432 2,734,918
84	1320		" "	"	8.8	-		-8.8		1128.2		+36	+1320	459,426 2,734,699
85	1100		" "	"	12.8	BH	-5.5	-18.3		1118.7		+30	+1100	459,420 2,734,479
86	880		" "	"	9.5	91°-	-15.4	-24.9		1112.1		+24	+880	459,414 2,734,259
87	660		" "	"	14.1	91°-	-11.5	-25.6		1111.4		+18	+660	459,408 2,734,039
88	440		" "	"	11.9	91°-	-7.7	-19.6		1117.4		+12	+440	459,402 2,733,819
89	220		" "	"	11.0	-		-11.0		1126.0		+6	+220	459,396 2,733,599
90	0				54	-		-5.4		1131.6	TP	0	0	459,390 2,733,379
91	220		262° 12.6'	+6.1°	9.8	-		-9.8		1127.2		-6	-220	459,384 2,733,159
92	440		" "	"	10.8	91°-	-7.7	-18.5		1118.5		-13	-440	459,377 2,732,939 last sta. on pavement
93	660		" "	"	11.2	91°30'	-17.3	-28.5		1108.5		-19	-660	459,371 2,732,719 dirt road

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DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 7
AREA Kansas	TOPO MAP EFFINGHAM	STATE Kansas	COUNTY Atchison	TWP 5 S	RANGE 18 E	PPM
				PARTY MANAGER L.D. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1137.0					
94	880		262°12.6'	+6.1°	9.1	91°30'	-23.0	-32.1		1104.9		-26	-880	459,364 2,732,499
95	1100		" "	"	9.1	91°-	-19.2	-28.3		1108.7		-32	-1100	459,358 2,732,279
96	1320		" "	"	13.2	BH	-6.6	-19.8		1117.2		-39	-1320	459,351 2,732,059
97	1540		" "	"	13.0	-	-	-13.0		1124.0		-45	-1539	459,345 2,731,840
98	1760		262°12.6'	+6.1°	3.5	-	-	-3.5		1133.5	TP	-52	-1759	459,338 2,731,620
98	1760				12.3	TH	+8.8	-3.5			TP			
	2200		82°0' +180°	+6.1°	+3.2	-	-	+3.2	1136.7		BS	-73	-2199	
	2200				+11.2	TH	-11.0	+3.2			BS			
<u>JL</u>	2100		82°19'	+6.1°	0.6	-	-	-0.6		1136.1		+58	+2099	459,323 2,731,520 459,305 + 2,731,513(9) T-rd(north) elev. 1136
99	1980		82°-	+6.1°	3.7	-	-	-3.7		1133.0		+66	+1979	459,331 2,731,400
100	1760		" "	"	13.4	-	-	-13.4		1123.3		+58	+1759	459,323 2,731,180
101	1540		" "	"	12.9	BH	-7.7	-20.6		1116.1		+51	+1539	459,316 2,730,960
102	1320		" "	"	14.8	90°22'	-8.4	-23.2		1113.5		+44	+1319	459,309 2,730,740
103	1100		" "	"	14.0	90°20'	-6.4	-20.4		1116.3		+36	+1099	459,301 2,730,520
104	880		" "	"	14.4	-	-	-14.4		1122.3		+29	+880	459,294 2,730,301
105	660		" "	"	7.0	-	-	-7.0		1129.7		+22	+660	459,287 2,730,081
106	440		" "	"	3.2	-	-	-3.2		1133.5		+15	+440	459,280 2,729,861
107	220		" "	"	5.1	-	-	-5.1		1131.6		+7	+220	459,272 2,729,641
108	0		" "	"	5.4	-	-	-5.4		1131.3	TP	0	0	459,265 2,729,421
109	220		262°20.9'	+6.1°	10.0	-	-	-10.0		1126.7		-6	-220	459,259 2,729,201

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 8
AREA Kansas	TOPO MAP EFFINGHAM	STATE Kansas	COUNTY ATCHISON	TWP 5 S.	RANGE 18 E.	PPM
				PARTY MANAGER L.O. Paris		

STATION NO.	SLOPE DISTANCE	PLOTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1136.7					
110	440		262°20.4'	+6.1°	14.8	6H	-2.2	-17.0		1119.7		-12	-440	459,253 2,728,981
111	660		" "	"	3.8	92°-	-23.0	-26.8		1109.9		-18	-660	459,247 2,728,761
112	880	879	" "	"	5.6	92°-	-30.7	-36.3		1100.4		-24	-879	459,241 2,728,542
113	1100	1099	" "	"	3.3	92°-	-38.4	-41.7		1095.0		-30	-1099	459,235 2,728,322
114	1320	1319	" "	"	7.6	91°40'	-38.4	-46.0		1090.7		-36	-1319	459,229 2,728,102
115	1540	1539	" "	"	7.8	91°40'	-44.8	-52.6		1084.1		-42	-1538	459,223 2,727,883
116	1760	1759	" "	"	9.0	91°40'	-51.2	-60.2		1076.5		-48	-1758	459,217 2,727,663
117	1980	1979	" "	"	12.8	91°40'	-57.6	-70.4		1066.3		-54	-1978	459,211 2,727,443
118	2200	2199	262°20.4'	+6.1°	10.9	91°40'	-64.0	-74.9		1061.8	TP	-60	-2198	459,205 2,727,223
118	2200				4.5	91°50'	-70.4	-74.9			TP			
	660		82°53'+180°	+6.1°	+8.9	92°-	+23.0	+31.9	1093.7		BS	-12	-660	
	660				+4.7	91°30'	+17.3	+32.0			BS			
119	440		82°53'	+6.1°	14.5	92°-	-15.3	-29.8		1063.9		+8	+440	459,201 2,727,003
120	220		" "	"	13.3	92°-	-7.7	-21.0		1072.7		+4	+220	459,197 2,726,783
121	0				5.4	-	-5.4			1088.3	π	0	0	459,193 2,726,563
122	220		261°27.7'	+6.1°	14.5	-	-14.5			1079.2		-9	-220	459,184 2,726,343
122	335		259°18'	+6.1°	13.1	91°-	-5.8	-18.9		1074.8		-27	-334	459,166 2,726,229
123	440		261°27.7'	+6.1°	12.5	91°-	-7.7	-20.2		1073.5		-19	-440	459,174 2,726,123
124	660		" "	"	12.8	-	-12.8			1080.9		-28	-660	459,165 2,725,903

459,175 + 2,726,260(S)
Tied (North) elev. 1074'

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY R WT	LINE NO. 1	PAGE 9
AREA Kansas	TOPO MAP EFFINGHAM	STATE Kansas	COUNTY Atchison	TWP 5 S.	RANGE .18 E.	PPM
			PARTY MANAGER L.O. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1093.7					
125	880		261° 27.7'	+6.1°	12.0	-		-12.0		1081.7	TP	-37	-879	459,156 2725,684
125	880				7.6	84	-4.4	-12.0			TP			
	1760		82° 16.5' + 130°	+6.1°	+1.7	-		+1.7	1083.4		BS	-50	-1759	
	1760				+10.5	74	-8.8	+1.7			BS			
126	1540		82° 16.5'	+6.1°	11.2	84	-7.7	-18.9		1064.5		+44	+1539	459,150 2725,484
127	1320		" "	"	8.9	91°	-23.0	-31.9		1051.5		+37	+1319	459,143 2725,244
128	1100		" "	"	10.8	91° 20'	-25.6	-36.4		1047.0		+31	+1100	459,137 2725,025
129	880		" "	"	13.7	91° 20'	-20.5	-34.2		1049.2		+25	+880	459,131 2724,805
130	660		" "	"	14.6	91° 20'	-15.4	-30.0		1053.4		+19	+660	459,125 2724,585
131	440		" "	"	14.0	91° 20'	-10.2	-24.2		1059.2		+12	+440	459,118 2724,365
132	220		" "	"	12.9	91°	-3.8	-16.7		1066.7		+6	+220	459,112 2724,145
133	0				5.4	-		-5.4		1078.0	X	0	0	459,106 2723,925
134	220		262° 38'	+6.1°	6.6	87°	+11.5	+4.9		1088.3		-5	-220	459,101 2723,705
134	300		260° 50.9'	+6.1°	6.4	88°	+10.5	+4.1		1087.5		-16	-300	459,090 2723,625
135	440		262° 38'	+6.1°	11.3	88°	+15.3	+4.0		1087.4		-10	-440	459,096 2723,485
136	660		" "	"	12.2	88°	+23.0	+10.8		1094.2		-15	-660	459,091 2723,265
137	880		" "	"	5.0	88°	+30.7	+25.7		1109.1		-19	-880	459,087 2723,045
138	1100		" "	"	6.3	88°	+38.4	+32.1		1115.5		-24	-1100	459,082 2722,825
139	1320	1319	262° 38'	+5.9°	11.5	88°	+46.0	+34.5			TP	-34 -2	-1319 +3	459,070 2722,609
139	1320				7.6	88° 10'	+42.2	+34.6		1118.0	TP			




horiz. correct. y = -4'
x = +18'
459,070 + 2,723,625 (S)
Trd (north) elev. 1088'

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/25/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 10
AREA Kansas	TOPO MAP Effingham	STATE Kansas	COUNTY Atchison	TWP S s.	RANGE 18 E.	PPM
			PARTY MANAGER L.O. Davis			

STATION NO.	SLOPE DISTANCE 	PLOTTING DISTANCE 	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE 	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
139	1760		82° 38.3' +180°	+5.9°	+7.7	89° -	-30.7	-23.0		1118.0	BS	-45.2	-1759.3			
	1760				+15.0	88° 46'	-37.9	-22.9	1095.1		BS					
140	1540		82° 38.3'	+5.9°	4.1	89° -	+26.9	+22.8		1117.9		+39	+1539	459,062	2,722,392	
141	1320		" "	"	1.7	89° -	+23.0	+21.3		1116.4		+34	+1320	459,057	2,722,173	
142	1100		" "	"	7.1	89° -	+19.2	+12.1		1107.2		+28	+1100	459,051	2,721,953	
7F	1030		83° 8.5'	+5.9°	9.1	89° -	+18.0	+8.9		1104.0		+17	+1030	459,040	2,721,883	959,030 + 2,721,890(s) T-rod (south) elev 1104'
143	880		82° 38.3'	+5.9°	3.5	TH	+4.4	+0.9		1096.0		+22	+880	459,045	2,721,733	
144	660		" "	"	8.8	-	-	-8.8		1086.3		+17	+660	459,040	2,721,513	
145	440		" "	"	13.8	-	-	-13.8		1081.3		+11	+440	459,034	2,721,293	
146	220		" "	"	11.4	-	-	-11.4		1083.7		+6	+220	459,029	2,721,073	
147	0				5.4	-	-	-5.4		1089.7	π	0	0	459,023	2,720,853	
148	220		262° 35'	+5.7°	14.8	91° -	-3.8	-18.6		1076.5		-7	-220	459,016	2,720,633	
149	440		" "	"	11.5	92° -	-15.3	-26.8		1068.3		-13	-440	459,010	2,720,413	
150	660		" "	"	13.4	91° -	-11.5	-24.9		1070.2		-20	-660	459,003	2,720,193	
151	880		" "	"	5.2	91° -	-15.4	-20.6		1074.5		-26	-880	458,997	2,719,973	
152	1100		" "	"	13.0	91° 20'	-25.6	-38.6		1056.5		-33	-1100	458,990	2,719,753	
153	1320		" "	"	15.9	91° 20'	-30.7	-46.6		1048.5		-40	-1319	458,983	2,719,534	
154	1540		" "	"	13.2	91° 20'	-35.8	-49.0		1046.1		-46	-1539	458,977	2,719,314	
155	1760		" "	"	11.1	91° -	-30.7	-41.8		1053.3		-53	-1759	458,970	2,719,094	
156	1980		" "	"	9.6	90° 30'	-17.3	-26.9		1068.2		-59	-1979	458,964	2,718,874	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/25/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 11
AREA Kansas	TOPO MAP Effingham	STATE Kansas	COUNTY Atchison	TWP 5 s.	RANGE 18E/17E	PPM
			PARTY MANAGER L.O. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1095.1					
157	2200		262°35'	+5.7°	10.9	-		-10.9		1084.2		-66	-2199	458,957 2,718,654
158	2420		262°35'	+5.7°	2.0	-		-2.0		1093.1	TP	-72	-2419.2	458,951 2,718,436
158	2420				13.1	TH	+12.1	-1.0			TP			misread rod
	1100		82°32.7' +180°	+5.7°	+12.3	90°30'	+9.6	+21.9	1115.0		BS	-34	-1099.2	
	1100				+5.9	90°50'	+16.0	+21.9			BS			
158														Turn (month)
159	880		82°32.7'	+5.7°	15.0	GH	-4.4	-19.4		1095.6		+27	+880	458,944 2,718,219
160	660		" "	"	12.9	GH	-3.3	-16.2		1098.8		+20	+660	458,937 2,717,999
161	440		" "	"	10.0	-		-10.0		1105.0		+13	+440	458,930 2,717,779
162	220		" "	"	6.0	-		-6.0		1109.0		+7	+220	458,924 2,717,559
163	0				5.4	-		-5.4		1109.6	TP	0	0	458,917 2,717,339
164	220		262°36.6'	+5.7°	9.1	-		-9.1		1105.9		-6	-220	458,911 2,717,119
165	440		" "	"	10.3	91°-	-7.7	-18.0		1097.0		-13	-440	458,904 2,716,899
166	660		" "	"	11.5	91°-	-11.5	-23.0		1092.0		-19	-660	458,898 2,716,679
167	880		" "	"	11.9	91°-	-15.4	-27.3		1087.7		-26	-880	458,891 2,716,459
TP	996		262°2.3'	+5.7°	11.4	91°-	-17.4	-28.8		1086.2		-39	-995	458,878 2,716,344
168	1100		262°36.6'	+5.7°	12.4	91°-	-19.2	-31.6		1083.4		-32	-1100	458,885 2,716,239
169	1320		262°36.6'	+5.7°	13.1	91°30'	-34.5	-47.6		1067.4	TP	-39	-1319.2	458,878 2,716,022
169	1320				10.8	91°36'	-36.8	-47.6			TP			

458,880 + 2,716,335 (S)
T-rod (SOUTH) elev 1085'

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10/25/79		G. Cotcamp		R. Turner		6834		RWT		1	12					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Effingham		Kansas	Atchison		5 S	17 E.		L.O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
169										1067.4						
	1760		82°15' +180°	+5.7°	+150	BH	+8.8	+23.8	1091.2		BS	-63	-1759.2			
	1760				+8.6	90°30'	+15.4	+24.0			BS					
170	1540		82°15'	+5.7°	4.6	91°-	-26.9	-31.5		1059.7		+55	+1539	458,870	2,715,804	
171	1320		" "	"	12.0	91°-	-23.0	-35.0		1056.2		+47	+1319	458,862	2,715,584	
172	1100	1099	" "	"	6.7	92°-	-38.4	-45.1		1046.1		+39	+1098	458,854	2,715,363	
173	880	879	" "	"	3.7	93°-	-46.0	-49.7		1041.5		+31	+878	458,846	2,715,143	
174	660	659	" "	"	9.6	93°-	-34.5	-44.1		1047.1		+24	+658	458,839	2,714,923	
175	440	439	" "	"	12.8	93°-	-23.0	-35.8		1055.4		+16	+439	458,831	2,714,704	
176	220		" "	"	14.1	92°-	-7.7	-21.8		1069.4		+8	+220	458,823	2,714,485	
177	0				5.4	-		-5.4		1085.8	X	0	0	458,815	2,714,265	
178	220		262°32'	+5.7°	12.0	-		-12.0		1079.2		-7	-220	458,808	2,714,045	
179	440		" "	"	13.9	91°-	-7.7	-21.6		1069.6		-14	-440	458,801	2,713,825	
180	660		" "	"	6.1	92°-	-23.0	-29.1		1062.1		-20	-660	458,795	2,713,605	
181	880	879	" "	"	5.4	92°-	-30.7	-36.1		1055.1		-27	-879	458,788	2,713,386	
182	1100		" "	"	13.1	BH	-5.5	-18.6		1072.6		-34	-1099	458,781	2,713,166	
<u>TL</u>	1220		262°8'	+5.7°	9.7	-		-9.7		1081.5		-46	-1219	458,769	2,713,046	458,780 + 2,713,055 T-rd (North) elev 1080'
183	1320		262°32'	+5.7°	3.6	-		-3.6		1087.6		-41	-1319	458,774	2,712,946	
184	1540		262°32'	+5.7°	13.3	TH	+7.7	-5.6		1085.6	TP	-47.2	-1539.2	458,766	2,712,728	
184	1540				10.1	89°50'	+4.5	-5.6			TP					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10/25/79		G. Cotcamp		R. Turner		6834		RWT		1	13					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Ft. Hingham		Kansas	Atchison		5 S	17 E		L. O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
184										1085.6						
	880		81° 58.2' + 180°	+5.7°	+14.8	88° 50'	-17.9	-3.1	1082.5		BS	-36-2	-879+2			
	880				+14.3	88° 52'	-17.4	-3.1		BS						
185	660		81° 58.2'	+5.7°	20.0	88° 50'	+13.4	-6.6		1075.9		+27	+659	458,755	2,712,510	
186	440		" "	"	19.2	88° 50'	+9.0	-10.2		1072.3		+18	+440	458,746	2,712,291	
187	220		" "	"	5.6	88° 30'	+5.8	+0.2		1082.7		+9	+220	458,737	2,712,071	
188	0				5.4	-		-5.4		1077.1	TP	0	0	458,728	2,711,851	
189	220		262° 30'	+5.7°	12.5	92° -	-7.7	-20.2		1062.3		-7	-220	458,721	2,711,631	
190	440		" "	"	14.8	92° -	-15.3	-30.1		1052.4		-14	-440	458,714	2,711,411	
191	660		" "	"	14.5	92° -	-23.0	-37.5		1045.0		-21	-660	458,707	2,711,191	
192	880	879	" "	"	14.8	92° -	-30.7	-45.5		1037.0		-28	-879	458,700	2,710,972	
193	1100	1099	" "	"	4.0	92° -	-38.4	-42.4		1040.1		-35	-1098	458,693	2,710,753	
194	1320		262° 30'	+5.7°	5.0	91° 30'	-34.5	-39.5		1043.0	TP	-41-2	-1319+2	458,685	2,710,534	
194	1320				12.6	91° 10'	-26.9	-39.5			TP					
	2200	2199	82° 31' + 180°	+5.7°	+4.4	88° 20'	-64.0	-59.6	983.4		BS	-68-2	-2198+2			
	2200				+14.7	88° 9'	-74.2	-59.5			BS					
195	1980	1979	82° 31'	+5.7°	5.7	88° 20'	+57.6	+51.9		1035.3		+62	+1978	458,677	2,710,316	
196	1760		" "	"	8.1	88° 40'	+40.9	+32.8		1016.2		+55	+1759	458,670	2,710,097	
197	1540		" "	"	12.7	89° -	+26.9	+14.2		997.6		+48	+1539	458,663	2,709,877	
198	1320		" "	"	2.8	TH	+6.6	+3.8		987.2		+41	+1319	458,656	2,709,657	
199	1100		" "	"	0.8	-		-0.8		982.6		+34	+1099	458,649	2,709,437	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/25/79	INSTRUMENT MAN G. Catcamp	ROD MAN R Turner	PARTY NUMBER 6834	NOTES CHECKED BY R WT	LINE NO. 1	PAGE 14
AREA Kansas	TOPO MAP Effingham	STATE Kansas	COUNTY Atchison	TWP 5 s.	RANGE 17 e.	PPM
					PARTY MANAGER L.O. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									983.4					
200	880		82° 31'	+5.7°	3.5	-		-3.5		979.9		+27	+880	458,642 2,709,218
201	660		" "	"	6.0	-		-6.0		977.4		+21	+660	458,636 2,708,998
202	440		" "	"	6.5	-		-6.5		976.9		+14	+440	458,629 2,708,778
203	220		" "	"	6.7	-		-6.7		976.7		+7	+220	458,622 2,708,558
204	0				5.4	-		-5.4		978.0	π	0	0	458,615 2,708,338
205	133		261° 3.6'	-5.7°	1.8	-		-1.8		981.6		-8	-133	458,607 2,708,205 bridge (7-700) elev. 981'
206	220		263° 8.7'	+5.7°	2.9	-		-2.9		980.5		-4	-220	458,611 2,708,118
207	440		" "	"	5.9	-		-5.9		977.5		-9	-440	458,606 2,707,898
208	660		" "	"	4.0	-		-4.0		979.4		-13	-660	458,602 2,707,678
209	880		" "	"	1.8	-		-1.8		981.6		-18	-880	458,597 2,707,458
210	1100		" "	"	1.6	-		-1.6		981.8		-22	-1100	458,593 2,707,238
211	1320		" "	"	14.2	89° -	+23.0	+8.8		992.2		-27	-1320	458,588 2,707,018
212	1540		" "	"	8.7	88° 40'	+35.8	+27.1		1010.5		-31	-1540	458,584 2,706,798
212	1760		263° 8.7'	+5.7°	10.4	88° 40'	+40.9	+30.5		1013.9	TP	-35	-1760	458,580 2,706,577
212	1760				5.2	88° 50'	+35.8	+30.6			TP			
	880		83° 3' +180°	+5.7°	+13.7	-		+13.7	1027.6		BS	-19	-880	
	880				+9.3	BH	+4.4	+13.7			BS			
213	660		83° 3'	+5.7°	12.1	BH	-3.3	-15.4		1012.2		+14	+660	458,575 2,706,357
214	440		" "	"	14.8	-		-14.8		1012.8		+10	+440	458,571 2,706,137
215	220		" "	"	10.6	-		-10.6		1017.0		+5	+220	458,566 2,705,917

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/25/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 15
AREA Kansas	TOPO MAP Effingham/Whiting	STATE Kansas	COUNTY Atchison	TWP 5 s.	RANGE 17E	PPM
					PARTY MANAGER L.O. Davis	

STATION NO.	SLOPE DISTANCE	PLOTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1027.6					
216	0				54	-		-5.4		1022.2	π	0	0	458,561 2,705,697
217	220		263° 1.8'	+5.7°	14.7	-		-14.7		1012.9		-5	-220	458,556 2,705,477
218	440		" "	"	13.8	92°-	-15.3	-29.1		998.5		-10	-440	458,551 2,705,257
219	660		" "	"	14.2	92°-	-23.0	-37.2		990.4		-15	-660	458,546 2,705,037 ↑
220	880		" "	"	4.9	92°-	-30.7	-35.6		992.0		-20	-880	458,541 2,704,817 Effingham Quad.
221	1100		" "	"	6.3	91°-	-19.2	-25.5		1002.1		-24	-1100	458,537 2,704,597 Whiting Quad.
222	1320		263° 1.8'	+5.7°	12.2	-		-12.2		1015.4	TP	-29	-1320	458,532 2,704,377 ↓
	660		82° 46.6' +180°	+5.7°	4.1	92°-	+23.0	+27.1	1042.5		BS	-18	-660	
	660				11.7	91°20'	+15.4	+27.1			BS			
223	440		82° 46.6'	+5.7°	10.9	92°-	-15.3	-26.2		1016.3		+12	+440	458,526 2,704,157
224	220		" "	"	12.3	92°-	-7.7	-20.0		1022.5		+6	+220	458,520 2,703,937
225	0				54	-		-5.4		1037.1	π	0	0	458,514 2,703,717
226	220		262° 56.2'	+5.7°	8.7	-		-8.7		1033.8		-5	-220	458,509 2,703,497
227	440		" "	"	22.9	90°40'	-5.1	-28.0		1014.5		-10	-440	458,504 2,703,277
228	660		" "	"	28.5	90°40'	-7.7	-36.2		1006.3		-16	-660	458,498 2,703,057
229	880		" "	"	27.5	90°40'	-10.2	-37.7		1004.8		-21	-880	458,493 2,702,837
230	1100		" "	"	22.8	90°40'	-12.8	-35.6		1006.9		-26	-1100	458,488 2,702,617
231	1320		" "	"	13.7	90°30'	-11.5	-25.2		1017.3		-31	-1320	458,483 2,702,397
232	1540		" "	"	7.4	-		-7.4		1035.1		-37	-1540	458,477 2,702,177

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	10/25/79	INSTRUMENT MAN	G. Cotcamp	ROD MAN	R. Turner	PARTY NUMBER	6834	NOTES CHECKED BY	RWT	LINE NO.	1	PAGE	16	
AREA	Kansas	TOPG MAP	Ettingham	STATE	Kansas	COUNTY	Atchison	TWP	5 S	RANGE	17 E	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS	
														Y	X		
									1042.5								
233	1760		262° 56.2'	+5.7°	33	TH	+8.8	+5.5		1048.0		-42	-1759	458,472	2,701,958		
234	1980		"	"	23	89° 30'	+17.3	+15.0		1057.5		-47	-1979	458,467	2,701,738		
235	2200		262° 56.2'	+5.7°	81	89° 10'	+32.0	+23.9		1066.4	TP	-52	-2199	458,462	2,701,518		
235	2200				5.5	89° 14'	+29.4	+23.9			TP						
	1540		82° 51.3' +180°	+5.7°	+9.9	BH	+7.7	+17.6	1084.0		BS	-39	-1540±2				
	1540				+4.2	90° 30'	+13.4	+17.6			BS						
236	1320		82° 51.3'	+5.7°	1.0	91°	-23.0	-24.0		1060.0		+33	+1320	458,456	2,701,300		
237	1100		"	"	9.2	91°	-19.2	-28.4		1055.6		+28	+1100	458,451	2,701,080		
238	880		"	"	10.6	91° 20'	-20.5	-31.1		1052.9		+22	+880	458,445	2,700,860		
239	660		"	"	13.0	91° 20'	-15.4	-28.4		1055.6		+17	+660	458,440	2,700,640		
240	440		"	"	13.7	91°	-7.7	-21.4		1062.6		+11	+440	458,434	2,700,420		
241	220		"	"	11.4	-	-	-11.4		1072.6		+6	+220	458,429	2,700,200		
242	0		"	"	5.4	-	-	-5.4		1078.6	π	0	0	458,423	2,699,980		
BM	238		314° 59'	+5.7°	9.0	89° 20'	+2.8	-6.2		1077.8		+184	-151	458,607	2,699,829	" (elev) 1075.8 " I.S.G.C. 93 L 1940	
243	220		263° 1.8'	+5.7°	13.4	-	-	-13.4		1070.6		-5	-220	458,418	2,699,760		
244	440		"	"	9.8	92°	-15.3	-25.1		1058.9		-10	-440	458,413	2,699,540	horiz. correct. Y = -12' X = +23'	
245	660		"	"	10.3	92°	-23.0	-33.3		1050.7		-15	-660	458,408	2,699,320		
TP	780		262° 37'	+5.7°	7.9	92°	-27.2	-35.1		1048.9		-23	-780	458,400	2,699,200	458,400 + 2,699,200(s) T-rd (south)	
246	880		263° 1.8'	+5.7°	4.1	92°	-30.7	-34.8		1049.2		-20	-880	458,403	2,699,100		
247	1100		"	"	10.7	91°	-19.2	-29.9		1054.1		-24	-1100	458,399	2,698,880		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/25/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C.	LINE NO. 1	PAGE 17
AREA Kansas	TOPO MAP Whiting	STATE Kansas	COUNTY Atchison	TWP 5 S	RANGE 17 E	PPM
				PARTY MANAGER L. V. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1084.0							
248	1320		263° 1.8'	+5.7°	10.6	90° 30'	-11.5	-22.1		1061.9		-29	-1320	458,394	2,698,660	
249	1540		263° 1.8'	+5.5°	19.5	-		-14.5		1069.5	TP	-40+2	-1539.4	458,385	2,698,445	
249	1540				6.8	84	-7.7	-14.5			TP					
	660	659	82° 36.6' +180°	+5.5°	+13.8	87° 30'	-28.8	-15.0	1054.5		BS	-22+2	-659+4			
	660				+10.8	87° 46'	-25.7	-14.9			BS					
250	440		82° 36.6'	+5.5°	4.5	87° 30'	+19.2	+14.7		1069.2		+15	+440	458,380	2,698,230	
251	220		"	"	1.7	87° 30'	+9.6	+7.9		1062.4		+7	+220	458,372	2,698,010	
JL 75	75		80° 42'	+5.5°	1.0	87° 30'	+3.3	+2.3		1056.8		+5	+75	458,370	2,697,865	4-way Intersect (elev) 1055'
252	0				54	-		-5.4		1049.1	X	0	0	458,365	2,697,790	
253	220		262° 24.8'	+5.5°	12.1	-		-12.1		1042.4		-8	-220	458,357	2,697,570	
254	440			"	11.9	-		-11.9		1042.6		-16	-440	458,349	2,697,350	
255	660		262° 24.8'	+5.5°	9.6	-		-9.6			TP	-24+2	-659+3	458,343	2,697,134	
255	660				8.9	90° 4'	-0.8	-9.7		1044.8	TP					T.P. opposite sta.
	1100	1097	83° 16.6' +180°	+5.5°	+11.8	85° 30'	-86.0	-74.2	970.6		BS	-23+2	-1097+3			
	1100				+8.7	85° 40'	-82.9	-74.2			BS					
256	880	877	82° 31.3'	+5.5°	6.5	85° 30'	+68.8	+62.3		1032.9		+30	+876	458,352	2,696,916	
257	660	658	"	"	10.5	85° 30'	+51.6	+41.1		1011.7		+23	+658	458,345	2,696,698	
258	440	437	"	"	6.3	87° -	+23.0	+16.7		987.3		+15	+439	458,337	2,696,479	
259	220		"	"	0.6	-		-0.6		970.0		+8	+220	458,330	2,696,260	
260	0				54	-		-5.4		965.2	X	0	0	458,322	2,696,040	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
10/26/79		G. Cotcamp		R. Turner		6834		RWT		1		18			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Whiting		Kansas		Atchison		5s.		17E.				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									970.6						
261	220		263°40.1	+53°	7.0	-		-7.0		963.6		-4	-220	458,318	2,695,820
262	440		" "	"	6.2	-		-6.2		964.4		-8	-440	458,314	2,695,600
263	660		" "	"	5.4	-		-5.4		965.2		-12	-660	458,310	2,695,380
264	880		263°40.1	+53°	5.2	-		-5.2		965.4	TP	-16	-880+3	458,306	2,695,163
264	880				9.6	TH	+4.4	-5.2			TP				last sta. on road
	438		83°59'+180°	+5.3°	+11.4	89°-	-7.6	+3.8	969.2		BS	-5	-438+3		
	438				+7.6	89°30'	-3.8	+3.8			BS				
265	219		83°59'	+5.3°	19.5	-		-19.5		949.7		+3	+220	458,304	2,694,948
266	0				5.4	-		-5.4		963.8	TP	0	0	458,301	2,694,728
267	220		273°44'	+53°	10.6	-		-10.6		958.6		+35	-217	458,336	2,694,511
268	440		271°14'	+5.3°	5.1	-		-5.1		964.1		+50	-437	458,351	2,694,291
269	660		269°30'	+5.3°	9.6	TH	+3.3	-6.3		962.9	TP	+55	-658+3	458,356	2,694,073
269	660				9.8	89°42'	+3.5	-6.3			TP				
	425		69°29.2'+180°	+5.3°	+10.1	TH	-2.1	+8.0	970.9		BS	-112	-910+3		
	425				+9.5	89°48'	-1.5	+8.0			BS				
270	215		56°23'	+5.3°	10.1	91°20'	-5.0	-15.1		955.8		+102	+189	458,346	2,693,855
271	0				5.4	-		-5.4		965.5	TP	0	0	458,244	2,693,666
272	220		268°51'	+5.3°	5.4	-		-5.4		965.5		-3	-220	458,241	2,693,446
273	440		" "	"	3.6	-		-3.6		967.3		-7	-440	458,237	2,693,226
274	660		" "	"	0.5	-		-0.5		970.4		-10	-660	458,234	2,693,006

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	10/26/79	INSTRUMENT MAN	G. Catcamp	ROD MAN	R. Turner	PARTY NUMBER	6834	NOTES CHECKED BY	G.W.C.	LINE NO.	1	PAGE	19	
AREA	Kansas	TOPO MAP	Whiting	STATE	Kansas	COUNTY	Atchison	TWP	5s.	RANGE	17E.	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS
														Y	X	
									970.9							
275	880		263° 51'	+5.3°	10.0	89° -	+15.4	+5.4		976.3		-13	-880	458,231	2,692,786	
FF	1066		263° 31.5'	+5.3°	2.8	89° -	+18.6	+15.8		986.7		-22	-1066	458,220	2,692,600	458,225 + 2,692,600 (s) T=rod (south) (elev) 983'
276	1100		263° 51'	+5.3°	2.4	89° -	+19.2	+16.8		987.7		-16	-1100	458,228	2,692,566	
277	1320		" "	"	8.6	88° 30'	+34.5	+25.9		996.8		-20	-1320	458,224	2,692,346	
278	1540	1539	263° 51'	+5.3°	7.0	88° 30'	+40.3	+33.3		1004.2	TP	-23	-1539+2	458,221	2,692,129	
278	1540				4.3	88° 36'	+37.6	+33.3			TP					
	1540		83° 23.6' + 180°	+5.3°	+9.2	-	+9.2		1013.4		BS	-35	-1539			
	1540				+1.5	04	+7.7	+9.2			BS					
279	1320		83° 23.6'	+5.3°	12.8	04	-6.6	-19.4		994.0		+30	+1320	458,216	2,691,910	
280	1100		" "	"	9.3	91° -	-19.2	-28.5		984.9		+25	+1100	458,211	2,691,690	
281	880		" "	"	11.0	91° 30'	-23.0	-34.0		979.4		+20	+880	458,206	2,691,470	
282	660		" "	"	11.5	92° -	-23.0	-34.5		978.9		+15	+660	458,201	2,691,250	
283	440		" "	"	12.9	91° -	-7.7	-20.6		992.8		+10	+440	458,196	2,691,030	
284	220		" "	"	8.4	-	-	-8.4		1005.0		+5	+220	458,191	2,690,810	
285	0				5.4	-	-	-5.4		1008.0	TP	0	0	458,186	2,690,590	
286	220		263° 17'	+5.3°	12.2	-	-	-12.2		1001.2		-5	-220	458,181	2,690,370	
287	440		" "	"	11.3	-	-	-11.3		1002.1		-11	-440	458,175	2,690,150	horiz. correct. y = +8' x = +28'
288	660		" "	"	11.0	-	-	-11.0		1002.4		-16	-660	458,170	2,689,930	
FF	610		262° 45.7'	+5.3°	10.9	-	-	-10.9		1002.5		-21	-610	458,165	2,689,980	458,165 + 2,689,980 (s) T=rod (south) (elev) 1001'
289	880		263° 17'	+5.3°	6.8	-	-	-6.8		1006.6		-22	-880	458,164	2,689,710	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	10/26/79	INSTRUMENT MAN	G. Cotcamp	ROD MAN	A. Turner	PARTY NUMBER	6834	NOTES CHECKED BY	RWT	LINE NO.	1	PAGE	20	
AREA	Kansas	TOPO MAP	Whiting	STATE	Kansas	COUNTY	Atchison/Jackson	TWP	5 S.	RANGE	17E/16E	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1013.4					
290	1100		263°17'	+5.3°	5.1	TH	+5.5	+0.4		1013.8		-27	-1100	458,159 2689,490
291	1320		" "	"	122	89°-	+23.0	+10.8		1024.2		-33	-1320	458,153 2689,270
292	1540		" "	"	4.8	89°-	+26.9	+22.1		1035.5		-38	-1540	458,148 2689,050
293	1760	1759	" "	"	11.7	88°30'	+46.1	+34.4		1047.8		-44	-1759	458,142 2688,831
294	1980	1979	263°17'	+5.5°	8.1	88°30'	+51.8	+43.7		1057.1	TP	-42 +3	-1979 +2	458,147 2688,613
294	1980				11.5	88°24'	+55.3	+43.8			TP			
	2200		83°19.7' +180°	+5.5°	+11.9	BH	+11.0	+22.9	1080.0		BS	-45 +3	-2200 +2	
	2200				+3.9	90°30'	+19.2	+23.1			BS			
295	1980		83°19.7'	+5.5°	14.8	BH	-9.9	-24.7		1055.3		+40	+1980	458,145 2688,395
296	1760		" "	"	22	91°-	-30.7	-32.9		1047.1		+36	+1760	458,141 2688,175
297	1540		" "	"	12.7	91°-	-26.9	-39.6		1040.4		+31	+1540	458,136 2687,955
298	1320		" "	"	7.5	91°30'	-34.5	-42.0		1038.0		+27	+1320	458,132 2687,735
299	1100		" "	"	12.9	91°30'	-28.8	-41.7		1038.3		+22	+1100	458,127 2687,515
300	880	879	" "	"	8.2	92°-	-30.7	-38.9		1041.1		+18	+879	458,123 2687,294
301	660		" "	"	10.4	92°-	-23.0	-33.4		1046.6		+13	+660	458,118 2687,075
302	440		" "	"	9.4	92°-	-15.3	-24.7		1055.3		+9	+440	458,114 2686,855
<u>JL</u>	265		84°34'	+5.5°	12.4	91°-	-4.6	-17.0		1063.0		0	+265	458,105 2686,680
303	220		83°19.7'	+5.5°	14.8	-		-14.8		1065.2		+4	+220	458,109 2686,635
304	0				5.4	-		-5.4		1074.6	TP	0	0	458,105 2686,415
305	220		263°23.2'	+5.5°	8.7	-		-8.7		1071.3		-4	-220	458,101 2686,195

↑
Atchison Co.
458,100 +2,686,685(s)
Tnd (north) elev. 1063'
Jackson Co.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
10/26/79		G. Catcamp		R. Turner		6834		RWT		1	21						
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Whiting	Kansas	Jackson		5 S.	16 E		L.O. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
												LAT.	DEP.				
									1080.0								
306	440		263° 23.2'	+5.5°	15.0	-		-15.0		1065.0		-9	-440	458,096	2685,975		
307	660		" "	"	12.3	91°-	-11.5	-23.8		1056.2		-13	-660	458,092	2685,755		
308	880		263° 23.2'	+5.5°	130	91°40'	-25.6	-38.6		1041.4	TP	-17+2	-880+2	458,090	2685,537		
308	880				10.5	91°50'	-28.1	-38.6			TP						
	1980		82° 32' +180°	+5.5°	+0.2	-		+0.2	1041.6		BS	-68+2	-1979+2				
	1980				+10.1	TH	-9.9	+0.2			BS						
309	1760		82° 32'	+5.5°	10.8	BH	-8.8	-19.6		1022.0		+60	+1759	458,084	2685,319		
310	1540		" "	"	8.3	90°40'	-17.9	-26.2		1015.4		+53	+1539	458,077	2685,099		
311	1320		" "	"	7.9	91°-	-23.0	-30.4		1011.2		+45	+1319	458,069	2684,879		
##	1320		82° 51.3'	+5.5°	7.9	91°-	-23.0	-30.4		1011.2		+38	+1319	458,062	2684,879	railroad	
312	1100		82° 32'	+5.5°	11.9	91°30'	-28.8	-40.7		1000.9		+38	+1099	458,062	2684,659		
313	880	879	" "	"	8.5	92°-	-30.7	-39.2		1002.4		+30	+878	458,054	2684,438		
314	660		" "	"	13.3	92°-	-23.0	-36.3		1005.3		+23	+660	458,047	2684,220		
315	440		" "	"	13.0	92°-	-15.3	-28.3		1013.3		+15	+440	458,039	2684,000		
316	220		" "	"	12.1	-		-12.1		1029.5		+8	+220	458,032	2683,780		
317	0		" "	"	5.4	-		-5.4		1036.2	TP	0	0	458,024	2683,560		
318	220		262° 48.3'	+5.8°	5.0	-		-5.0		1036.6		-5	-220	458,019	2683,340		
319	440		" "	"	2.8	-		-2.8		1038.8		-11	-440	458,013	2683,120		
320	660		" "	"	0.7	TH	+3.3	+2.6		1044.2		-16	-660	458,008	2682,900		
321	880		" "	"	6.0	89°-	+15.4	+9.4		1051.0		-21	-880	458,003	2682,680		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY			LINE NO.		PAGE		
10/29/79		G. Cotcamp			R. Turner			6834		RWT			1		23		
AREA		TOPO MAP			STATE			COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Whiting			Kansas			Jackson		5 s.		16 E.				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
												LAT.	DEP.	Y	X		
									1072.0								
337	1100		262° 28.7'	+6.3°	2.2	-		-2.2		1069.8	TP	-23+3	-1100	457,910	2,679,162		
337	1100				7.7	TH	+5.5	-2.2			TP						
	1320		82° 9.2' +180°	+6.3°	+2.5	-		+2.5	1072.3		BS	-36+3	-1319+1				
	1320				+9.1	TH	-6.6	+2.5			BS						
338	1100		82° 9.2'	+6.3°	14.4	-		-14.1		1058.2		+30	+1100	457,907	2,678,944		
339	880		" "	"	12.0	91°-	-15.4	-27.4		1044.9		+24	+880	457,901	2,678,724		
340	660		" "	"	10.0	91°30'	-17.3	-27.3		1045.0		+18	+660	457,895	2,678,504		
341	440		" "	"	14.1	BH	-2.2	-16.3		1056.0		+12	+440	457,889	2,678,284		
342	220		" "	"	13.8	-		-13.8		1058.5		+6	+220	457,883	2,678,064		
343	0		" "	"	5.4	-		-5.4		1066.9	TP	0	0	457,877	2,677,844		
344	220		262° 8.9'	+6.7°	7.4	-		-7.4		1064.9		-4	-220	457,873	2,677,624		
345	440		" "	"	10.9	91°-	-7.7	-18.6		1053.7		-9	-440	457,868	2,677,404		
346	660		" "	"	12.5	91°-	-11.5	-24.0		1048.3		-13	-660	457,864	2,677,184		
347	880		" "	"	5.6	91°-	-15.4	-21.0		1051.3		-18	-880	457,859	2,676,964		
348	1100		" "	"	12.2	90°30'	-9.6	-21.8		1050.5		-22	-1100	457,855	2,676,744		
349	1320		262° 8.9'	+6.7°	14.6	90°30'	-11.5	-26.1		1046.2	TP	-26+3	-1320+1	457,854	2,676,525		
349	1320				6.9	90°50'	-19.2	-26.1			TP						
	1320	1319	81° 49.4' +180°	+6.7°	+7.2	92°-	+46.0	+53.2	1099.4		BS	-34+3	-1319+1				
	1320				+4.2	91°42'	+39.1	+53.3			BS						
350	1100	1099	81° 49.4'	+6.7°	7.4	92°-	-38.4	-45.8		1053.6		+28	+1099	457,851	2,676,306		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/29/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWJ	LINE NO. 1	PAGE 24
AREA Kansas	TOPO MAP Whiting	STATE Kansas	COUNTY Jackson	TWP 5 S.	RANGE 16 E.	PPM
			PARTY MANAGER L. O. Davis			

STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS
												SOUTH -	WEST -	Y	X	
												LAT.	DEP.			
									1099.4							
<u>JK</u>	920	919	81°47.7'	+5.7°	8.0	92°-	-32.1	-40.1		1059.3		+24	+919	457,847	2,676,126	457,845 + 2,676,120 (s) = rd (south) elev. 1058'
351	880	879	81°49.4'	+6.7°	7.9	92°-	-30.7	-38.6		1060.8		+23	+879	457,846	2,676,086	
352	660		" "	"	8.7	92°-	-23.0	-31.7		1067.7		+17	+660	457,840	2,675,867	
353	440		" "	"	14.6	91°-	-7.7	-22.3		1077.1		+11	+440	457,834	2,675,647	
354	220		" "	"	12.2	-	-	-12.2		1087.2		+6	+220	457,829	2,675,427	
355	0				5.4	-	-	-5.4		1094.0	π	0	0	457,823	2,675,207	
356	220		261°25.5'	+7.1°	9.6	-	-	-9.6		1089.8		-6	-220	457,817	2,674,987	
357	440		" "	"	14.5	-	-	-14.5		1084.9		-11	-440	457,812	2,674,767	
358	660		" "	"	12.9	-	-	-12.9		1086.5		-17	-660	457,806	2,674,547	
359	880		" "	"	7.4	-	-	-7.4		1092.0		-23	-880	457,800	2,674,327	
360	1100		261°25.5'	+7.1°	8.6	-	-	-8.6		1090.8	TP	-28+2	-1100+3	457,797	2,674,110	
360	1100				14.1	TH	+5.5	-8.6			TP					
	1320		80°58' + 180°	+7.1°	+1.8	-	-	+1.8	1092.6		BS	-44+3	-1319+3			
	1320				+8.4	TH	-6.6	+1.8			BS					
361	1100		80°58'	+7.1°	14.1	-	-	-14.1		1078.5		+37	+1099	457,793	2,673,893	
362	880		" "	"	16.8	TH	-4.4	-21.2		1071.4		+30	+879	457,786	2,673,673	
363	660		" "	"	19.4	-	-	-19.4		1073.2		+22	+660	457,778	2,673,454	
364	440		" "	"	12.2	-	-	-12.2		1080.4		+15	+440	457,771	2,673,234	
365	220		" "	"	3.1	-	-	-3.1		1089.5		+7	+220	457,763	2,673,014	
366	0				5.4	-	-	-5.4		1087.2	π	0	0	457,756	2,672,794	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
10/29/79		G. Cotcamp		R. Turner		6834		RWT		1	25						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Whiting / NETAWAKA		Kansas	Jackson		5 S.	16 E		L. O. Davis							
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1092.6								
367	220		261°23'	+7.1°	12.8	91°	-3.8	-16.6		1076.0		-6	-220	457,750	2,672,574		
368	490		" "	"	10.2	92°	-15.3	-25.5		1067.1		-12	-440	457,744	2,672,354		
369	660		" "	"	10.8	91°	-11.5	-22.3		1070.3		-17	-660	457,739	2,672,134		
370	880		" "	"	11.8	-	-	-11.8		1080.8		-23	-880	457,733	2,671,914		
371	1100		" "	"	2.9	-	-	-2.9		1089.7		-29	-1100	457,727	2,671,694		
372	1320		" "	"	6.0	-	-	-6.0		1086.6		-35	-1320	457,721	2,671,474		
373	1540		" "	"	11.2	-	-	-11.2		1081.4		-41	-1539	457,715	2,671,255	horiz. correct. y=+32 x=+17'	
374	1760		" "	"	7.7	-	-	-7.7		1084.9		-47	-1759	457,709	2,671,035	457,705 + 2,670,855(S) T-rd (north) elev. 1092'	
375	1980		" "	"	6.9	TH	+9.7	+0.5		1093.1		-51	-1939	457,705	2,670,855		
376	2200		261°23'	+7.1°	3.0	TH	+11.0	+8.0			TP	-58	-2199.3	457,704	2,670,815		
376	2200				4.9	89°40'	+12.8	+7.9		1100.5	TP						
	1540		81°22.5' + 180°	+7.1°	+8.7	-	-	+8.7	1109.2		BS	-41	-1539.4				
	1540				+1.0	BH	+7.7	+8.7			BS						
377	1320		81°22.5'	+7.1°	10.3	-	-	-10.3		1098.9		+35	+1320	457,692	2,670,388		
378	1100		" "	"	7.3	-	-	-7.3		1101.9		+29	+1100	457,686	2,670,163		
379	880		" "	"	11.2	-	-	-11.2		1098.0		+23	+880	457,680	2,669,943		
380	660		" "	"	13.6	BH	-3.3	-16.9		1092.3		+18	+660	457,675	2,669,723	↑	
381	440		" "	"	14.7	-	-	-14.7		1094.5		+12	+440	457,669	2,669,503	Whiting Quad.	
382	220		" "	"	9.6	-	-	-9.6		1099.6		+6	+220	457,663	2,669,283	Netawaka quad.	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/29/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6839	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 26
AREA Kansas	TOPO MAP NETAWAKA	STATE Kansas	COUNTY Jackson	TWP 5 S.	RANGE 16 E.	PPM
PARTY MANAGER L. O. Davis						

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS	
														Y	X		
									1109.2								
77	207		82°56'	+7.1°	91	-		-9.1		1100.1		0	+207	457,657	2,669,270	457,645 + 2,669,290 (i) T-rd (south) elev. 1097.1	
383	0				54	-		-5.4		1103.8	X	0	0	457,657	2,669,063		
384	220		260°53.6'	+7.1°	14.4	BH	-1.1	-15.5		1093.7		-8	-220	457,649	2,668,843		
385	440		" "	"	12.2	92°-	-15.3	-27.5		1081.7		-15	-440	457,642	2,668,623		
386	660		" "	"	9.7	92°-	-23.0	-32.7		1076.5		-23	-660	457,634	2,668,403		
387	880		" "	"	13.3	91°-	-15.4	-28.7		1080.5		-31	-880	457,626	2,668,183		
388	1100		260°53.6'	+7.1°	113	BH	-5.5	-16.8			TP	-39+2	-1099+3	457,620	2,667,967		
388	1100				54	90°36'	-11.5	-16.9		1092.3	TP						
	2200		81°17.6'+180°	+7.1°	+8.5	90°30'	+19.2	+27.7			BS	-62+2	-2199+4				
	2200				+14.8	90°20'	+12.8	+27.6	1119.9		BS						
389	1920		81°17.6'	+7.1°	9.2	90°40'	-23.0	-32.2		1087.7		+56	+1979	457,616	2,667,751		
390	1760		" "	"	9.7	91°-	-30.7	-40.4		1079.5		+49	+1759	457,609	2,667,531		
391	1540	1539	" "	"	4.9	91°30'	-40.3	-45.2		1074.7		+43	+1538	457,603	2,667,310		
392	1320		" "	"	13.1	91°30'	-34.5	-47.6		1072.3		+37	+1319	457,597	2,667,091		
393	1100	1099	" "	"	9.3	92°-	-38.4	-47.7		1072.2		+31	+1099	457,591	2,666,871		
394	880	879	" "	"	10.8	92°20'	-35.8	-46.6		1073.3		+25	+879	457,585	2,666,651		
395	660	659	" "	"	13.1	92°20'	-26.8	-39.9		1080.0		+18	+659	457,578	2,666,431		
396	440		" "	"	14.3	92°-	-15.3	-29.6		1090.3		+12	+440	457,572	2,666,212		
397	220		" "	"	14.6	91°-	-3.8	-18.4		1101.5		+6	+220	457,566	2,665,992		
397	50		89°29'	+7.1°	3.7	-		-3.7		1116.2		-6	+50	457,554	2,665,822	railroad overpass	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE					
10/30/79		G. Cotcamp		R Turner		6834		R WT		1		27					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER			
Kansas		NETAWAKA		Kansas		Jackson		5 S.		16 E.				L.O. Davis			
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS	
														Y	X		
									1119.9								
398	0				54	-		-5.4		1114.5	TP	0	0	457,560	2,665,772	on overpass	
399	220		261° 37.8'	+7.1°	12.4	-		-12.4		1107.5		-5	-220	457,555	2,665,532		
400	440		" "	"	12.5	-		-12.5		1107.4		-10	-440	457,550	2,665,332		
401	660		" "	"	10.4	-		-10.4		1109.5		-15	-660	457,545	2,665,112		
402	880		" "	"	12.3	84	-4.4	-16.7		1103.2		-20	-880	457,540	2,664,892		
403	1100		" "	"	13.7	90° 30'	-9.6	-23.3		1096.6		-24	-1100	457,536	2,664,672		
404	1320		" "	"	12.7	90° 40'	-15.4	-28.1		1091.8		-29	-1320	457,531	2,664,452		
405	1540		" "	"	12.9	90° 40'	-17.9	-30.8		1089.1		-34	-1540	457,526	2,664,232		
406	1760		" "	"	14.9	90° 40'	-20.5	-35.4		1084.5		-39	-1760	457,521	2,664,012		
TP	1765		261° 16.5'	+7.1°	9.2	90° 50'	-25.7	-34.9		1085.0		-50	-1764	457,510	2,664,008	457,510 + 2,669,015 (S. Twp 1 (south) elev. 1084'	
407	1980		261° 37.8'	+7.1°	8.2	90° 50'	-28.8	-37.0		1082.9		-44	-1980	457,516	2,663,792		
408	2200		" "	"	6.0	90° 40'	-25.6	-31.6		1088.3		-49	-2199	457,511	2,663,573		
409	2420		261° 37.8'	+7.1°	5.7	90° 30'	-21.1	-26.8			TP	-54+2	-2419+3	457,508	2,663,356		
409	2420		" "	"	12.8	90° 20'	-14.1	-26.9		1093.0	TP						
	1540		80° 37' + 180°	+7.1°	+0.3	TH	-7.7	-7.4	1085.6		BS	-61+2	-1539+4				
	1540		" "	"	+6.0	89° 30'	-13.4	-7.4			BS						
410	1320		80° 37'	+7.1°	3.1	TH	+6.6	+3.5		1089.1		+53	+1319	457,502	2,663,140		
411	1100		" "	"	5.2	-		-5.2		1080.4		+44	+1099	457,493	2,662,920		
412	880		" "	"	15.1	-		-15.1		1070.5		+35	+879	457,484	2,662,700		
413	660		" "	"	9.1	91°	-11.5	-20.6		1065.0		+26	+659	457,475	2,662,480		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10/30/79		G. Cotcamp		R. Turner		6834		RWT		1	28					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		NETAWAKA	Kansas	Jackson	5 S.	16 E.		L.O. Davis								
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1085.6							
414	440		80°37'	+7.1°	12.1	91°	-7.7	-19.8		1065.8		+18	+490	457,467	2,662,261	
415	220		"	"	12.5	-		-12.5		1073.1		+9	+220	457,458	2,662,041	
416	0				54	-		-5.4		1080.2	π	0	0	457,449	2,661,821	
417	220		261°42.2'	+7.1°	12.3	-		-12.3		1073.3		-5	-220	457,444	2,661,601	
418	440		"	"	9.9	92°	-15.3	-25.2		1060.4		-9	-440	457,440	2,661,381	
419	660		"	"	14.5	92°	-23.0	-37.5		1048.1		-14	-660	457,435	2,661,161	
420	880	879	"	"	10.1	92°30'	-38.4	-48.5		1037.1		-18	-879	457,431	2,660,942	
421	1100	1099	"	"	6.6	92°30'	-47.9	-54.5		1031.1		-23	-1099	457,426	2,660,722	
422	1320	1319	"	"	11.0	92°	-46.0	-57.0		1028.6		-28	-1319	457,421	2,660,502	
423	1540	1539	"	"	5.9	92°	-53.7	-59.6		1026.0		-32	-1539	457,417	2,660,282	
424	1760	1759	261°42.2'	+7.1°	9.8	91°40'	-51.2	-61.0		1024.6	TP	-37+1	-1759+3	457,413	2,660,065	
424	1760				4.7	91°50'	-56.3	-61.0			TP					
	1760	1759	81°26.6' +180°	+7.1°	+12.0	92°10'	+66.5	+78.5	1103.1		BS	-45	-1758+4			
	1760				+6.9	92°20'	+71.6	+78.5			BS					
425	1540	1539	81°26.6'	+7.1°	11.8	92°20'	-62.6	-74.4		1028.7		+39	+1539	457,407	2,659,850	
426	1320	1319	"	"	14.7	92°20'	-53.7	-68.4		1034.7		+34	+1319	457,402	2,659,630	
427	1100	1099	"	"	12.9	92°30'	-47.9	-60.3		1042.8		+28	+1099	457,396	2,659,410	
428	880	879	"	"	13.7	92°30'	-38.4	-52.1		1051.0		+22	+879	457,390	2,659,190	
429	660	659	"	"	11.7	92°30'	-28.8	-40.5		1062.6		+17	+659	457,385	2,658,970	
430	440		"	"	10.9	92°	-15.3	-26.2		1076.9		+11	+440	457,379	2,658,751	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	10/30/79	INSTRUMENT MAN	G. Colcamp	ROD MAN	R. Turner	PARTY NUMBER	6834	NOTES CHECKED BY	RWT	LINE NO.	1	PAGE	29	
AREA	Kansas	TOPO MAP	NETAWAKA	STATE	Kansas	COUNTY	Jackson	TWP	5 S.	RANGE	16 E.	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1103.1							
FF	418		82°17'	+7.1°	10.0	92°	-14.6	-24.6		1078.5		+4	+418	457,372	2658,729	457,380 + 2,658,740(s) Frd (south) elev. 1076
431	220		81°26.6'	+7.1°	11.5	-		-11.5		1091.6		+6	+220	457,374	2658,531	
432	0				5.4	-		-5.4		1097.7	TP	0	0	457,368	2658,311	
433	220		261°37.7'	+7.1°	10.2	-		-10.2		1092.9		-5	-220	457,363	2658,091	
434	440		" "	"	14.4	BH	-2.2	-16.6		1086.5		-10	-440	457,358	2657,871	
435	660		" "	"	11.3	91°-	-11.5	-22.8		1080.3		-15	-660	457,353	2657,651	
436	880		" "	"	5.3	91°40'	-25.6	-30.9		1072.2		-20	-880	457,348	2657,431	
437	1100		" "	"	12.8	91°40'	-32.0	-44.8		1058.3		-24	-1100	457,344	2657,211	
438	1320		" "	"	10.6	91°40'	-38.4	-49.0		1054.1		-29	-1320	457,339	2656,991	
439	1540		" "	"	14.3	91°-	-26.9	-41.2		1061.9		-34	-1540	457,334	2656,771	
440	1760		" "	"	11.5	90°30'	-15.4	-26.9		1076.2		-39	-1760	457,329	2656,551	
441	1980		261°37.7'	+7.1°	2.1	90°30'	-17.3	-19.4		1083.7	TP	-44	-1980+3	457,324	2656,334	
441	1980				7.8	90°20'	-11.5	-19.3			TP					
	1760	1759	81°28.5' + 180°	+7.1°	+9.3	88°-	-61.4	-52.1	1031.6		BS	-44	-1758+3			
	1760				+6.3	88°6'	-58.3	-52.0			BS					
442	1540	1539	81°28.5'	+7.1°	7.7	88°-	+53.7	+44.0		1075.6		+38	+1540	457,318	2656,119	
443	1320	1319	" "	"	5.0	88°-	+46.0	+41.0		1072.6		+33	+1319	457,313	2655,898	
444	1100	1099	" "	"	13.0	88°-	+38.4	+25.4		1057.0		+27	+1099	457,307	2655,678	
445	880	879	" "	"	20.0	88°-	+30.7	+10.7		1042.3		+22	+879	457,302	2655,458	
446	660		" "	"	12.0	88°-	+23.0	+11.0		1042.6		+16	+660	457,296	2655,239	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 10/30/79	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 30
AREA Kansas	TOPO MAP NETAWAKA	STATE Kansas	COUNTY Jackson	TWP 5 S.	RANGE 15 E	PPM
					PARTY MANAGER L.O. Davis	

STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1031.6					
447	440		81° 28.5'	+7.1°	2.3	88°	+15.3	+13.0		1044.6		+11	+440	457,291 2,655,019
448	220		81° 28.5'	+7.1°	5.3	88°	+7.7	+2.4		1034.0		+5	+220	457,285 2,654,799
449	0				5.4	-		-5.4		1026.2	TP	0	0	457,280 2,654,579
450	220		261° 18'	+7.1°	11.7	-		-11.7		1019.9		-6	-220	457,274 2,654,359
451	440		" "	"	11.8	-		-11.8		1019.8		-12	-440	457,268 2,654,139
452	660		" "	"	5.1	-		-5.1		1026.5		-18	-660	457,262 2,653,919
453	880		" "	"	7.2	89°	+15.4	+8.2		1039.8		-25	-880	457,255 2,653,699 <small>horiz. correct. Y = +9'</small>
454	1100		" "	"	9.1	88° 20'	+32.0	+22.9		1054.5		-31	-1100	457,249 2,653,479 <small>Y = +34'</small>
TP	1120		261° 8'	+7.1°	14.7	88°	+39.1	+24.4		1056.0		-35	-1119	457,245 2,653,460 <small>457,245 + 2,653,460 (S) Elev. 1054'</small>
455	1320	1319	261° 18'	+7.3°	5.7	88°	+46.0	+40.3		1071.9		-32	-1319	457,248 2,653,260
456	1540	1539	" "	"	8.3	87° 30'	+67.1	+58.8		1090.4		-38	-1539	457,242 2,653,040
457	1760	1759	261° 18'	+7.3°	13.0	87° 40'	+71.6	+58.6			TP	-43+2	-1758+6	457,239 2,652,827
457	1760				10.0	87° 40'	+68.5	+58.5		1090.1	TP			
	1100		80° 54.6' +180°	+7.3°	+10.9	91°	+19.2	+30.1	1120.2		BS	-34+2	-1099+6	
	1100				+7.7	91° 0'	+22.4	+30.1			BS			
458	880		80° 54.6'	+7.3°	12.0	91° 30'	-23.0	-35.0		1085.2		+27	+880	457,234 2,652,614
459	660		" "	"	12.5	91° 30'	-17.3	-29.8		1090.4		+21	+660	457,228 2,652,394
460	440		" "	"	12.8	91°	-7.7	-20.5		1099.7		+14	+440	457,221 2,652,174
461	220		" "	"	7.9	-		-7.9		1112.3		+7	+220	457,214 2,651,954
462	0				5.4	-		-5.4		1114.8	TP	0	0	457,207 2,651,734

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11/1/79	INSTRUMENT MAN C. Catcamp	ROD MAN R. Turner	PARTY NUMBER 6834	NOTES CHECKED BY RWT	LINE NO. 1	PAGE 31
AREA Kansas	TOPO MAP Netawaka	STATE Kansas	COUNTY Jackson	TWP 5 S.	RANGE 15 E.	PPM
				PARTY MANAGER L.O. Davis		

STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1120.2					
463	220		261° 23.8'	+7.3°	12.1	-		-12.1		1108.1		-5	-220	457,202 2,651,514
464	440		" "	"	14.6	-		-14.6		1105.6		-10	-440	457,197 2,651,294
465	660		" "	"	11.4	-		-11.4		1108.8		-15	-660	457,192 2,651,074
466	880		" "	"	13.4	84	-4.4	-17.8		1102.4		-20	-880	457,187 2,650,854
467	1100		" "	"	13.7	90° 40'	-12.8	-26.5		1093.7		-25	-1100	457,182 2,650,634
468	1320		" "	"	10.6	90° 50'	-19.2	-29.8		1090.4		-30	-1320	457,177 2,650,414
469	1540		261° 23.8'	+7.3°	9.7	90° 30'	-13.4	-23.1		1097.1	TP	-35.2	-1590.6	457,174 2,650,200
469	1540				5.2	90° 40'	-17.9	-23.1			TP			
	1760		80° 58' +180°	+7.3°	+8.5	89° 30'	-15.4	-6.9	1090.2		BS	-53.2	-1759.5	
	1760				+5.5	89° 36'	-12.3	-6.8			BS			
470	1540		80° 58'	+7.3°	10.9	89° 30'	+13.4	+2.5		1092.7		+47	+1539	457,170 2,649,985
470	1342		81° 14'	+7.3°	1.6	-		-1.6		1088.6		+34	+1342	457,157 2,649,788 T=rd (north) elev. 1088'
471	1320		80° 58'	+7.3°	1.6	-		-1.6		1088.6		+40	+1319	457,163 2,649,765
472	1100		" "	"	10.5	-		-10.5		1079.7		+33	+1099	457,156 2,649,545
473	880	879	" "	"	3.5	92° -	-30.7	-34.2		1056.0		+27	+879	457,150 2,649,325
474	660	659	" "	"	6.9	93° -	-34.5	-41.4		1048.8		+20	+659	457,143 2,649,105
475	440	439	" "	"	10.1	93° -	-23.0	-33.1		1057.1		+13	+439	457,136 2,648,885
476	220		" "	"	13.4	-		-13.4		1076.8		+7	+220	457,130 2,648,666
477	0				5.4	-		-5.4		1084.8	TP	0	0	457,123 2,648,446
478	220		261° 56.6'	+7.3°	5.2	-		-5.2		1085.0		-3	-220	457,120 2,648,226

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
1/11/79		G. Cotcamp		R. Turner		6834		RWT		1	32						
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER					
Kansas		Netawaka		Kansas		Jackson		5 s.		15 e.		L. O. Davis					
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS A TP	NORTH +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
												LAT.	DEP.	Y	X		
									1090.2								
71	305		260°38'	+7.3°	9.2	-		-9.2		1081.0		-11	-305	457,112	2,648,141	457,115 + 2,648,115(s) T-rd (south) c/l 1080	
479	440		261°56.6'	+7.3°	13.1	-		-13.1		1077.1		-6	-440	457,117	2,648,006		
480	660		" "		7.2	-		-7.2		1083.0		-9	-660	457,114	2,647,786		
481	880		261°56.6'	+7.3°	1.7	TH	+4.4	+2.7		1092.9	TP	-12 +2	-880 +8	457,113	2,647,574		
481	880				5.0	89°30'	+7.7	+2.7			TP						
	2200	2198	81°25.2' +180°	+7.3°	+3.8	87°32'	-81.8	-78.0	1014.9		BS	-49 +1	-2197 +8				
	2200				+14.0	87°36'	-92.0	-78.0			BS						
482	1980	1979	81°25.2'	+7.3°	3.6	87°50'	+74.8	+71.2		1086.1		+44	+1978	457,109	2,647,363		
483	1760	1759	" "	"	3.3	88°-	+61.4	+58.1		1073.0		+39	+1758	457,104	2,647,143		
489	1540	1539	" "	"	6.5	88°20'	+44.8	+38.3		1053.2		+34	+1539	457,099	2,646,924		
485	1320		" "	"	8.1	88°40'	+30.7	+22.6		1037.5		+29	+1320	457,094	2,646,705		
486	1100		" "	"	12.8	88°40'	+25.6	+12.8		1027.7		+25	+1100	457,090	2,646,485		
487	880		" "	"	9.0	88°40'	+20.5	+11.5		1026.4		+20	+880	457,085	2,646,265		
488	660		" "	"	3.0	88°40'	+15.4	+12.4		1027.3		+15	+660	457,080	2,646,045		
489	440		" "	"	2.1	TH	+2.2	+0.1		1015.0		+10	+440	457,075	2,645,825		
490	220		" "	"	3.5	-		-3.5		1011.4		+5	+220	457,070	2,645,605		
491	0				5.4	-		-5.4		1009.5	TP	0	0	457,065	2,645,385		
492	220		261°27.8'	+7.3°	5.8	-		-5.8		1009.1		-5	-220	457,060	2,645,165		
493	440		" "	"	6.8	-		-6.8		1008.1		-9	-440	457,056	2,644,945		
494	660		" "	"	7.1	-		-7.1		1007.8		-14	-660	457,051	2,644,725		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11/1/79		G. Cotcamp		R Turner		6834		R WT		1		33			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Metawaka		Kansas		Jackson		5 s.		15 E.				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1014.9						horiz correct. $y=+11'$ $x=+39'$
495	880		261° 27.8'	+7.3°	8.7	-		-8.7		1006.2		-19	-880	457,046	2,644,505
$\frac{1}{2}$	895		261° 5'	+7.3°	8.7	-		-8.7		1006.2		-25	-895	457,040	2,644,490
496	1100		261° 27.8'	+7.1°	8.2	-		-8.2		1006.7		-28	-1100	457,037	2,644,285
497	1320		"	"	7.0	-		-7.0		1007.9		-33	-1320	457,032	2,644,065
498	1540		"	"	3.9	-		-3.9		1011.0		-39	-1540	457,026	2,643,845
499	1760		"	"	1.8	-		-1.8		1013.1		-44	-1759	457,021	2,643,626
500	1980		"	"	3.2	-		-3.2		1011.7		-50	-1979	457,015	2,643,906
501	2200		261° 27.8'	+7.1°	3.7	-		-3.7		1011.2	TP	-55	-2199.10	457,010	2,643,176
501	2200				14.7	TH	+11.0	-3.7			TP				
	1980		81° 33.6' + 180°	+7.1°	+14.3	90° 58'	+33.4	+47.7	(+47.5)		BS	-46	-1979.10		
	1980				+3.6	91° 16'	+43.8	+47.4	1058.7		BS				
502	1760	1759	81° 33.6'	+7.1°	6.3	91° 20'	-40.9	-47.2		1011.5		+41	+1758	457,005	2,642,945
503	1540		"	"	11.7	91° 20'	-35.8	-47.5		1011.2		+36	+1540	457,000	2,642,727
504	1320	1319	"	"	8.2	91° 40'	-38.4	-46.6		1012.1		+31	+1319	456,995	2,642,506
505	1100		"	"	13.1	91° 40'	-32.0	-45.1		1013.6		+26	+1100	456,990	2,642,287
506	880	879	"	"	12.3	92°	-30.7	-43.0		1015.7		+21	+879	456,985	2,642,066
507	660	659	"	"	9.9	92° 30'	-28.8	-38.7		1020.0		+15	+659	456,979	2,641,846
508	440		"	"	14.1	92° 30'	-19.2	-33.3		1025.4		+10	+440	456,974	2,641,627
509	220		"	"	14.7	92° 30'	-9.6	-24.3		1034.4		+5	+220	456,969	2,641,407
510	0				5.4	-		-5.4		1053.3	TP	0	0	456,964	2,641,187

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	11/1/79	INSTRUMENT MAN	G. Cotcamp	ROD MAN	R. Turner	PARTY NUMBER	6834	NOTES CHECKED BY	RWT	LINE NO.	1	PAGE	34	
AREA	Kansas	TOPO MAP	Metawaka	STATE	Kansas	COUNTY	Jackson	TWP	5 S.	RANGE	15 E.	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1058.7					
511	220		261°18'	+7.1°	5.0	-		-5.0		1053.7		-6	-220	456,958 2,640,967
512	490		" "	"	13.1	TH	+2.2	-10.9		1047.8		-12	-490	456,952 2,640,797
513	660		" "	"	15.5	89°24'	+1.2	-14.3		1044.4		-18	-660	456,946 2,640,527
514	880		" "	"	14.2	TH	+4.4	-9.8		1048.9		-25	-880	456,939 2,640,307
515	1100		" "	"	3.1	TH	+5.5	-2.4		1056.3		-31	-1100	456,933 2,640,087
516	1320		261°18'	+7.1°	9.2	88°30'	+34.5	+25.3		1084.0	TP	-37	-1319-11	456,927 2,639,857
516	1320		" "	"	5.3	88°40'	+30.7	+25.4			TP			
	660	659	81°47.5'+180°	+7.1°	+12.2	92°-	+23.0	+35.2			BS	-13	-659-11	
	660		" "	"	+8.3	92°20'	+26.8	+35.1	1119.1		BS			
517	440		81°47.5'	+7.1°	9.2	92°-	-15.3	-24.5		1094.6		+9	+440	456,923 2,639,627 horiz. correct. y=0', x=-42'
518	220		" "	"	12.1	92°-	-7.7	-19.8		1099.3		+4	+220	456,918 2,639,407
IF	16		118° 5'	+7.1°	5.4	-		-5.4		1113.7		-9	+13	456,905 2,639,200 4-way Intersect.
519	0		" "	"	5.4	-		-5.4		1113.7	X	0	0	456,914 2,639,187
520	220		261°52.3'	+7.1°	4.7	-		-4.7		1114.4		-4	-220	456,910 2,638,967
IF	245		259°32.3'	+7.1°	5.1	-		-5.1		1114.0		-14	-245	456,900 2,638,792 4-way Intersect. el. 1113, R# 75
521	440		261°52.3'	+7.1°	14.3	BH	-2.2	-16.5		1102.6		-8	-440	456,906 2,638,797
522	660		" "	"	13.3	91°-	-11.5	-24.8		1094.3		-12	-660	456,902 2,638,527
523	880		" "	"	10.8	91°-	-15.4	-26.2		1092.9		-16	-880	456,898 2,638,307
524	1100		" "	"	13.2	90°30'	-9.6	-22.8		1096.3		-20	-1100	456,894 2,638,087
525	1320		" "	"	13.4	-		-13.4		1105.7		-24	-1320	456,890 2,637,867

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11/6/79	INSTRUMENT MAN G. Cotcamp	ROD MAN H. Saucedo	PARTY NUMBER 6834	NOTES CHECKED BY Gwc.	LINE NO. 1	PAGE 35
AREA Kansas	TOPO MAP Netawaka	STATE Kansas	COUNTY Jackson	TWP 5S	RANGE 15E	PPM
			PARTY MANAGER L.O. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1119.1					
526	1540		261° 52.3'	+7.1°	3.7	-		-3.7		1115.4	TP	-28	-1540	456,886 2,637,697
526	1540				11.4	TH	+7.7	-3.7			TP			
	1980		81° 12.8' +180°	+7.1°	+11.7	-		+11.7	1127.1		BS	-58	-1979	
	1980				+1.8	BH	+9.9	+11.7			BS			
527	1760		81° 12.8'	+7.1°	12.8	-		-12.8		1114.3		+52	+1759	456,880 2,637,927
528	1540		" "	"	11.9	BH	-7.7	-19.6		1107.5		+45	+1539	456,873 2,637,207
529	1320		" "	"	4.6	91°	-23.0	-27.6		1099.5		+39	+1319	456,867 2,636,987
530	1100		" "	"	14.3	91°	-19.2	-33.5		1093.6		+32	+1100	456,860 2,636,768
531	880		" "	"	12.8	91° 30'	-23.0	-35.8		1091.3		+26	+880	456,854 2,636,548
532	660		" "	"	14.2	91° 30'	-17.3	-31.5		1095.6		+19	+660	456,847 2,636,328
533	440		" "	"	11.9	91° 30'	-11.5	-23.4		1103.7		+13	+440	456,841 2,636,108
534	220		" "	"	11.9	-		-11.9		1115.2		+6	+220	456,834 2,635,888
535	0		" "	"	5.4	-		-5.4		1121.7	X	0	0	456,828 2,635,668
536	220		262° 4.9'	+6.9°	12.4	-		-12.4		1114.7		-4	-220	456,824 2,635,448
537	440		" "	"	14.2	BH	-2.2	-16.4		1110.7		-8	-440	456,820 2,635,228
538	660		" "	"	14.8	-		-14.8		1112.3		-12	-660	456,816 2,635,008
539	880		" "	"	10.0	-		-10.0		1117.1		-16	-880	456,812 2,634,788
540	1100		262° 4.9'	+6.9°	0.6	-		-0.6		1126.5	TP	-20.3	-1100	456,805 2,634,568
540	1100				6.1	TH	+5.5	-0.6			TP			

SURVEY NOTES-HIGH RESOLUTION DATA

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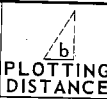
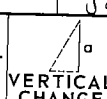
Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11/24/79		G. Cotcamp		G. L.T.		6834		Gwc.		1	36						
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Netawaka/Cirleville		Kansas		Jackson		5S	15E		L.O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
540										1126.5							
	1320		81°22.1' 1180°	+6.9°	+4.6	TH	-6.6	-2.0	1124.5		BS	-40.3	-1319				
	1320				+5.8	89°20'	-7.7	-1.9			BS						
541	1100		81°22.1'	+6.9°	3.0	TH	+5.5	+2.5		1127.0		+33	+1099	456,795	2,634,398	Netawaka Quad.	
542	880		" "	"	5.0	-		-5.0		1119.5		+27	+880	456,789	2,634,129	Cirleville Quad.	
543	660		" "	"	9.2	-		-9.2		1115.3		+20	+660	456,782	2,633,909	↓	
544	440		" "	"	9.1	-		-9.1		1115.4		+13	+440	456,775	2,633,689		
545	220		" "	"	2.9	-		-2.9		1121.6		+7	+220	456,769	2,633,469		
546	0				5.4	-		-5.4		1119.1	X	0	0	456,762	2,633,249		
547	220		261°48'	+6.9°	13.5	-		-13.5		1111.0		-5	-220	456,757	2,633,029		
548	440		" "	"	15.0	BH	-2.2	-17.2		1107.3		-10	-440	456,752	2,632,809		
549	660		" "	"	14.4	-		-14.4		1110.1		-15	-660	456,747	2,632,589		
550	880		" "	"	9.2	-		-9.2		1115.3		-20	-880	456,742	2,632,369		
7F	1080		261°34'	+6.9°	5.5	-		-5.5		1119.0		-29	-1080	456,733	2,632,169	456,715 + 2,632,145 (S) T-rd (South) el. 1119.	
551	1100		261°48'	+6.9°	5.4	-		-5.4		1119.1		-25	-1100	456,737	2,632,149		
552	1320		" "	"	1.8	-		-1.8		1122.7		-30	-1320	456,732	2,631,929		
553	1540		" "	"	3.2	TH	+7.7	+4.5		1129.0		-35	-1540	456,727	2,631,709		
554	1760		" "	"	7.7	89°20'	+20.5	+12.8		1137.3		-40	-1760	456,722	2,631,489		
555	1980		261°48'	+7.0°	12.9	89°20'	+23.0	+10.1		1134.6	TP	-41.2	-1980	456,719	2,631,269		
555	1980		" "	"	7.1	89°30'	+17.3	+10.2			TP						

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11/24/79		G. Cotcamp		G. Litzinger		6834		GWC.		1	37					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Kansas		Circleville		Kansas		Jackson		5S	15E		L.O. Davis					
STATION NO.	 SLOPE DISTANCE	 PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	 VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES Y X		REMARKS
555	1100		81° 0' +180°	+7.0°	+14.9	-		+14.9	1149.5	1134.6						
	1100				+9.4	0H	+5.5	+14.9		BS		-38-2	-1099			
556	880		81° -	+7.0°	11.3	0H	-4.4	-15.7		1133.8		+31	+879	456,710	2,631,049	
557	660		" "	"	13.0	-		-13.0		1136.5		+23	+660	456,702	2,630,830	
558	440		" "	"	9.7	-		-9.7		1139.8		+15	+440	456,694	2,630,610	
559	220		" "	"	5.2	-		-5.2		1144.3		+8	+220	456,687	2,630,390	
560	0				5.4	-		-5.4		1144.1	A	0	0	456,679	2,630,170	
561	220		261° 32.8'	+7.0°	7.2	-		-7.2		1142.3		-6	-220	456,673	2,629,950	
562	440		" "	"	14.3	-		-14.3		1135.2		-11	-440	456,668	2,629,730	
563	660		" "	"	8.8	91° -	-11.5	-20.3		1129.2		-17	-660	456,662	2,629,510	
564	880		" "	"	7.3	91° -	-15.4	-22.7		1126.8		-22	-880	456,657	2,629,290	
565	1100		" "	"	14.1	0H	-5.5	-19.6		1129.9		-28	-1100	456,651	2,629,070	
566	1320		261° 32.8'	+7.0°	12.0	0H	-6.6	-18.6		1130.9	TP	-33-2	-1320	456,644	2,628,850	
	1100		81° 20' +180°	+7.0°	+1.6	-		+1.6	1132.5							
	1100				+7.1	TH	-5.5	+1.6		TP					456,645	2,629,070
567	880		81° 20'	+7.0°	9.5	-		-9.5		1123.0		+26	+880	456,636	2,628,630	
568	660		" "	"	14.7	-		-14.7		1117.8		+19	+660	456,629	2,628,410	
569	440		" "	"	12.9	-		-12.9		1119.6		+13	+440	456,623	2,628,190	
570	220		" "	"	8.1	-		-8.1		1124.4		+6	+220	456,611	2,627,970	

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE 11/24/79	INSTRUMENT MAN G. Cotcamp	ROD MAN G. Litzinger	PARTY NUMBER 6834	NOTES CHECKED BY GWC.	LINE NO. 1	PAGE 38
AREA Kansas	TOPO MAP Circleville	STATE Kansas	COUNTY Jackson	TWP 5S	RANGE 15E	PPM
				PARTY MANAGER L. O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1132.5							
571	0				54	-		-5.4		1127.1	T	0	0	456,610	2,627,750	
572	220		261° 41.5'	+7.0°	14.0	-		-14.0		1118.5		-5	-220	456,605	2,627,530	
573	440		" "	"	15.2	BH	-2.2	-17.4		1115.1		-10	-440	456,600	2,627,310	
574	660		" "	"	11.9	-		-11.9		1120.6		-15	-660	456,595	2,627,090	
T	802		261° 7'	+7.0°	11.7	-		-11.7		1120.8		-26	-802	456,584	2,626,948	456,590 + 2,626,935(2) Twd (south) el. 1121.
575	880		261° 41.5'	+7.0°	15.2	-		-15.2		1117.3		-20	-880	456,590	2,626,870	
576	1100		" "	"	11.8	90° 30'	-9.6	-21.4		1111.1		-25	-1100	456,585	2,626,650	
577	1320		261° 41.5'	+7.0°	6.6	90° 30'	-11.5	-18.1	}		TP	-30-2	-1320	456,578	2,626,430	
577	1320				14.2	90° 10'	-3.8	-18.0			1114.5	TP				
	1100		81° 25.7' + 180°	+7.0°	+4.9	91° -	+19.2	+24.1	}	1138.6	BS	-30	-1100			
	1100				+14.5	90° 30'	+9.6	+24.1				BS				
578	880		81° 25.7'	+7.0°	10.8	91° -	-15.4	-26.2		1112.4		+24	+880	456,572	2,626,210	
579	660		" "	"	7.8	92° -	-23.0	-30.8		1107.8		+18	+660	456,566	2,625,990	
580	440		" "	"	7.9	92° -	-15.3	-23.2		1115.4		+12	+440	456,560	2,625,770	
581	220		" "	"	10.3	-		-10.3		1128.3		+6	+220	456,554	2,625,550	
582	0				54	-		-5.4		1133.2	T	0	0	456,548	2,625,330	
583	220		261° 49.1'	+7.0°	8.9	-		-8.9		1129.7		-5	-220	456,543	2,625,110	
584	440		" "	"	14.7	BH	-2.2	-16.9		1121.7		-9	-440	456,539	2,624,890	
585	660		" "	"	7.7	91° -	-11.5	-19.2		1119.4		-14	-660	456,534	2,624,670	
586	880		" "	"	13.8	-		-13.8		1124.8		-18	-880	456,530	2,624,450	

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE	11/24/79	INSTRUMENT MAN	G. Cotcamp	ROD MAN	G. Litzinger	PARTY NUMBER	6834	NOTES CHECKED BY	G.W.C.	LINE NO.	9	PAGE	39	
AREA	Kansas	TOPO MAP	Circleville	STATE	Kansas	COUNTY	Jackson/Nemaha	TWP	5S	RANGE	15E/19E	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1138.6					
587	1100		261° 49.1'	+7.0°	10.9	84	-5.5	-16.4		1122.2		-23	-1100	456,525 2,624,230
588	1320		" "	"	10.7	90° 30'	-11.5	-22.2		1116.4		-27	-1320	456,521 2,624,010
589	1540		" "	"	11.2	90° 30'	-13.4	-24.6		1114.0		-32	-1540	456,516 2,623,790
590	1760		261° 49.1'	+7.0°	7.0	90° 30'	-15.4	-22.4		1116.2	TP	-36	-1760	456,512 2,623,570
590	1760				14.1	90° 16'	-8.2	-22.3			TP			
	1980	1979	81° 43.3' +180°	+7.0°	+5.0	91° 30'	+51.8	+56.8	1173.1		BS	-44	-1979	
	1980				+10.9	91° 20'	+46.1	+57.0	56.9		BS			
591	1760	1759	81° 43.3'	+7.0°	11.1	91° 30'	-46.1	-57.2		1115.9		+39	+1759	456,507 2,623,350 Jackson Co./R15 E
592	1540	1539	" "	"	5.9	92° -	-53.7	-59.6		1113.5		+34	+1539	456,502 2,623,130 Nemaha Co./R19 E
593	1320	1319	" "	"	10.2	92° -	-46.0	-56.2		1116.9		+29	+1319	456,497 2,622,910 ↓
594	1100	1099	" "	"	13.8	92° -	-38.4	-52.2		1120.9		+25	+1099	456,493 2,622,690
595	880	879	" "	"	15.4	92° -	-30.7	-46.1		1127.0		+20	+879	456,488 2,622,470 456,475 + 2,622,295(s)
TP	680	679	82° 17'	+7.0°	19.5	92° -	-23.7	-38.2		1134.9		+8	+679	456,476 2,622,270 T-rd (south) el. 1134.
596	660		81° 43.3'	+7.0°	14.1	92° -	-23.0	-37.1		1136.0		+15	+660	456,483 2,622,251
597	440		" "	"	11.1	92° -	-15.3	-26.4		1146.7		+10	+440	456,478 2,622,031
598	220		" "	"	11.7	-		-11.7		1161.4		+5	+220	456,473 2,621,811
599	0				5.9	-		-5.9		1167.7	X	0	0	456,468 2,621,591
600	220		261° 57.7'	+6.8°	10.6	-		-10.6		1162.5		-5	-220	456,463 2,621,371
601	440		" "	"	13.3	-		-13.3		1159.8		-10	-440	456,458 2,621,151
602	660		" "	"	5.5	-		-5.5		1167.6		-14	-660	456,454 2,620,931

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11/24/79	INSTRUMENT MAN G. Cotcamp		ROD MAN G. Litzinger		PARTY NUMBER 6834		NOTES CHECKED BY GWC.		LINE NO. 1	PAGE 40
AREA Kansas	TOPO MAP Circleville	STATE Kansas	COUNTY Memaha	TWP 5S	RANGE 14E	PPM	PARTY MANAGER L.O. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1173.1						
603	880		261° 57.7'	+6.8°	9.2	89° -	+15.4	+6.2		1179.3		-19	-880	456,449	2,620,711
604	1100		" "	"	8.3	89° -	+19.2	+10.9		1184.0		-24	-1100	456,444	2,620,491
605	1320		261° 57.7'	+6.8°	11.4	89° -	+23.0	+11.6	}	1184.7	TP	-29-2	-1320+3	456,437	2,620,274
605	1320				3.7	89° 20'	+15.4	+11.7		TP					
	1100		81° 21.7' +180°	+6.8°	+12.5	-		+12.5	}	1197.2	BS	-35-2	-1099+3		
	1100				+7.0	OH	+5.5	+12.5		BS					
606	880		81° 21.7'	+6.8°	7.6	91° -	-15.4	-23.0		1174.2		+28	+880	456,428	2,620,058
607	660		" "	"	14.2	91° -	-71.5	-25.7		1171.5		+21	+660	456,421	2,619,838
608	440		" "	"	10.8	91° -	-7.7	-18.5		1178.7		+14	+440	456,414	2,619,618
609	220		" "	"	10.0	-		-10.0		1187.2		+7	+220	456,407	2,619,398
610	0		" "	"	5.4	-		-5.4		1191.8	TP	0	0	456,400	2,619,178
611	220		261° 38'	+6.8°	9.3	-		-9.3		1187.9		-6	-220	456,394	2,618,958
612	440		" "	"	11.3	91° -	-7.7	-19.0		1178.2		-12	-440	456,388	2,618,738
613	660		" "	"	10.8	91° -	-11.5	-22.3		1174.9		-18	-660	456,382	2,618,518
614	880		" "	"	14.5	OH	-4.4	-18.9		1178.3		-24	-880	456,376	2,618,298
615	1100		" "	"	11.8	-		-11.8		1185.4		-30	-1100	456,370	2,618,078
616	1320		261° 38'	+6.8°	4.1	-		-4.1	}	1193.1	TP	-36-1	-1320+3	456,363	2,617,861
616	1320				10.7	TH	+6.6	-4.1		TP					
	1100		81° 21.8' +180°	+6.8°	+6.0	-		+6.0	}	1199.1	BS	-35	-1099+3		
	1100				+11.5	TH	-5.5	+6.0		BS					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	11/24/79	INSTRUMENT MAN	G. Cotcamp	ROD MAN	G. Litzinger	PARTY NUMBER	6834	NOTES CHECKED BY	GWC.	LINE NO.	1	PAGE	4/	
AREA	Kansas	TOPO MAP	Circleville	STATE	Kansas	COUNTY	Nemaha	TWP	5S	RANGE	14E	PPM	PARTY MANAGER	L.O. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1199.1					
617	880		81° 21.8'	+6.8°	138	-		-138		1185.3		+28	+880	456,356 2,617,695
618	660		" "	"	7.9	91° -	-11.5	-21.4		1177.7		+21	+660	456,399 2,617,425
619	490		" "	"	11.7	91° -	-7.7	-19.4		1179.7		+14	+490	456,342 2,617,205
620	220		" "	"	8.3	-		-8.3		1190.8		+7	+220	456,335 2,616,985
TP	204		83° 15'	+6.8°	7.2	-		-7.2		1191.9		0	+204	456,328 2,616,969 456,315 + 2,616,970 (S) T-rod (south) el. 1191.
621	0				5.4	-		-5.4		1193.7	X	0	0	456,328 2,616,765
622	220		261° 52.5'	+6.8°	14.7	91° -	-3.8	-18.5		1180.6		-5	-220	456,323 2,616,595
623	440		" "	"	15.3	91° -	-7.7	-23.0		1176.1		-10	-490	456,318 2,616,325
624	660		" "	"	4.1	91° -	-11.5	-15.6		1183.5		-15	-660	456,313 2,616,105
625	880		" "	"	1.7	-		-1.7		1197.4		-20	-880	456,308 2,615,885
626	1100		" "	"	1.9	TH	+5.5	+3.6		1202.7		-25	-1100	456,303 2,615,665
627	1320		" "	"	9.9	TH	+6.6	-3.3		1195.8		-31	-1320	456,297 2,615,495
628	1540		" "	"	4.5	TH	+7.7	+3.2		1202.3		-36	-1540	456,292 2,615,225
629	1760		261° 52.5'	+6.8°	6.6	89° 30'	+15.4	+8.8		1207.9	TP	-41	-1760+2	456,287 2,615,007
629	1760				11.7	89° 20'	+20.5	+8.8			TP			
	1100		81° 53' + 180°	+6.8°	+0.4	TH	-5.5	-5.1	1202.8		BS	-25	-1100+2	
	1100				+4.5	89° 30'	-9.6	-5.1			BS			
630	880		81° 53'	+6.8°	7.3	-		-7.3		1195.5		+20	+880	456,282 2,614,789
631	660		" "	"	9.9	91° -	-11.5	-21.4		1181.4		+15	+660	456,277 2,614,569
632	490		" "	"	10.3	92° -	-15.3	-25.6		1177.2		+10	+490	456,272 2,614,349

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE					
11/24/79		G. Cotcamp		G. Litzinger		5834		GWC			1	42					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Circleville		Kansas	Nemaha		5S	14E		L.O. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH+	EAST+	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
LAT.	DEP.																
									1202.8								
633	220		81° 53'	+6.8°	14.7	-		-14.7		1188.1		+5	+220	456,267	2,619,129		
634	0				54	-		-5.4		1197.4	π	0	0	456,262	2,613,909		
635	220		262° 9'	+6.8°	10.3	-		-10.3		1192.5		-4	-220	456,258	2,613,689		
636	440		" "	"	10.5	92°-	-15.3	-25.8		1177.0		-8	-440	456,254	2,613,469		
637	660		" "	"	10.8	92°-	-23.0	-33.8		1169.0		-12	-660	456,250	2,613,249		
638	880		" "	"	12.1	91°-	-15.4	-27.5		1175.3		-16	-880	456,246	2,613,029		
639	1100		" "	"	14.3	-		-14.3		1188.5		-20	-1100	456,242	2,612,809		
640	1320		262° 9'	+6.8°	15.0	-		-15.0		1187.8	TP	-24	-1320	456,238	2,612,589		
640	1320				8.4	BH	-6.6	-15.0			TP						
	1760		81° 40' +180°	+6.8°	+11.2	BH	+8.8	+20.0	1207.8		BS	-47	-1759				
	1760				+4.7	90°30'	+15.4	+20.1			BS						
641	1540		81° 40'	+6.8°	3.5	91°-	-26.9	-30.4		1177.4		+41	+1539	456,232	2,612,369		
642	1320		" "	"	6.0	91°30'	-34.5	-40.5		1167.3		+35	+1320	456,226	2,612,150		
643	1100		" "	"	6.4	92°-	-38.4	-44.8		1163.0		+29	+1100	456,220	2,611,930	horiz. correct y = -21'	
644	880		" "	"	13.7	92°-	-30.7	-44.4		1163.4		+24	+880	456,215	2,611,710	x = +16'	
71	850		82° 15'	+6.8°	14.3	92°-	-29.6	-43.9		1163.9		+14	+850	456,205	2,611,680	456,205 + 2,611,680 (s) T-rd (south) el. 1163	
645	660		81° 40'	+6.8°	11.0	92°30'	-28.8	-39.8		1168.0		+18	+660	456,209	2,611,490		
646	440		" "	"	14.9	92°-	-15.3	-30.2		1177.6		+12	+440	456,203	2,611,270		
647	220		" "	"	14.3	91°-	-3.8	-18.1		1189.7		+6	+220	456,197	2,611,050		
648	0				5.4	-		-5.4		1202.4	π	0	0	456,191	2,610,830		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11/25/79	INSTRUMENT MAN G. Cotcamp	ROD MAN G. Litzinger	PARTY NUMBER 6834	NOTES CHECKED BY GHL	LINE NO. 1	PAGE 43
AREA Kansas	TOPO MAP Circleville	STATE Kansas	COUNTY Nemaha	TWP 5S	RANGE 14E	PPM
				PARTY MANAGER L.O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1207.8					
649	220		262° 7.3'	+7.0°	2.3	-		-2.3		1205.5		-3	-220	456,188 2,610,610
650	440		" "	"	4.3	89°-	+7.7	+3.4		1211.2		-7	-440	456,184 2,610,390
651	660		" "	"	8.3	88°-	+23.0	+14.7		1222.5		-10	-660	456,181 2,610,170
652	880		" "	"	11.9	88°-	+30.7	+18.8		1226.6		-13	-880	456,178 2,609,950
653	1100		" "	"	10.8	88°30'	+28.8	+18.0		1225.8		-17	-1100	456,174 2,609,730
654	1320		262° 7.3'	+7.0°	14.6	88°34'	+33.0	+18.4			TP	-20.2	-1320.3	456,169 2,609,513
654	1320				13.9	88°36'	+32.2	+18.3		1226.1	TP			
	2420		81° 42' +180°	+7.0°	+0.7	-		+0.7	1226.8		BS	-55.2	-2419.3	
	2420				+12.8	TH	-12.1	+0.7			BS			
655	2200		81° 42'	+7.0°	3.9	-		-3.9		1222.9		+50	+2199	456,162 2,609,296
656	1980		" "	"	8.7	-		-8.7		1218.1		+45	+1979	456,157 2,609,076
657	1760		" "	"	10.3	84	-8.8	-19.1		1207.7		+40	+1759	456,152 2,608,856
658	1540		" "	"	5.9	91°-	-26.9	-32.8		1194.0		+35	+1540	456,147 2,608,637
659	1320		" "	"	4.7	91°30'	-34.5	-39.2		1187.6		+30	+1320	456,142 2,608,417
660	1100		" "	"	14.8	91°30'	-28.8	-43.6		1183.2		+25	+1100	456,137 2,608,197
661	880	879	" "	"	6.9	92°30'	-38.4	-45.3		1181.5		+20	+879	456,132 2,607,976
662	660	659	" "	"	13.9	92°30'	-28.8	-42.7		1184.1		+15	+659	456,127 2,607,756
663	440		" "	"	13.7	92°30'	-19.2	-32.9		1193.9		+10	+440	456,122 2,607,537
664	220		" "	"	13.8	91°-	-3.8	-17.6		1209.2		+5	+220	456,117 2,607,317
665	0				5.4	-		-5.4		1221.4	TP	0	0	456,112 2,607,097

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11/27/79	INSTRUMENT MAN G. Cotcamp	ROD MAN G. Litzinger	PARTY NUMBER 6834	NOTES CHECKED BY GHL	LINE NO. 1	PAGE 47
AREA Kansas	TOPO MAP Circleville	STATE Kansas	COUNTY Nemaha	TWP 5S	RANGE 19E	PPM
				PARTY MANAGER L. O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1226.8					
666	220		261°58.8'	+7.0°	2.6	-		-2.8		1224.0		-4	-220	456,108 2,606,877
667	440		" "	"	7.2	-		-7.2		1219.6		-8	-440	456,104 2,606,657
668	660		" "	"	11.2	-		-11.2		1215.6		-12	-660	456,100 2,606,437
669	708		261°43'	+7.0°	10.8	-		-10.8		1216.0		-16	-708	456,096 2,606,389 456,103 + 2,606,400 (s) Ford (sew. + h) el. 1215
669	880		261°58.8'	+7.0°	8.1	-		-8.1		1218.7		-16	-880	456,096 2,606,217
670	1100		" "	"	7.0	-		-7.0		1219.8		-20	-1100	456,092 2,605,997
671	1320		" "	"	5.6	-		-5.6		1221.2		-23	-1320	456,089 2,605,777
672	1540		" "	"	6.8	TH	+7.7	+0.9		1227.7		-27	-1540	456,085 2,605,557
673	1760		" "	"	8.1	89°20'	+20.5	+12.4		1239.2		-31	-1760	456,081 2,605,337
674	1980		" "	"	7.0	89°-	+39.6	+27.6		1254.4		-35	-1980	456,077 2,605,117
675	2200		" "	"	7.3	89°-	+38.4	+31.1		1257.9		-39	-2200	456,073 2,604,897
676	2420		" "	"	7.8	89°-	+42.2	+34.4		1261.2		-43	-2420	456,069 2,604,677
677	2640		261°58.8'	+7.0°	12.4	89°-	+46.1	+33.7		1260.6	TP	-47	-2640	456,065 2,604,457
677	2640		" "	"	7.6	89°6'	+41.5	+33.9	+338		TP			
	1980		81°44'+180°	+7.0°	+10.0	90°40'	+23.0	+33.0		1293.6	BS	-44	-1980	
	1980		" "	"	+13.4	90°34'	+19.6	+33.0			BS			
678	1760		81°44'	+7.0°	6.9	90°50'	-25.6	-32.5		1261.1		+39	+1760	456,060 2,604,237
679	1540		" "	"	4.0	90°50'	-22.4	-26.4		1267.2		+34	+1540	456,055 2,604,017
680	1320		" "	"	13.1	91°-	-23.0	-36.1		1257.5		+29	+1320	456,050 2,603,797
681	1100		" "	"	14.3	91°20'	-25.6	-39.9		1253.7		+24	+1100	456,045 2,603,577

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.		PAGE		
11/27/79		G. Cotcamp		G. Litzinger		6834		GHL			1		95		
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Circleville		Kansas		Nemaha		5S		14F				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1293.6						
682	880		81°44'	+7.0°	13.2	91°30'	-23.0	-36.2		1257.4		+19	+880	456,040	2,603,357
683	660		" "	"	9.3	91°30'	-17.3	-26.6		1267.0		+15	+660	456,036	2,603,137
684	440		" "	"	14.2	-	-	-14.2		1279.4		+10	+440	456,031	2,602,917
685	220		" "	"	6.1	-	-	-6.1		1287.5		+5	+220	456,026	2,602,697
686	0				5.4	-	-	-5.4		1288.2	X	0	0	456,021	2,602,977
687	220		262°4.6'	+7.0°	6.2	-	-	-6.2		1287.4		-4	-220	456,017	2,602,257
±	272		259°15'	+7.0°	8.3	-	-	-8.3		1285.3		-18	-271	456,003	2,602,206
688	440		262°4.6'	+7.0°	15.0	0H	-2.2	-17.2		1276.4		-7	-440	456,014	2,602,037
689	660		" "	"	13.1	91°20'	-15.4	-28.5		1265.1		-11	-660	456,010	2,601,817
690	880		" "	"	14.2	91°30'	-23.0	-37.2		1256.4		-14	-880	456,007	2,601,597
691	1100		" "	"	13.8	91°30'	-28.8	-42.6		1251.0		-18	-1100	456,003	2,601,377
692	1320		" "	"	8.6	91°30'	-34.5	-43.1		1250.5		-21	-1320	456,000	2,601,157
693	1540		" "	"	14.5	91°-	-26.9	-41.4		1252.2		-25	-1540	455,996	2,600,937
694	1760		" "	"	10.0	91°-	-30.7	-40.7		1252.9		-28	-1760	455,993	2,600,717
695	1980		" "	"	7.0	91°-	-34.6	-41.6		1252.0		-32	-1980	455,989	2,600,497
696	2200		" "	"	5.0	91°-	-38.4	-43.4		1250.2		-35	-2200	455,986	2,600,277
697	2420		262°4.6'	+7.0°	5.1	91°-	-42.2	-47.3		1246.2	TP	-39-1	-2420	455,981	2,600,057
697	2420				13.7	90°48'	-33.8	-47.5	47.4		TP				
	2640	2639	81°42' +180°	+7.0°	+9.4	88°20'	-76.7	-67.3	1178.9		BS	-60-1	-2638		
	2640				+14.0	88°14'	-81.3	-67.3			BS				

456,003 + 2,602,200
Twd (north) el. 1289

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE				
11/27/79		G. Cotcamp		G. Litzinger		6839		GHL		1		46				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Kansas		Circleville/Soldier		Kansas		Nemaha		5S		19E				L.O. Davis		
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS
														Y	X	
									1178.9							
698	2420	2419	81°42'	+7.0°	6.1	88°20'	+70.3	+64.2		1243.1		+55	+2418	455,975	2,599,837	
699	2200	2199	" "	"	3.2	88°20'	+64.0	+60.8		1239.7		+50	+2198	455,970	2,599,617	
700	1980	1979	" "	"	2.6	88°20'	+57.6	+55.0		1233.9		+45	+1978	455,965	2,599,397	↑
701	1760	1759	" "	"	6.8	88°20'	+51.2	+99.4		1223.3		+40	+1759	455,960	2,599,178	Circleville quad.
702	1540	1539	" "	"	8.8	88°30'	+40.3	+31.5		1210.4		+35	+1539	455,955	2,598,958	Soldier quad
703	1320		" "	"	4.5	89°-	+23.0	+18.5		1197.4		+30	+1320	455,950	2,598,739	↓
704	1100		" "	"	13.8	89°-	+19.2	+5.4		1184.3		+25	+1100	455,945	2,598,519	
705	880		" "	"	4.8	-		-4.8		1174.1		+20	+880	455,940	2,598,299	
706	660		" "	"	10.0	-		-10.0		1168.9		+15	+660	455,935	2,598,079	
707	440		" "	"	12.7	-		-12.7		1166.2		+10	+440	455,930	2,597,859	
708	220		" "	"	12.3	-		-12.3		1166.6		+5	+220	455,925	2,597,639	bridge
709	0		" "	"	5.4	-		-5.4		1173.5	↑	0	0	455,920	2,597,419	
710	220		262°24'	+7.0°	1.9	88°-	+7.7	+5.8		1184.7		-4	-220	455,916	2,597,199	
711	440	439	" "	"	4.7	87°-	+23.0	+18.3		1197.2		-7	-439	455,913	2,596,980	
712	515	514	260°38'	+7.0°	4.3	87°-	+26.9	+22.6		1201.5		-21	-514	455,899	2,596,905	455,900 + 2,596,900 T-rod (north) el. 1205.
713	660	659	262°24'	+7.0°	4.1	87°-	+34.5	+30.4		1209.3		-11	-659	455,909	2,596,760	
714	880	879	" "	"	4.1	87°-	+46.0	+41.9		1220.8		-15	-879	455,905	2,596,540	
715	1100	1098	" "	"	5.0	87°-	+57.5	+52.5		1231.4		-18	-1098	455,902	2,596,321	
715	1320	1318	262°2.4'	+7.0°	10.4	87°-	+69.0	+58.6		1237.5	TP	-22-1	-1318	455,897	2,596,101	
715	1320		" "	"	5.8	87°12'	+64.4	+58.6			TP					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE				
11/27/79		G. Cotcamp		B. Litzinger		6837		GHL			1	47				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Soldier		Kansas	Nemaha		5S	14E		L. O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
715										1237.5						
	1760	1759	81° 27.2' ± 18.0°	+7.0°	+14.9	88° 10'	-56.3	-41.4	1196.1		BS	-47	-1758.3			
	1760				+12.8	88° 14'	-54.2	-41.4		BS						
716	1540	1539	81° 27.2'	+7.0°	7.2	88° 10'	+49.2	+42.0		1238.1		+42	+1538	455,892	2,595,884	
717	1320	1319	" "	"	4.7	88° 10'	+42.2	+37.5		1233.6		+36	+1319	455,886	2,595,665	
718	1100	1099	" "	"	2.9	88° 10'	+35.2	+32.3		1228.4		+30	+1099	455,880	2,595,445	
719	880		" "	"	3.4	88° 10'	+28.1	+24.7		1220.8		+24	+880	455,874	2,595,226	
720	660		" "	"	5.9	88° 20'	+19.2	+13.3		1209.4		+18	+660	455,868	2,595,006	
721	440		" "	"	8.2	88° 20'	+12.8	+4.6		1200.7		+12	+440	455,862	2,594,786	
722	220		" "	"	2.3	-	-	-2.3		1193.8		+6	+220	455,856	2,594,566	
723	0		" "	"	5.4	-	-	-5.4		1190.7	TP	0	0	455,850	2,594,346	
724	220		261° 51.8'	+7.0°	2.9	-	-	-2.9		1193.2		-4	-220	455,846	2,594,126	
725	440		" "	"	1.7	89° -	+7.7	+6.0		1202.1		-9	-440	455,841	2,593,906	
726	660		" "	"	3.7	88° -	+23.0	+19.3		1215.4		-13	-660	455,837	2,593,686	
727	880	879	" "	"	12.1	87° -	+46.0	+33.9		1230.0		-17	-879	455,833	2,593,467	
728	1100	1098	" "	"	11.0	87° -	+57.5	+46.5		1242.6		-22	-1098	455,828	2,593,248	
729	1320	1318	" "	"	12.7	87° -	+69.0	+56.3		1252.4		-26	-1318	455,824	2,593,028	
730	1540	1538	261° 51.8'	+7.0°	11.7	87° 20'	+71.6	+59.9		1256.0	TP	-31	-1538.3	455,819	2,592,811	
730	1540		" "	"	7.3	87° 30'	+67.1	+59.8			TP					
	2640		81° 29.3' ± 18.0°	+7.0°	+13.1	84	+13.2	+26.3	1282.4		BS	-70	-2639.3			
	2640				+3.5	90° 30'	+23.0	+26.5		+26.4	BS					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11/27/79		G. Cotcamp		G. Litzinger		6837		GHL		1		48			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Soldier		Kansas		Nemaha		55		14E/13F				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1282.4						
731	2420		81° 29.3'	+7.0°	7.1	90° 30'	-21.1	-28.2		1254.2		+64	+2419	455,813	2,592,599
732	2200		" "	"	12.9	90° 30'	-19.2	-32.1		1250.3		+58	+2199	455,807	2,592,374
733	1980		" "	"	7.9	90° 50'	-28.8	-36.7		1246.7		+52	+1979	455,801	2,592,154
734	1760		" "	"	14.2	91°	-30.7	-44.9		1237.5		+46	+1759	455,795	2,591,934 ↑
735	1540	1539	" "	"	12.0	91° 30'	-40.3	-52.3		1230.1		+41	+1538	455,790	2,591,713 R. 14E
736	1320	1319	" "	"	8.3	92°	-46.0	-54.3		1228.1		+35	+1319	455,784	2,591,494 R. 13E
737	1100	1099	" "	"	11.8	92°	-38.4	-50.2		1232.2		+29	+1099	455,778	2,591,274 ↓
738	880	879	" "	"	9.5	92°	-30.7	-40.2		1242.2		+23	+879	455,772	2,591,054
739	660		" "	"	14.6	91° 10'	-13.4	-28.0		1254.4		+17	+660	455,766	2,590,835
7F	591		82° 8'	+7.0°	13.9	91°	-10.3	-24.2		1258.2		+9	+591	455,758	2,590,766 455,765 + 2,590,760 T-rd (south) el. 1258
740	440		81° 29.3'	+7.0°	15.0	BN	-2.2	-17.2		1265.2		+12	+440	455,761	2,590,615
741	220		" "	"	9.9	-		-9.9		1272.5		+6	+220	455,755	2,590,395
742	0		" "	"	5.4	-		-5.4		1277.0	7	0	0	455,749	2,590,175
743	220		261° 40.3'	+7.0°	3.9	-		-3.9		1278.5		-5	-220	455,744	2,589,955
744	440		" "	"	6.3	-		-6.3		1276.1		-10	-440	455,739	2,589,735
745	660		" "	"	8.4	-		-8.4		1274.0		-15	-660	455,734	2,589,515
746	880		" "	"	7.4	-		-7.4		1275.0		-20	-880	455,729	2,589,295
747	1100		" "	"	5.8	-		-5.8		1276.6		-26	-1100	455,723	2,589,075
748	1320		" "	"	4.1	-		-4.1		1278.3		-31	-1320	455,718	2,588,855
749	1540		" "	"	2.2	-		-2.2		1280.2		-36	-1540	455,713	2,588,635

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11/27/79		G. Cotcamp		G. Litzinger		6834		GHL		1		49			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Soldier		Kansas		Nemaha		5S		13E				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1282.4						
750	1760		261° 40.3'	+7.0°	0.2	-		-0.2		1282.2		-41	-1760	455,708	2,588,915
751	1980		" "	"	9.0	TH	+9.9	+0.9		1283.3		-46	-1979	455,703	2,588,196
752	2200		" "	"	10.0	TH	+11.0	+1.0		1283.4		-51	-2199	455,698	2,587,976
753	2420		" "	"	11.4	TH	+12.1	+0.7		1283.1		-56	-2419	455,693	2,587,756
754	2640		261° 40.3'	+7.0°	14.7	TH	+13.2	-1.5	}	1280.9	TP	-61	-2639.3	455,688	2,587,539
754	2640		" "	"	6.2	89° 54'	+4.6	-1.6				TP			
	1760		81° 37.4' +180°	+7.0°	+8.5	TH	-8.8	-0.3	}	1280.6	BS	-42	-1759.3		
	1760		" "	"	+4.9	89° 50'	-5.1	-0.2				BS			
755	1540		81° 37.4'	+7.0°	0.3	-		-0.3		1280.3		+37	+1540	455,683	2,587,323
756	1320		" "	"	1.3	-		-1.3		1279.3		+32	+1320	455,678	2,587,103
757	1100		" "	"	3.2	-		-3.2		1277.4		+26	+1100	455,672	2,586,883
758	880		" "	"	4.6	-		-4.6		1276.0		+21	+880	455,667	2,586,663
759	660		" "	"	5.8	-		-5.8		1274.8		+16	+660	455,662	2,586,443
760	440		" "	"	7.1	-		-7.1		1273.5		+11	+440	455,657	2,586,223
761	220		" "	"	8.0	-		-8.0		1272.6		+5	+220	455,651	2,586,003
762	0		" "	"	5.4	-		-5.4		1275.2	TP	0	0	455,646	2,585,783
763	220		261° 54.7'	+7.0°	5.9	88° -	+7.7	+1.8		1282.4		-4	-220	455,642	2,585,563
TP	300		259° 56'	+7.0°	6.0	88° -	+10.5	+4.5		1285.1		-16	-300	455,630	2,585,485
764	440		261° 54.7'	+7.0°	7.9	88° -	+15.3	+7.4		1288.0		-8	-440	455,638	2,585,343
765	660		" "	"	13.4	88° -	+23.0	+9.6		1290.2		-13	-660	455,633	2,585,123

horiz. correct. y = -7'
x = +21'
455,630 + 2,585,485
T-r d (south) el. 1286.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11/27/79		G. Cotcamp		G. Litzinger		6874		GHL		1		50			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Soldier		Kansas		Memaha		55		13E				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1280.6						
766	880		261°59.7'	+7.0°	10.0	88°30'	+23.0	+13.0		1293.6		-17	-880	455,629	2,584,903
767	1100		"	"	6.8	88°30'	+28.8	+22.0		1302.6		-21	-1100	455,625	2,584,683
768	1320		"	"	2.1	88°30'	+34.5	+32.4		1313.0		-25	-1320	455,621	2,584,463
769	1540	1539	261°59.7'	+7.0°	2.5	88°30'	+40.3	+37.8		1318.4	TP	-29	-1539	455,617	2,584,244
769	1540				6.9	88°20'	+44.8	+37.9			TP				
	1100	1099	81°33.8' + 180°	+7.0°	+6.5	92°-	+38.4	+44.9	1363.3		BS	-28	-1099		
	1100				+13.0	91°40'	+32.0	+45.0			BS				
770	880	879	81°33.5'	+7.0°	-12.0	92°-	-30.7	-42.7		1320.6		+22	+879	455,611	2,584,024
771	660		"	"	13.3	92°-	-23.0	-36.3		1327.0		+17	+660	455,606	2,583,805
772	440		"	"	10.3	92°-	-15.3	-25.6		1337.7		+11	+440	455,600	2,583,585
773	220		"	"	12.9	-	-	-12.9		1350.4		+6	+220	455,595	2,583,365
774	0				54	-	-	-5.4		1357.9	X	0	0	455,589	2,583,145
775	220		261°56'	+7.0°	3.9	-	-	-3.9		1359.4		-4	-220	455,585	2,582,925
776	440		"	"	6.3	-	-	-8.3		1355.0		-8	-440	455,581	2,582,705
777	660		261°56'	+7.0°	14.7	BH	-3.3	-18.0		1345.3	TP	-12	-660	455,577	2,582,985
777	660				10.3	90°40'	-7.7	-18.0			TP				
	1980	1979	81°35.3' + 180°	+7.0°	+10.6	88°-	-6.91	-58.5	1286.7		BS	-49	-1978		
	1980				+4.6	88°10'	+63.3	-58.7	-58.6		BS				
778	1760	1759	81°35.3'	+7.0°	12.2	88°-	+61.4	+49.2		1335.9		+43	+1758	455,571	2,582,265
779	1540	1539	"	"	13.1	89°-	+53.7	+40.6		1327.3		+38	+1538	455,566	2,582,045

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11/27/79		G. Cotcamp		G. Litzinger		6834		GHL		1		51			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Soldier		Kansas		Nemaha		55		13F				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1286.7						
780	1320	1319	81°35.3'	+7.0°	12.3	88° -	+46.0	+33.7		1320.4		+32	+1319	455,560	2,581,826
781	1100	1099	" "	"	11.1	88° -	+38.4	+27.3		1314.0		+27	+1099	455,555	2,581,606
782	880	879	" "	"	10.2	88° -	+30.7	+20.5		1307.2		+22	+879	455,550	2,581,386
783	660		" "	"	9.3	88° -	+23.0	+19.7		1300.4		+16	+660	455,549	2,581,167
784	440		" "	"	0.7	89° -	+7.7	+7.0		1293.7		+11	+440	455,539	2,580,947
785	220		" "	"	3.5	89° -	+3.8	+0.3		1287.0		+5	+220	455,533	2,580,727
786	0				54	-		-5.4		1291.3	TP	0	0	455,528	2,580,507
787	220		261°46.2'	+7.0°	6.3	-		-6.3		1280.4		-5	-220	455,523	2,580,287
FF	312		260°20.6'	+7.0°	4.7	-		-4.7		1282.0		-14	-312	455,514	2,580,195
788	440		261°46.2'	+7.0°	1.2	-		-1.2		1285.5		-9	-440	455,519	2,580,067
789	660		" "	"	4.1	89° -	+11.5	+7.4		1294.1		-14	-660	455,514	2,579,847
790	880		" "	"	3.2	89° -	+15.4	+12.2		1298.9		-19	-880	455,509	2,579,627
791	1100		" "	"	8.6	89° -	+19.2	+10.6		1297.3		-24	-1100	455,504	2,579,407
792	1320		" "	"	14.0	89° 6'	+20.7	+6.7		1293.4		-28	-1320	455,500	2,579,187
793	1540		" "	"	19.4	89° 10'	+22.4	+8.0		1294.7		-33	-1540	455,495	2,578,967
794	1760		" "	"	11.4	89° 10'	+25.6	+14.2		1300.9		-38	-1760	455,490	2,578,747
795	1980		" "	"	7.7	89° 10'	+28.8	+21.1		1307.8		-43	-1980	455,485	2,578,527
796	2200		" "	"	14.3	89° -	+38.4	+24.1		1310.8		-47	-2199	455,481	2,578,308
797	2420		261°46.2'		13.3	89° 10'	+35.2	+21.9		1308.6	TP	-52	-2419	455,476	2,578,088
797	2420		" "		14.6	89° 8'	+36.6	+22.0			TP				

455,510 + 2,580,190(s)
Terd (south) el. 1278.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11/28/79		G. Cotcamp		G. Litzinger		6834		GHL		1		52			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Soldier		Kansas		Nemaha		55		13F				L.O. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
797										1308.6					
	1320		81° 40.7' +180°	+7.0°	+5.6	89°-	-23.0	-17.4	1291.2		BS	-30	-1320		
	1320				+9.5	88°50'	-26.9	-17.4		BS					
798	1100		81° 40.7'	+7.0°	3.5	89°-	+19.2	+15.7		1306.9		+25	+1100	455,471 2,577,888	
799	880		" "	"	2.1	89°-	+15.4	+13.9		1304.5		+20	+880	455,466 2,577,698	
800	660		" "	"	0.4	89°-	+11.5	+11.1		1302.3		+15	+660	455,461 2,577,428	
801	440		" "	"	1.6	89°-	+7.7	+6.1		1297.3		+10	+440	455,456 2,577,208	
802	220		" "	"	2.3	89°-	+3.8	+1.5		1292.7		+5	+220	455,451 2,576,988	
803	0				5.4	-		-5.4		1285.8	TP	0	0	455,446 2,576,768	
804	220		262° 2'	+7.0°	14.6	84	-1.1	-15.7		1278.5		-4	-220	455,442 2,576,548	
805	440		" "	"	11.8	92°-	-15.3	-27.1		1264.1		-7	-440	455,439 2,576,328	
806	660		" "	"	15.0	92°-	-23.0	-38.0		1253.2		-11	-660	455,435 2,576,108	
807	880	879	" "	"	11.1	92°30'	-38.4	-49.5		1241.7		-15	-879	455,431 2,575,889	
808	1100	1099	" "	"	10.9	92°30'	-47.9	-58.8		1232.4		-19	-1099	455,427 2,575,669	
* 808	1200	1199	261° 28.7'	+7.0°	8.6	92°30'	-52.3	-60.9		1230.3		-32	-1199	455,414 2,575,569	
809	1320	1319	262° 2'	+7.0°	5.1	92°30'	-57.5	-62.6		1228.6		-22	-1319	455,424 2,575,449	
810	1540	1539	262° 2'		11.1	92°-	-53.7	-64.8		1224.4	TP	-26	-1539	455,420 2,575,229	
810	1540				6.6	92°10'	-58.2	-64.8			TP				
	1760		81° 41' +180°	+7.0°	+15.0	84	+8.8	+23.8	1250.2		BS	-40	-1760		
	1760				+5.3	90°36'	+18.4	+23.7		BS					
811	1540		81° 41'	+7.0°	11.2	90°30'	-13.4	-24.6		1225.6		+35	+1540	455,415 2,575,009	

455,420 + 2,575,570(s)
4 Way Intersect. c.l. 1230.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11/29/79	INSTRUMENT MAN G. Cotcamp	ROD MAN G. Litzinger	PARTY NUMBER 6834	NOTES CHECKED BY GHL	LINE NO. 1	PAGE 53 of 53
AREA Kansas	TOPO MAP Soldier	STATE Kansas	COUNTY Nemaha	TWP 5S	RANGE 13E	PPM
				PARTY MANAGER L.O. Davis		

STATION NO.	SLOPE DISTANCE	PLOTting DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1250.2					
812	1320		81° 41'	+7.0°	12.3	90° 30'	-11.5"	+23.8		1226.4		+30	+1320	455,910 2,574,789
813	1100		" "	"	13.2	90° 30'	-9.6"	+22.8		1227.4		+25	+1100	455,905 2,574,569
814	880		" "	"	14.3	90° 30'	-7.7"	+22.0		1228.2		+20	+880	455,900 2,574,349 bridge
815	660		" "	"	14.8	90° 30'	-5.8"	+20.6		1229.6		+15	+660	455,395 2,574,129
816	440		" "	"	13.8	90° 30'	-3.8"	+17.6		1232.6		+10	+440	455,390 2,573,909
817	220		" "	"	12.3	-	-	+12.3		1237.9		+5	+220	455,385 2,573,689
818	0				5.4	-	-	+5.4		1244.8	X	0	0	455,380 2,573,469
819	220		261° 56'	+7.0°	5.2	88° -	+7.7"	+2.5		1252.7		-4	-220	455,376 2,573,249
820	440		" "	"	5.3	88° -	+15.3"	+10.0		1260.2		-8	-440	455,372 2,573,029
821	660		" "	"	5.8	88° -	+23.0"	+17.2		1267.4		-12	-660	455,368 2,572,809
822	880		" "	"	5.8	88° -	+30.7"	+24.9		1275.1		-16	-880	455,364 2,572,589
823	1100		" "	"	5.9	88° -	+38.4"	+32.5		1292.7		-20	-1100	455,360 2,572,369
824	1320		" "	"	6.9	88° -	+46.0"	+39.1		1289.3		-25	-1320	455,355 2,572,149
825	1540		261° 56'	+7.0°	11.6	88° -	+53.7"	+42.1		1292.3		-29	-1540	455,351 2,571,929 EOL #1
825	1540				7.1	88° 10'	+49.2"	+42.1						

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc. Client-COCORP

1 OF 119

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
4/27/81		G. Cotcamp		T. Grady		6839		C.C.C. rsw		1		1			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Circleville 7 1/2		Kansas		Nemaha		5 S / 6 S		14 E				L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
7F										1215.0					Instrument - W.T.I.A chaining - 330' steel cable + pins
	603		262°45'-180°	+5.5°	+134	-		+13.4			BS	+18	+603		→ scaled
	603				+10.4	BH	+3.0	+13.4	1228.4		BS				T-rod (south) el. 1215.0
710	1180		83°17'	+5.5°	6.0	92°-	-41.2	-47.2		1181.2		+25	+1180	456,148	2,608,193
711	850		" "	"	12.8	92°20'	-34.6	-47.4		1181.0		+18	+850	456,141	2,607,863
712	520		" "	"	12.4	92°20'	-21.2	-33.6		1,194.8		+11	+520	456,134	2,607,533
713	190		" "	"	11.8	-	-	-11.8		1,216.6		+4	+190	456,127	2,607,203
π	0				5.4	-	-	-5.4		1,223.0	π	0	0	456,123	2,607,013
714	140		263°21'	+5.5°	5.4	-	-	-5.4		1,223.0		-3	-140	456,120	2,606,873
715	470		" "	"	11.8	BH	-2.4	-14.2		1,214.2		-9	-470	456,114	2,606,543
716	800		" "	"	10.8	-	-	-10.8		1,217.6		-16	-800	456,107	2,606,213
717	1130		" "	"	9.9	-	-	-9.9		1,218.5		-23	-1130	456,100	2,605,883
718	1460		" "	"	1.3	-	-	-1.3		1,227.1		-29	-1460	456,094	2,605,553
719	1790	1789.7	263°21'20"	+5.5°	12.8	89°-	+31.2	+18.4		1,246.8	TP	-36	-1789	456,087	2,605,224
719	1790				4.3	89°16'	+22.9	+18.6			TP				
	2640		83°11'+180°	+5.5°	+10.9	90°46'	+35.3	+46.2			BS	-61	-2639		
	2640				+13.8	90°42'	+32.3	+46.1	1,292.9		BS				
720	2310		83°11'	+5.5°	9.8	90°40'	-26.9	-36.7		1,256.2		+53	+2309	456,079	2,604,894
721	1980		" "	"	8.6	90°40'	-23.0	-31.0		1,261.9		+46	+1979	456,072	2,604,564
722	1650		" "	"	8.9	90°50'	-24.0	-32.9		1				456,064	2,604,235
723	1320		" "	"	9.2	91°-	-23.0	-32.2							

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/27/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C. rlu	LINE NO. 1	PAGE 2
AREA Kansas	TOPO MAP Circleville/Soldier	STATE Kansas	COUNTY Nemaha	TWP 55/65	RANGE 14E	PPM
			PARTY MANAGER L. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH+ SOUTH - LAT.	EAST+ WEST - DEP.	
									1292.9					
724	990		83°11'	+5.5°	5.8	92°-	-34.5	-40.3		1,252.6		+23	+990	456,049 2,603,575
725	660		" "	"	8.3	92°-	-23.0	-31.3		1,261.6		+15	+660	456,091 2,603,295
726	330		" "	"	11.9	84	-1.7	-13.6		1,279.3		+8	+330	456,039 2,602,915
727	0				54	-		-5.4		1,287.5	π	0	0	456,026 2,602,585
728	330		263°27'	+5.5°	6.5	-		-6.5		1,286.4		-6	-330	456,020 2,602,255
<u>IL</u>	360		261°19'	+5.5°	8.2	-		-8.2		1,284.7		-20	-359	456,006 2,602,226 456,005 + 2,602,205 T-rd(north) el. 1284
729	660		263°27'	+5.5°	12.5	91°-	-11.5	-24.0		1,268.9		-12	-660	456,014 2,601,925
730	990		" "	"	20.8	91°-	-17.3	-38.1		1,254.8		-18	-990	456,008 2,601,595
731	1320		" "	"	20.8	91°-	-23.0	-43.8		1,249.1		-24	-1320	456,002 2,601,265
732	1650		" "	"	13.3	91°-	-28.8	-42.1		1,250.8		-30	-1650	455,996 2,600,935
733	1980		" "	"	6.9	91°-	-34.6	-41.5		1,251.4		-36	-1980	455,990 2,600,605
734	2310	2309.7	263°26'38"	+5.5°	4.5	91°-	-40.3	-44.8			TP	-43+1	-2309	455,984 2,600,276
734	2310				14.0	90°46'	-30.9	-44.9		1,248.0	TP			
	990	989.8	82°41'+180°	+5.5°	+4.7	88°50'	-20.2	-15.5	1,232.5		BS	-31+1	-989	
	990				+7.5	88°40'	-23.0	-15.5			BS			
735	660		82°41'	+5.5°	4.2	88°40'	+15.4	+11.2		1,243.7		+21	+660	455,975 2,599,947
736	330		" "	"	2.0	88°40'	+7.7	+5.7		1,238.2		+10	+330	455,964 2,599,617 ↑
737	0				54	-		-5.4		1,227.1	π	0	0	455,954 2,599,287 Circleville Quad.
738	330		263°15'	+5.5°	12.4	92°-	-11.5	-23.9		1,208.6		-7	-330	455,947 2,598,957 Soldier Quad.
739	660		" "	"	9.0	93°-	-34.5	-43.5		1,189.0		-14	-660	455,940 2,598,627 ↓

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/27/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C. o.l.w.	LINE NO. 1	PAGE 3
AREA Kansas	TOPO MAP	STATE Kansas	COUNTY Nemaha	TWP 5S/6S	RANGE 14E	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS - X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X			
									1232.5									
740	990		263°15'	+5.5°	7.8	93°-	-51.7	-59.5		1,173.0		-22	-990	455,932	2,598,297			
741	1320	1318.7	263°15'	+5.5°	9.3	92°30'	-57.5	-66.8			TP	-29 ₁	-1318 ₂	455,926	2,597,971			
741	1320				13.9	92°18'	-52.8	-66.7		1,165.8	TP							
	1980	1979.0	83°09'42" +180°	+5.5°	+14.7	91°50'	+63.3	+78.0			BS	-46 ₁	-1978 ₂					
	1980				+13.5	91°52'	+64.5	+78.0	1243.8		BS							
742	1650		83°10'	+5.5°	20.0	92°-	-57.6	-77.6		1,166.2		+38	+1650	455,919	2,597,695	bridge		
743	1320		" "	"	18.7	92°-	-46.0	-64.7		1,179.1		+31	+1320	455,912	2,597,315			
744	990		" "	"	11.7	92°-	-34.5	-46.2		1,197.6		+23	+990	455,904	2,596,985			
<u>745</u>	915	914.4	83°56'	+5.5°	10.2	92°-	-31.9	-42.1		1,201.7		+9	+919	455,890	2,596,909	455,900 + 2,596,900 T-rd (north) el. 1205		
745	660		83°10'	+5.5°	13.0	91°20'	-15.4	-28.4		1,215.4		+15	+660	455,896	2,596,655			
746	330		" "	"	12.2	-	-	-12.2		1,231.6		+8	+330	455,889	2,596,325			
747	0				54	-	-	-5.4		1,238.4	X	0	0	455,881	2,595,995			
748	330		263°16'	+5.5°	10.8	-	-	-10.8		1,233.0		-7	-330	455,874	2,595,665			
749	660		" "	"	7.4	91°-	-11.5	-18.9		1,224.9		-14	-660	455,867	2,595,335			
750	990		" "	"	9.0	91°30'	-25.9	-34.9		1,208.9		-21	-990	455,860	2,595,005			
751	1320		" "	"	12.6	91°30'	-34.5	-47.1		1,196.7		-28	-1320	455,853	2,594,675			
752	1650		" "	"	9.1	91°30'	-43.2	-52.3		1,191.5		-36	-1650	455,845	2,594,345			
753	1980		" "	"	12.1	91°-	-34.6	-46.7		1,197.1		-43	-1980	455,838	2,594,015			
754	2310		" "	"	7.3	90°30'	-20.2	-27.5		1,216.3		-50	-2309	455,831	2,593,686			
755	2640		" "	"	6.8	-	-	-6.8		1,237.0		-57	-2639	455,824	2,593,356			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
4/27/81		G. Cotcamp		T. Grady		6834		GWC, rlu		1	4						
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Soldier		Kansas		Nemaha		5S/6S	19E/13E		L. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
									1243.8								
756	2970		263°15'40"	+5.5°	6.2	TH	+14.9	+8.7			TP	-64 +1	-2969 _{±2}	455,818	2,593,028		
756	2970				13.9	89°34'	+22.5	+8.6		1252.4	TP						
	2640		83°04'40"±180°	+5.5°	+12.9	BH	+13.2	+26.1			BS	-66 +1	-2639 _{±2}				
	2640				+13.7	90°16'	+12.3	+26.0	1278.4		BS						
757	2310		83°05'	+5.5°	10.9	BH	-11.6	-22.5		1255.9		+57	+2309	455,810	2,592,700		
758	1980		" "	"	5.1	90°40'	-23.0	-28.1		1250.3		+49	+1979	455,802	2,592,370		
759	1650		" "	"	8.1	91°-	-28.8	-36.9		1241.5		+41	+1650	455,794	2,592,091		
760	1320		" "	"	2.5	92°-	-46.0	-48.5		1229.9		+33	+1320	455,786	2,591,711		
761	990		" "	"	8.4	92°20'	-40.3	-48.7		1229.7		+24	+990	455,777	2,591,381		
762	660		" "	"	12.4	92°-	-23.0	-35.4		1243.0		+16	+660	455,769	2,591,051	455,765 + 2,590,760	
TP	378		83°32'	+5.5°	13.3	91°-	-6.6	-19.9		1258.5		+6	+378	455,759	2,590,769	T-rd (south) el. 1258	
763	330		83°05'	+5.5°	11.8	91°-	-5.8	-17.6		1260.8		+8	+330	455,761	2,590,721		
764	0				5.4	-		-5.4		1273.0	π	0	0	455,753	2,590,391		
765	330		263°15'	+5.5°	1.5	TH	+1.7	+0.2		1278.6		-7	-330	455,746	2,590,061		
766	660		" "	"	5.3	TH	+3.3	-2.0		1276.4		-14	-660	455,739	2,589,731		
767	990		" "	"	8.7	TH	+5.0	-3.7		1274.7		-22	-990	455,731	2,589,401		
768	1320		" "	"	8.0	TH	+6.6	-1.4		1277.0		-29	-1320	455,724	2,589,071		
769	1650		" "	"	7.1	TH	+8.3	+1.2		1279.6		-36	-1650	455,717	2,588,741		
770	1980		" "	"	5.9	TH	+9.9	+4.0		1282.4		-43	-1980	455,710	2,588,411		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	4/27/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	G.W.C. rlu	LINE NO.	1	PAGE	5	
AREA	Kansas	TOPO MAP	Soldier	STATE	Kansas	COUNTY	Nemaha	TWP	55/65	RANGE	13E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1278.4					
771	2310		263° 14' 42"	+5.5°	6.2	TH	+11.6	+5.4			TP	-51 +1	-2309 +2	455,703 2,588,084
771	2310				5.4	89° 44'	+10.7	+5.3		1283.7	TP			
	2640		82° 57' 20" +180°	+5.5°	+8.2	-		+8.2			BS	-71 +1	-2639 +2	
	2640				+3.5	90° 6'	+4.6	+8.1	1291.8		BS			
772	2310		82° 57'	+5.5°	8.6	-		-8.6		1283.2		+62	+2309	455,695 2,587,756
773	1980		" "	"	10.8	-		-10.8		1281.0		+54	+1979	455,687 2,587,926
774	1650		" "	"	12.1	-		-12.1		1279.7		+45	+1699	455,678 2,587,096
775	1320		" "	"	8.2	BH	-6.6	-14.8		1277.0		+36	+1320	455,669 2,586,767
776	990		" "	"	11.7	BH	-5.0	-16.7		1275.1		+27	+990	455,660 2,586,437
777	660		" "	"	7.1	91° -	-11.5	-18.6		1273.2		+18	+660	455,651 2,586,107
778	330		" "	"	9.7	91° -	-5.8	-15.5		1276.3		+9	+330	455,642 2,585,777
TP	25		95° 33'	+5.5°	5.9	-		-5.9		1285.9		-5	+25	455,628 2,585,472 455,630 + 2,585,785 T-rd (south) el. 1286
779	0				5.4	-		-5.4		1286.4	TP	0	0	455,633 2,585,997
780	330		263° 18'	+5.5°	1.3	-		-1.3		1290.5		-7	-330	455,626 2,585,117
781	660		" "	"	5.4	89° -	+11.5	+6.1		1297.9		-14	-660	455,619 2,584,787
782	990		" "	"	4.0	88° 30'	+25.9	+21.9		1313.7		-21	-990	455,612 2,584,457
783	1320		" "	"	6.3	88° 30'	+34.5	+28.2		1320.0		-28	-1320	455,605 2,584,127
784	1650		" "	"	7.5	88° 30'	+43.2	+35.7		1327.5		-35	-1650	455,598 2,583,797
785	1980		" "	"	10.1	88° 10'	+63.3	+53.2		1345.0		-41	-1980	455,592 2,583,467
786	2310		" "	"	6.6	88° 10'	+73.9	+67.3		1359.1		-48	-2309	455,585 2,583,138

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/27/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C. rlu	LINE NO. 1	PAGE 6
AREA Kansas	TOPO MAP Soldier	STATE Kansas	COUNTY Nemaha	TWP 55/65	RANGE 13E	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1291.8					
787	2640	2638.8	263°18'20"	+5.5°	11.1	88°18'	+78.3	+67.2		1359.0	TP	-55	-2638.2	455,578 2,582,811
787	2640				14.1	88°14'	+81.3	+67.2			TP			
	1980	1978.8	83°11'180"	+5.5°	+7.1	88°-	-69.1	-62.0	12970		BS	-45	-1978.2	
	1980				+3.6	88°6'	-65.6	-62.0			OS			
788	1650		83°11'	+5.5°	8.1	88°-	+57.6	+49.5		1346.5		+38	+1650	455,571 2,582,985
789	1320		" "	"	10.8	88°-	+46.0	+35.2		1332.2		+30	+1320	455,563 2,582,155
790	990		" "	"	1.5	88°30'	+25.9	+24.4		1321.4		+23	+990	455,556 2,581,825
791	660		" "	"	2.9	88°30'	+17.3	+14.4		1311.4		+15	+660	455,548 2,581,995
792	330		" "	"	4.1	88°30'	+8.6	+4.5		1301.5		+8	+330	455,541 2,581,165
793	0				5.4	-	-	-5.4		1291.6	X	0	0	455,533 2,580,835
794	330		263°20'	+5.5°	12.4	BH	-1.7	-14.1		1282.9		-7	-330	455,526 2,580,505
795	660		" "	"	10.3	BH	-3.3	-13.6		1283.4		-13	-660	455,520 2,580,175
TP	645		262°38'	+5.5°	13.7	-	-	-13.7		1283.3		-21	-645	455,512 2,580,190 +55,510 +2,580,190 T-rod (south) el. 1278
796	990		263°20'	+5.5°	2.0	-	-	-2.0		1295.0		-20	-990	455,513 2,579,845
797	1320		" "	"	3.7	TH	+6.6	+2.9		1299.9		-27	-1320	455,506 2,579,515
798	1650		" "	"	11.0	TH	+8.3	-2.7		1294.3		-34	-1650	455,499 2,579,185
799	1980		" "	"	8.5	TH	+9.9	+1.4		1298.4		-40	-1980	455,493 2,578,855
800	2310		" "	"	8.0	89°30'	+20.2	+12.2		1309.2		-47	-2310	455,486 2,578,525
801	2640		263°20'	+5.5°	8.9	89°30'	+23.0	+14.1		1311.1	TP	-54	-2639.2	455,479 2,578,198
801	2640				13.4	89°24'	+27.6	+14.2			TP			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/27/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY GWC' rlu	LINE NO. 1	PAGE 7
AREA Kansas	TOPO MAP Soldier	STATE Kansas	COUNTY Nemaha	TWP 5S/6S	RANGE 13E	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS	
												LAT.	DEP.	Y	X				
801										1311.1									
	1320		83°17' + 180°	+5.5°	+8.7	89°-	-23.0	-14.3			BS	-28	-1320						
	1320				+4.8	89°10'	-19.2	-14.4	1296.7		BS								
802	990		83°17'	+5.5°	6.4	89°-	+17.3	+10.9		1307.6		+21	+990	455,472	2,577,868				
803	660		" "	"	3.6	89°-	+11.5	+7.9		1304.6		+14	+660	455,465	2,577,538				
804	330		" "	"	3.5	89°-	+5.8	+2.3		1299.0		+7	+330	455,458	2,571,208				
805	0				5.4	-		-5.4		1291.3	TP	0	0	455,451	2,576,878				
806	330		263°37'	+5.5°	8.3	92°-	-11.5	-19.8		1276.9		-5	-330	455,446	2,576,548				
807	660		" "	"	10.0	92°20'	-26.8	-36.8		1259.9		-10	-660	455,441	2,576,218			horiz. coord. y=+8'	
808	990		" "	"	10.6	92°30'	-43.1	-53.7		1243.0		-15	-990	455,436	2,575,888				
±	1310	1308.8	263°08'	+5.5°	8.1	92°30'	-57.1	-65.2		1,231.5		-31	-1308	455,420	2,575,570			455,420 + 2,575,570	4-way Intersect. 12.30
809	1320		263°37'	+5.5°	8.3	92°30'	-57.5	-65.8		1,230.9		-20	-1320	455,431	2,575,558				
810	1650	1649	263°37'22"	+5.5°	11.7	92°-	-57.6	-69.3		1227.4	TP	-25	-1649	455,426	2,575,229				
810	1650				13.7	91°56'	-55.6	-69.3			TP								
	1650		83°11'44" + 180°	+5.5°	+11.3	BH	+8.3	+19.6			BS	-38	-1650						
	1650				+14.7	90°10'	+4.8	+19.5	1246.9		BS								
811	1320		83°12'	+5.5°	9.2	90°30'	-11.5	-20.7		1226.2		+30	+1320	455,418	2,574,899				
812	990		" "	"	10.3	90°30'	-8.6	-18.9		1228.0		+22	+990	455,410	2,574,569				
813	660		" "	"	11.9	90°30'	-5.8	-17.7		1229.2		+15	+660	455,403	2,574,239				bridge
814	330		" "	"	10.9	90°30'	-2.9	-13.8		1233.1		+7	+330	455,395	2,573,909				
815	0				5.4	-		-5.4		1241.5	TP	0	0	455,388	2,573,579				

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	4/28/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	G.M.F. rlu	LINE NO.	1	PAGE	8	
AREA	Kansas	TOPO MAP	Soldier	STATE	Kansas	COUNTY	Nemaha	TWP	55/65	RANGE	13E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1246.9					
816	330		263° 23'	+5.5°	5.3	88° -	+11.5	+6.2		1253.1		-6	-330	455,382 2,573,249
817	660		" "	"	5.8	88° -	+23.0	+17.2		1264.1		-13	-660	455,375 2,572,919
818	990		" "	"	5.9	88° -	+34.5	+28.6		1275.5		-19	-990	455,369 2,572,589
819	1320		" "	"	6.5	88° -	+46.0	+39.5		1286.4		-26	-1320	455,362 2,572,259
820	1650	1699	263° 22' 42"	+5.5°	11.5	88° -	+57.6	+46.0		1292.9	TP	-32	-1699	455,356 2,571,930
820	1650				4.7	88° 14'	+50.8	+46.1			TP			
	1980		83° 11' 24" +180°	+5.5°	8.7	89° 24'	-20.7	-12.0			BS	-45	-1979.2	
	1980				+10.9	89° 20'	-23.0	-12.1	1280.8		BS			
821	1650		83° 11'	+5.5°	8.0	89° 20'	+19.2	+11.2		1292.0		+38	+1650	455,349 2,571,603
822	1320		" "	"	5.7	89° 20'	+15.4	+9.7		1290.5		+30	+1320	455,341 2,571,273
823	990		" "	"	3.5	89° 20'	+11.5	+8.0		1288.8		+23	+990	455,334 2,570,943
824	660		" "	"	2.3	89° 20'	+7.7	+5.4		1286.2		+15	+660	455,326 2,570,613
<u>TL</u>	537		84° 0'	+5.5°	2.2	89° 20'	+6.2	+4.0		1284.8		+5	+537	455,316 2,570,490
825	330		83° 11'	+5.5°	5.7	89° -	+5.8	+0.1		1280.9		+8	+330	455,319 2,570,283
826	0				5.4	-	-	-5.4		1275.4	π	0	0	455,311 2,569,953
827	330		263° 29'	+5.5°	9.5	-	-	-9.5		1271.3		-6	-330	455,305 2,569,623
828	660		" "	"	8.9	-	-	-8.9		1271.9		-12	-660	455,299 2,569,293
829	990		" "	"	1.5	-	-	-1.5		1279.3		-18	-990	455,293 2,568,963
830	1320		" "	"	12.3	89° -	+23.0	+10.7		1291.5		-23	-1320	455,288 2,568,633
831	1650		" "	"	5.8	89° -	+28.8	+23.0		1303.8		-29	-1650	455,282 2,568,303

455,340 + 2,570,490
T-rd (north) el. 1283.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/28/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY Gwl. rlu	LINE NO. 1	PAGE 9
AREA Kansas	TOPO MAP Soldier/Havensville	STATE Kansas	COUNTY Nemaha	TWP 55/65	RANGE 13E	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1280.8					
832	1980		263° 29'	+5.5°	10.7	88° 40'	+46.1	+35.4		1316.2		-35	-1980	455,276 2,567,973
833	2310		" "	"	6.9	88° 40'	+53.7	+46.8		1327.6		-41	-2310	455,270 2,567,643
834	2640	2639.3	263° 29' 18"	+5.5°	6.7	88° 40'	+61.4	+54.7		1335.5	TP	-47.3	-2639.3	455,261 2,567,317
834	2640				11.1	88° 34'	+66.0	+54.9			TP			
	2310		83° 22' 38" +180°	+5.5°	+11.8	89° 20'	-26.9	-15.1	1320.4		BS	-45.3	-2309.3	
	2310				14.5	89° 16'	-29.6	-15.1			BS			
835	1980		83° 23'	+5.5°	8.0	89° 20'	+23.0	+15.0		1335.4		+39	+1980	455,252 2,566,991
836	1650		" "	"	6.4	89° 20'	+19.2	+12.8		1333.2		+32	+1650	455,245 2,566,661
837	1320		" "	"	4.5	89° 20'	+15.4	+10.9		1331.3		+26	+1320	455,239 2,566,331
838	990		" "	"	2.9	89° 20'	+11.5	+8.6		1329.0		+19	+990	455,232 2,566,001
839	660		" "	"	1.6	89° 20'	+7.7	+6.1		1326.5		+13	+660	455,226 2,565,671
840	330		" "	"	2.8	89° 20'	+3.8	+1.0		1321.4		+6	+330	455,219 2,565,341
±	192		85° 28'	+5.5°	1.2	-		-1.2		1319.2		-3	+192	455,210 2,565,203 455,215 + 2,565,190 T-rd (north) el. 1318.
841	0				5.4	-		-5.4		1315.0	X	0	0	455,213 2,565,011
842	330		263° 39'	+5.5°	11.4	-		-11.4		1309.0		-5	-330	455,208 2,564,681
843	660		" "	"	6.8	91° -	-11.5	-18.3		1302.1		-10	-660	455,203 2,564,351 ↑
844	990		" "	"	12.1	91° -	-17.3	-29.4		1291.0		-15	-990	455,198 2,564,021 Soldier Quad
845	1320		" "	"	8.0	91° 20'	-30.7	-38.7		1281.7		-20	-1320	455,193 2,563,691 Havensville Quad.
846	1650		" "	"	7.1	91° -	-28.8	-35.9		1284.5		-24	-1650	455,189 2,563,361 ↓
847	1980		" "	"	10.3	90° 30'	-17.3	-27.6		1292.8		-29	-1980	455,184 2,563,031

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/28/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY GnC. rlu	LINE NO. 1	PAGE 10
AREA Kansas	TOPO MAP Havensville	STATE Kansas	COUNTY Nemaha	TWP. 55/65	RANGE 13E/12E	PPM
					PARTY MANAGER L. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X			
									1320.4									
848	2310		263°38'40"	+5.5°	9.8	90°30'	-20.2	-30.0		1290.4	TP	-34.2	-2310.3	455,176	2,562,704			
848	2310				138	90°24'	-16.1	-29.9			TP							
	1980		83°28'+180°	+5.5°	+14.1	90°24'	+13.8	+27.9	1318.3		BS	-36.3	-1980.3					
	1980				+10.7	90°30'	+17.3	+28.0			BS							
849	1650		83°28'	+5.5°	11.3	91°-	-28.8	-40.1		1278.2		+30	+1650	455,167	2,562,377			
850	1320		" "	"	12.0	91°30'	-34.5	-46.5		1271.8		+24	+1320	455,161	2,562,047			
851	990		" "	"	11.0	91°30'	-25.9	-36.9		1281.4		+18	+990	455,155	2,561,717			
852	660		" "	"	10.2	91°-	-11.5	-21.7		1296.6		+12	+660	455,149	2,561,387			
853	330		" "	"	11.8	-	-	-11.8		1306.5		+6	+330	455,143	2,561,057			
854	0				5.4	-	-	-5.4		1312.9	π	0	0	455,137	2,560,727			
855	330		263°44'	+5.5°	6.1	-	-	-6.1		1312.2		-9	-330	455,133	2,560,397			
856	660		" "	"	5.4	91°-	-11.5	-16.9		1301.4		-9	-660	455,128	2,560,067			
<u>TL</u>	815		262°50'	+5.5°	9.0	90°50'	-11.9	-20.9		1297.4		-24	-815	455,113	2,559,912	455,102+2,559,903		
857	990		263°44'	+5.5°	12.1	90°40'	-11.5	-23.6		1294.7		-13	-990	455,124	2,559,737	T-rd (north) e.l. 1294		
858	1320		" "	"	6.3	90°40'	-15.4	-21.7		1296.6		-18	-1320	455,119	2,559,407	Line# 3 tie		
859	1650		263°44'	+5.5°	4.7	90°30'	-14.4	-19.1		1299.2	TP	-22.3	-1650.3	455,112	2,559,080			
859	1650				10.8	BH	-8.3	-19.1			TP							
	1980		83°10'44"+180°	+5.5°	+6.0	88°24'	-55.3	-49.3			BS	-46.3	-1979.3					
	1980				+10.4	88°16'	-59.9	-49.5	1249.7		BS							
860	1650		83°11'	+5.5°	1.0	88°30'	+43.2	+42.2		1291.9		+38	+1650	455,101	2,558,759			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	4/28/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	GWC rlw	LINE NO.	1	PAGE	11	
AREA	Kansas	TOPO MAP	Havensville	STATE	Kansas	COUNTY	Nemaha	TWP	55/65	RANGE	12E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1249.7					
861	1320		83° 11'	+5.5°	3.4	88° 30'	-34.5	-37.9		1211.8		+30	+1320	455,093 2,558,424
862	990		" "	"	2.0	89° -	-17.3	-19.3		1230.4		+23	+990	455,086 2,558,094
863	660		" "	"	8.7	89° -	-11.5	-20.2		1229.5		+15	+660	455,078 2,557,764
864	330		" "	"	1.8	-	-	-1.8		1247.9		+8	+330	455,071 2,557,434
865	0				5.4	-	-	-5.4		1244.3	X	0	0	455,063 2,557,104
866	330		263° 30'	+5.5°	10.3	91° 30'	-8.6	-18.9		1230.8		-6	-330	455,057 2,556,774
867	660		" "	"	10.2	92° 30'	-28.8	-39.0		1210.7		-12	-660	455,051 2,556,444
868	990		" "	"	9.7	92° -	-34.5	-44.2		1205.5		-17	-990	455,046 2,556,114
869	1320		" "	"	12.5	91° -	-23.0	-35.5		1214.2		-23	-1320	455,040 2,555,784
870	1650		" "	"	9.5	BH	-8.3	-17.8		1231.9		-29	-1650	455,034 2,555,454
871	1980		263° 30' 24"	+5.5°	3.4	-	-	-3.4		1246.3	TP	-34 -1,	-1980 +3	455,028 2,555,127
871	1980				13.3	TH	+9.9	-3.4			TP			
	244 330		84° 32' +180°	+5.5°	+13.4	-	-	+13.4	1259.7		BS	+0 -	-330 +3	
	± 330				+11.7	BH	+1.7	+13.4			BS			
872	0				5.4	-	-	-5.4		1254.3	X	0	0	455,028 2,554,800
872	750		302° 0'	+5.5°	6.4	89° -	+13.1	+6.7		1266.4		+457	-595	455,485 2,554,205
873	328		262° 10'	+5.5°	9.4	-	-	-9.4		1250.3	TP	-13 -2	-328	455,013 2,554,772
873	328				11.0	TH	+1.6	-9.4			TP			old road bed
	244	243.8	80° 0' +180°	+5.5°	+6.0	87° 36'	-10.2	-4.2	1246.1		BS	-19 -2	-243	
	244				+6.5	87° 30'	-10.6	-4.1			BS			

horiz. Corred. y = -1.9'
x = +26'
455,485 + 2,554,205
T-intersect (R162) el. 1264

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/28/81	INSTRUMENT MAN G. Cotcamp		ROD MAN T. Grady		PARTY NUMBER 6837	NOTES CHECKED BY TG <i>rdw</i>	LINE NO. 1	PAGE 12
AREA Kansas	TOPO MAP Havensville	STATE Kansas	COUNTY Nemaha		TWP	RANGE	PPM	PARTY MANAGER L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS
												LAT.	DEP.	Y	X			
									1246.1									
874	0		269°17'	+5.5°	5.4	-		-5.4		1240.7	π	0	0	454,992	2,554,229		old road	
875	86		269°17'	"	4.9	-		-4.9		1241.2		+7	-86	454,999	2,554,143		↓	
875	416		269°25'	"	10.1	-		-10.1		1236.0	TP	-1-2	-416	454,989	2,553,813			
875	416				12.2	TH	+2.1	-10.1			TP							
	326		89°37'+180°	+5.5°	+10.8	92°-	+11.4	+22.2	1258.2		BS	+29-2	-325					
	326				+14.2	91°24'	+8.0	+22.2			BS							
876	0				5.4	-		-5.4		1252.8	π	0	0	455,016	2,553,988		south shoulder rt #63	
877	326		262°26'	+5.6°	13.1	-		-13.1		1245.1		-12	-326	455,004	2,553,162			
878	656		"	"	9.3	91°30'	-17.2	-26.5		1231.7		-24	-656	454,992	2,552,932			
879	986	985.4	262°26'	+5.6°	9.4	92°-	-34.4	-43.8			TP	-36-2	-985+3	454,978	2,552,506			
879	986				14.7	91°42'	-29.2	-43.9		1214.3	TP							
	2310		83°01'42'+180°	+5.6°	+4.9	89°20'	-26.9	-22.0			BS	-59-2	-2309+3					
	2310				+14.2	89°6'	-36.3	-22.1	1192.2		BS							
880	1980		83°02'	+5.5°	4.8	TH	+9.9	+5.1		1197.3		+50	+1979	454,967	2,552,179			
881	1650		"	"	8.2	-		-8.2		1184.0		+42	+1649	454,959	2,551,849			
882	1320		"	"	6.8	BH	-6.6	-13.4		1178.8		+34	+1320	454,951	2,551,520			
883	990		"	"	11.9	BH	-5.0	-16.9		1175.3		+25	+990	454,942	2,551,190			
884	660		"	"	12.6	BH	-3.3	-15.9		1176.3		+17	+660	454,934	2,550,860			
885	330		"	"	8.9	-		-8.9		1183.3		+8	+330	454,925	2,550,530			
886	0				5.4	-		-5.4		1186.8	π	0	0	454,917	2,550,200			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/29/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6839	NOTES CHECKED BY TG rlw	LINE NO. 1	PAGE 13
AREA Kansas	TOPO MAP Havensville	STATE Kansas	COUNTY Nemaha	TWP	RANGE	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y	X
									1192.2							
887	330		262° 53'	+5.5°	6.9	-		-6.9		1185.3		-9	-330	454,908	2,547,870	bridge
888	660		"	"	9.3	-		-9.3		1182.9		-19	-660	454,898	2,549,590	
889	990		"	"	0.2	-		-0.2		1192.0		-28	-990	454,889	2,549,210	
890	1320		"	"	8.8	89°-	+23.0	+14.2		1206.4		-37	-1319	454,880	2,548,881	
TP	1680	1679.7	262° 32'	+5.5°	5.0	89°-	+29.3	+24.3		1216.5		-58	-1679	454,859	2,548,521	454,875 + 2,548,515 T-rd (south) el. 1215
891	1650		262° 53'	+5.5°	5.5	89°-	+28.8	+23.3		1215.5		-47	-1649	454,870	2,548,551	
892	1980	1979.7	262° 53' 36"	+5.5°	7.8	89°-	+34.6	+26.8		1219.0	TP	-56-2	-1979.3	454,859	2,548,224	
892	1980				5.5	89°4'	+32.3	+26.8			TP					
	1650	1649.0	83° 03' 50" +180°	+5.5°	+4.9	92°-	+57.6	+62.5	1281.5		BS	-26-2	-1649.3			
	1650				+14.5	91°40'	+48.0	+62.5			BS					
893	1320		83° 04'	+5.5°	11.9	92°-	-46.0	-57.9		1223.6		+33	+1320	454,864	2,547,898	
894	990		"	"	10.0	92°-	-34.5	-44.5		1237.0		+25	+990	454,856	2,547,568	
895	660		"	"	6.1	92°-	-23.0	-29.1		1252.4		+17	+660	454,848	2,547,238	
896	330		"	"	12.4	BH	-1.7	-14.1		1267.4		+8	+330	454,839	2,546,908	
897	0				5.4	-		-5.4		1276.1	X	0	0	454,831	2,546,598	
898	330		262° 55'	+5.5°	1.6	-		-1.6		1279.9		-9	-330	454,822	2,546,248	
899	660		"	"	8.0	89°-	+11.5	+3.5		1285.0		-18	-660	454,813	2,545,918	
900	990		"	"	9.7	89°-	+17.3	+7.6		1289.1		-27	-990	454,804	2,545,588	
901	1320		262° 55'	+5.5°	5.4	89°30'	+11.5	+6.1		1287.6	TP	-36-2	-1319.3	454,793	2,545,262	
901	1320				9.2	89°20'	+15.4	+6.2			TP					

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

GEO-445

DATE 4/29/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6837	NOTES CHECKED BY TG New	LINE NO. 1	PAGE 14
AREA Kansas	TOPO MAP Havensville	STATE Kansas	COUNTY Nemaha	TWP	RANGE	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH+ SOUTH - LAT.	EAST+ WEST - DEP.	
901										1287.6				
	2640		83°07' +180°	+5.5°	+4.5	-		+4.5	1292.1		BS	-15	-2640.3	
	2640				+13.7	89°48'	-9.2	+4.5			BS			
902	2310		83°07'	+5.5°	11.5	-		-11.5		1280.6		+56	+2309	454,834 2,544,834
903	1980		" "	"	6.2	90°30'	-17.3	-23.5		1268.6		+48	+1979	454,826 2,544,609 last sta on pavement
904	1650		" "	"	11.5	90°50'	-24.0	-35.5		1256.6		+40	+1650	454,818 2,544,275 in field
905	1320		" "	"	16.8	90°50'	-19.2	-36.0		1256.1		+32	+1320	454,810 2,543,945 dirt road
906	990		" "	"	9.3	90°50'	-14.4	-23.7		1268.4		+24	+990	454,802 2,543,615 ↓
907	660				10.3	-		-10.3		1281.8		+16	+660	454,794 2,543,285
TP	552		89°18'	+5.5°	8.2	-		-8.2		1283.9		+2	+552	454,780 2,543,177 454,755 + 2,543,120 Trd (south)
Δ	605		86°50'	+5.5°	9.4	-		-9.4		1282.7		-25	+605	454,753 2,543,230 U.S.C.G.S. America City el. 1281. 1992
908	330		83°07'	+5.5°	8.8	-		-8.8		1283.3		+8	+330	454,786 2,542,955
909	0				5.4	-		-5.4		1286.7	TP	0	0	454,778 2,542,625
910	330		263°03'32"	+5.5°	12.2	91°-	-5.8	-18.0		1274.1		-8	-330	454,770 2,542,295
911	660		" "	"	9.1	92°-	-23.0	-32.1		1260.0		-17	-660	454,761 2,541,965
912	990		" "	"	11.5	92°-	-34.5	-46.0		1246.1		-25	-990	454,753 2,541,535
913	1320		" "	"	11.4	92°0'	-49.9	-61.3		1230.8		-33	-1320	454,745 2,541,305
914	1650		" "	"	11.9	92°-	-57.6	-69.5		1222.6		-42	-1649	454,736 2,540,976
915	1980	1979.2	263°03'32"	+5.5°	9.1	91°40'	-57.6	-66.7		1225.4	TP	-50	-1979.3	454,728 2,540,649
915	1980				14.8	91°30'	-51.8	-66.6			TP			

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

GEO-445

DATE 4/28/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY TG rluw	LINE NO. 9	PAGE 15
AREA Kansas	TOPO MAP Havensville	STATE Kansas	COUNTY Nemaha	RANGE	PPM	PARTY MANAGER L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
915										1225.4				
	1980	1979.9	83°26'20" +180°	+5.5°	+14.4	90°42'	+24.2	+38.6			BS	-37	-1980.3	
	1980				+9.7	90°50'	+28.8	+38.5	1263.9		BS			
916	1650		83°26'	+5.5°	10.4	91°20'	-38.4	-48.8		1215.1		+31	+1650	454,722 2,540,322
917	1320		" "	"	10.0	92°-	-46.0	-56.0		1207.9		+25	+1320	454,716 2,539,992
918	990		" "	"	10.3	92°-	-39.5	-44.8		1219.1		+18	+990	454,709 2,539,662
919	660		" "	"	6.1	92°-	-23.0	-29.1		1234.8		+12	+660	454,703 2,539,332
920	330		" "	"	13.6	91°-	-5.8	-19.4		1244.5		+6	+330	454,697 2,539,002
921														
921	120		81°40'	+5.5°	6.4	-	-	-6.4		1257.5		+6	+120	454,697 2,538,792 454,675 + 2,538,785 T-rod (north) el. 1255.
921	0				5.4	-	-	-5.4		1258.5	TP	0	0	454,691 2,538,672
922	330		264°34'	+5.5°	10.0	91°-	-5.8	-15.8		1248.1		0	-330	454,691 2,538,342
923	660		" "	"	9.6	91°-	-11.5	-21.1		1242.8		+1	-660	454,692 2,538,012
924	990		" "	"	12.3	91°-	-17.3	-29.6		1234.3		+1	-990	454,692 2,537,682
925	1320		264°34'	+5.5°	7.2	91°-	-23.0	-30.2			TP	+2	-1320.3	454,693 2,537,355
925	1320				14.2	90°42'	-16.1	-30.3		1233.6	TP			
	1980	1979.4	83°12'20" +180°	+5.5°	+4.8	88°34'	-49.5	-44.7			BS	-45	-1979.4	
	1980				+10.5	88°24'	-55.3	-44.8	1188.8		BS			
926	1650		83°12'	+5.5°	3.8	88°40'	+38.4	+34.6		1223.4		+37	+1650	454,685 2,537,029
927	1320		" "	"	4.9	89°-	+23.0	+18.1		1206.9		+30	+1320	454,678 2,536,699
928	990		" "	"	3.4	TH	+5.0	+1.6		1190.4		+22	+990	454,670 2,536,369

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	4/29/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	TG alw	LINE NO.	1	PAGE	16
AREA	Kansas	TOPO MAP	Havensville	STATE	Kansas	COUNTY	Nemaha	RANGE		PPM		PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1188.8					
929	660		83°12'	+5.5°	11.2	84	-3.3	-14.5		1174.3		+15	+660	454,663 2,536,039
930	330		" "	"	13.1	91°-	-5.8	-8°		1169.9		+7	+330	454,655 2,535,709
931	0				5.4	-		-5.4		1183.1	π	0	0	454,648 2,535,379
932	330		263°33'	+5.5°	11.1	-		-11.1		1177.7		-5	-330	454,643 2,535,099
933	660		" "	"	10.3	91°-	-11.5	-21.8		1167.0		-11	-660	454,637 2,534,719
934	990		" "	"	11.8	91°10'	-20.2	-32.0		1156.8		-16	-990	454,632 2,534,389
935	1320		" "	"	11.7	91°-	-23.0	-34.7		1154.1		-22	-1320	454,626 2,534,059
936	1650		263°33'	+5.5°	9.5	91°-	-28.8	-38.3			TP	-27-	-1650,	454,620 2,533,732
936	1650				11.5	90°56'	-26.9	-38.4		1150.4	TP			
	658		73°14'+180°	+5.5°	+2.3	-		+2.3	1152.7		BS	-129	-645+	horiz. coord. y = -19', x = +36'
	658				+5.6	TH	-3.3	+2.3			OS			
<u>IL</u>	460		72°45'	+5.5°	7.6	-		-7.6		1145.1		+94	+450	454,585 2,533,540 T-rd (north) el. 1142.
937	330		73°14'	+5.5°	8.7	-		-8.7		1144.0		+64	+324	454,555 2,533,416
938	0				5.4	-		-5.4		1147.3	π	0	0	454,491 2,533,090
939	330		271°51'	+5.5°	1.7	88°-	+11.5	+9.8		1162.5		+42	-327	454,533 2,532,763
940	660		" "	"	0.2	88°-	+23.0	+22.8		1175.5		+84	-655	454,575 2,532,435
941	988	987.4	269°40'	+5.9°	8.7	88°-	+34.5	+25.8		1178.5	TP	+96	-983	454,587 2,532,107
941	988				11.5	87°50'	+37.3	+25.8			TP			
	1320	1319.2	83°27'+180°	+5.9°	+13.5	92°-	+46.0	+59.5	1238.0		BS	-15	-1319	
	1320				+5.8	92°20'	+53.7	+59.5			BS			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/30/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY TG ulw	LINE NO. 1	PAGE 17
AREA Kansas	TOPO MAP Havensville	STATE Kansas	COUNTY Memaha	TWP 55/65	RANGE R 12E	PARTY MANAGER L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1238.0					
942	990		83° 27'	+5.9°	6.8	93° -	-51.7	-58.5		1179.5		+11	+990	454,583 2,531,778
943	660		" "	"	10.9	93° -	-34.5	-45.4		1192.6		+7	+660	454,579 2,531,448
944	330		" "	"	10.2	92° -	-11.5	-21.7		1215.3		+4	+330	454,576 2,531,118
945	0				5.4	-		-5.4		1232.6	π	0	0	454,572 2,530,788
946	330		263° 19'	+5.9°	0.4	88° -	+11.5	+11.1		1249.1		-5	-330	454,567 2,530,458
947	660		" "	"	6.3	87° -	-34.5	+28.2		1216.2		-9	-660	454,563 2,530,128
948	990	989.0	263° 18' 40"	+5.9°	9.1	87° 30'	+43.1	+34.0		1272.0	TP	-14	-989	454,558 2,529,799
948	990				12.0	87° 20'	+46.0	+34.0			TP			
	2640		82° 26' +180°	+5.9°	+12.8	0H	+13.2	+26.0			BS	-77	-2639	
	2640				+13.5	90° 16'	+12.3	+25.8	1237.8		BS			
949	2310		82° 26'	+5.9°	3.1	91° -	-40.3	-43.4		1254.4		+67	+2309	454,548 2,529,469
950	1980		" "	"	12.6	91° 12'	-41.5	-54.1		1218.7		+58	+1979	454,539 2,529,139
951	1650		" "	"	7.0	91° -	-28.8	-35.8		1212.0		+48	+1649	454,529 2,528,809
952	1320		" "	"	7.0	91° 20'	-30.7	-37.7		1250.1		+38	+1319	454,519 2,528,479
953	990		" "	"	18.2	92° -	-34.5	-52.7		1245.1		+29	+990	454,510 2,528,150 Havensville Quad.
954	660		" "	"	12.1	92° -	-23.0	-35.1		1262.7		+19	+660	454,500 2,527,820 Duluth Quad
TP	596		83° 24'	+5.9°	10.7	92° -	-20.8	-31.5		1266.3		+7	+596	454,488 2,527,756 T-rd (south) pt. 1264.
955	330		82° 26'	+5.9°	10.0	91° -	-5.8	-15.8		1282.0		+10	+330	454,491 2,527,490
956	0				5.4	-		-5.4		1232.4	π	0	0	454,481 2,527,160
957	330		263° 06'	+6.3°	11.1	92° -	-11.5	-22.6		1275.2		-3	-330	454,478 2,526,830

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/30/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6839	NOTES CHECKED BY T.G. rlu	LINE NO. 1	PAGE 18
AREA Kansas	TOPO MAP Duluth	STATE Kansas	COUNTY Nemaha	TWP 5S6S	RANGE 12E/11E	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1297.8					
958	660		263°06'	+6.3°	11.9	92°10'	-24.9	-36.8		1261.0		-7	-660	454,474 2,526,500
959	990		"	"	10.0	91°20'	-23.0	-33.0		1264.8		-10	-990	454,471 2,526,170
960	1320		263°06'	+6.3°	3.7	91°-	-23.0	-26.7		1271.1	TP	-14	-1320.2	454,467 2,525,892
960	1320				14.4	90°32'	-12.3	-26.7			TP			
	1980	1979	81°54'40"+180°	+6.3°	+4.2	88°20'	-57.6	-53.4	1217.7		BS	-62	-1978.3	
	1980				+13.4	88°4'	-66.8	-53.4			BS			
961	1650		81°55'	+6.3°	9.4	88°40'	+38.4	+29.0		1246.7		+51	+1649	454,456 2,525,516
962	1320		"	"	6.6	89°20'	+15.4	+8.8		1226.5		+41	+1319	454,446 2,525,186
963	990		"	"	6.9	-	-	-6.9		1210.8		+31	+990	454,436 2,524,857
964	660		"	"	11.2	-	-	-11.2		1206.5		+21	+660	454,426 2,524,527
□	760		82°16'	+6.3°	11.1	-	-	-11.1		1206.6		+19	+760	454,424 2,524,627 bridge
965	330		81°55'	+6.3°	2.8	-	-	-2.8		1214.9		+10	+330	454,415 2,524,197
966	0				5.4	-	-	-5.4		1212.3	π	0	0	454,405 2,523,867
967	330		262°03'	+6.3°	7.8	-	-	-7.8		1209.9		-10	-330	454,395 2,523,537
968	660		"	"	11.8	91°-	-11.5	-23.3		1194.4		-19	-660	454,386 2,523,207
969	330-990													
970	1320													
≡	930		261°28'	+6.3°	12.6	BH	-4.7	-17.3		1200.4		-36	-929	454,369 2,522,938 T-rod(north)
969	990		262°03'	+6.3°	13.1	-	-	-13.1		1204.6		-29	-990	454,376 2,522,877
970	1320		"	"	7.1	89°20'	+15.4	+8.3		1226.0		-38	-1319	454,367 2,522,548

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	4/30/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	TG rluw	LINE NO.	1	PAGE	19	
AREA	Kansas	TOPO MAP	Duluth	STATE	Kansas	COUNTY	Nemaha	TWP	55/65	RANGE	12E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1217.7					
971	1650		262°03'	+6.3°	2.2	88°50'	+33.6	+31.4		1249.1	TP	-48	-1649.3	454,357 2,522,221
971	1650				6.9	88°40'	+38.9	+31.5			TP			
	2310		82°24'40" +180°	+6.3°	+5.7	-		+5.7	1254.8		BS	-52	-2309.3	
	2310				+3.0	90°4'	+2.7	+5.7			BS			
972	1980		82°25'	+6.3°	7.8	-		-7.8		1247.0		+94	+1980	454,349 2,521,895
973	1650		" "	"	3.4	91°-	-28.8	-32.2		1222.6		+37	+1650	454,342 2,521,565
974	1320		" "	"	6.2	92°-	-46.0	-52.2		1202.6		+30	+1320	454,335 2,521,235
975	990		" "	"	11.2	92°10'	-37.4	-48.6		1206.2		+22	+990	454,327 2,520,905
976	660		" "	"	10.2	92°10'	-24.9	-35.1		1219.7		+15	+660	454,320 2,520,575
977	330		" "	"	9.1	92°-	-11.5	-20.6		1234.2		+7	+330	454,312 2,520,245
978	0				5.4	-		-5.4		1249.4	X	0	0	454,305 2,519,915
TP	62		256°43'	+6.3°	2.0	-		-2.0		1252.8		-8	-62	454,297 2,519,853 454,310 + 2,519,840 T-rd (south) el. 1250
979	330		262°28'	+6.3°	3.7	88°-	+11.5	+7.8		1262.6		-7	-330	454,298 2,519,585
980	660		" "	"	10.9	88°-	+23.0	+12.1		1266.9		-14	-660	454,291 2,519,255
981	990		" "	"	5.2	88°30'	+25.9	+20.7		1275.5		-21	-990	454,284 2,518,925
982	1320		262°28'20"	+6.6°	11.6	88°36'	+32.2	+20.6		1275.9	TP	-21-2	-1319.3	454,282 2,518,599
982	1320				14.5	88°28'	+35.3	+20.8			TP			
	2310	230°	82°26'10" +180°	+6.6°	+11.5	88°-	-80.6	-69.1	1206.3		BS	-39-2	-2308.3	
	2310				+4.9	88°10'	-73.9	-69.1			BS			
983	1980		82°26'	+6.6°	10.2	88°-	+69.1	+58.9		1265.2		+33	+1980	454,274 2,518,274

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 4/30/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY TG rlu	LINE NO. 1	PAGE 20
AREA Kansas	TOPO MAP Duluth	STATE Kansas	COUNTY Nemaha	TWP 55/65	RANGE 11E	PPM
PARTY MANAGER L. Davis						

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1206.3						
984	1650		82°26'	+6.6°	5.6	88°20'	+48.0	+42.4		1248.7		+28	+1650	454,269	2,517,949
985	1323		82°54'	+6.6°	6.4	88°30'	+34.6	+28.2		1234.5		+12	+1323	454,253	2,517,617
986	990		" "	"	3.9	89°-	+17.3	+13.4		1217.7		+17	+990	454,258	2,517,284
987	660		" "	"	1.1	89°-	+11.5	+10.4		1215.7		+11	+660	454,252	2,516,954
988	330		" "	"	1.2	89°-	+5.8	+4.6		1210.9		+6	+330	454,247	2,516,624
989	0				5.4	-	-	-5.4		1200.9	TP	0	0	454,241	2,516,294
990	330		262°36'	+6.6°	9.3	91°-	-5.8	-15.1		1191.2		-5	-330	454,236	2,515,964
991	660		" "	"	7.4	91°-	-11.5	-18.9		1187.4		-9	-660	454,232	2,515,634
992	990		" "	"	5.1	91°-	-17.3	-20.7		1183.7		-14	-990	454,227	2,515,304
993	1320		" "	"	2.0	91°-	-23.0	-25.0		1181.8		-18	-1320	454,223	2,514,974
994	1650		" "	"	6.7	BH	-27.3	-15.0		1179.8		-23	-1650	454,218	2,514,644
995	1980		262°35'42"	+6.6°	10.8	-	-	-10.8		1175.5	TP	-28-2	-1980+3	454,211	2,514,317
995	1980				0.9	BH	-9.9	-10.8			TP				
	1650		82°13'20"+180°	+6.6°	+3.7	88°50'	-33.6	-29.9			BS	-34-3	-1649+3		
	1650				+8.4	88°40'	-38.4	-30.0	1165.5		BS				
996	1320		82°13'	+6.6°	7.7	89°-	+23.0	+16.3		1180.8		+27	+1320	454,201	2,513,991
997	990		" "	"	2.0	-	-	-2.0		1163.5		+20	+990	454,194	2,513,661
998	660		" "	"	4.9	-	-	-4.9		1160.6		+14	+660	454,188	2,513,331
999	330		" "	"	6.2	-	-	-6.2		1159.3		+7	+330	454,181	2,513,001

454,285 + 2,517,600
4-Way Intersect. el. 1234

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	4/6/81 4/30/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	TG rlv	LINE NO.	1	PAGE	21	
AREA	Kansas	TOPO MAP	Duluth	STATE	Kansas	COUNTY	Nemaha	TWP	55/65	RANGE	11E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1165.5						
1000	206		83°46'	+6.6°	5.7	-		-5.7	1159.8		-1	+206	459,173 2,512,877	bridge el. 1158'	
1000	0				5.4	-		-5.4	1160.1	X	0	0	459,179 2,512,671		
1001	296		260°40'	+6.6°	1.6	89°-	+5.2	+3.6	1169.1		-14	-296	459,160 2,512,375	459,160 + 2,512,375 T-rd (north)	
1001	330		262°16'	+6.6°	1.6	89°-	+5.8	+4.2	1169.7		-7	-330	459,167 2,512,391	horiz. correct. y = -9'	
1002	660		" "	"	4.8	88°-	+73.0	+12.2	1182.7		-13	-660	459,160 2,512,011	x = +23	
1003	990		" "	"	5.7	87°30'	+48.1	+37.4	1202.8		-20	-990	459,154 2,511,681		
1004	1320		" "	"	5.8	87°30'	+57.5	+11.7	1207.0		-26	-1320	459,148 2,511,351		
1005	1650	1648.4	262°16'10"	+6.6°	14.6	87°30'	+71.9	+57.8	1209.8		TP	-33	-1648	459,141 2,511,023	
1005	1650				12.7	87°34'	+70.0	+57.3			TP				
	2310		82°06' +180°	+6.6°	+6.1	91°-	+40.3	+46.4	1269.2		BS	-52	-2309		
	2316				+14.5	90°48'	+32.2	+46.7			BS				
1006	1980		82°06'	+6.6°	6.7	91°-	-34.6	-41.3	1227.9		+45	+1979	459,134 2,510,693		
1007	1650		" "	"	6.1	91°-	-28.8	-34.9	1234.3		+37	+1650	459,126 2,510,364		
1008	1320		" "	"	9.1	91°-	-23.0	-32.1	1237.1		+30	+1320	459,119 2,510,034		
1009	990		" "	"	10.4	91°-	-17.3	-27.7	1241.5		+22	+990	459,111 2,509,704		
1010	660		" "	"	11.5	91°-	-11.5	-23.0	1246.2		+15	+660	459,104 2,509,374		
1011	330		" "	"	11.1	-		-11.1	1258.1		+7	+330	459,096 2,509,044		
1012	0				5.4	-		-5.4	1263.8	X	0	0	459,089 2,508,714		
1013	330		262°20'	+6.6°	10.7	91°30'	-8.6	-19.3	1249.9		-6	-330	459,083 2,508,384		
1014	660		" "	"	12.8	91°30'	-17.3	-30.1	1239.1		-12	-660	459,077 2,508,054		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/1/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY TG. xlw	LINE NO. 9	PAGE 22
AREA Kansas	TOPO MAP Duluth	STATE Kansas	COUNTY Nemaha	TWP 5S/6S	RANGE 11E	PPM
			PARTY MANAGER L. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1269.2					
1015	990		262°20'	+6.6°	8.1	91°-	-17.3	-25.4		1243.8		-18	-990	454,071 2,507,724
1016	1320		262°20'	+6.6°	13.5	84	-6.6	-20.1			TP	-25	-1320	454,069 2,507,394
1016	1320				14.8	90°14'	-5.4	-20.2		1249.0	TP			
	2310		82°41'+180°	+6.6°	4.8	89°-	-40.3	-35.5			BS	-29	-2309	
	2310				0.7	89°6'	-36.3	-35.6	1213.4		BS			
1017	1980		82°41'	+6.6°	10.0	89°-	+34.6	+24.6		1238.0		+25	+1980	454,060 2,507,065
1018	1650		" "	"	3.7	89°30'	+14.4	+10.7		1224.1		+21	+1650	454,056 2,506,735
TP	1620		83°04'	+6.6°	4.4	89°30'	+14.1	+9.7		1223.1		+9	+1620	454,044 2,506,705 T-rd.(south)
1019	1320		82°41'	+6.6°	2.7	-	-	-2.7		1210.7		+17	+1320	454,052 2,506,405
1020	990		" "	"	12.7	-	-	-12.7		1200.7		+12	+990	454,047 2,506,075
1021	660		" "	"	4.6	-	-	-4.6		1208.8		+8	+660	454,043 2,505,745
1022	330		" "	"	2.2	-	-	-2.2		1211.2		+4	+330	454,039 2,505,915
1023	0				5.4	-	-	-5.4		1208.0	TP	0	0	454,035 2,505,085
1024	330		263°15'	+6.2°	11.1	92°-	-11.5	-22.6		1190.8		-3	-330	454,032 2,504,755
1025	660		" "	"	10.5	93°-	-34.5	-45.0		1168.4		-6	-660	454,029 2,504,425
1026	993	991.6	262°25'	+6.2°	4.0	93°-	-51.9	-55.9		1157.5	TP	-24	-991+2	454,011 2,504,096
1026	993				12.6	92°30'	-43.3	-55.9			TP			
	657		106°21'+180°	+6.2°	+14.9	-	-	+14.9	1172.4		BS	+252	-607+2	
	657				+11.6	84	+3.3	+14.9			BS			
1027	330		111°25'	+6.2°	5.9	-	-	-5.9		1166.5		-153	+292	454,110 2,503,783

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/1/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY TG <i>rlw</i>	LINE NO. 1	PAGE 24
AREA Kansas	TOPO. MAP Duluth	STATE Kansas	COUNTY Nemaha	TWP 55/65	RANGE 11 E	PPM
						PARTY MANAGER L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1252.2							
1039	1320		263° 22'	+5.8°	7.5	-		-7.5		1244.7	TP	-19	-1320	453,940	2,499,957	
1039	1320				14.1	TH	+6.6	-7.5			TP					
	1320	1319.2	82° 27' +180°	+5.8°	+2.1	92° -	+46.0	+48.1	1292.8		BS	-40	-1319			
	1320				+13.6	91° 30'	+34.5	+48.1			BS					
1040	990		82° 27'	+5.8°	12.7	92° 10'	-37.4	-50.1		1242.7		+30	+990	453,920	2,499,628	
1041	660		" "	"	16.6	92° -	-23.0	-39.6		1253.2		+20	+660	453,920	2,499,298	
1042	330		" "	"	9.2	91° -	-5.8	-15.0		1277.8		+10	+330	453,910	2,498,968	
1043	0				5.4	-		-5.4		1287.4	X	0	0	453,900	2,498,638	
1044	330		262° 49'	+5.8°	2.5	-		-2.5		1290.3		-8	-330	453,892	2,498,308	
1045	660		" "	"	8.1	-		-8.1		1284.7		-16	-660	453,884	2,497,978	
1046	990		" "	"	1.5	-		-1.5		1291.3		-24	-990	453,876	2,497,648	
1047	1320		262° 49'	+5.8°	4.7	89° 30'	+11.5	+6.8		1299.6	TP	-32	-1320	453,868	2,497,318	
1047	1320				2.4	89° 36'	+9.2	+6.8			TP					
	1320		82° 44' +180°	+5.8°	+3.2	89° -	-23.0	-19.8	1279.8		BS	-34	-1319			
	1320				+7.1	88° 50'	-26.9	-19.8			BS					
1048	990		82° 44'	+5.8°	6.0	89° -	+17.3	+11.3		1291.1		+25	+990	453,859	2,496,989	
1049	660		" "	"	9.6	-		-9.6		1270.2		+17	+660	453,851	2,496,659	
TP	332		84° 20'	+5.8°	9.3	-		-9.3		1270.5		-1	+332	453,833	2,496,331	T-rod (south)
1050	330		82° 44'	+5.8°	9.1	-		-9.1		1270.7		+8	+330	453,842	2,496,329	
1051	0				5.4	-		-5.4		1274.4	X	0	0	453,834	2,495,999	

453,820 + 2,496,330
T-rod (south)

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	5/1/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6839	NOTES CHECKED BY	TG rlu	LINE NO.	1	PAGE	25	
AREA	Kansas	TOPO MAP	Duluth/WHEATON	STATE	Kansas	COUNTY	Nemaha	TWP	55/65	RANGE	10E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1279.8					
1052	330		262° 46'	+6.2°	8.9	92° -	-11.5	-20.4		1259.4		-6	-330	453,828 2,495,669
1053	660		" "	"	9.2	92° 30'	-28.8	-38.0		1241.8		-12	-660	453,822 2,495,339
1054	990		" "	"	5.2	92° -	-34.5	-39.7		1240.1		-18	-990	453,816 2,495,009
1055	1320		" "	"	8.0	91° 20'	-30.7	-38.7		1241.1		-24	-1320	453,810 2,494,679
1056	1650		" "	"	7.6	91° -	-28.8	-36.4		1243.4		-30	-1650	453,804 2,494,349
1057	1980		262° 46' 20"	+6.2°	2.4	91° -	-34.6	-37.0		1242.8	TP	-36-2	-1979	453,796 2,494,020
1057	1980				14.0	90° 40'	-23.0	-37.0			TP			
	2640		82° 43' 38" +180°	+6.2°	+13.0	91° 6'	+50.7	+63.7			BS	-49-2	-2639	
	2640				+9.8	91° 10'	+53.8	+63.6	1306.4		BS			
1058	2310		82° 44'	+6.2°	8.5	91° 20'	-53.7	-62.2		1244.2		+43	+2310	453,788 2,493,691 ↑
1059	1980		" "	"	8.7	91° 30'	-51.8	-60.5		1245.9		+37	+1980	453,782 2,493,361 Duluth Quad
1060	1650		" "	"	10.3	91° 40'	-48.0	-58.3		1248.1		+31	+1650	453,776 2,493,031 WHEATON Quad
1061	1320		" "	"	9.7	92° -	-46.0	-55.7		1250.7		+25	+1320	453,770 2,492,701 ↓
1062	990		" "	"	10.4	92° 30'	-43.1	-53.5		1252.9		+18	+990	453,763 2,492,371
1063	660		" "	"	10.4	92° 40'	-30.7	-41.1		1265.3		+12	+660	453,757 2,492,041
1064	330		" "	"	11.1	91° -	-5.8	-16.9		1289.5		+6	+330	453,751 2,491,711
1065	0				5.4	-	-	-5.4		1301.0	TP	0	0	453,745 2,491,381
<u>IL</u>	151		260° 06'	+6.2°	2.4	-	-	-2.4		1304.0		-10	-151	453,735 2,491,230 453,735 + 2,491,230 T-cd(north) el. 130A.
1066	330		262° 55'	+6.2°	7.6	-	-	-7.6		1298.8		-5	-330	453,740 2,491,051 horiz. correct y = -9
1067	660		" "	"	11.8	90° 56'	-10.8	-22.6		1283.8		-10	-660	453,735 2,490,721 x = +13

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
5/1/81		G. Cotcamp		T. Grady		6837		Gwc. <i>rlw</i>		1	26					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Wheaton		Kansas	Marshall					L. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1306.4							
1068	990		262°55'	+6.2°	5.9	-		-5.9		1300.5		-15	-990	453,730	2,490,391	
1069	1320		" "	"	3.8	TH	+6.6	+2.8		1309.2		-20	-1320	453,725	2,490,061	
1070	1650		262°55'	+6.4°	2.2	TH	+8.3	+6.1			TP	-20+1	-1650+3	453,726	2,489,734	
1070	1650				3.7	89°40'	+9.6	+5.9		1312.3	TP					
	1320		82°22'44" +180'	+6.4°	+11.1	91°-	-123.0	+34.1	1346.4		BS	-28+1	-1320+3			
	1320				+14.9	90°50'	+19.2	+34.1			BS					
1071	990		82°23'	+6.4°	11.8	91°30'	-25.9	-37.7		1308.7		+21	+990	453,720	2,489,407	
1072	660		" "	"	12.2	92°30'	-28.8	-41.0		1305.4		+14	+660	453,713	2,489,077	
1073	330		" "	"	10.4	92°30'	-14.4	-24.8		1321.6		+7	+330	453,706	2,488,717	
1074	0				5.4	-		-5.4		1341.0	TP	0	0	453,699	2,488,917	
1075	330		262°51'	+6.4°	10.9	-		-10.9		1335.5		-4	-330	453,695	2,488,087	
1076	660		" "	"	7.3	-		-7.3		1339.1		-9	-660	453,690	2,487,757	
1077	990		" "	"	1.3	TH	+5.0	+3.7		1350.1		-13	-990	453,686	2,487,427	
1078	1320		" "	"	9.9	TH	+6.6	-3.3		1343.1		-17	-1320	453,682	2,487,097	
1079	1650		" "	"	8.6	89°20'	+19.2	+10.6		1357.0		-22	-1650	453,677	2,486,767	
1080	1980		" "	"	1.0	89°20'	+23.0	+22.0		1368.4		-26	-1980	453,673	2,486,437	
1081	2310		" "	"	11.0	89°-	+40.3	+29.3		1375.7		-30	-2310	453,669	2,486,107	
1082	2640		262°51'	+6.4°	7.5	89°10'	+38.4	+30.9			TP	-35+1	-2639.3	453,665	2,485,781	
1082	2640				12.2	89°4'	+43.0	+30.8		1377.2	TP					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/4/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C. edw	LINE NO. 1	PAGE 27
AREA Kansas	TOPO MAP Wheaton	STATE Kansas	COUNTY Marshall	TWP	RANGE	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
1082										1377.2						
	2310		82°33'38" +180°	+6.4°	+9.7	TH	-11.6	-1.9	1375.3		BS	-42.1	-2310.4			
	2310				+5.0	89°50'	-6.7	-1.7		BS						
\bar{T}	2255		82°48'	+6.4°	9.2	TH	+11.3	+2.1		1377.4		+31	+2255	453,655	2,485,730	453,660 + 2,485,740 T-rd(south) el. 1376
1083	1980		82°34'	+6.4°	3.3	-		-3.3		1372.0		+36	+1980	453,660	2,485,455	
1084	1650		" "	"	6.0	BH	-8.3	-14.3		1361.0		+30	+1650	453,654	2,485,125	
1085	1320		" "	"	5.1	91°-	-23.0	-28.1		1347.2		+24	+1320	453,648	2,484,795	
#	1300		82°56'	+6.4°	5.8	91°-	-22.7	-28.5		1346.8		+15	+1300	453,639	2,484,775	railroad
1086	990		82°34'	+6.4°	9.1	91°30'	-25.9	-35.0		1340.3		+18	+990	453,642	2,484,465	
1087	660		" "	"	10.8	91°30'	-17.3	-28.1		1347.2		+12	+660	453,636	2,484,135	
1088	330		" "	"	13.1	BH	-1.7	-14.8		1360.5		+6	+330	453,630	2,483,805	
1089	0				5.4	-		-5.4		1367.9	TP	0	0	453,624	2,483,475	
1090	330		262°37'	+6.4°	12.2	-		-12.2		1363.1		-6	-330	453,618	2,483,145	
1091	660		" "	"	12.6	91°-	-11.5	-24.1		1351.2		-11	-660	453,613	2,482,815	
1092	990		" "	"	5.2	92°-	-34.5	-39.7		1335.6		-17	-990	453,607	2,482,485	
1093	1320		" "	"	10.6	92°-	-46.0	-56.6		1318.7		-23	-1320	453,601	2,482,155	
1094	1650		" "	"	3.1	92°-	-57.6	-60.7		1314.6		-28	-1650	453,596	2,481,825	bridge
1095	1980		" "	"	12.4	91°-	-34.6	-47.0		1328.3		-34	-1980	453,590	2,481,495	
1096	2310		" "	"	6.3	90°30'	-20.2	-26.5		1348.8		-40	-2310	453,584	2,481,165	
1097	2640		262°37'38"	+6.4°	15.0	-		-15.0		1360.3	TP	-45.1	-2640.4	453,530	2,480,839	
1097	2640				1.8	BH	-13.2	-15.0			TP					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	5/4/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	Grd. rlew	LINE NO.	1	PAGE	28
AREA	Kansas	TOPO MAP	Wheaton	STATE	Kansas	COUNTY	Marshall	RANGE		PPM		PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
1097										1360.3				
	660		82°28' ±120°	+6.4°	+9.9	91° -	+11.5	+21.4	1381.7		BS	-13+1	-660+4	
	660				+138	90°40'	+7.7	+21.5			BS			
1098	330		82°28'	+6.4°	12.1	BH	-1.7	-13.8		1367.9		+7	+330	453,575 2,980,517
TF	270		84°11'	+6.4°	12.5	-		-12.5		1369.2		-3	+270	453,565 2,980,453 Trail (south) el. 1367
1099	0				5.4	-		-5.4		1376.3	TP	0	0	453,568 2,980,883
1100	330		262°26'30'37"	+6.6°	9.9	-		-9.9		1371.8		-5	-330	453,563 2,979,853
1101	660		"	"	12.3	91° -	-11.5	-22.8		1357.9		-9	-660	453,559 2,979,523
1102	990		"	"	13.0	91°10'	-20.2	-32.2		1348.5		-14	-990	453,534 2,979,193
1103	1320		"	"	4.0	91° -	-23.0	-57.0		1354.7		-18	-1320	453,550 2,978,863
1104	1650		262°37'	+6.6°	10.1	-		-10.1		1371.6	TP	-23+1	-1650+4	453,546 2,978,537
1104	1650		"	"	1.8	BH	-8.3	-10.1			TP			
	2640		82°20' ±180°	+6.6°	+14.7	90°48'	+36.9	+51.6	1423.2		BS	-49	-2639+3	
	2640				+10.1	90°54'	+41.5	+51.6			BS			
1105	2310		82°20'	+6.6°	2.3	91° -	-40.3	-92.6		1380.6		+43	+2310	453,540 2,978,211
1106	1980		"	"	4.7	91° -	-34.6	-39.3		1383.9		+37	+1980	453,534 2,977,881
1107	1650		"	"	9.3	91°30'	-43.2	-52.5		1370.7		+31	+1650	453,528 2,977,551
1108	1320		"	"	12.8	92° -	-46.0	-58.8		1364.4		+25	+1320	453,522 2,977,221
1109	990		"	"	11.1	92°10'	-37.4	-48.5		1374.7		+18	+990	453,515 2,976,891
1110	660		"	"	9.7	92° -	-23.0	-32.7		1390.5		+12	+660	453,506 2,976,561
1111	330		"	"	13.0	91° -	-5.8	-18.8		1404.8		+6	+330	453,503 2,976,231

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	5/6/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	GWC	LINE NO.	1	PAGE	29	
AREA	Kansas	TOPO MAP	Wheaton	STATE	Kansas	COUNTY	Marshall	TWP	55/65	RANGE	10E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1423.2						
1112	0				5.4	-		-5.4		1417.8	X	0	0	453,497	2,475,901
1113	330		262°12'	+6.6°	3.9	-		-3.9		1419.3		-7	-330	453,490	2,475,571
1114	660		" "	"	13.4	-		-13.4		1409.8		-14	-660	453,483	2,475,291
1115	690		261°20'	+6.6°	11.6	-		-11.6		1411.6		-25	-690	453,472	2,475,211
1115	990		262°12'	+6.6°	1.8	TH	+5.0	+3.2		1426.4		-21	-990	453,476	2,474,911
1116	1320		262°11'40"	+6.6°	8.4	89°-	+23.0	+14.6		1437.8	TP	-28	-1320	453,469	2,474,584
1116	1320				4.4	89°10'	+19.2	+14.8			TP				
	2640		82°05'+180°	+6.6°	+10.0	BH	+13.2	+23.2	1461.0		BS	-61	-2639.3		
	2640				+19.0	90°12'	+9.2	+23.2			BS				
1117	2310		82°05'	+6.6°	8.8	90°30'	-20.2	-29.0		1432.0		+53	+2309	453,461	2,474,257
1118	1980		" "	"	8.0	90°30'	-17.3	-25.3		1435.7		+46	+1979	453,454	2,473,927
1119	1650		" "	"	3.8	91°-	-28.8	-32.6		1428.4		+38	+1650	453,446	2,473,598
1120	1320		" "	"	9.0	91°30'	-34.5	-43.5		1417.5		+30	+1320	453,438	2,473,268
1121	990		" "	"	8.0	92°-	-34.5	-42.5		1418.5		+23	+990	453,431	2,472,938
1122	660		" "	"	7.0	92°-	-23.0	-30.0		1431.0		+15	+660	453,423	2,472,608
1123	330		" "	"	9.5	91°-	-5.8	-15.3		1445.7		+8	+330	453,416	2,472,278
1124	0				5.4	-		-5.4		1455.6	X	0	0	453,408	2,471,948
1125	330		262°19'	+6.6°	11.8	BH	-1.7	-13.5		1447.5		-6	-330	453,402	2,471,618
1126	660		" "	"	12.4	BH	-3.3	-15.7		1445.3		-12	-660	453,396	2,471,288
1127	990		" "	"	8.2	-		-8.2		1452.8		-19	-990	453,389	2,470,958

453,465 + 2,475,210
4-Way Intersect 1.1911

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
5/6/81		G. Cotcamp		T. Grady		6834		GWC jlw		1		30			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Wheaton		Kansas		Marshall		55/65		10 E				L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1461.0						
1128	1320		262° 19'	+6.6°	8.7	-	-8.7		1452.3			-25	-1320	453,383	2470,628
1129	1650		262° 18' 40"	+6.6°	8.5	BH	-8.3	-16.8		1444.2	TP	-31	-1650	453,377	2470,301
1129	1650				13.8	90° 6'	-2.9	-16.7			TP				
	1320		81° 54' +180°	+6.6°	+9.1	-	+9.1		1453.3		BS	-35	-1320		
	1320				+2.5	BH	+6.6	+9.1			BS				
±	1122		82° 21'	+6.6°	10.2	BH	-5.6	-15.8		1437.5		+21	+1122	453,363	2470,106
1130	990		81° 54'	+6.6°	10.9	BH	-5.0	-15.9		1437.4		+26	+990	453,368	2469,979
1131	660		"	"	12.4	BH	-3.3	-15.7		1437.6		+17	+660	453,359	2469,694
1132	330		"	"	11.2	91° -	-5.8	-17.0		1436.3		+9	+330	453,351	2469,314
1133	0				5.4	-	-5.4		1447.9		X	0	0	453,392	2468,984
1134	330		262° 05'	+6.6°	9.4	-	-9.4		1443.9			-8	-330	453,334	2468,654
1135	660		"	"	8.8	91° -	-11.5	-20.3		1433.0		-15	-660	453,327	2468,324
1136	990		"	"	7.9	91° -	-17.3	-25.2		1428.1		-23	-990	453,344	2467,994
1137	1320		262° 05'	+6.6°	3.4	91° -	-23.0	-26.4		1426.9	TP	-30	-1319	453,312	2467,668
1137	1320				14.9	90° 30'	-11.5	-26.4			TP				
	2310		81° 57' +180°	+6.6°	+10.7	89° -	-40.3	-29.6	1397.3		BS	-58	-2309		
	2310				+5.2	89° 8'	-34.9	-29.7			BS				
1138	1980		81° 57'	+6.6°	4.6	89° 20'	+23.0	+18.5	1415.8			+50	+1979	453,304	2467,339
1139	1650		"	"	9.9	89° 50'	+4.8	-5.1	1392.2			+42	+1699	453,296	2467,009
1140	1320		"	"	11.8	89° 54'	+2.3	-9.5	1387.8			+33	+1320	453,287	2466,680

453,355 + 2,470,700
T-rd (north) 1/2, 1908

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE: 5/6/81
 AREA: Kansas
 INSTRUMENT MAN: G. Cotcamp
 TOPO MAP: Wheaton
 STATE: Kansas
 COUNTY: Marshall
 ROD MAN: T. Grady
 PARTY NUMBER: 6834
 TWP: 5S/16E
 RANGE: 10E/9E
 PPM:
 NOTES CHECKED BY: Gwl. rlv
 LINE NO.: 1
 PAGE: 31
 PARTY MANAGER: L. Davis

STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS
														Y	X	
									1397.3							
1141	990		81°57'	+6.6°	3.8	TH	+5.0	+1.2		1398.5		+25	+990	453,271	2,466,350	
1142	660		" "	"	5.9	-		-5.9		1391.4		+17	+660	453,271	2,466,020	
1143	330		" "	"	11.0	91°	-5.8	-16.8		1380.5		+8	+330	453,262	2,465,690	
1144	0				5.4	-		-5.4		1391.9	π	0	0	453,249	2,465,360	horiz. coord. y = +7' x = +44'
1145	330		261°58'	+6.6°	8.8	-		-8.8		1388.5		-8	-330	453,246	2,465,030	453,235 + 2,469,930 T-rd (south) el. 1387
TP	430		260°50'	+6.6°	12.0	-		-12.0		1385.3		-19	-430	453,235	2,464,930	
1146	660		261°58'	+6.6°	10.6	90°30'	-5.8	-16.4		1380.9		-17	-660	453,227	2,464,700	
1147	990		" "	"	10.8	91°20'	-23.0	-33.8		1363.5		-25	-990	453,229	2,464,370	
1148	1320		" "	"	22.6	91°	-23.0	-45.6		1351.7		-33	-1320	453,221	2,464,040	
1149	1650		" "	"	2.6	91°	-28.8	-31.4		1365.9		-41	-1649	453,213	2,463,711	
1150	1980		" "	"	7.2	90°40'	-23.0	-30.2		1367.1		-50	-1979	453,204	2,463,381	
1151	2310		" "	"	3.0	90°40'	-26.9	-29.9		1367.4		-58	-2309	453,196	2,463,051	
1152	2640		261°57'38"	+6.8°	15.0	-		-15.0		1382.3	TP	-57	-2639	453,197	2,462,721	
1152	2640				1.8	BH	-13.2	-15.0			TP					
	990		81°48' + 180°	+6.8°	+6.9	89°40'	-5.8	+1.1	1383.4		BS	-24	-990			
	990				+9.7	89°30'	-8.6	+1.1			BS					
1153	660		81°48'	+6.8°	5.1	TH	+3.3	-1.8		1381.6		+16	+660	453,189	2,462,391	
1154	330		" "	"	0.2	TH	+1.7	+1.5		1384.9		+8	+330	453,181	2,462,061	
1155	0				5.4	-		-5.4		1378.0	π	0	0	453,173	2,461,731	
1155	330		262°13'	+6.8°	12.6	92°	-11.5	-24.1		1359.3		-6	-330	453,167	2,461,401	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/7/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY G.W.C. <i>sw</i>	LINE NO. 1	PAGE 32
AREA Kansas	TOPO MAP Wheaton / Frankfort SW	STATE Kansas	COUNTY Marshall	TWP 55/65	RANGE 10E/9E	PPM
			PARTY MANAGER L. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1383.4					
1157	660		262° 13'	+6.8°	8.2	92° -	-23.0	-31.2		1352.2		-11	-660	453,162 2,461,071
1158	990		" "	"	4.8	91° 30'	-25.9	-30.7		1352.7		-17	-990	453,156 2,460,741
1159	1320		" "	"	6.8	91° 30'	-34.5	-41.3		1342.1		-23	-1320	453,150 2,460,411
1160	1650	1649.4	262° 13' 20"	+6.8°	6.5	91° 30'	-43.2	-49.7			TP	-28	-1649.4	453,145 2,460,984
1160	1650				14.1	91° 14'	-35.5	-49.6		1333.8	TP			
	2640		82° 09' 20" + 180°	+6.8°	+2.8	TH	-13.2	-10.4			BS	-48	-2640.0	
	2640				+5.1	89° 40'	-15.4	-10.3	1323.5		BS			
1161	2310		82° 09'	+6.8°	9.1	TH	+11.6	+2.5		1326.0		+42	+2310	453,139 2,459,756
<u>1161</u>	2102		82° 26'	+6.8°	6.4	-	-	-6.4		1317.1		+28	+2102	453,125 2,459,548 Trd (north)
1162	1980		82° 09'	+6.8°	11.2	-	-	-11.2		1312.3		+36	+1980	453,133 2,459,426
1163	1650		" "	"	10.2	BH	-8.3	-18.5		1305.0		+30	+1650	453,127 2,459,096
1164	1320		" "	"	11.8	90° 30'	-11.5	-23.3		1300.2		+24	+1320	453,121 2,458,766
1165	990		" "	"	11.0	91° -	-17.3	-28.3		1295.2		+18	+990	453,115 2,458,436
1166	660		" "	"	11.1	91° 30'	-17.3	-28.4		1295.1		+12	+660	453,109 2,458,106 Wheaton Quad.
1167	330		" "	"	10.5	91° -	-5.8	-16.3		1307.2		+6	+330	453,103 2,457,776 Frankfort SW Quad.
1168	0				5.9	-	-	-5.4		1318.1	π	0	0	453,097 2,457,446 ↓
1169	330		262° 19'	+6.8°	11.3	-	-	-11.3		1312.2		-5	-330	453,092 2,457,116
1170	660		" "	"	11.1	91° -	-11.5	-22.6		1300.9		-10	-660	453,087 2,456,786
1171	990		" "	"	8.0	91° 30'	-25.9	-33.9		1289.6		-15	-990	453,082 2,456,456
1172	1320		" "	"	8.3	91° 50'	-42.2	-50.5		1273.0		-20	-1320	453,077 2,456,126

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/7/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY GWC rlu	LINE NO. 1	PAGE 33
AREA Kansas	TOPO MAP FRANKFORT SW	STATE Kansas	COUNTY Marshall	TWP 55/65	RANGE 9E	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1323.5					
1173	1650		262°19'	+6.8°	11.8	91°50'	-52.8	-64.6		1258.9		-25	-1650	453,072 2,455,796
1174	1980	12-0	262°19'	+6.8°	2.5	91°50'	-63.3	-65.8			TP	-31-2	-1979+3	453,064 2,455,470
1174	1980				13.8	91°30'	-51.8	-65.6		1257.9	TP			
	1318		78°22' +180°	+6.8°	+3.8	TH	-6.6	-2.8	1255.1		BS	-111-2	-1313+3	
	1318				+4.9	89°40'	-7.7	-2.8			BS			
1175	988		78°22'	+6.8°	4.0	TH	+4.9	+0.9		1256.0		+83	+984	453,034 2,455,144
1176	660		80°27'	+6.8°	0.2	-	-	-0.2		1254.9		+32	+659	452,983 2,454,819
±	622		82°02'	+6.8°	0.1	-	-	-0.1		1255.0		+13	+622	452,964 2,454,782
1177	330		83°12'	+6.8°	1.5	-	-	-1.5		1253.6		0	+330	452,951 2,454,990
≡	313		83°12'	+6.8°	1.5	-	-	-1.5		1253.6		0	+313	452,951 2,454,473
1178	0				5.4	-	-	-5.4		1249.7	π	0	0	452,951 2,454,160
1179	330		270°07'	+6.8°	9.0	-	-	-9.0		1246.1		+40	-328	452,991 2,453,832
1180	660		" "	"	8.1	-	-	-8.1		1247.0		+79	-655	453,030 2,453,505
1181	990		267°46'	+6.8°	9.9	-	-	-9.9		1245.2	TP	+79-2	-987.3	453,028 2,453,176
1181	990				14.9	TH	+5.0	-9.9			TP			
	2130	2127.4	81°13' +180°	+6.8°	+4.3	92°50'	+105.2	+109.5	1354.7		BS	-74	-2126.1	
	2130				+14.2	92°34'	+95.3	+109.5			BS			
1182	1800		81°13'	+6.8°	10.8	93°10'	-99.3	-110.1		1244.6		+62	+1799	453,016 2,452,852
1183	1470		" "	"	8.3	93°40'	-93.8	-102.1		1252.6		+51	+1469	453,005 2,452,522
1184	1140		" "	"	12.0	93°40'	-72.8	-84.8		1269.9		+39	+1139	452,993 2,452,192

452985 + 2454,795
Trd (north)

bridge e.l. 1255.

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE		
5/7/81		G. Cotcamp		T. Grady		6834		Guc rlu		1		37		
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER		
Kansas		FRANK FORT SW		Kansas		Marshall		9 E				L. Davis		
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1354.7					
1185	810		81° 13'	+6.8°	10.3	93° 40'	-51.7	-62.0		1292.7		+28	+810	452,982 2,451,863
1186	480		" "	"	10.2	93° -	-25.1	-35.3		1319.4		+17	+480	452,971 2,451,533
1187	150		" "	"	11.4	-		-11.4		1343.3		+5	+150	452,959 2,451,203
π	0				5.4	-		-5.4		1349.3	π	0	0	452,954 2,451,053 split sta. - hill
1188	180		262° 07'	+6.8°	3.3	-		-3.3		1351.4		-3	-180	452,951 2,450,873
1189	510		" "	"	12.0	BH	-2.6	-14.6		1340.1		-10	-510	452,944 2,450,543
1190	840		" "	"	10.1	91° -	-14.7	-24.8		1329.9		-16	-840	452,938 2,450,213
1191	1170		" "	"	10.1	-		-10.1		1344.6		-22	-1170	452,932 2,449,883
1192	1500		" "	"	12.3	-		-12.3		1342.4		-28	-1500	452,926 2,449,553 horiz. correct. y = -6', x = +19'
1193	1830		" "	"	1.6	-		-1.6		1353.1		-35	-1830	452,919 2,449,223 452,905 + 2,449,085
71	1972		261° 46'	+6.8°	7.5	TH	+9.9	+2.4		1357.1	TP	-49	-1971.33	452,905 2,449,085 Intersect. el 1358
71	1972				5.7	89° 46'	+8.0	+2.3			TP			
	1715	1714	171° 24' +180°	+7.1°	+10.3	88° -	-59.8	-49.5	1307.6		BS	+1713	-45	Note - 5,035 (stadia) offset
	1715				+5.3	88° 10'	-54.8	-49.5			BS			
π	0				5.4	-		-5.4		1302.2	π	0	0	454,618 2,449,040 north between
TP	1550		350° 39' 40"	+7.1°	5.3	89° -	+27.0	+21.7		1329.3	TP	+1549	-61	456,167 2,448,979 1193 + 1194.
TP	1550				12.7	88° 44'	+34.3	+21.6			TP			↓
	1080		171° 40' +180°	+7.1°	+14.3	-		+14.3	1343.6		BS	+1080	-23	
	1080				+8.9	BH	+5.4	+14.3			BS			
π	0				5.4	-		-5.4		1338.2	π	0	0	457,347 2,448,956

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	INSTRUMENT MAN	ROD MAN	PARTY NUMBER	NOTES CHECKED BY	LINE NO.	PAGE
5/11/81	G. Cotcamp	T. Grady	6834	GWC ulw	1	35
AREA	TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM
Kansas	Frankfort SW	Kansas	Marshall	55	9E	
					PARTY MANAGER	
					L. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1343.6					
TP	690		349°59'20"	+7.1°	13.2	90°30'	-6.0	-19.2		1329.4	TP	+689	-35	457,936 2,448,921
TP	690				14.4	90°24'	-4.8	-19.2			TP			
	518	516.7	86°52'+180°	+7.1°	+2.5	86°-	-36.0	-33.5	1290.9		BS	+36	-516	
	518				+0.9	86°10'	-34.6	-33.7			BS			
1194	330		85°53'	+7.1°	138	88°-	+11.5	-2.3		1288.6		-17	+330	457,955 2,448,735 in field
1195	0				5.4	-		-5.4		1285.5	π	0	0	457,972 2,448,405 "
1196	320	316	294°59'	+7.1°	144	99°-	-49.9	-63.8		1227.1	TP	+168	-268	458,140 2,448,137 dict road
1196	320				150	98°59'	-48.9	-63.9			TP			↓
	1320		82°27'44"+180°	+7.1°	+9.1	90°48'	+18.4	+27.5			BS	-10	-1320	
	1320				+6.9	96°54'	+20.7	+27.6	1254.7		BS			
1197	990		82°28'	+7.1°	5.7	91°30'	-25.9	-31.6		1223.1		+7	+990	458,137 2,447,807
1198	660		" "	"	8.0	92°-	-23.0	-31.0		1223.7		+5	+660	458,135 2,447,477
1199	538		83°03'	+7.1°	10.4	92°-	-18.8	-29.2		1225.5		-1	+538	458,129 2,447,355 bridge el 1228
1199	330		82°28'	+7.1°	11.7	92°30'	-14.4	-26.1		1228.6		+3	+330	458,133 2,447,147
1200	0				5.4	-		-5.4		1249.3	π	0	0	458,130 2,446,817
1201	330		262°12'	+7.1°	4.5	88°-	+11.5	+7.0		1261.7		-9	-330	458,126 2,446,587
1202	660		" "	"	10.3	88°-	+23.0	+12.7		1267.4		-8	-660	458,122 2,446,157
1203	990		" "	"	6.8	88°30'	+25.9	+19.1		1273.8		-12	-990	458,118 2,445,827
1204	1320		" "	"	8.9	88°30'	+34.5	+25.6		1280.3		-16	-1320	458,114 2,445,497
1205	1650		" "	"	8.6	88°30'	+43.2	+34.6		1289.3		-20	-1650	458,110 2,445,167

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	5/11/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6839	NOTES CHECKED BY	Gwc	LINE NO.	1	PAGE	36
AREA	Kansas	TOPO MAP	Frankfort SW	STATE	Kansas	COUNTY	Marshall	TWP	55	RANGE	9E	PPM	
												PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1254.7					
1206	1980	1979.3	262° 11' 38"	+7.1°	5.7	88° 30'	+51.8	+46.1		1300.8	TP	-24	-1979	458,106 2,444,838
1206	1980				13.6	88° 16'	+59.9	+46.3			TP			
	1650		81° 32' 30" +180°	+7.1°	+11.3	-		+11.3	1312.1		BS	-39	-1650	
	1650				+3.0	04	+8.3	+11.3			BS			
1207	1320		81° 33'	+7.1°	7.9	04	-6.6	-14.5		1297.6		+31	+1320	458,098 2,444,508
1208	990		" "	"	9.4	-		-9.4		1302.7		+23	+990	458,090 2,444,178
1209	660		" "	"	7.2	91° -	-11.5	-18.7		1293.4		+16	+660	458,083 2,443,898
1210	428		80° 15'	+7.1°	12.3	91° -	-7.5	-19.8		1292.3		+20	+427	458,087 2,443,615 458,095 + 2,443,670 T-rd (south) el 1295
1210	330		81° 33'	+7.1°	12.4	91° -	-5.8	-18.2		1293.9		+8	+330	458,075 2,443,518
1211	0				5.4	-		-5.4		1306.7	π	0	0	458,067 2,443,188
1212	330		262° 32'	+7.1°	2.2	89° -	+5.8	+3.6		1315.7		-2	-330	458,065 2,442,858
1213	660		" "	"	4.0	89° -	+11.5	+7.5		1319.6		-4	-660	458,063 2,442,528
1214	990		" "	"	4.1	88° -	+34.5	+30.4		1342.5		-6	-990	458,061 2,442,198
1215	1320	1318.6	262° 32'	+7.1°	5.1	87° 20'	+61.3	+56.2			TP	-8 -2	-1319	458,057 2,441,869
1215	1320				8.9	87° 10'	+65.2	+56.3		1368.4	TP			
	990		81° 49' +180°	+7.1°	+14.0	91° 14'	+21.3	+35.3			BS	-19 -2	-990	
	990				+12.4	91° 20'	+23.0	+35.4	1403.8		BS			
1216	660		81° 49'	+7.1°	22.4	91° 10'	-13.4	-35.8		1368.0		+12	+660	458,048 2,441,539
1217	330		" "	"	12.2	-		-12.2		1391.6		+6	+330	458,042 2,441,209
1218	0				5.4	-		-5.4		1398.4	π	0	0	458,036 2,440,879

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/11/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY Gwl. edw	LINE NO. 1	PAGE 37
AREA Kansas	TOPO MAP Frankfort SW	STATE Kansas	COUNTY Marshall	TWP 55	RANGE 9E	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1403.8					
1219	330		262°05'	+7.3°	12.5	91°-	-5.8	-18.3		1385.5		-4	-330	458,032 2,440,549
1220	660		" "	"	2.0	-		-2.0		1401.8		-7	-660	458,029 2,440,219
1221	990		262°05'	+7.3°	7.9	89°20'	+11.5	+3.6		1407.4	TP	-11-2	-990	458,023 2,439,889
1221	990				6.2	89°26'	+9.8	+3.6			TP			
	990		81°46'+180°	+7.3°	+9.0	-		+9.0	1416.4		BS	-16-2	-990	
	990				+13.9	TH	-5.0	+8.9			BS			
1222	660		81°46'	+7.3°	8.8	92°-	-23.0	-31.8		1384.6		+11	+660	458,016 2,439,559
1223	330		" "	"	11.1	91°-	-5.8	-16.9		1399.5		+5	+330	458,010 2,439,229
1224	0				5.4	-		-5.4		1411.0	π	0	0	458,005 2,438,899
1225	330		260°38'	+7.3°	10.9	92°-	-11.5	-22.4		1394.0		-12	-330	457,993 2,438,569
1226	660		" "	"	10.9	91°-	-11.5	-22.4		1394.0		-24	-660	457,981 2,438,239
1227	990		260°38'	+7.3°	7.3	-		-7.3		1409.1	TP	-36-2	-989	457,967 2,437,910
1227	990				12.3	TH	+5.0	-7.3			TP			
	1980		81°58'+180°	+7.3°	+5.3	-		+5.3			BS	-25-2	-1980	
	1980				+14.7	89°44'	-9.2	+5.5	1414.6		BS			
1228	1650		81°58'	+7.3°	10.4	BH	-8.3	-18.7		1395.9		+21	+1650	457,961 2,437,580
1229	1320		" "	"	12.4	91°-	-23.0	-35.4		1379.2		+17	+1320	457,957 2,437,250
1230	990		" "	"	10.8	91°-	-17.3	-28.1		1386.5		+13	+990	457,953 2,436,920
1231	660		" "	"	21.2	91°-	-11.5	-32.7		1381.9		+8	+660	457,948 2,436,590
1232	330		" "	"	12.3	-		-12.3		1402.3		+4	+330	457,944 2,436,260

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-475

Geosource Inc.

DATE 5/11/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY Guc. <i>new</i>	LINE NO. 1	PAGE 38
AREA Kansas	TOPO MAP Frankfort SW	STATE Kansas	COUNTY Marshall	TWP 5S	RANGE 9E	PPM
PARTY MANAGER L. Davis						

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1414.6					
1233	0				5.4	-		-5.4		1409.2	π	0	0	457,990 2,435,930
1234	330		261° 59'	+73°	12.7	91° -	-5.8	-18.5		1396.1		-4	-330	457,926 2,435,600
1235	660		" "	"	7.1	-		-7.1		1407.5		-8	-660	457,932 2,435,270
1236	990		" "	"	10.5	-		-10.5		1404.1		-12	-990	457,926 2,434,990
1237	1320		" "	"	7.2	-		-7.2		1407.4		-17	-1320	457,923 2,434,610
1238	1650		261° 59' 20"	+73°	8.7	-		-8.7			TP	-20-2	-1650	457,918 2,434,281
1238	1650				6.7	90° 4'	-1.9	-8.6		1406.0	TP			
	660		82° 18' +180°	+7.3°	+0.6	89° -	-11.5	-10.9	1395.1		BS	-5-2	-660	
	660				+4.5	88° 46'	-15.4	-10.9			BS			
1239	330		82° 18'	+7.3°	3.3	89° -	+5.8	+2.5		1397.6		+2	+330	457,913 2,433,952
1240	0				5.4	-		-5.4		1389.7	π	0	0	457,911 2,433,622 <i>horiz. curved. Y=-16</i>
1241	330		262° 06'	+7.3°	14.2	91° -	-5.8	-20.0		1375.1		-3	-330	457,908 2,433,292 <i>X=+2</i>
	522		260° 57'	+7.3°	13.7	91° 10'	-10.6	-24.3		1370.8		-16	-522	457,895 2,433,100 <i>T-intersect. el. 1372.0</i>
	522				10.7	91° 30'	-13.7	-24.4						
														<i>Note - 2,660' (scaled offset north between 1241 and 1242.</i>
										1388.0	π			460,545 2,433,070 <i>T-intersect. el. 1388.0</i>
	1458		82° 22' 40" +180°	+7.1°	+6.8	TH	-7.3	-0.5	1381.5		BS	-13-1	-1458	
	1458				+3.8	89° 50'	-4.2	-0.4			BS			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	5/12/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	G.W.C. <i>nmw</i>	LINE NO.	1	PAGE	39	
AREA	Kansas	TOPO MAP	Frankfort SW	STATE	Kansas	COUNTY	Marshall	TWP	55	RANGE	8E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1387.5					
1242	1320		82° 03'	+7.1°	5.9	-	-5.9		1381.6			+20	+1320	460,551 2,432,932
1243	990		" "	"	6.0	91°	-17.2	-23.3	1364.2			+15	+990	460,546 2,432,602
1244	660		" "	"	7.4	92°	-22.0	-30.4	1357.1			+10	+660	460,541 2,432,272
1245	330		" "	"	11.1	91°	-5.8	-16.9	1370.6			+5	+330	460,536 2,431,942
1246	0				5.4	-	-5.4		1382.1	TP		0	0	460,531 2,431,612
1247	330		262° 17'	+7.1°	8.7	92°	-11.5	-20.2	1367.3			-4	-330	460,527 2,431,282
1248	660		" "	"	7.3	92°	-25.0	-20.8	1357.2			-7	-660	460,524 2,430,952
1249	990		" "	"	7.9	91° 30'	-25.9	-33.8	1353.7			-11	-990	460,520 2,430,622
1250	1320		" "	"	4.5	91° 30'	-34.5	-39.0	1348.5			-14	-1320	460,517 2,430,292
1251	1650		" "	"	8.0	91° 30'	-33.2	-51.2	1336.3			-18	-1650	460,513 2,429,962
1252	1980	1979.3	262° 17' 10"	+7.1°	13.2	91° 30'	-51.8	-65.0	1322.5	TP		-21.1	-1979	460,509 2,429,633
1252	1980				11.0	91° 34'	-54.1	-65.1			TP			
	1320		82° 01' +180°	+7.1°	+8.4	-	-8.4		1330.9	BS		-20.1	-1320	
	1320				+15.0	TH	-6.6	-8.4		BS				
1253	990		82° 01'	+7.1°	12.9	-	-12.9		1318.0			+15	+990	460,503 2,429,303
1254	660		" "	"	13.0	90° 30'	-5.8	-18.8	1312.1			+10	+660	460,498 2,428,973
1255	330		" "	"	6.6	-	-6.6		1324.3			+5	+330	460,493 2,428,643
1256	0				5.4	-	-5.4		1325.5	TP		0	0	460,488 2,428,313
1257	330		262° 18'	+7.1°	12.1	BH	-1.7	-13.8	1317.1			-3	-330	460,485 2,427,983
TP	523		261° 47'	+7.1°	12.8	BH	-2.6	-15.4	1315.5			-10	-523	460,478 2,427,790 Trd (see A1) el. 1315

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
5/12/81		G. Cotcamp		T. Grady		6834		GWC <i>new</i>		1	40					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Frankfort SW	Kansas	Marshall	55	8E		L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1330.9							
1258	660		262°18'	+7.1°	8.0	-		-8.0		1322.9		-7	-660	460,481	2,427,653	
1259	990		" "	"	4.0	89°-	+17.3	+13.3		1344.2		-10	-990	460,478	2,427,323	
1260	1320		" "	"	6.0	88°40'	+30.7	+24.7		1355.6		-14	-1320	460,474	2,426,983	
1261	1650		" "	"	5.7	88°30'	+48.0	+42.3		1373.2		-17	-1650	460,471	2,426,663	
1262	1980		" "	"	6.1	88°20'	+57.6	+51.5		1382.4		-21	-1980	460,467	2,426,333	
1263	2310	2309.1	262°18'	+7.1°	14.6	88°24'	+64.5	+49.9		1380.8	TP	-24-2	-2309.2	460,462	2,426,006	
1263	2310				13.3	88°26'	+63.1	+49.8			TP					
	1650		81°50'20"+180°	+7.1°	+9.5	89°-	-28.8	-19.3	1361.5		OS	-31-2	-1649.2			
	1650				+4.7	89°10'	-24.0	-19.3			BS					
1264	1320		81°50'	+7.1°	3.9	89°30'	+11.5	+7.6		1369.1		+25	+1320	460,454	2,425,679	
1265	990		" "	"	4.9	89°30'	+8.6	+3.7		1365.2		+18	+990	460,447	2,425,349	
1266	660		" "	"	3.8	-		-3.8		1357.7		+12	+660	460,441	2,425,019	
1267	330		" "	"	3.0	-		-3.0		1358.5		+6	+330	460,435	2,424,689	
1268	0		" "	"	5.4	-		-5.4		1356.1	A	0	0	460,429	2,424,359	
1269	330		262°09'	+7.1°	6.5	92°-	-11.5	-18.0		1343.5		-4	-330	460,425	2,424,029	
B.M.	640		259°01'	+7.1°	5.3	92°-	-22.3	-27.6		1333.9		-43	-639	460,386	2,423,720	el 1334 U.S.G.S. Bigelow 199
1270	660		262°09'	+7.1°	6.6	92°-	-23.0	-29.6		1331.9		-9	-660	460,420	2,423,699	
1271	990		" "	"	7.3	92°-	-34.5	-41.8		1319.7		-13	-990	460,416	2,423,369	
1272	1320		" "	"	2.0	91°-	-23.0	-25.0		1336.5		-17	-1320	460,412	2,423,039	
1273	1650		" "	"	2.3	-		-2.3		1359.2		-22	-1650	460,407	2,422,709	

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE				
5/12/81		G. Cotcamp		T. Grady		6839		TG <i>rlw</i>			1	41				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Kansas		BLUE RAPIDS SE		Kansas		Marshall		5S	8E		L. Davis					
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y	X
									1361.5							
TP	1910		261°50'20"	+7.1°	8.6	TH	+9.1	+0.5		1362.0		-34	-1810	460,395	2,422,519	460,390 + 2,422,535. T-rod (south) @ 1361
1274	1980		262°09'	+7.1°	12.9	TH	+9.9	-3.0		1358.5	TP	-26	-1980.3	460,403	2,422,382	
1274	1980				8.8	89°50'	+5.8	-3.0			TP					
	2310		81°57'20"+180°	+7.1°	+12.7	89°20'	-26.9	-14.2	1344.3		BS	-38	-2310.3			
	2310				+13.9	89°16'	-28.2	-14.3			BS					
1275	1980		81°57'	+7.1°	2.9	89°20'	+23.0	+20.1		1364.4		+33	+1980	460,398	2,422,050	
1276	1650		" "	"	12.2	89°20'	+19.2	+7.0		1351.3		+27	+1650	460,392	2,421,725	
1277	1320		" "	"	3.2	-	-	-3.2		1341.1		+22	+1320	460,387	2,421,395	
1278	990		" "	"	11.3	BH	-5.0	-16.3		1328.0		+16	+990	460,381	2,421,065	
1279	660		" "	"	12.4	91°-	-11.5	-23.9		1320.4		+11	+660	460,376	2,420,735	
1280	330		" "	"	9.7	91°-	-5.8	-15.5		1328.8		+5	+330	460,370	2,420,405	
1281	0				5.4	-	-	-5.4		1338.9	π	0	0	460,365	2,420,075	
1282	330		262°04'	+7.1°	9.5	92°-	-11.5	-21.0		1323.3		-5	-330	460,360	2,419,745	
1283	660		" "	"	13.1	91°-	-11.5	-24.6		1319.7		-10	-660	460,355	2,419,415	
1284	990		" "	"	10.7	90°30'	-8.6	-19.3		1325.0		-14	-990	460,351	2,419,085	
1285	1320		262°04'	+7.1°	9.6	90°30'	-11.5	-21.1		1323.2	TP	-19	-1320.3	460,346	2,418,758	
1285	1320				5.8	90°40'	-15.4	-21.2			TP					
	990		81°47'20"+180°	+7.1°	+8.4	85°30'	-77.4	-69.0	1254.2		BS	-19-2	-990.3			
	990				+6.7	85°36'	-75.7	-69.0			BS					
1281	160		81°47'	+7.1°	0.8	86°-	+45.9	+45.1		1299.3		+13	+660	460,338	2,418,431	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
5/12/81		G. Cotcamp		T. Grady		6834		TG JAW		1		42			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Franklin		Kansas		Marshall		55		8E				L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1259.2						
1287	330		81° 47'	+7.1°	4.7	87° -	+17.2	+12.5		1266.7		+6	+330	460,331	2,418,101
1288	0				5.4	-		-5.4		1248.8	π	0	0	460,325	2,417,711
1289	330		262° 49'	+7.1°	4.2	89° -	+5.8	+1.6		1255.8		0	-330	460,325	2,417,441
IF	547	546.0	261° 54'	+7.1°	1.9	86° 40'	+31.8	+29.9		1284.1		-10	-546	460,315	2,417,225
IF	547				5.0	86° 20'	+34.9	+29.9							
															Note-5,280' (scaled) offset north
7										1236.0				465,585	2,417,130
	442		81° 31' +180°	+7.1°	+6.5	89° -	-7.7	-1.2	1234.8		BS	-11	-442.1		90° bend el. 1236.0
	442				+3.9	89° 20'	-5.1	-1.2			BS				
1290	330		80° 42'	+7.1°	3.1	89° -	-5.8	-8.9		1225.9		+13	+330	465,587	2,417,019
1291	0				5.4	-		-5.4		1229.4	π	0	0	465,574	2,416,689
1292	330		261° 53'	+7.1°	10.1	92° -	-11.5	-21.6		1213.2		-6	-330	465,568	2,416,359
1293	660		"	"	7.6	92° -	-23.0	-30.6		1204.2		-12	-660	465,562	2,416,029
1294	990		261° 53'	+7.1°	5.7	92° -	-34.5	-40.2		1194.6	TP	-18	-989.1	465,556	2,415,701
1294	990				14.3	91° 30'	-25.9	-40.2			TP				
	660		81° 55' +180°	+7.1°	+2.2	88° 30'	-17.3	-15.1	1179.5		BS	-11	-660.1		
	660				+0.3	88° 40'	-15.4	-15.1			BS				
1295	330		81° 55'	+7.1°	4.8	89° -	+5.8	+1.0		1180.5		+6	+330	465,551	2,415,372
1296	0				5.4	-		-5.4		1174.1	π	0	0	465,545	2,415,042

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
5/13/81		G. Cotcamp		T. Grady		6834		TG. <i>slw</i>		1	43						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Blue Rapids SE		Kansas	Marshall		55	8E		L. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1179.5								
1297	330		262°30'	+7.1°	11.1	91°-	-5.8	-16.9		1162.6		-2	-330	465,513	3,414,712	465,540 + 2,974,570	
L	534		261°24'	+7.1°	14.7	91°-	-9.3	-24.0		1155.5	TP	-14	-534	465,531	3,414,509	90° bend north	
L	534				10.0	91°30'	-14.0	-24.0			TP						
	1068	1067.3	170°28'40" +180°	+7.1°	+5.0	92°06'	+39.1	+44.1	1199.6		BS	+1066	-45			Note - 1,327 (stadia)	
	1068				+14.4	91°36'	+29.8	+44.2			BS					offset north	
π	0				5.4	-		-5.4		1194.2	π	0	0	466,597	2,414,465		
∩	259		352°10'	+7.1°	9.1	-		-9.1		1190.5	TP	+259	-3	466,856	2,414,463	466,865 + 2,414,470	90° bend west
∩	259				10.4	TH	+1.3	-9.1			TP						
	455		81°34' +180°	+7.1°	+9.3	91°-	+7.9	+17.2	1207.7		BS	-11	-455				
	455				+14.9	OH	+2.3	+17.2			BS						
1298	330		81°34'	+7.1°	12.9	92°-	-11.5	-24.4		1183.3		+8	+330	466,853	2,414,339		
1299	0				5.4	-		-5.4		1202.3	π	0	0	466,895	2,414,009		
1300	330		262°11'	+7.1°	10.1	91°-	-5.8	-15.9		1191.8		-4	-330	466,841	2,413,679		
1301	660		262°11'	+7.1°	6.3	92°-	-23.0	-29.3		1178.4	TP	-8	-660	466,837	2,414,350		
1301	660				12.1	91°30'	-17.3	-29.4			TP						
	858	857.2	81°42' +180°	+7.1°	+8.1	87°30'	-37.4	-29.3	1149.1		BS	-18	-857				
	858				+3.1	87°30'	-32.4	-29.3			BS						
1302	528		81°42'	+7.1°	4.5	89°-	+9.2	+4.7		1153.8		+11	+528	466,820	2,413,022		
1303	198		"	"	6.8	-		-6.8		1142.3		+4	+198	466,823	2,412,692		
π	0				5.4	-		-5.4		1143.7	π	0	0	466,823	2,412,494	split sta. - hill	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
5/13/81		G. Cotcamp		T. Grady		6834		TG		1	44				
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Blue Rapids SE	Kansas	Marshall	55	8E		L. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1149.1						
1304	132		263°53'	+7.1°	11.2	93°	-6.9	-18.1		1131.0		+2	+132	466,821	2,412,626
1305	463	462	263°53'	+7.1°	13.0	93°36'	-29.0	-42.0		1107.1	TP	+8	-462	466,827	2,412,033
1305	463				12.2	93°42'	-29.8	-42.0			TP				
	290		145°20' +180°	+7.1°	+5.6	91°	+5.1	+10.7	1117.8		BS	+257	-134		
	290				+6.5	90°50'	+4.2	+10.7			BS				
π	0				5.4	-		-5.4		1112.4	π	0	0	467,084	2,411,900
1306	40		284°39'	+7.1°	5.4	-		-5.4		1112.4		+15	-37	467,099	2,411,863
TP	352		271°25'	+7.1°	5.0	92°10'	-13.3	-18.3		1099.5	TP	+52	-348	467,136	2,411,553
TP	352				6.0	92°	-12.3	-18.3			TP				east edge of river
	358		89°06' +180°	+7.1°	+3.2	-		+3.2	1102.7		BS	+39	-356		
	358				+5.0	TH	-1.8	+3.2			BS				
1307	330		89°06'	+7.1°								-36	+328	467,139	2,411,525
1308	0				5.4	-		-5.4		1097.3	π	0	0	467,175	2,411,197
1309	330		245°26'	+7.1°	6.2	-		-6.2		1096.5	TP	-99	-315	467,076	2,410,882
1309	330				4.6	BH	-1.7	-6.3			TP				jeep trail
	118		79°09' +180°	+7.1°	+6.6	-		+6.6	1103.1		BS	-8	-118		↓
	118				+6.0	BH	+0.6	+6.6			BS				
π	0				5.4	-		-5.4		1097.7	π	0	0	467,068	2,410,764
1310 TP	161		288°55'	+7.1°	5.3	TH	+0.8	-4.5		1098.6	TP	+71	-145	467,139	2,410,619
TP	161				3.7	AH	-0.8	-4.5			TP				

middle of river - no rod reading available

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
5/20/81		G. Cotcamp		T. Grady		6837		TG <i>slw</i>		1	45						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Blue Rapids SE		Kansas	Marshall		5S	8E		L. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
TP										1098.6							
	278		128° 28' +180°	+7.1°	+7.4	8 -		+7.4	1106.0		BS	+199	-195				
	278				+8.8	TH	-1.4	+7.4			BS						
1310	219		128° 34'	+7.1°	5.9	-		-5.9		1100.1		-157	+153	467,181	2,410,577		
π	0				5.4	-		-5.4		1100.6	π	0	0	467,338	2,410,424		
1311	111		333° 09'	+7.1°	4.7	-		-4.7		1101.3		+104	-38	467,442	2,410,386		
TP	370		334° 30'	+7.1°	4.6	-		-4.6		1101.4	TP	+351	-117	467,689	2,410,307		
TP	370				6.4	TH	+1.9	-4.5			TP						
	260		165° 27' +180°	+7.1°	+5.5	-		+5.5	1106.9		BS	+258	-34				
	260				+6.8	TH	-1.3	+5.5			BS						
1312	181		165° 40'	+7.1°	5.4	-		-5.4		1101.5		-180	+23	467,767	2,410,296		
π	0				5.4	-		-5.4		1101.5	π	0	0	467,947	2,410,273		
1313	133		299° 49'	+7.1°	5.0	-		-5.0		1101.9		+80	-106	468,027	2,410,167		
TP	311		297° 41'	+7.1°	5.2	-		-5.2		1101.7	TP	+177	-255	468,124	2,410,018		
TP	311				6.7	TH	+1.6	-5.1			TP						
	1463		82° 33' +180°	+7.1°	+5.9	-		+5.9	1107.6		BS	-9	-1463				
	1463				+3.3	90° 6'	+2.6	+5.9			BS						
1314	1320		82° 33'	+7.1°	5.5	-		-5.5		1102.1		+8	+1320	468,123	2,409,875		
1315	990		" "	"	5.1	-		-5.1		1102.5		+6	+990	468,121	2,409,545		
1316	660		" "	"	5.8	-		-5.8		1101.8		+4	+660	468,119	2,409,215		
1317	320		" "	"	8.7	-		-8.7		1098.9		+2	+330	468,117	2,408,885		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/20/81	INSTRUMENT MAN G. Cotcamp		ROD MAN T. Grady		PARTY NUMBER 6834		NOTES CHECKED BY GWC' rlu		LINE NO. 1	PAGE 46
AREA Kansas	TOPO MAP Blue Rapids SE	STATE Kansas	COUNTY Marshall		TWP 5S	RANGE 8E	PPM	PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1107.6					
1318	0				5.4	-		-5.4		1102.2	X	0	0	468,115 2,408,555
1319	330		262°57'	+7.1°	5.8	-		-5.8		1101.8		0	-330	468,115 2,408,225
1320	660		" "	"	5.3	-		-5.3		1102.3		+1	-660	468,115 2,407,895
1321	990		" "	"	2.1	-		-2.1		1105.5		+1	-990	468,115 2,407,565
1322	1320		262°57'	+7.1°	6.3	89°20'	+15.4	+9.1	}	1116.7	TP	+1	-1	-1320 468,115 2,407,235
1322	1320				14.0	89°-	+23.0	+9.0		TP				
	706		82°04'+180°	+7.1°	+8.2	-		+8.2	}	1124.9	BS	-10	-1	-706
	706				+11.7	TH	-3.5	+8.2		BS				
1323	4376		82°04'	+7.1°	6.1	-		-6.1		1118.8		+5	+376	468,109 3,406,905
1324	46		" "	"	7.8	-		-7.8		1117.1		+1	+46	468,105 3,406,575
I=	0				5.4	-		-5.4		1119.5	X	0	0	468,104 3,406,529 T-intersect. EL 1119
TP	1625		352°05'40"	+7.1°	8.7	89°-	+28.4	+19.7	}	1144.5	TP	+1625	-23	469,728 2,406,506 ↑
TP	1625				136	88°50'	+33.1	+19.5		TP				
	860		172°44'+180°	+7.1°	+9.1	-		+9.1	}	1153.6	BS	+860	-3	offset north
	860				+13.4	TH	-4.3	+9.1		BS				
X	0				5.4	-		-5.4		1148.2	X	0	0	470,588 2,406,503
TP	1398		350°56'	+7.1°	11.4	-		-11.4	}	1142.2	TP	+1397	-48	471,985 2,406,455 T-intersect.
TP	1398				4.4	BH	-7.0	-11.4		TP				
	611		83°05'+180°	+7.1°	+4.7	-		+4.7	}	1146.9	BS	+2	-611	
	611				+7.8	TH	-3.1	+4.7		BS				

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/20/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY GNC <i>rlw</i>	LINE NO. 1	PAGE 47
AREA Kansas	TOPO MAP Blue Rapids SE / Blue Rapids	STATE Kansas	COUNTY Marshall	TWP 55	RANGE 8E	PPM
					PARTY MANAGER L. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1146.9					
1325	330		77° 37'	+7.1°	5.4	-	-5.4			1141.5		+30	+329	472,017 2,406,173
1326	0				5.4	-	-5.4			1141.5	π	0	0	471,987 2,405,844 set-up opposite sta.
1327	332		304° 24'	+7.1°	5.3	-	-5.3			1141.6		+220	-249	472,207 2,405,595
1328	662		"	"	3.7	-	-3.7			1143.2		+439	-496	472,426 2,405,348
1329	992		304° 24'	+7.1°	2.5	-	-2.5			1144.4	TP	+657+1	-743	472,185 2,405,101
1329	992				7.5	TH	+5.0	-2.5			TP			
	660		124° 42' +180°	+7.1°	+11.0	-	+11.0		1155.4		BS	+440+1	-492	
	660				+14.3	TH	-3.3	+11.0			BS			
1330	330		124° 42'	+7.1°	11.5	-	-11.5			1143.9		-220	+246	472,866 2,404,855
1331	0				5.4	-	-5.4			1150.0	π	0	0	473,086 2,404,609
1332	330		305° 44'	+7.1°	9.8	-	-9.8			1145.6		+224	-242	473,310 2,404,367
1333	660		303° 30'	+7.1°	13.1	-	-13.1			1142.3	TP	+430+1	-501	473,517 2,404,108 T.P. opposite station
1333	660				9.8	OH	-3.3	-13.1			TP			Blue Rapids SE
	640		148° 06' +180°	+7.1°	+14.3	90° 8'	+1.5	+15.8	1158.1		BS	+581+1	-269	
	640				+13.2	90° 14'	+2.6	+15.8			BS			
1334	325		160° 44'	+7.1°	8.9	91° -	-5.7	-14.6		1143.5		-318	+69	473,781 2,403,908 Blue Rapids NE
1335	0				5.4	-	-5.4			1152.7	π	0	0	474,099 2,403,839 ↓
1336	330		338° 24'	+7.1°	3.6	-	-3.6			1154.5	TP	+319+1	-83	474,419 2,403,756
1336	330				5.3	TH	+1.7	-3.6			TP			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
5/20/81		G. Cotcamp		B. Cotcamp		6834		TG <i>dlw</i>		1	48					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Blue Rapids NE	Kansas	Marshall	55	8E		L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS
												SOUTH -	WEST -	Y	X	
												LAT.	DEP.			
1336										1154.5						
	660		145°19'+180°	+7.1°	+4.1	89°-	-11.5	-7.47			BS	+585.1	-306			
	660				+2.1	89°10'	-9.6	-7.5	1147.0		BS					
1337	330		145°19'	+7.1°	3.2	-		-3.2	1143.8			-292	+153	474,713	2,403,603	
1338	0				5.4	-		-5.4	1141.6		π	0	0	475,005	2,403,450	
1339	330		319°52'	+7.1°	4.8	-		-4.8	1142.2			+277	-180	475,282	2,403,270	
1340	660		" "	"	0.2	TH	+3.3	+3.1	1150.1			+553	-360	475,558	2,403,090	
1341	990		319°52'	+7.1°	3.0	88°40'	+23.0	+20.0	1167.0		TP	+830.1	-540	475,836	2,402,910	
1341	990				5.8	88°30'	+25.9	+20.1			TP					
	660		139°05'+180°	+7.1°	+12.0	89°40'	-3.8	+8.2			BS	+548.1	-367			
	660				+13.9	89°30'	-5.8	+8.1	1175.1		BS					
1342	330		139°05'	+7.1°	2.3	TH	+1.7	-0.6	1174.5			-274	+184	476,111	2,402,727	
1343	0				5.4	-		-5.4	1169.7		π	0	0	476,385	2,402,543	
1344	330		322°40'	+7.1°	9.3	91°-	-5.8	-15.1	1160.0			+285	-166	476,670	2,402,377	
1345	660		" "	"	8.3	91°-	-11.5	-19.8	1155.3			+570	-332	476,955	2,402,211	
1346	992		321°16'	+7.1°	5.2	91°16'	-21.9	-27.1	1148.0		TP	+844.1	-520	477,230	2,402,023	
1346	992				8.0	91°06'	-19.0	-27.0			TP					
	660		155°02'+180°	+7.1°	+9.0	-		+9.0	1157.0		BS	+628	-202			
	660				+5.7	BH	+3.3	+9.0			BS					
1347	330		153°43'	+7.1°	12.0	BH	-1.7	-13.7	1143.3			-312	+108	477,546	2,401,929	
1348	0				5.4	-		-5.4	1151.6		π	0	0	477,858	2,401,821	

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE: 5/21/81 INSTRUMENT MAN: G. Cotcamp ROD MAN: T. Grady PARTY NUMBER: 6834 NOTES CHECKED BY: TG JLD LINE NO.: 1 PAGE: 49
 AREA: Kansas TOPO MAP: Blue Rapids NE STATE: Kansas COUNTY: Marshall TWP: 55 RANGE: 8E 17E PPM: PARTY MANAGER: L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1157.0						
1349	330		336° 27'	+7.1°	4.8	88° -	+11.5	+6.7		1163.7		+316	-93	478,174	2,901,728
1350	656		331° 45'	+7.1°	14.5	88° -	+22.9	+8.4		1165.4	TP	+611	-237	478,469	2,901,584
1350	656				10.7	88° 20'	+19.1	+8.4			TP				
	325		104° 12' + 180°	+7.1°	4.2	89° -	-5.7	-1.5	1163.9		BS	+118	-303		
	325				+2.3	89° 20'	-3.8	-1.5			BS				
1351	0				5.9	-	-	-5.4		1158.5	π	0	0	478,587	2,901,281
1352	330		262° 04'	+7.1°	12.0	91° 30'	-8.6	-20.6		1143.3		-5	-330	478,582	2,900,951
<u>1352</u>	341		262° 06'	+7.1°	12.5	91° 30'	-8.9	-21.9		1142.5		-5	-341	478,582	2,900,940
1353	660	658.9	262° 04'	+7.1°	9.4	93° 20'	-38.3	-47.7			TP	-10	-659	478,577	2,900,622
1353	660				13.3	93° -	-34.5	-47.8		1116.1	TP				
	990		82° 13' + 180°	+7.1°	+3.4	89° -	-17.3	-13.9	1102.2		BS	-12	-990		
	990				+0.5	89° 10'	-14.4	-13.9			BS				
1354	660		82° 13'	+7.1°	2.8	TH	+33	+0.5		1102.7		+8	+660	478,573	2,900,292
1355	330		" "	"	4.9	-	-	-4.9		1097.3		+4	+330	478,569	2,399,962
1356	0				5.4	-	-	-5.4		1096.8	π	0	0	478,565	2,399,632
TP	146		272° 23'	+7.1°	0.9	88° -	+5.1	+4.2		1106.4	TP	+24	-144	478,589	2,399,488
TP	146				1.7	87° 40'	+5.9	+4.2			TP				east edge of river no bridge
	360		75° 25' + 180°	+7.1°	+6.3	88° 40'	-8.4	-2.1			BS	-47	-357		
	360				+8.3	88° 20'	-10.5	-2.2	1104.2		BS				
1357	171		75° 25'	+7.1°								+23	+175	478,565	2,399,306

in river (no red reading)

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
5/22/81		G. Cotcamp		T. Grady		6834		TG <i>slw</i>		1	50						
AREA		TOPO MAP		STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Blue Rapids NE		Kansas	Marshall	55	7E		L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1104.2								
	0				5.4	-		-5.4		1098.8	π	0	0	478,542	2,399,131		
1358	147		267° 48'	+7.1'	10.3	-		-10.3		1093.9		+13	-146	478,555	2,398,985	in field	
1359	466		264° 54'	+7.1°	3.1	-		-3.1			TP	+16	-466	478,558	2,398,665	dirt road	
1359	466				5.5	TH	+2.3	-3.2		1101.0	TP						↓
	1650		82° 33' +180°	+7.1°	+10.2	-		+10.2	1111.2		BS	-10	-1650				
	1650				+1.9	BH	+8.3	+10.2			BS						
1360	1320		82° 20'	+7.1°	9.9	-		-9.9		1101.3		+13	+1320	478,561	2,398,335		
1361	990		"	"	9.9	-		-9.9		1101.3		+10	+990	478,558	2,398,005		
1362	660		"	"	9.7	-		-9.7		1101.5		+7	+660	478,555	2,397,675		
1363	330		"	"	9.3	-		-9.3		1101.9		+3	+330	478,551	2,397,345		
1364	0				5.4	-		-5.4		1105.8	π	0	0	478,548	2,397,015		
1365	330		262° 16'	+7.1°	3.4	89° -	+5.8	+2.4		1113.6		-4	-330	478,544	2,396,685		
1366	660		"	"	0.3	89° -	+11.5	+11.2		1122.4		-7	-660	478,541	2,396,355		
1367	13990		"	"	4.9	88° 30'	+25.9	+21.0		1132.2		-11	-990	478,537	2,396,025		
1368	1320		"	"	5.2	88° 30'	+34.5	+29.3		1140.5		-15	-1320	478,533	2,395,695		
1369	1650		262° 16'	+7.1°	9.5	88° 30'	+43.2	+33.7		1144.9	TP	-18	-1649	478,530	2,395,366		
1369	1650				4.7	88° 40'	+38.4	+33.7			TP						
	2310		82° 46' 20" +180°	+7.1°	+9.0	TH	-11.6	-2.6	1142.3		BS	-5	-2310				
	2310				+4.5	89° 50'	-6.7	-2.2			BS						
1370	1980		82° 46'	+7.1°	8.2	TH	+9.9	+1.7		1144.0		+5	+1980	478,530	2,395,034		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
5/22/81		G. Cotcamp		T. Grady		6834		TG dsw		1	51			
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER		
Kansas		Blue Rapids NE		Kansas		Marshall		7E				L. Davis		
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1142.3					
1371	1650		82°46'	+7.1°	8.0	TH	+8.3	+0.3		1142.6		+4	+1650	478,528 2,394,704
1372	1320		" "	"	1.3	-		-1.3		1141.0		+3	+1320	478,528 2,394,374
1373	990													
1373	1135		82°42'	+7.1°	2.4	-		-2.4		1139.9		+4	+1135	478,529 2,394,189 478,540+2,394,190 4-Way Intersect.
1373	990		82°46'	+7.1°	5.9	-		-5.9		1136.4		+2	+990	478,527 2,394,044
1374	660		" "	"	11.6	-		-11.6		1130.7		+2	+660	478,527 2,393,714
1375	330		" "	"	11.8	-		-11.8		1130.5		+1	+330	478,526 2,393,384
1376	0				5.4	-		-5.4		1136.9	TP	0	0	478,525 2,393,054
1377	330		262°10'	+6.9°	0.7	-		-0.7		1141.6		-5	-330	478,520 2,392,724
1378	660		" "	"	3.2	TH	+3.3	+0.1		1142.4		-11	-660	478,514 2,392,394
1379	990		" "	"	4.2	TH	+5.0	+0.8		1143.1		-16	-990	478,509 2,392,064
1380	1320		" "	"	3.9	TH	+6.6	+2.7		1145.0		-22	-1320	478,503 2,391,734
1381	1650		" "	"	5.0	TH	+8.3	+3.3		1145.6		-27	-1650	478,498 2,391,404
1382	1980		262°10'	+6.9°	6.6	TH	+9.9	+3.3		1145.6	TP	-32	-1980	478,493 2,391,072
1382	1980				14.0	89°30'	+17.3	+3.3			TP			
	2310		82°24'+180°	+6.9°	+13.9	90°34'	+22.8	+36.7	1182.3		BS	-28	-2310	
	2310				+9.9	90°40'	+26.9	+36.8			BS			
1383	1980		82°24'	+6.9°	6.3	90°50'	-28.8	-35.1		1147.2		+24	+1980	478,489 2,390,740
1384	1650		" "	"	9.1	90°50'	-24.0	-33.1		1149.2		+20	+1650	478,485 2,390,410
1385	1320		" "	"	9.0	90°50'	-19.2	-28.2		1154.1		+16	+1320	478,481 2,390,080

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE	INSTRUMENT MAN	ROD MAN	PARTY NUMBER	NOTES CHECKED BY	LINE NO.	PAGE
5/22/81	G. Cotcamp	T. Grady	6834	T.G. New	1	52
AREA	TOPO MAP	STATE	COUNTY	RANGE	PPM	PARTY MANAGER
Kansas	Blue Rapids NE RAPIDS	Kansas	Marshall	7E		L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1182.3						
1386	990		82°24'	+6.9°	12.9	90°30'	-8.6	-21.5		1160.8		+12	+990	478,477	2,389,750
1387	660		" "	"	10.5	90°30'	-5.8	-16.3		1166.0		+8	+660	478,473	2,389,420
1388	330		" "	"	12.0	-	-	-12.0		1170.3		+4	+330	478,469	2,389,090
1388	118		85°09'	+6.9°	6.7	-	-	-6.7		1175.6		-4	+118	478,461	2,388,878
1389	0				5.4	-	-	-5.4		1176.9	TP	0	0	478,465	2,388,760
1390	330		262°37'	+6.9°	0.1	-	-	-0.1		1182.2		-3	-330	478,462	2,388,430
1391	660		" "	"	3.5	89°-	+11.5	+8.0		1190.3		-6	-660	478,459	2,388,100
1392	990		" "	"	6.0	88°40'	+23.0	+17.0		1199.3		-8	-990	478,457	2,387,770
1393	1320		" "	"	8.0	88°40'	+30.7	+22.7		1205.0		-11	-1320	478,454	2,387,440
1394	1650		" "	"	3.0	88°30'	+43.2	+40.2		1222.5		-14	-1650	478,451	2,387,110
1395	1932	1930.8	257°17'15"	+6.9°	11.8	88°-	+67.4	+55.6		1237.9	TP	-196	-1921-2	478,268	2,386,837
1395	1932				6.2	88°10'	+61.9	+55.6			TP				
	205		58°37'+180°	+6.9°	+2.6	88°50'	-4.2	-1.6			BS	-85	-187-2		
	205				+3.8	88°30'	-5.4	-1.7	1236.2		BS				
TP	0				5.4	-	-	-5.4		1230.8	TP	0	0	478,184	2,386,648
1396	130		268°02'	+6.9°	10.9	-	-	-10.9		1225.3		+11	-130	478,195	2,386,518
1397	460		" "	"	6.1	-	-	-6.1		1230.1		+40	-458	478,224	2,386,190
1398	793		268°02'	+6.9°	3.2	-	-	-3.2		1233.0	TP	+68	-790-2	478,252	2,385,856
1398	793				7.2	TH	+4.0	-3.2			TP				

478,460 + 2,388,860
4-way Intersect.
el. 1174

Blue Rapids NE Quad.
Blue Rapids Quad.
↓

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	INSTRUMENT MAN	ROD MAN	PARTY NUMBER	NOTES CHECKED BY	LINE NO.	PAGE
5/22/81	G. Cotcamp	T. Grady	6834	TG <i>rdw</i>	1	53
AREA	TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM
Kansas	Blue Rapids	Kansas	Marshall	5S	7E	
					PARTY MANAGER	
					L. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
1398										1233.0				
	331		109°43'+180°	+6.9°	+12.3	92°-	+11.5	+23.8	1256.8		BS	+198	-296.2	
	331				+14.2	91°40'	+9.6	+23.8			BS			
1399	0				5.4	-		-5.4		1251.4	X	0	0	478,400 2,385,558
1400	330		268°21'	+6.9°	0.4	88°-	+11.5	+11.1		1267.9		+30	-329	478,430 2,385,229
1401	656		265°07'	+6.9°	6.7	88°-	+22.9	+16.2		1273.0	TP	+23	-655.2	478,423 2,384,901
1401	656				10.5	87°40'	+26.7	+16.2			TP			
	330		81°17'+180°	+6.9°	+11.2	-		+11.2	1284.2		BS	-10	-330.2	
	330				+12.9	TH	-1.7	+11.3			BS			
1402	0				5.4	-		-5.4		1278.8	X	0	0	478,413 2,384,569
1403	330		262°26'	+6.9°	12.2	91°-	-5.8	-18.0		1266.2		-4	-330	478,409 2,384,239
1404	660		262°26'	+6.9°	5.3	91°-	-11.5	-16.8		1267.4	TP	-8	-660.2	478,405 2,383,907
1404	660				13.5	BH	-3.3	-16.8			TP			
	328		77°31'+180°	+6.9°	+9.6	89°-	-5.7	+3.9	1271.3		BS	-32	-326.2	horiz. correct. y=+9 x=-22
	328				+7.7	89°20'	-3.8	+3.9			BS			478,385+2,383,600
TF	24		54°19'	+6.9°	4.2	-		-4.2		1267.1		+12	+21	478,385 2,383,600 T-rd (south) cl. 1264
1405	0				5.4	-		-5.4		1265.9	X	0	0	478,373 2,383,579
1406	330	329.2	254°09'	+6.6°	9.6	94°-	-23.0	-32.6		1238.7	TP	-53.2	-325.2	478,318 2,383,256
1406	330				14.4	93°10'	-18.2	-32.6			TP			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
5/26/81		G. Cotcamp		T. Grady		6834		TG rldw		1	54			
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Kansas		Blue Rapids		Kansas	Marshall		5S	7E		L. Davis				
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
1406										1238.7				
	330		92°07'+180°	+6.6°	+3.4	89°-	-5.8	-2.4	1236.3		BS	+50-2	-326+2	
	330				+1.0	89°24'	-3.5	-2.5		BS				
1407	0				54	-		-5.4		1230.9	π	0	0	478,366, 2,382,932
1408	330	329.0	264°54'	+6.6°	3.0	85°30'	+25.8	+22.8			TP	+9-2	-329+2	478,373, 2,382,605
1408	330				3.9	85°20'	+26.8	+22.9		1259.2	TP			
	990		82°31'+180°	+6.6°	+13.9	91°-	+17.3	+31.2	1290.4		BS	-15-2	-990+2	
	990				+12.8	91°4'	+18.4	+31.2		BS				
1409	660		82°31'	+6.6°	11.6	91°0'	-13.4	-25.0		1265.4		+10	+660	478,366, 2,382,277
1410	330		" "	"	8.9	-		-8.9		1281.5		+5	+330	478,361, 2,381,947
1411	0				54	-		-5.4		1285.0	π	0	0	478,356, 2,381,617
1412	330		263°10'	+6.6°	1.8	-		-1.8		1288.6		-1	-330	478,355, 2,381,287
1413	660		" "	"	6.1	89°-	+11.5	+5.4		1295.8		-3	-660	478,353, 2,380,957
1414	990		263°10'	+6.6°	4.5	88°50'	+20.2	+15.7	1306.1		TP	-4-2	-990+2	478,350, 2,380,629
1414	990				10.2	88°30'	+25.9	+15.7		TP				
	990		82°36'20"+180°	+6.6°	+0.1	89°40'	-5.8	-5.7	1300.4		BS	-14-2	-990	
	990				+8.7	89°0'	-14.4	-5.7		BS				
1415	660		82°36'	+6.6°	8.2	91°-	-11.5	-19.7		1280.7		+9	+660	478,343, 2,380,299
1416	330		" "	"	11.2	91°-	-5.8	-17.0		1283.4		+5	+330	478,339, 2,379,969
1417	0				54	-		-5.4		1295.0	π	0	0	478,334, 2,379,639
<u>Σ</u>	19		240°22'	+6.6°	4.8	-		-4.8		1295.6		-7	-17	478,345, 2,379,610 I-cd (north)

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
5/26/81		G. Cotcamp		T. Grady		6834		TG <i>slw</i>		1	55						
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Blue Rapids	Kansas	Marshall		5S	7E		L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
									1300.4								
1418	330		262° 53'	+6.6°	2.0	87° -	+17.2	+15.2		1315.6		-3	-330	478,331	2,379,309		
1419	660	657.3	262° 53'	+6.6°	8.7	84° 50'	+59.2	+50.5		1350.9	TP	-6-2	-657	478,326	2,378,982		
1419	660				9.4	84° 46'	+59.9	+50.5			TP						
	311		60° 28' +180°	+6.6°	+9.9	89° -	-5.4	+4.5	1355.4		BS	-121-2	-286				
	311				+9.0	89° 10'	-4.5	+4.5			BS					curve	
1420	0				5.4	-		-5.4		1350.0	π	0	0	478,203	2,378,676		
1421	334		223° 39'	+6.6°	8.7	TH	+1.7	-7.0		1348.4	TP	-214-2	-257	477,987	2,378,439		
1421	334				10.0	89° 30'	+2.9	-7.1			TP						
	219		114° 53' +180°	+6.6°	+11.0	89° -	-3.8	+7.2	1355.6		BS	+114	-187				
	219				+9.7	89° 20'	-2.5	+7.2			BS						
1422A	0				5.4	-		-5.4		1350.2	π	0	0	478,101	2,378,252	split sta. - curve	
1422	108		302° 0'	+6.6°	12.1	-		-12.1		1343.5		+67	-84	478,168	2,378,168		
1423	430		292° 47'	+6.6°	1.2	TH	+2.2	+1.0		1356.6	TP	+211	-375	478,312	2,377,877		
1423	430				2.8	89° 30'	+3.8	+1.0			TP						
	330		82° 41' +180°	+6.6°	+13.0	91° -	+5.8	+18.8	1375.4		BS	-4	-330.41				
	330				+14.0	90° 50'	+4.8	+18.8			BS						
1424	0		26		5.4	-		-5.4		1370.0	π	0	0	478,308	2,377,548		
1425	330		263° 04'	+6.6°	12.5	92° 20'	-13.4	-25.9		1349.5		-2	-330	478,306	2,377,218		
1426	660		"	"	11.0	-		-11.0		1364.4		-4	-660	478,304	2,376,888		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
5/26/81		G. Cotcamp		T. Grady		6834		TG <i>new</i>		1		56			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Blue Rapids		Kansas		Marshall		55		7E				L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1375.4						
1427	990		263°04'	+6.6°	6.7	89°-	+17.3	+10.6		1386.0	TP	-6	-990	2,478,302	2,376,560
1427	990				3.8	89°10'	+14.4	+10.6			TP				
	2310		83°16'+180°	+6.3°	+14.8	90°6'	+4.0	+18.8	1404.8		BS	-17	-2310		
	2310				+13.5	90°8'	+5.4	+18.9			BS				
1428	1980		83°16'	+6.3°	8.1	90°30'	-17.3	-25.4		1379.4		+15	+1980	478,300	2,376,232
1429	1650		"	"	9.9	90°40'	-19.2	-29.1		1375.7		+12	+1650	478,297	2,375,902
1430	1320		"	"	10.3	90°40'	-15.4	-25.7		1379.1		+10	+1320	478,295	2,375,572
1431	990		"	"	12.1	90°24'	-24.2	-36.3		1368.5		+7	+990	478,292	2,375,242
1432	660		"	"	10.6	91°-	-11.5	-22.1		1382.7		+5	+660	478,290	2,374,912
1433	330		"	"	8.7	-	-	-8.7		1396.1		+3	+330	478,288	2,374,582
1434	0				5.4	-	-	-5.4		1399.4	TP	0	0	478,285	2,374,252
1435	330		262°50'	+6.3°	6.2	-	-	-6.2		1398.5		-5	-330	478,280	2,373,922
1436	660		"	"	11.2	90°40'	-7.8	-18.9		1385.9		-10	-660	478,275	2,373,592
1437	990		"	"	12.1	90°40'	-11.5	-23.6		1381.2		-15	-990	478,270	2,373,262
1437	1228		262°21'	+6.3°	14.8	90°10'	-3.6	-18.4		1386.4		-29	-1228	478,256	2,373,024
1438	1320		262°50'	+6.3°	12.0	BH	-6.6	-18.6		1386.2		-20	-1320	478,265	2,372,932
1439	1650		262°49'40"	+6.3°	8.2	-	-	-8.2		1396.6	TP	-25-2	-1650	2,478,258	2,372,604
1439	1650				13.0	89°50'	+4.8	-8.2			TP				
	1650		83°11'22"+180°	+6.3°	+4.0	TH	-8.3	-4.3	1392.3		BS	-15-2	-1650		
	1650				+5.4	89°40'	-9.6	-4.2			BS				

478,280 + 2,373,015
4 Way Intersect. el. 1384

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-4.5

Geosource Inc.

DATE	5/26/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6839	NOTES CHECKED BY	TG New	LINE NO.	1	PAGE	57	
AREA	Kansas	TOPO MAP	Blue Rapids	STATE	Kansas	COUNTY	Marshall	TWP	55	RANGE	7E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1392.3					
1440	1320		83° 11'	+6.3°	3.5	-		-3.5		1388.8		+12	+1320	478,253 2,372,276
1441	990		" "	"	7.1	90° 40'	-11.5	-18.6		1373.7		+9	+990	478,250 2,371,996
1442	660		" "	"	10.7	91° -	-11.5	-22.2		1370.1		+6	+660	478,247 2,371,616
1443	330		" "	"	6.7	-		-6.7		1385.6		+3	+330	478,244 2,371,286
1444	0				5.4	-		-5.4		1386.9	TP	0	0	478,241 2,370,956
1445	330		263° 26'	+6.3°	7.3	-		-7.3		1385.0		-2	-330	478,239 2,370,626
1446	660		" "	"	9.7	91° -	-11.5	-21.2		1371.1		-3	-660	478,238 2,370,296
1447	990		" "	"	5.8	91° -	-17.3	-23.1		1369.2		-5	-990	478,236 2,369,966
1448	1320		263° 25' 42"	+6.3°	14.1	-		-14.1		1378.2	TP	-6-2	-1320+2	478,233 2,369,638
1448	1320				7.5	BH	-6.6	-14.1			TP			
	1320		83° 10' +180°	+6.3°	+2.7	TH	-6.6	-3.9	1374.3		BS	-12-2	-1320+2	
	1320				+3.8	89° 40'	-7.7	-3.9			BS			
1449	990		83° 10'	+6.3°	7.2	-		-7.2		1367.1		+9	+990	478,228 2,368,310
1450	660		" "	"	6.8	91° -	-11.5	-18.3		1356.0		+6	+660	478,225 2,368,980
1451	330		" "	"	11.8	-		-11.8		1362.5		+3	+330	478,222 2,368,650
1452	0				5.4	-		-5.4		1368.9	TP	0	0	478,219 2,368,320 horiz. correct. y=-26
1453	330		263° 33'	+6.3°	7.2	-		-7.2		1367.1		-1	-330	478,218 2,367,990 x=+23
TP	515		262° 09'	+6.3°	11.0	-		-11.0		1363.3		-14	-515	478,205 2,367,805 Trd (south) el. 1362, offset south 1453-5

Note - 5,280 (scaled)
offset south 1453-5

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
5/27/81		G. Cotcamp		T. Grady		6834		TG		1	58					
AREA		TOPO MAP		STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Blue Rapids SW		Kansas	Marshall	55	6E		L. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH +	EAST +	COORDINATES		REMARKS
												SOUTH -	WEST -	Y	X	
												LAT.	DEP.			
JL TF										1361.0	R			472,905	2,367,915	→ scaled
	475		83°10' +180°	+6.6°	+11.9	91° -	+8.3	+20.2	1381.2		BS	-2 -2	-475 -2			4-way Intersect @ 1361
	475				+14.7	90°40'	+5.5	+20.2			BS					
1454	330		81°55'	+6.6°	14.8	BH	-1.7	-16.5		1364.7		+9	+330	472,910	2,367,768	
1455	0				5.4	-		-5.4		1375.8	T	0	0	472,901	2,367,438	
1456	330		263°57'	+6.6°	5.8	-		-5.8		1375.4	TP	+3 -2	-330 -2	472,902	2,367,106	
1456	330				7.5	TH	+1.7	-5.9			TP					
	990		82°32'20" +180°	+6.6°	+2.0	TH	-5.0	-3.0			BS	-15 -2	-990 -1			
	990				+5.7	89°30'	-8.6	-2.9	1372.5		BS					
1457	660		82°32'	+6.6°	9.8	-		-9.8		1362.7		+10	+660	472,895	2,366,775	
1458	330		" "	"	12.7	BH	-1.7	-14.4		1358.1		+5	+330	472,890	2,366,445	
1459	0				5.4	-		-5.4		1367.1	T	0	0	472,885	2,366,115	
1460	330		262°35'	+6.6°	8.7	-		-8.7		1363.8		-5	-330	472,880	2,365,785	
1461	660		" "	"	10.2	-		-10.2		1362.3		-9	-660	472,876	2,365,455	
1462	990		262°35'	+6.6°	6.1	-		-6.1		1366.4	TP	-14 -2	-990	472,869	2,365,125	
1462	990				11.1	TH	+5.0	-6.2			TP					
	2310		82°35'40" +180°	+6.6°	+4.7	89°30'	-20.2	-15.5	1350.9		BS	-32 -2	-2310			
	2310				+11.4	89°20'	-26.9	-15.5			BS					
1463	1980		82°36'	+6.6°	4.6	TH	+9.9	+5.3		1356.2		+28	+1980	472,863	2,364,795	
1464	1650		" "	"	12.1	89°52'	+3.8	-8.3		1342.6		+23	+1650	472,852	2,364,465	
1465	1320		" "	"	3.5	90°30'	-11.5	-15.0		1335.9		+10				

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	5/27/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	T.G.	LINE NO.	1	PAGE	59	
AREA	Kansas	TOPO MAP	Blue Rapids SW	STATE	Kansas	COUNTY	Marshall	TWP	55	RANGE	6E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1350.9					
1466	990		82°36'	+6.6°	10.9	91°-	-17.3	-28.2		1322.7		+14	+990	472,849 2,363,805
1467	660		"	"	10.2	91°30'	-17.3	-27.5		1323.4		+9	+660	472,844 2,363,475
1468	330		"	"	11.5	90°30'	-2.9	-14.4		1336.5		+5	+330	472,840 2,363,145
1469	0				5.4	-		-5.4		1345.5	π	0	0	472,835 2,362,815
IL IF	160		259°53'	+6.6°	1.6	89°-	+2.8	+1.2		1352.1		-10	-160	472,825 2,362,655 +72,820 + 2,362,680 4-way Intersect
BM	191		251°41'	+6.9°	2.1	88°-	+6.7	+4.6		1355.5		-38	-187	472,797 2,362,628 U.S.G.S. 7HEN 1965 el. 1356
1470	330		262°44'	+6.9°	3.2	89°-	+5.8	+2.6		1353.5		-2	-330	472,833 2,362,485
1471	660		"	"	9.4	89°-	+1.5	+2.1		1353.0		-4	-660	472,831 2,362,155
1472	990		262°43'40"	+6.9°	4.4	89°-	+17.3	+12.9)		1363.8	TP	-6-2	-990	472,827 2,361,825
1472	990				1.5	89°10'	+14.4	+12.9)			TP			
	1980		82°24'20"+180°	+6.9°	+0.2	89°-	-34.6	-34.4)			BS	-24-2	-1980	
	1980				+6.0	88°50'	-40.3	-34.3)	1329.5		BS			
1473	1650		82°24'	+6.9°	10.7	89°-	+28.8	+18.1		1347.6		+20	+1650	472,821 2,361,495
1474	1320		"	"	5.0	89°30'	+11.5	+6.5		1336.0		+16	+1320	472,817 2,361,165
1475	990		"	"	8.8	89°30'	+8.6	-0.2		1329.3		+12	+990	472,813 2,360,835
1476	660		"	"	10.7	91°-	-11.5	-22.2		1307.3		+8	+660	472,809 2,360,505
1477	330		"	"	11.5	93°20'	-19.2	-30.7		1298.8		+4	+330	472,805 2,360,175
1478	0				5.4	-		-5.4		1324.1	π	0	0	472,801 2,359,845
1479	330		262°44'	+6.9°	2.7	88°40'	+7.7	+5.0		1334.5		-2	-330	472,799 2,359,515
1480	660		"	"	6.8	88°40'	+15.4	+8.6		1338.1		-4	-660	472,797 2,359,185

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	5/27/81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	T. Grady	PARTY NUMBER	6834	NOTES CHECKED BY	T.G.	LINE NO.	1	PAGE	60	
AREA	Kansas	TOPO MAP	Blue Rapids SW	STATE	Kansas	COUNTY	Marshall	TWP	55	RANGE	6E	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1344.6					
1481	990		262°44'	+6.9°	7.9	88°40'	+23.0	+15.1		1344.6		-6	-990	472,795 2,358,855
1482	1320		262°44'30"	+6.9°	3.9	88°40'	+30.7	+26.8		1356.3	TP	-8-2	-1320	472,791 2,358,525
1482	1320				7.7	88°30'	+34.5	+26.8			TP			
	990		82°08'+180°	+6.9°	+15.0	-		+15.0	1371.3		BS	-17-2	-990	
	990				+10.0	BH	+5.0	+15.0			BS			
1483	660		82°08'	+6.9°	5.8	91°-	-11.5	-17.3		1354.0		+11	+660	472,783 2,358,195
1484	330		" "	"	9.0	91°-	-5.8	-14.8		1356.5		+6	+330	472,778 2,357,865
1485	0				5.4	-		-5.4		1365.9	X	0	0	472,772 2,357,535
1485	196		260°27'	+6.9°	5.6	-		-5.6		1365.7		-9	-196	472,763 2,357,339
1486	330		262°43'20"	+6.9°	11.4	-		-11.4		1359.9		-2	-330	472,770 2,357,205
1487	660		" "	"	12.5	91°-	-11.5	-24.0		1347.3		-4	-660	472,768 2,356,875
1488	990		" "	"	12.0	91°-	-17.3	-24.3		1342.0		-7	-990	472,765 2,356,545
1489	1320		" "	"	9.7	90°30'	-11.5	-21.2		1350.1		-9	-1320	472,763 2,356,215
1490	1650		262°43'20"	+6.9°	5.8	90°30'	-14.4	-20.2		1351.1	TP	-11-2	-1650	472,759 2,355,885
1490	1650				14.5	90°12'	-5.8	-20.3			TP			
	1320		82°30'+180°	+6.9°	+14.7	-		+14.7	1365.8		BS	-14-1	-1320	
	1320				+8.1	BH	+6.6	+14.7			BS			
1491	990		82°30'	+6.9°	4.8	91°-	-17.3	-22.1		1343.7		+10	+990	472,754 2,355,555
1492	660		" "	"	11.7	91°-	-11.5	-23.2		1342.6		+7	+660	472,751 2,355,225
1493	330		" "	"	8.9	-		-8.9		1356.9		+3	+330	472,747 2,354,895

472,775 + 2,357,320
4-Way Intersect. 1366

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/27/81	INSTRUMENT MAN G. Cotcamp		ROD MAN J. Grady		PARTY NUMBER 6834		NOTES CHECKED BY T.G.		LINE NO. 1	PAGE 61
AREA Kansas	TOPO MAP Blue Rapids SW	STATE Kansas	COUNTY Marshall	TWP 55	RANGE 6E	PPM	PARTY MANAGER L. Davis			

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS	
												LAT.	DEP.	Y	X				
									1365.8										
1494	0				5.4	-		-5.4		1360.4	π	0	0	472,744	2,354,565				
1495	330		262°40'	+6.9°	11.1	91°30'	-8.6	-19.7		1346.1		-3	-330	472,741	2,354,235				
1496	660		" "	"	11.4	92°-	-23.0	-34.4		1331.4		-5	-660	472,789	2,352,925				
1497	990		262°40'	+6.9°	7.4	91°30'	-25.9	-33.3		1332.5	TP	-7	-990	472,787	2,352,475				
1497	990				13.1	91°10'	-20.2	-33.3			TP								
	990		82°10' +180°	+6.9°	+7.9	-		+7.9			BS	-16	-990						
	990				+12.9	TH	-5.0	+8.0	1340.5		BS								
1498	660		82°10'	+6.9°	11.7	-		-11.7		1328.8		+11	+660	472,732	2,353,225				
1499	330		" "	"	10.1	-		-10.1		1330.4		+5	+330	472,726	2,352,925				
1500	0				5.4	-		-5.4		1335.1	π	0	0	472,721	2,352,585				
1501	330		262°53'	+6.9°	0.1	-		-0.1		1340.4		-1	-330	472,720	2,352,255				
1501	525		261°57'	+6.9°	2.4	89°-	+9.2	+6.8		1347.3		-11	-525	472,710	2,352,060				472,710 + 2,352,060 4-way (RT 27) el. 1349
1502	660		262°53'	+6.9°	2.9	89°-	+11.5	+8.6		1342.1	TP	-3-1	-660.5	472,717	2,351,930				Greenleaf SE Quad
1502	660				1.0	89°10'	+9.6	+8.6			TP								↓
	990		82°03' +180°	+6.9°	+13.1	91°-	+17.3	+30.4	1379.5		BS	-18-1	-990.5						
	990				+10.2	91°10'	+20.2	+30.4			BS								
1503	660		82°03'	+6.9°	9.0	91°-	-11.5	-20.5		1359.0		+12	+660	472,710	2,351,605				
1504	330		" "	"	8.3	91°-	-5.8	-14.1		1365.4		+6	+330	472,704	2,351,275				
1505	0				5.4	-		-5.4		1374.1	π	0	0	472,698	2,350,945				
1506	330		262°17'	+6.9°	8.7	-		-8.7		1370.8		-5	-330	472,693	2,350,615				

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
5/28/81		G. Cotcamp		T. Grady		6834		TG		1		62			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Greenleaf SE		Kansas		Marshall		55		6E				L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH -	EAST + WEST -		LAT. DEP.
									1379.5						
1507	660		262°17'	+6.9°	8.7	91°-	-11.5	-20.2		1359.3		-9	-660	472,689	2,350,285
1508	990		262°17'	+6.9°	13.4	91°-	-17.3	-30.8			TP	-14 -1	-990.5	472,683	2,349,760
1508	990				10.5	91°10'	-20.2	-30.7		1348.8	TP				
	1320		82°02'40" +180°	+6.9°	+12.8	89°-	-23.0	-10.2	1338.6		BS	-24 -1	-1320.5		
	1320				+5.2	89°20'	-15.4	-10.2			BS				
1509	990		82°03'	+6.9°	10.7	89°-	+17.3	+6.6		1345.2		+18	+990	472,676	2,349,635
1510	660		" "	"	6.9	89°-	+11.5	+4.6		1343.2		+12	+660	472,670	2,349,305
1511	330		" "	"	1.7	-	-	-1.7		1336.9		+6	+330	472,664	2,349,975
1512	0				5.4	-	-	-5.4		1333.2	X	0	0	472,658	2,348,645
1513	330		262°15'	+6.9°	4.7	-	-	-4.7		1333.9		-5	-330	472,653	2,348,315
1514	660		" "	"	5.4	-	-	-5.4		1333.2		-10	-660	472,648	2,347,985
1515	990		" "	"	0.8	-	-	-0.8		1337.8		-15	-990	472,643	2,347,655
1516	1320		262°14'50"	+6.9°	5.9	89°30'	+11.5	+5.6		1344.2	TP	-20 -1	-1320.5	472,637	2,347,330
1516	1320				2.0	89°40'	+7.7	+5.7			TP				
	1320		81°45' +180°	+6.9°	+10.8	81°	+6.6	+17.4	1361.6		BS	-31 -1	-1320.5		
	1320				+13.5	90°10'	+3.8	+17.4			BS				
1517	990		81°45'	+6.9°	3.9	91°-	-17.3	-20.7		1340.9		+23	+990	472,628	2,347,005
TP	780		82°10'	+6.9°	12.8	91°10'	-15.9	-28.7		1332.9		+13	+780	472,618	2,346,795
1518	660		81°45'	+6.9°	13.1	91°30'	-17.3	-30.4		1331.2		+16	+660	472,621	2,346,675
1519	330		" "	"	9.9	91°-	-5.8	-15.7		1345.9		+8	+330	472,613	2,346,345

472,615 2,346,805
4-way el. 1333.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 5/28/81	INSTRUMENT MAN G. Cotcamp	ROD MAN T. Grady	PARTY NUMBER 6834	NOTES CHECKED BY TG	LINE NO. 1	PAGE 63
AREA Kansas	TOPO MAP Greenleaf SE	STATE Kansas	COUNTY Marshall	TWP 5S	RANGE 6E	PPM
					PARTY MANAGER L. Davis	

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1361.6					
1520	0				5.4	-		-5.4		1356.2	π	0	0	472,605 2,346,015
1521	330		262°42'	+6.9°	10.8	92°-	-11.5	-22.3		1339.3		-2	-330	472,603 2,345,685
1522	660		"	"	6.8	92°-	-23.0	-29.8		1331.8		-5	-660	472,600 2,345,355
1523	990		"	"	8.9	91°20'	-23.0	-31.9		1329.7		-7	-990	472,598 2,345,025
1524	1320		262°42'	+6.9°	3.9	91°-	-23.0	-26.9		1334.7	TP	-9	-1320	472,596 2,344,700
1524	1320				14.6	90°32'	-12.3	-26.9			TP			
	1980		82°49'40" +180°	+6.9°	+11.2	-		+11.2	1345.9		BS	-9	-1980	
	1980				+1.3	04	+9.9	+11.2			BS			
1525	1650		82°50'	+6.9°	8.2	90°30'	-14.4	-22.6		1323.3		+8	+1650	472,595 2,344,375
1526	1320		"	"	9.8	91°-	-23.0	-32.8		1313.1		+6	+1320	472,593 2,344,045
1527	990		"	"	9.7	92°-	-34.5	-44.2		1301.7		+5	+990	472,592 2,343,715
1528	660		"	"	11.5	92°20'	-26.8	-38.3		1307.6		+3	+660	472,590 2,343,385
1529	330		"	"	12.2	91°20'	-7.7	-19.9		1326.0		+2	+330	472,589 2,343,055
1530	0				5.4	-		-5.4		1340.5	π	0	0	472,587 2,342,725
1531	330		262°10'	+6.9°	10.9	-		-10.9		1335.0		-5	-330	472,582 2,342,395
1532	660		"	"	11.0	91°20'	-15.4	-26.4		1319.5		-11	-660	472,576 2,342,065
1533	990		"	"	18.0	91°24'	-24.2	-42.2		1303.7		-16	-990	472,571 2,341,735
IF	1230		261°41'	+6.9°	21.3	91°24'	-30.0	-51.3		1294.6		-30	-1229	472,557 2,341,405
1534	1320		262°10'	+6.9°	12.3	91°24'	-32.2	-44.5		1301.4		-22	-1320	472,565 2,341,075
1535	1650		"	"	8.3	90°40'	-19.2	-27.5		1318.4		-27	-1650	472,560 2,341,075

472,560 + 2,341,505
4-Way Intersect. el. 1294

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
5/28/81		G. Cotcamp		T. Grady		6834		TG		1	64			
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	SPM	PARTY MANAGER				
Kansas		Greenleaf SE		Kansas	Marshall		55	6E		L. Davis				
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1345.9					
1536	1980		262°10'	+6.6°	15.1	-		-15.1		1330.8	TP	-43	-1980.5	472,544 2,340,750
1536	1980				5.2	84	-9.9	-15.1			TP			
	1320		82°08'50"+180°	+6.6°	+5.1	89°	-23.0	-17.9	1312.9		BS	-29	-1319.5	
	1320				+12.8	88°40'	-30.7	-17.9			BS			
1537	990		82°09'	+6.6°	10.1	89°	+17.3	-7.2		1305.7		+22	+990	472,537 2,340,426
1538	660		" "	"	11.9	-		-11.9		1301.0		+14	+660	472,527 2,340,096
1539	330		" "	"	12.8	92°24'	-13.8	-26.6		1286.3		+7	+330	472,522 2,339,766
1540	0				5.4	-		-5.4		1307.5	X	0	0	472,515 2,339,436
1541	330	329.6	261°46'	+6.6°	10.7	92°40'	-15.3	-26.0		1286.9	TP	-9	-330.4	472,506 2,339,110
1541	330				8.8	93°	-17.2	-26.0			TP			
	1320	1318.7	82°27'22"+180°	+6.6°	+8.5	92°30'	+57.5	+66.0			BS	-22	-1319.4	
	1320				+5.5	92°38'	+60.6	+66.1	1353.0		BS			
1542	990		82°27'	+6.6°	12.4	92°10'	-37.4	-49.8		1303.2		+16	+990	472,500 2,338,785
1543	660		" "	"	8.9	92°	-23.0	-31.9		1321.1		+11	+660	472,495 2,338,455
1544	330		" "	"	9.4	92°	-11.5	-20.9		1332.1		+5	+330	472,489 2,338,125
1545	0				5.4	-		-5.4		1347.6	X	0	0	472,484 2,337,795
1546	330		262°50'	+6.6°	4.1	-		-4.1		1348.9	TP	-3	-330.4	472,481 2,337,467
1546	330				5.8	74	+1.7	-4.1			TP			
	660	659.1	81°02'+180°	+6.6°	+2.3	87°	-34.5	-32.2	1316.7		BS	-27	-659	
	660				+0.4	87°10'	-32.6	-32.2			BS			

URVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
5/29/81		G. Cotcamp		T. Grady		6834		MPK		1		65			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Greenleaf SE		Kansas		Marshall/Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1316.7						
1547	330		81°02'	+6.6°	5.2	87°-	+17.3	+12.1		13288		+14	+330	472,468	2,337,140
1548	0				5.4	-		-5.4		1311.3	TP	0	0	472,454	2,336,810
1549	330		262°37'	+6.6°	0.9	-		-0.9		1315.8		-5	-330	472,449	2,336,480
1550	540		261°56'	+6.6°	3.9	88°30'	+14.1	+10.2		1326.9		-14	-590	472,440	2,336,270
1550	660		262°37'	+6.6°	2.3	88°30'	+17.3	+15.0		1331.7		-9	-660	472,445	2,336,150
1551	990		262°37'	+6.6°	9.2	88°30'	+25.4	+16.7		1333.4	TP	-14	-990+2	472,440	2,335,822
1551	990				7.5	88°36'	+24.2	+16.7			TP				
	660		83°47'+180°	+6.6°	+12.9	BH	+3.3	+16.2			BS	+4	-660+2		
	660				+14.2	90°10'	+1.9	+16.1	1349.5		BS				
1552	330		83°47'	+6.6°	8.0	-		-8.0		1341.5		-2	+330	472,442	2,335,494
1553	0				5.4	-		-5.4		1344.1	TP	0	0	472,444	2,335,164
1554	330		263°47'	+6.6°	11.7	-		-11.7		1337.8		+2	-330	472,446	2,334,834
1555	660		"	"	11.7	91°-	-11.5	-23.2		1326.3		+4	-660	472,448	2,334,504
1556	990		263°47'	+6.6°	10.7	91°-	-17.3	-28.0		1321.5	TP	+7-2	-990+2	472,449	2,334,176
1556	990				14.1	90°48'	-13.8	-27.9			TP				
	330		84°27'+180°	+6.6°	+2.0	88°-	+11.5	-9.5	1312.0		BS	+6	-330+2		
	330				+1.1	88°10'	-10.6	-9.5			BS				
1557	0				5.4	-		-5.4		1306.6	TP	0	0	472,455	2,333,848
1558	330		263°0'	+6.6°	3.9	-		-3.9		1308.1	TP	-2	-330	472,453	2,333,518
1558											TP				

Marshall Co.
472,440+2,336,270
Way (Line #4) el. 1327

Washington Co.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10-30-81		G. Cotcamp		M. Knapp		6834		MPK		1	66					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Kansas		Greenleaf SE		Kansas		Washington					L. Davis					
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS
												SOUTH -	WEST -	Y	X	
									1312.0							
1559	655		263°17'	+6.6°	3.5	-		-3.5		1308.5	TP	-1	-655+2	472,454	2,333,195	
1559	655				6.8	TH	+3.3	-3.5			TP					
	330		82°58'+180°	+6.6°	+5.0	-		+5.0			BS	-3	-330+2			
	330				+6.6	TH	-1.7	+4.9	1313.4		BS					
1560	0				5.4	-		-5.4		1308.0	π	0	0	472,451	2,332,867	
1561	330		263°47'	+6.6°	11.7	92°-	-11.5	-23.2		1290.2		+2	-330	472,453	2,332,537	
1562	660		" "	"	6.1	93°-	-34.5	-40.6		1272.8		+4	-660	472,455	2,332,207	
1563	990		263°47'	+6.6°	12.5	93°-	-51.7	-64.2		1249.2	TP	+7	-989+2	472,458	2,331,880	
1563	990				9.6	93°10'	-54.6	-64.2			TP					
	326		93°57'+180°	+6.6°	+7.7	89°-	-5.7	+2.0	1251.2		BS	+60	-320+2			
	326				+6.4	89°14'	-4.4	+2.0			BS					
1564	0				5.4	-		-5.4		1245.8	π	0	0	472,518	2,331,562	
TP	194		281°09'	+6.6°	3.9	88°-	+6.8	+2.9			TP	+59	-185	472,577	2,331,377	
TP	194				1.9	88°36'	+4.7	+2.8		1254.0	TP					
	130		78°58'+180°	+6.6°	+9.9	-		+9.9	1263.9		BS	-10	-130			
	130				+10.6	TH	-0.7	+9.9			BS					
1565	0				5.4	-		-5.4		1258.5	π	0	0	472,567	2,331,247	
1566	320		241°05'	+6.6°	14.5	91°46'	-9.9	-24.4		1239.5	TP	-121	-296	472,446	2,330,951	
1566	320				12.1	92°12'	-12.3	-24.4			TP					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10-30-81		G. Cotcamp		M. Knapp		6834		MPK		1	67					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Greenleaf SE		Kansas	Washington					L. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH+	EAST+	COORDINATES		REMARKS
												SOUTH-	WEST-	Y	X	
												LAT.	DEP.			
1566										1239.5						
	1650	1649.	82°07'±180°	+6.6°	+11.9	92°-	+57.6	+69.5	1309.0		BS	-37	-1649			
	1650				+13.9	91°56'	+55.6	+69.5		BS						
JL 7F	1700	1699	82°03'30"	+6.6°	9.1	92°-	-59.3	-68.4		1240.6		+40	+1699	472,449	2,331,001	472,460 ± 2,330,990 Way Inter. el. 1241
1567	1320		81°46'	+6.6°	9.7	92°30'	-57.5	-67.2		1241.8		+38	+1319	472,447	2,330,621	
1568	990		" "	"	10.4	92°50'	-48.9	-59.3		1249.7		+28	+990	472,437	2,330,292	
1569	660		" "	"	7.2	92°50'	-32.6	-39.8		1269.2		+19	+660	472,428	2,329,962	
1570	330		" "	"	7.9	92°30'	-14.4	-22.3		1286.7		+9	+330	472,418	2,329,632	
1571	0				5.4	-		-5.4		1303.6	π	0	0	472,409	2,329,302	
1572	330		262°16'36"	+6.6°	9.4	-		-9.4		1299.6		-6	-330	472,403	2,328,972	
1573	660		" "	"	9.6	-		-9.6		1299.4		-13	-660	472,396	2,328,642	
1574	990		" "	"	3.8	TH	+5.0	+1.2		1310.2		-19	-990	472,390	2,328,312	
1575	1320		" "	"	7.2	89°20'	+15.4	+8.2		1317.2		-26	-1320	472,383	2,327,982	
1576	1650		262°16'36"	+6.6°	4.8	89°20'	+19.2	+14.4	1407.5		TP	-32	-1650±2	472,377	2,327,654	
1576	1650				14.4	89°-	+28.8	+14.4		TP						
	1650	1648.4	81°44'±180°	+6.6°	+12.2	92°30'	+71.9	+84.1			BS	-48	-1648±2			
	1650				+14.2	92°26'	+70.0	+84.2			BS					
1577	1320		81°44'	+6.6°	11.2	92°50'	-65.2	-76.4		1331.1		+38	+1319	472,367	2,327,327	
1578	990		" "	"	13.4	93°-	-51.7	-65.1		1342.4		+29	+990	472,358	2,326,998	
1579	660		" "	"	5.9	95°-	-57.3	-63.2		1344.3		+19	+660	472,348	2,326,668	
1580	330		" "	"	10.2	96°-	-28.7	-38.9		1368.6		+10	+330	472,339	2,326,338	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10-30-81		C. Cotcamp		M. Knapp		6834		MPK		1	68					
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Greenleaf SE		Kansas	Washington					L. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH+	EAST+	COORDINATES		REMARKS
												SOUTH-	WEST-	Y	X	
									1407.5							
1581	0				5.4	-		-5.4		1402.1	π	0	0	472,329	2,326,008	
1582	330		263°03'	+6.6°	12.0	92°-	-11.5	-23.5		1384.0		-2	-330	472,327	2,325,678	
1583	340		262°49'	+6.6°	12.3	92°-	-11.9	-24.2		1383.3		-3	-340	472,326	2,325,668	472,310 + 2,325,690 4-Way Intersect. 1383.
1583	660		263°03'	+6.8°	13.4	0H	-3.3	-16.7			TP	-2	-660+2	472,327	2,325,350	
1583	660				14.5	90°12'	-2.3	-16.8		1390.7	TP					
	660		82°24'+180°	+6.8°	+9.0	88°-	-23.0	-14.0			BS	-9	-660+2			
	660				+7.8	88°06'	-21.9	-14.1	1376.6		BS					
1584	330		82°24'	+6.8°	12.5	-		-12.5		1364.1		+5	+330	472,323	2,325,022	
1585	0				5.4	-		-5.4		1371.2	π	0	0	472,318	2,324,692	
1586	330		263°06'	+6.8°	12.4	94°-	-23.0	-35.4		1341.2		-1	-330	472,317	2,324,362	
1587	660		"	"	4.0	93°-	-34.5	-38.5		1338.1		-1	-660	472,317	2,324,032	
1588	968		257°57'	+6.8°	7.3	TH	+4.8	-2.5		1374.1	TP	-89	-964+2	472,229	2,323,730	
1588	968				8.1	89°40'	+5.6	-2.5			TP					
	171	170	89°55'+180°	+6.8°	+14.2	96°30'	+19.2	+33.4	1407.5		BS	+20	-169+2			
	171				+13.7	96°46'	+19.7	+33.4			BS					
	π	0			5.4	-		-5.4		1402.1	π	0	0	472,249	2,323,563	
1589	150		289°55'	+6.8°	5.7	87°-	+7.8	+2.1		1409.6	TP	+67	-134+2	472,316	2,323,431	
1589	150				4.4	87°30'	+6.5	+2.1			TP					
	660		81°12'+180°	+6.8°	+2.3	-		+2.3	1411.9		BS	-23	-660+2			
	660				+5.6	TH	-3.3	+2.3			BS					

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
10-30-81		G. Catcamp		M. Knapp		6834		MPK		1	69				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Kansas		Greenleaf SE		Kansas		Washington					L. Davis				
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1411.9						
1590	330		81° 12'	+6.8°	6.3	-		-6.3		1405.6		+12	+330	472,305	2,323,103
1591	0				5.4	-		-5.4		1406.5	π	0	0	472,293	2,322,773
1592	330		262° 15'	+6.8°	5.4	94°	-23.0	-28.4		1383.5		-5	-330	472,288	2,322,443
1593	660		" "	"	4.1	94°	-45.9	-50.0		1361.9		-11	-660	472,282	2,322,113
1594	960		261° 15'	+6.8°	10.4	04	-4.8	-15.2		1396.7		-33	-959	472,260	2,321,814
1595	1290		262° 29' 24"	+6.8°	5.7	TH	+6.5	+0.8		1412.7	TP	-16	-1290	472,277	2,321,485
1595	1290				4.5	89° 46'	+5.3	+0.8			TP				
	618		80° 58' +180°	+6.8°	+13.2	89°	-10.8	+2.4	1415.1		BS	-24	-617+2		
	618				+8.5	89° 26'	-6.1	+2.4			BS				
1596	290		83° 22'	+6.8°	7.0	-		-7.0		1408.1		-1	+290	472,252	2,321,160
1597	0				5.4	--		-5.4		1409.7	π	0	0	472,253	2,320,870
1598	329		265° 05'	+6.8°	8.6	89°	+5.7	-2.9		1412.2	TP	+11	-329+2	472,264	2,320,543
1598	329				10.3	88° 42'	+7.5	-2.8			TP				
	1320	1318.7	82° 54' 08" +180°	+6.8°	+8.1	87° 30'	-57.5	-49.4			BS	-7	-1319+2		
	1320				+4.2	87° 40'	-53.7	-49.5	1362.7		BS				
π	1100	1099	83° 32'	+6.8°	5.5	87° 40'	+44.7	+39.2		1401.9		-6	+1099	472,251	2,320,325
1599	990		82° 54'	+6.8°	4.5	88°	+34.5	+30.0		1392.7		+5	+990	472,262	2,320,216
1600	660		" "	"	11.9	TH	+3.3	-8.6		1354.1		+3	+660	472,260	2,319,886
1601	330		" "	"	14.5	TH	+1.7	-12.8		1349.9		+2	+330	472,259	2,319,556
1602	0				5.4	-		-5.4		1357.3	π	0	0	472,257	2,319,226

472,265 + 2,320,370
4-way Intersect. el. 140.2

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
10-31-91		G. Cotcamp		M. Knapp		6834		MPK Jn		1	70					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Greenleaf SE/Kimeo	Kansas	Washington				L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1362.7							
1603	330		262°47'	+6.8°	13.2	BH	-1.7	-14.9		1347.8		-2	-330	472,255	2,318,896	
1604	660		262°47'	+6.8°	10.4	-		-10.4		1352.3	TP	-5	-660	472,252	2,318,566	
1604	660				7.1	BH	-3.3	-10.4			TP					
	1965		86°18'12" +180°	+6.8°	+9.2	91°-	+34.3	+43.5	1395.8		BS	+106	-1962			
	1965				+14.9	90°50'	+28.6	+43.5			BS					
1605	1630		87°06'	+6.8°	9.4	92°-	-56.9	-66.3		1329.5		-111	+1626	472,247	2,318,230	
1606	1312		86°10'	+6.8°	10.8	93°30'	-79.9	-90.7		1305.1		-68	+1310	472,290	2,317,914	
1607	988		83°28'	+6.8°	8.3	95°-	-85.8	-94.1		1301.7		-5	+988	472,353	2,317,592	
1608	660		80°38'	+6.8°	14.3	95°-	-57.3	-71.6		1324.2		+30	+659	472,388	2,317,263	↑
1609	330		" "	"	11.2	96°-	-34.3	-45.5		1350.3		+15	+330	472,373	2,316,934	Greenleaf SE Quad.
1610	0				5.4	-		-5.4		1390.4	π	0	0	472,358	2,316,604	Kimeo Quad.
1611	320		243°46'	+6.8°	14.8	87°-	+16.7	+1.9		1397.7	TP	-106	-301	472,252	2,316,303	↓
1611	320				9.2	88°-	+11.2	+2.0			TP					
	1320		82°48'26" +180°	+6.8°	+0.9	-		+0.9	1398.6		BS	-9	-1320			
	1320				+7.5	TH	-6.6	+0.9			BS					
1612	990		82°48'	+6.8°	6.2	-		-6.2		1392.4		+7	+990	472,250	2,315,973	
1613	660		" "	"	23.0	90°30'	-5.8	-28.8		1369.8		+5	+660	472,248	2,315,643	
1614	330		" "	"	8.9	-		-8.9		1389.7		+2	+330	472,245	2,315,317	
IF	11		101°0'	+6.8°	4.8	-		-4.8		1393.8		-3	+10	472,240	2,314,993	472,260 + 2,315,000 4-way el 1399.
1615	0				5.4	-		-5.4		1393.2	π	0	0	472,243	2,314,983	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
10-31-81		G. Cotcamp		M. Knapp		6834		MPK Jr		1	71			
AREA		TOPO MAP		STATE		COUNTY		RANGE		PARTY MANAGER				
Kansas		Kimeo		Kansas		Washington				L. Davis				
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1398.6					
1616	330		262°53'	+6.5'	13.5	-		-13.5		1385.1		-4	-330	472,239 2,314,653
1617	660		"	"	18.6	92°-	-23.0	-41.6		1357.0		-7	-660	472,236 2,314,323
1618	990		"	"	45.9	92°-	-34.5	-40.4		1358.2		-11	-990	472,232 2,313,993
1619	1320		"	"	10.9	8H	-6.6	-17.5		1381.1		-14	-1320	472,229 2,313,663
1620	1650		"	"	11.2	-		-11.2		1387.4		-18	-1650	472,225 2,313,333
1621	1980		262°53'18"	+6.5°	0.4	-		-0.4		1398.2	TP	-21	-1980	472,222 2,313,003
1621	1980				10.3	TH	+9.9	-0.4			TP			
	2310		83°04'46"+180°	+6.5°	+5.5	91°-	+10.3	+45.8	1444.0		BS	-17	-2310	
	2310				+14.9	90°46'	+30.9	+45.8			BS			
1622	1980		83°05'	+6.5°	6.7	91°20'	-46.1	-52.8		1391.2		+14	+1980	472,219 2,312,673
1623	1650		"	"	8.5	91°20'	-38.4	-46.9		1397.1		+12	+1650	472,217 2,312,343
1624	1320		"	"	9.0	91°20'	-30.7	-39.7		1404.3		+10	+1320	472,215 2,312,013
1625	990		"	"	11.9	91°20'	-23.0	-34.9		1409.1		+7	+990	472,212 2,311,683
1626	660		"	"	7.3	92°-	-23.0	-30.3		1413.7		+5	+660	472,210 2,311,353
1627	330		"	"	9.6	91°-	-5.8	-15.4		1428.6		+2	+330	472,207 2,311,023
1628	0				5.4	-		-5.4		1438.6	TP	0	0	472,205 2,310,693
1629	330		262°54'	+6.5°	0.2	TH	+1.7	+1.5		1445.5		-3	-330	472,202 2,310,363
1630	660		"	"	6.2	89°-	+11.5	+5.3		1449.3		-7	-660	472,198 2,310,033
1631	990		262°54'	+6.5°	14.1	89°20'	+11.5	-2.6		1441.4	TP	-10	-990	472,195 2,309,703
1631	990				13.5	89°22'	+10.9	-2.6			TP			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
10-31-81		G. Cotcamp		M. Knapp		6834		MPK <i>fr</i>		1	72			
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER			
Kansas		Kimeo		Kansas		Washington					L. Davis			
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
1631										1441.4				
	1320		82° 19' 48" +180°	+6.5°	+10.8	89° -	-23.0	-12.2	1429.2		BS	-27-2	-1320	
	1320				+4.7	89° 16'	-16.9	-12.2			BS			
$\frac{1632}{1631}$	1306		82° 33'	+6.5°	10.7	89° -	+22.8	+12.1		1441.3		+22	+1306	472,200 + 2,309,700 4-way el. 1441.
1632	990		82° 20'	+6.5°	7.9	89° 20'	+11.5	+3.6		1432.8		+20	+990	472,186 2,309,373
1633	660		"	"	4.8	89° 20'	+7.7	+2.9		1432.1		+13	+660	472,179 2,309,043
1634	330		"	"	7.1	-		-7.1		1422.1		+7	+330	472,173 2,308,713
1635	0				5.4	-		-5.4		1423.8	X	0	0	472,166 2,308,383
1636	330		261° 49'	+6.5°	7.0	-		-7.0		1422.2		-10	-330	472,156 2,308,053
1637	660		"	"	13.6	-		-13.6		1415.6		-19	-660	472,147 2,307,723
1638	990		261° 49'	+6.5°	12.6	BH	-5.0	-17.6		1411.6	TP	-29-2	-990	472,135 2,307,393
1638	990				14.7	90° 10'	-2.9	-17.6			TP			
	1320		81° 57' 20" +180°	+6.5°	+5.2	88° 40'	-30.7	-25.5			BS	-36-	-1319	
	1320				+9.7	88° 28'	-35.3	-25.6	1386.0		BS			
1639	990		81° 57'	+6.5°	4.9	88° 30'	+25.9	+21.0		1407.0		+27	+990	472,126 2,307,064
1640	660		"	"	6.2	88° 30'	+17.3	+11.1		1397.1		+18	+660	472,117 2,306,734
1641	330		"	"	3.8	89° -	+5.8	+2.0		1388.0		+9	+330	472,108 2,306,404
1642	0				5.4	-		-5.4		1380.6	X	0	0	472,099 2,306,074
1643	330		262° 29'	+6.5°	10.6	91° -	-5.8	-16.4		1369.6		-6	-330	472,093 2,305,744
1644	660		"	"	4.9	92° -	-23.0	-27.9		1358.1		-12	-660	472,087 2,305,414
1645	990		"	"	5.4	91° 30'	-25.9	-31.3		1354.7		-18	-990	472,081 2,305,084

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11-6-81	INSTRUMENT MAN G. Catcamp		ROD MAN M. Knapp		PARTY NUMBER 6834		NOTES CHECKED BY MPK		LINE NO. 1	PAGE 73
AREA Kansas	TOPO MAP Kimeo	STATE Kansas	COUNTY Washington		TWP	RANGE	PPM	PARTY MANAGER L. David		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y	X
									1386.0							
1646	1320		262°29'	+6.5°	7.6	91°-	-23.0	-30.6		1355.4		-23	-1320	472,076	2,304,754	horiz. correct. Y=+6' X=+40'
1647	1500		262°01'	+6.5°	11.5	90°30'	-13.1	-24.6		1361.4		-39	-1499	472,060	2,304,575	472,060 + 2,304,575
1647	1650		262°29'18"	+6.5°	7.2	90°30'	-14.4	-21.6		1364.4	TP	-29	-1650	472,070	2,304,426	4-way el. 1361.
1647	1650				11.9	90°20'	-9.6	-21.5			TP					
	660		84°42'+180°	+6.5°	+13.5	92°-	+23.0	+36.5	1400.9		BS	+14	-659			
	660				+11.6	92°10'	+24.9	+36.5			BS					
1648	330		84°42'	+6.5°	8.7	92°-	11.5	-20.2		1380.7		-7	+330	472,077	2,304,099	
1649	0				5.4	-	-	-5.4		1395.5	TP	0	0	472,084	2,303,769	
1650	330		264°16'	+6.5°	1.1	-	-	-1.1		1399.8		+4	-330	472,088	2,303,439	
1651	660		"	"	5.7	-	-	-5.7		1395.2		+9	-660	472,093	2,303,109	
1652	990		264°16'	+6.5°	0.3	TH	+5.0	+4.7			TP	+13	-990	472,097	2,302,781	
1652	990				4.0	89°30'	+8.6	+4.6		1405.5	TP					
	2310		84°25'32"+180°	+6.5°	+8.0	BH	+11.6	+19.6	1425.1		BS	+37	-2310			
	2310				+12.9	90°10'	+6.7	+19.6			BS					
1653	1980		84°26'	+6.5°	7.9	BH	-9.9	-17.8		1407.3		-32	+1980	472,102	2,302,453	
1654	1650		"	"	10.3	BH	-8.3	-18.6		1406.5		-27	+1650	472,107	2,302,123	
1655	1320		"	"	13.2	90°30'	-11.5	-24.7		1400.4		-22	+1320	472,112	2,301,793	
1656	990		"	"	10.8	90°30'	-8.6	-19.4		1405.7		-16	+990	472,118	2,301,463	
1657	660		"	"	11.0	-	-	-11.0		1414.1		-11	+660	472,123	2,301,133	
1658	330		"	"	6.8	-	-	-6.8		1418.3		-5	+330	472,129	2,300,803	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-6-81		G. Cotcamp		M. Knapp		6834		MPK Jn		1		74			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Kimeo		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTting DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1425.1						
1659	0				5.4	-		-5.4		1419.7	π	0	0	472,134	2,300,473
1660	330		263°58'	+6.5°	14.0	91°-	-5.8	-19.8		1405.3		+3	-330	472,137	2,300,143
1661	660		" "	"	13.2	91°-	-11.5	-24.7		1400.4		+5	-660	472,139	2,299,813
1662	990		" "	"	9.3	0H	-5.0	-14.3		1410.8		+8	-990	472,142	2,299,483
IT	1203		264°24'	+6.5°	5.3	-		-5.3		1419.8		+19	-1203	472,153	2,299,270
1663	1320		263°58'	+6.5°	7.7	-		-7.7		1417.4		+11	-1320	472,145	2,299,153
1664	1650		" "	"	6.0	-		-6.0		1419.1		+13	-1650	472,147	2,298,823
1665	1980		263°57'36"	+6.5°	5.0	TH	+9.9	+4.9			TP	+16	-1980+2	472,150	2,298,495
1665	1980				13.6	89°28'	+18.4	+4.8		1429.9	TP				
	1980		82°31'30"+180°	+6.5°	+13.9	90°44'	+25.3	+39.2	1469.1		BS	-34	-1980+2		
	1980				+11.6	90°48'	+27.6	+39.2			BS				
1666	1650		82°31'	+6.5°	11.3	90°50'	-24.0	-35.3		1433.8		+28	+1650	472,144	2,298,167
1667	1320		" "	"	10.0	90°40'	-15.4	-25.4		1443.7		+23	+1320	472,139	2,297,837
1668	990		" "	"	13.8	90°40'	-11.5	-25.3		1443.8		+17	+990	472,133	2,297,507
1669	660		" "	"	12.5	90°40'	-7.7	-20.2		1448.9		+11	+660	472,127	2,297,177
1670	330		" "	"	9.8	-		-9.8		1459.3		+6	+330	472,122	2,296,847
1671	0				5.4	-		-5.4		1463.7	π	0	0	472,116	2,296,517
1672	330		262°51'	+6.5°	11.7	-		-11.7		1457.4		-4	-330	472,112	2,296,187
1673	660		" "	"	7.3	91°-	-11.5	-18.8		1450.3		-7	-660	472,109	2,295,257
1674	990		" "	"	11.8	91°-	-17.3	-29.1		1440.0		-11	-990	472,105	2,295,527

472,100+2,299,295
4-way Intersect. el. 1419

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-6-81		G. Cotcamp		M. Knapp		6834		MPK Jr		1		75			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Kimeo		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1469.1						
1675	1320		262° 51'	+6.5°	11.1	91° 10'	-26.9	-38.0		1431.1		-15	-1320	472,101	2,295,197
1676	1650		" "	"	10.3	90° 40'	-19.2	-29.5		1439.6		-19	-1650	472,097	2,294,867
1677	1980		262° 51' 30"	+6.5°	10.5	90° 40'	-23.0	-33.5			TP	-22	-1980	472,094	2,294,539
1677	1980				14.0	90° 34'	-19.6	-33.6		1435.5	TP				
	2310		82° 47' 50" +180°	+6.5°	+14.9	91° 10'	+47.0	+61.92	1497.4		BS	-28	-2309		
	2310				+10.9	91° 16'	+51.1	+62.0			BS				
1678	1980		82° 48'	+6.5°	9.2	91° 48'	-62.2	-71.4		1426.0		+24	+1980	472,090	2,294,210
1678	1752		83° 17' 40"	+6.5°	13.7	91° 50'	-56.0	-69.7		1427.7		+6	+1751	472,072	2,293,981
1679	1650		82° 48'	+6.5°	10.3	92° -	-57.6	-67.9		1429.5		+20	+1650	472,086	2,293,880
1680	1320		" "	"	8.8	92° -	-46.0	-54.8		1442.6		+16	+1320	472,082	2,293,550
1681	990		" "	"	8.0	92° -	-34.5	-42.5		1454.9		+12	+990	472,078	2,293,220
1682	660		" "	"	7.3	93° -	-34.5	-41.8		1455.6		+8	+660	472,074	2,292,890
1683	330		" "	"	10.9	92° -	-11.5	-22.4		1475.0		+4	+330	472,070	2,292,560
1684	0				5.4	-	-	-5.4		1492.0	TP	0	0	472,066	2,292,230
1685	330		263° 16'	+6.5°	4.9	-	-	-4.9		1492.5		-1	-330	472,065	2,291,900
1686	660		" "	"	6.6	-	-	-6.6		1490.8		-3	-660	472,063	2,291,570
1687	990		" "	"	10.0	BH	-5.0	-15.0		1482.4		-4	-990	472,062	2,291,240
1688	1320		" "	"	12.9	90° 32'	-12.3	-25.2		1472.2		-5	-1320	472,061	2,290,910
1689	1650		263° 16' 18"	+6.5°	7.6	BH	-8.3	-15.92		1481.5	TP	-7	-1650	472,059	2,290,580
1689	1650				13.9	90° 04'	-1.9	-15.8			TP				

472,010 + 2,294,000
4-Way Intersect. el. 427

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	11-6-81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	M. Knapp	PARTY NUMBER	6834	NOTES CHECKED BY	MPK Lr	LINE NO.	1	PAGE	76	
AREA	Kansas	TOPO MAP	Kimco	STATE	Kansas	COUNTY	Washington	TWP		RANGE		PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
1689										1481.5				
	2310		82°47'30" +180°	+6.5°	+5.0	88°04'	-77.9	-72.9	1408.6		BS	-29	-2309	
	2310				+1.0	88°10'	-73.9	-72.9			BS			
1690	1980		82°47'	+6.5°	12.9	88°20'	+57.6	+44.7		1453.3		+25	+1980	472,055 2,290,251
1691	1650		" "	"	9.3	88°40'	+38.4	+29.1		1437.7		+21	+1650	472,051 2,289,921
1692	1320		" "	"	6.8	88°40'	+30.7	+23.9		1432.5		+17	+1320	472,047 2,289,591
1693	990		" "	"	6.8	89°-	+17.3	+10.5		1419.1		+12	+990	472,042 2,289,261
1694	660		" "	"	6.1	-	-4.1	-0.1		1408.5		+8	+660	472,038 2,288,931
1695	368		80°54'	+6.5°	4.7	-	-4.7	-4.7		1403.9		+17	+368	472,047 2,288,639 4-way Intersect.
1695	330		82°47'	+6.5°	6.5	-	-6.5	-6.5		1402.1		+4	+330	472,034 2,288,601
1696	0				5.4	-	-5.4	-5.4		1403.2	X	0	0	472,030 2,286,271
1697	330		262°33'	+6.5°	10.7	-	-10.7	-10.7		1397.9		-5	-330	472,025 2,287,941
1698	660		" "	"	3.5	-	-3.5	-3.5		1405.1		-11	-660	472,019 2,287,611
1699	990		" "	"	3.4	TH	+5.0	+1.6		1410.2		-16	-990	472,014 2,287,281
1700	1320		" "	"	5.9	TH	+6.6	+0.7		1409.3		-22	-1320	472,008 2,286,951
1701	1650		" "	"	7.5	TH	+8.3	+0.8		1409.4		-27	-1650	472,003 2,286,621
1702	1980		262°33'08"	+6.5°	3.0	TH	+9.9	+6.9			TP	-33+4	-1980	472,001 2,286,291
1702	1980				4.6	89°40'	+11.5	+6.9		1415.5	TP			
	1650		82°00'16" +180°	+6.5°	+8.9	BH	+8.3	+17.2			BS	-43+4	-1649.1	
	1650				+14.2	90°6'	+2.9	+17.1	1432.6		BS			
1703	1320		82°00'	+6.5°	13.6	-	-13.6	-13.6		1419.0		+35	+1320	471,997 2,285,963

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11-6-81		G. Cotcamp		M. Knapp		6834		MPK <i>Sm</i>		1	77						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Kansas		Kimco/Linn SE	Kansas	Washington				L. Davis									
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1432.6								
1704	990		82°00'	+6.5°	11.8	-		-11.8		1420.8		+26	+990	471,988	2,285,633		
1705	660		"	"	10.6	-		-10.6		1422.0		+17	+660	471,979	2,285,303		
1706	330		"	"	5.4	-		-5.4		1427.2		+9	+330	471,971	2,284,973		
1707	0				5.4	-		-5.4		1427.2	π	0	0	471,962	2,284,643		
1708	330		262°18'	+6.5°	6.3	-		-6.3		1426.3		-7	-330	471,955	2,284,313		
1709	660		"	"	6.8	-		-6.8		1426.8		-14	-660	471,948	2,283,983		
1710	990		"	"	7.4	-		-7.4		1425.2		-21	-990	471,941	2,283,653	horiz. corred. y = +8'	
1711	1320		"	"	7.8	-		-7.8		1424.8		-28	-1320	471,934	2,283,323	x = +15'	
1711	1328		262°07'	+6.5°	8.3	-		-8.3		1424.3		-32	-1328	471,930	2,283,315	4-way Inters.	
1712	1650		262°17'54"	+6.9°	10.6	-		-10.6		1422.0	TP	-23+2	-1650	471,941	2,282,993		
1712	1650				2.3	ΘH	-8.3	-10.6			TP						
	2310		82°04'54"+180°	+6.9°	+5.7	TH	-11.6	-5.9	1416.1		BS	-41+2	-2310				
	2310				+4.9	89°44'	-10.7	-5.8			BS						
1713	1980		82°05'	+6.9°	7.2	TH	+9.9	+2.7		1418.8		+35	+1980	471,937	2,282,663		
1714	1650		"	"	4.6	-		-4.6		1411.5		+29	+1650	471,931	2,282,333	↑	
1715	1320		"	"	3.0	-		-3.0		1413.1		+23	+1320	471,925	2,282,003	Kimco Quad.	
1716	990		"	"	4.5	-		-4.5		1411.6		+18	+990	471,920	2,281,673	Linn SE Quad.	
1717	660		"	"	5.1	-		-5.1		1411.0		+12	+660	471,914	2,281,343	↓	
1718	330		"	"	9.8	-		-9.8		1406.3		+6	+330	471,908	2,281,013		
1719	0				5.4	-		-5.4		1410.7	π	0	0	471,902	2,280,683		

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11-7-81		G. Cotcamp		M. Knapp		6834		Jr		1	78						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Kansas			Kansas	Washington				L. Davis									
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1416.1								
1720	330		262°10'	+6.9°	13.3	BH	-1.7	-15.0		1401.1		-5	-330	471,897	2,280,353		
1721	660		"	"	13.9	-		-13.9		1402.2		-11	-660	471,891	2,280,023		
1722	990		"	"	11.8	-		-11.8		1404.3		-16	-990	471,886	2,279,693		
1723	1320		"	"	11.7	-		-11.7		1404.4		-22	-1320	471,880	2,279,363		
1724	1650		"	"	3.8	-		-3.8		1412.3		-27	-1650	471,875	2,279,033		
1725	1980		"	"	1.2	-		-1.2		1414.9		-32	-1980	471,870	2,278,703		
1726	2310		262°10'18"	+6.9°	10.0	TH	+11.6	+1.6			TP	-37+2	-2310	471,867	2,278,373		
1726	2310				5.2	89°50'	+6.7	+1.5		1417.6	TP						
	1980		81°21'34"+180°	+6.9°	+13.8	91°16'	+43.8	+57.6	1475.2		OS	-60+1	-1979				
	1980				+12.7	91°18'	+44.9	+57.6			OS						
1727	1650		81°22'	+6.9°	9.8	91°20'	-38.4	-48.2		1427.0		+50	+1649	471,858	2,278,043		
IF	1634		81°24'	+6.9°	9.2	91°20'	-38.0	-47.2		1428.0		+48	+1633	471,856	2,278,027	471,805+2,278,010 Hwy Intersect. el. 1427	
1728	1320		81°22'	+6.9°	7.0	91°20'	-30.7	-37.7		1437.5		+40	+1319	471,848	2,277,713		
1729	990		"	"	10.6	91°-	-17.3	-27.9		1447.3		+30	+990	471,838	2,277,384		
1730	660		"	"	11.7	91°-	-11.5	-23.2		1452.0		+20	+660	471,828	2,277,054		
1731	330		"	"	12.0	-		-12.0		1463.2		+10	+330	471,818	2,276,724		
1732	0				5.4	-		-5.4		1469.8	T	0	0	471,808	2,276,394		
1733	330		260°59'	+7.3°	13.8	BH	-1.7	-15.5		1459.7		-10	-330	471,798	2,276,064		
1734	660		"	"	12.5	91°-	-11.5	-24.0		1451.2		-20	-660	471,788	2,275,734		
1735	990		"	"	11.1	91°-	-17.3	-28.4		1446.8		-30	-990	471,778	2,275,404		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-6-81		G. Cotcamp		M. Knapp		6834		Jm		1		79			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Linn SE		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1475.2						
1736	1320		260°59'	+7.3°	1.5	91°-	-23.0	-24.5		1450.7		-40	-1319	471,768	2,275,075
1737	1650		260°59'	+7.3°	12.1	90°30'	-14.4	-26.5		1448.7	TP	-49	-1649	471,759	2,274,745
1737	1650				7.3	90°40'	-19.2	-26.5			TP				
	660		80°46'+180°	+7.3°	+9.2	89°-	-11.5	-2.3	1446.4		BS	-22	-660+2		
	660				+1.0	TH	-3.3	-2.3			BS				
1738	330		80°46'	+7.3°	4.5	-	-	-4.5		1441.9		+11	+330	471,748	2,274,417
1739	0				5.4	-	-	-5.4		1441.0	π	0	0	471,787	2,274,087
1740	330		262°03'	+7.3°	9.7	92°-	-11.5	-21.2		1425.2		-4	-330	471,733	2,273,757
1741	660		" "	"	12.8	92°30'	-28.8	-41.6		1404.8		-7	-660	471,730	2,273,427
1742	990	989.1	262°03'	+7.3°	7.9	92°30'	-43.1	-51.0		1395.4	TP	-11	-989+3	471,726	2,273,101
1742	990				12.5	92°14'	-38.6	-51.1			TP				
	1650	1649.4	82°17'+180°	+7.3°	+4.6	91°30'	+43.2	+47.8	1443.2		BS	-12	-1649+3		
	1650				+14.2	91°10'	+33.6	+47.8			BS				
1743	1320		82°17'	+7.3°	9.8	91°40'	-38.4	-48.2		1395.0		+10	+1320	471,724	2,272,775
<u>1743</u>	1318		82°26'	+7.3°	9.5	91°40'	-38.3	-47.8		1395.4		+6	+1317	471,720	2,272,772 T-rd (north) Elev 1390
1744	990		82°17'	+7.3°	13.2	91°50'	-31.7	-44.9		1398.3		+7	+990	471,721	2,272,445
1745	660		" "	"	8.8	91°30'	-17.3	-26.1		1417.1		+5	+660	471,719	2,272,115
1746	330		" "	"	11.2	-	-	-11.2		1432.0		+2	+330	471,716	2,271,785
1747	0				5.4	-	-	-5.4		1437.8	π	0	0	471,714	2,271,455
1748	330		261°59'	+7.3°	11.7	91°-	-5.8	-7.5		1425.7		-4	-330	471,710	2,271,125

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	11-6-81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	M. Knapp	PARTY NUMBER	6834	NOTES CHECKED BY	MPK	LINE NO.	1	PAGE	81
AREA	Kansas	TOPO MAP	Lion SE	STATE	Kansas	COUNTY	Washington	RANGE	MPK	PPM		PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1424.5						
17643	2080		262°03'	+7.9°	5.2	89°-	+36.3	+31.1		1455.6		-2	-2080	471,679	2,266,182
17684	2410	2409.5	262°03'	+7.9°	5.4	88°50'	+49.1	+43.7		1468.2	TP	-2	-2410.3	471,679	2,265,855
17684	2410				12.4	88°40'	+56.1	+43.7			TP				
	1980		81°13'24"+180°	+7.9°	+4.6	-		+4.6			BS	-30	-1980.3		
	1980				+14.5	TH	-9.9	+4.6	1472.8		BS				
1765	1650		81°13'	+7.9°	6.3	-		-6.3		1466.5		+25	+1650	471,674	2,265,528
1766	1320		" "	"	1.8	-		-1.8		1471.0		+20	+1320	471,669	2,265,198
1767	990		" "	"	2.2	-		-2.2		1470.6		+15	+990	471,664	2,264,868
1768	660		" "	"	11.2	OH	-3.3	-14.5		1458.3		+10	+660	471,659	2,264,538
1769	330		" "	"	11.2	91°-	-5.8	-17.0		1455.8		+5	+330	471,654	2,264,208
1770	0				5.4	-		-5.4		1467.4	X	0	0	471,649	2,263,878
1771	330		260°53'	+7.9°	13.6	91°-	-5.8	-19.4		1453.4		-7	-330	471,642	2,263,548
1772	660		" "	"	11.4	91°-	-11.5	-22.9		1449.9		-14	-660	471,635	2,263,218
1773	990		" "	"	10.1	-		-10.1		1462.7		-21	-990	471,628	2,262,888
1774	1320		" "	"	5.9	-		-5.9		1466.9		-28	-1320	471,621	2,262,558
1774	1502		260°56'	+7.9°	8.6	-		-8.6		1464.2		-31	-1502	471,618	2,262,376
1775	1650		260°53'	+7.9°	6.6	-		-6.6		1466.2		-35	-1650	471,614	2,262,228
1776	1980		260°53'26"	+7.9°	6.4	TH	+9.9	+3.5			TP	-42	-1980.3	471,607	2,261,901
1776	1980				8.0	89°40'	+11.5	+3.5		1476.3	TP				

471,660 + 2,262,380
4-way ELEV 1463

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-6-81		G. Cotcamp		M. Knapp		6834		L		1		82			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Linn SF		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
1776										1476.3					
	2640		81° 29' 46" +180°	+7.9°	+13.6	89° 20'	-30.7	-17.12	1459.2		BS	-28	-2640.3		
	2640				+10.5	89° 24'	-27.6	-17.1		BS					
1777	2310		81° 30'	+7.9°	6.7	89° 30'	+20.2	+13.5		1472.7		+24	+2310	471,603	2,261,574
1778	1980		" "	"	7.0	89° 30'	+17.3	+10.3		1469.5		+21	+1980	471,600	2,261,244
1779	1650		" "	"	6.4	89° 30'	+14.4	+8.0		1467.2		+17	+1650	471,596	2,260,914
1780	1320		" "	"	6.0	89° 30'	+11.5	+5.5		1464.7		+14	+1320	471,593	2,260,584
1781	990		" "	"	5.8	89° 30'	+8.6	+2.8		1462.0		+10	+990	471,589	2,260,254
1782	660		" "	"	3.1	TH	+3.3	+0.2		1459.4		+7	+660	471,586	2,259,924
1783	330		" "	"	2.4	-	-	-2.4		1456.8		+3	+330	471,582	2,259,594
1784	0		" "	"	5.4	-	-	-5.4		1453.8	X	0	0	471,579	2,259,264
1785	330		261° 40'	+7.9°	12.3	-	-	-12.3		1446.9		-3	-330	471,576	2,258,934
1786	660		" "	"	12.3	OH	-3.3	-15.6		1443.6		-5	-660	471,574	2,258,604
1787	990		" "	"	13.2	-	-	-13.2		1446.0		-7	-990	471,572	2,258,274
1788	1320		" "	"	12.3	OH	-6.6	-18.9		1440.3		-10	-1320	471,569	2,257,944
1789	1650		" "	"	12.8	-	-	-12.8		1446.4		-12	-1650	471,567	2,257,614
1790	1980		" "	"	9.3	-	-	-9.3		1449.9		-15	-1980	471,564	2,257,284
IF	2257		261° 23' 44"	+7.9°	9.4	-	-	-9.4		1449.8		-28	-2257	471,551	2,257,007
1791	2310		261° 40'	+7.9°	12.9	-	-	-12.9		1446.3	TP	-17	-2310	471,562	2,256,954
1792	2310+2640		261° 39' 40"	+8.3°	7.2	90° 6'	-4.6	-11.8			TP	-2	-2640+3	471,577	2,256,627
1792	2640		" "	"	11.9	-	-	-11.9		1447.3	TP				

471,590 + 2,257,005
4-Way Intersect ELEV 1449

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-7-81		G. Cotcamp		M. Knapp		6834		MPK Jm		1		83			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Linn SE		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS A TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
1792										1447.3					
	2640		81° 32' 34" +180°	+8.3°	+6.7	89° 30'	-23.0	-16.3			BS	-7	-2640+3		
	2640				+9.7	89° 26'	-26.1	-16.4	1430.9		BS				
1793	2310		81° 33'	+8.3°	2.9	TH	+11.6	+8.7	1439.6			+6	+2310	471,576	2,251,680
1794	1980		"	"	7.9	TH	+9.9	+20	1432.9			+5	+1980	471,575	2,252,010
1795	1650		"	"	6.2	-		-6.2	1424.7			+4	+1650	471,574	2,252,340
1796	1320		"	"	9.4	BH	-6.6	-16.0	1414.9			+3	+1320	471,573	2,252,670
1797	990		"	"	9.1	-		-9.1	1421.8			+3	+990	471,573	2,253,000
1798	660		"	"	4.9	-		-4.9	1426.0			+2	+660	471,572	2,253,330
1799	330		"	"	6.6	-		-6.6	1424.3			+1	+330	471,571	2,253,660
1800	0				5.4	-		-5.4	1425.5		TP	0	0	471,570	2,253,990
1801	330		261° 41'	+8.3°	11.8	-		-11.8	1419.1			-0	-330	471,570	2,253,660
1802	660		"	"	10.8	91° -	-11.5	-22.3	1408.6			-0	-660	471,570	2,253,330
1803	990		"	"	12.0	91° -	-17.3	-29.3	1401.6			-0	-990	471,570	2,253,000
1804	1320		"	"	13.4	91° -	-23.0	-36.4	1394.5			-0	-1320	471,570	2,252,670
1805	1650		"	"	12.8	91° -	-28.8	-41.6	1389.3			-0	-1650	471,570	2,252,340
1806	1980		"	"	9.3	90° 40'	-23.0	-32.3	1398.6			-1	-1980	471,569	2,252,010
1807	2210		261° 26' 40"	+8.3°	8.7	BH	-11.1	-19.8	1411.1			-10	-2210	471,566	2,251,780
1807	2310		261° 40' 48"		12.2	BH	-11.6	-23.8	1407.1		TP	-1+2	-2310+2	471,571	2,251,682
1807	2310				14.4	90° 14'	-9.4	-23.8			TP				

horiz. correct y=+7
x=+32
471,560+2,251,780
4-Way Intersect. 1411

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11-9-81		G. Cotcamp		M. Knapp		6834		MPK <i>z</i>		1	84						
AREA		TOPO MAP		STATE	CDNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Linn SE		Kansas	Washington				L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
1807										1407.1							
	2970		81° 20' 20" +180	+8.3°	+14.6	89° 22'	-32.8	-18.2	1388.9		BS	-19+2	-2970.2				
	2970				+12.9	89° 24'	-31.1	-18.2			BS						
1808	2640		81° 20'	+8.3°	7.0	89° 46'	+10.7	+3.7		1392.6		+17	+2640	471,571	2,251,354		
1809	2310		" "	"	5.7	-	-	-5.7		1383.2		+15	+2310	471,569	2,251,024		
1810	1980		" "	"	13.1	-	-	-13.1		1375.8		+13	+1980	471,567	2,250,694		
1811	1650		" "	"	7.8	84	-8.3	-16.1		1372.8		+11	+1650	471,565	2,250,364		
1812	1320		" "	"	10.0	-	-	-10.0		1378.9		+8	+1320	471,562	2,250,034		
1813	990		" "	"	10.1	-	-	-10.1		1378.8		+6	+990	471,560	2,249,704		
1814	660		" "	"	11.9	-	-	-11.9		1377.0		+4	+660	471,558	2,249,374		
1815	330		" "	"	12.4	-	-	-12.4		1376.5		+2	+330	471,556	2,249,044		
1816	0		" "	"	5.4	-	-	-5.4		1383.5	π	0	0	471,554	2,248,714		
1817	330		261° 46' 20"	+8.3°	9.1	92° -	-11.5	-20.6		1368.3		0	-330	471,554	2,248,384		
1818	660		" "	"	12.6	92° -	-23.0	-36.6		1353.3		+1	-660	471,555	2,248,054		
1819	990		" "	"	3.8	92° -	-34.5	-38.9		1350.6		+1	-990	471,555	2,247,724		
1820	1320		" "	"	9.1	91° -	-23.0	-32.1		1356.8		+2	-1320	471,554	2,247,394		
1821	1650		261° 46' 20"	+8.3°	13.8	84	-8.3	-22.1		1366.8	TP	+2 +2	-1650+2	471,558	2,247,066		
1821	1650		" "	"	14.3	90° 16'	-7.7	-22.0			TP						
	2970		80° 01' 40" +180	+8.3°	+14.8	89° 04'	-48.4	-33.6	1333.2		BS	-87+2	-2968.2				
	2970		" "	"	+9.7	89° 10'	-49.2	-33.5			BS						
1822	2640		80° 02'	+8.3°	10.8	89° 20'	+30.7	+19.9		1353.1		+77	+2639	471,550	2,246,739	Linn SE Quad.	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE					
11-9-81		G. Cotcamp		M. Knapp		6834		MPK Zm		1		85					
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER					
Kansas		Linn SW		Kansas		Washington						L. Davis					
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS	
														Y	X		
									1333.2								
1822	2245		80° 00'	+8.3°	6.9	89° 20'	+26.1	+19.2		1352.4		+67	+2244	471,540	2,246,344	471,540 + 2,246,490	4-way (2+9)
1823	2310		80° 02'	+8.3°	7.9	89° 20'	+26.9	+19.0		1352.2		+67	+2309	471,540	2,246,409		Linn SW Quad.
1824	1980		"	"	9.4	TH	+9.9	+0.5		1333.7		+58	+1979	471,531	2,246,079		↓
1825	1650		"	"	5.1	-	-	-5.1		1328.1		+48	+1649	471,521	2,245,749		
1826	1320		"	"	5.2	-	-	-5.2		1328.0		+38	+1319	471,511	2,245,419		
1827	990		"	"	9.0	-	-	-9.0		1324.2		+29	+990	471,502	2,245,090		
1828	660		"	"	7.2	-	-	-7.2		1326.0		+19	+660	471,492	2,244,760		
1829	330		"	"	7.7	-	-	-7.7		1325.5		+10	+330	471,483	2,244,430		
1830	0		"	"	5.4	-	-	-5.4		1327.8	π	0	0	471,473	2,244,100		
1831	330		260° 49'	+8.3°	11.2	-	-	-11.2		1322.0		-5	-330	471,468	2,243,770		
1832	660		"	"	13.2	-	-	-13.2		1320.0		-10	-660	471,463	2,243,440		
1833	990		"	"	9.6	BH	-5.0	-14.6		1318.6		-15	-990	471,458	2,243,110		
1834	1320		"	"	14.0	BH	-6.6	-20.6		1312.6		-20	-1320	471,453	2,242,780		
1835	1650		"	"	12.3	BH	-8.3	-20.6		1312.6		-25	-1650	471,448	2,242,450		bridge (out)
1836	1980		"	"	7.4	BH	-9.9	-17.3		1315.9		-31	-1980	471,442	2,242,120		
1837	2310		260° 49' 24"	+8.3°	3.1	BH	-11.6	-14.7		1318.5		-35	-2310	471,438	2,241,790		
1838	2640		260° 49' 24"	+8.3°	5.0	90° 6'	-4.6	-9.6		1323.6	TP	-40+	-2640+	471,434	2,241,462		
1838	2640				2.0	90° 10'	-7.7	-9.7			TP						

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
11-9-81		G. Cotcamp		M. Knapp		6834		MPK dm		1	86				
AREA		TOPO MAP		STATE		COUNTY		TWP		PARTY MANAGER					
Kansas		Linn SW		Kansas		Washington				L. Davis					
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
1838	660		82°04'+180°	+8.3°	+12.2	92°-	+23.0	+35.2	1358.8	1323.6	BS	+4	-660.42		
	660				+9.9	92°12'	+25.3	+35.2			BS				
1839	463		83°08'	+8.3°	12.8	91°-	-8.1	-20.9	1337.9	1342.8		-12	+463	471,426 2,241,267	471,430 + 2,241,275 4-Way Intersect. 1338.
1840	330		82°04'	+8.3°	10.2	91°-	-5.8	-16.0	1342.8	1353.4	X	0	0	471,438 2,240,804	
1841	0				5.4	-	-	-5.4	1353.4	1351.3		-3	-55	471,435 2,240,749	railroad
1842	55		259°04'	+8.3°	7.5	-	-	-7.5	1351.3	1348.8		0	-330	471,438 2,240,474	
1843	330		261°37'	+8.3°	10.0	-	-	-10.0	1348.8	1348.1		-1	-660	471,437 2,240,144	
1844	660		" "	"	10.7	-	-	-10.7	1348.1	1353.9		-1	-990	471,437 2,239,814	
1845	990		" "	"	4.9	-	-	-4.9	1353.9	1364.4		-2	-1320	471,436 2,239,484	
1846	1320		" "	"	5.9	89°30'	+11.5	+5.6	1364.4	1378.8	TP	-3	-1650.12	471,435 2,239,156	
1847	1650		261°36'36"	+8.3°	4.0	89°10'	+24.0	+20.0	-	1378.8	TP				
1848	1650				0.2	89°18'	+20.2	+20.0			TP				
1849	920		80°57'+180°	+8.3°	+10.8	-	-	+10.8	1389.6	1389.6	BS	-12	-920		
1850	920				+6.2	0H	+4.6	+10.8			BS				
1851	590		80°57'	+8.3°	13.3	91°-	-10.3	-23.6	1366.0	1366.0		+8	+590	471,431 2,238,826	
1852	260		" "	"	10.8	92°-	-9.1	-19.9	1369.7	1369.7		+3	+260	471,426 2,238,496	
1853	0				5.4	-	-	-5.4	1384.2	1384.2	X	0	0	471,423 2,238,236	
1854	70		262°41'	+8.3°	11.4	-	-	-11.4	1378.2	1378.2		+1	-70	471,424 2,238,166	
1855	400		" "	"	14.2	92°-	-14.0	-28.2	1361.4	1361.4		+7	-400	471,430 2,237,836	
1856	730		" "	"	5.8	91°-	-12.7	-18.5	1371.1	1371.1		+13	-730	471,436 2,237,506	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	11-9-81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	M. Knapp	PARTY NUMBER	6834	NOTES CHECKED BY	MPK	LINE NO.	1	PAGE	87
AREA	Kansas	TOPO MAP	Linn SW	STATE	Kansas	COUNTY	Washington	RANGE		PPM		PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1389.6					
1851	1060		262° 41'	+8.3°	8.9	-		-8.9		1380.7	TP	+18	-1060	471,441 2,237,176
1851	1060				14.2	TH	+5.3	-8.9			TP			
	1320		82° 01' +180°	+8.3°	+8.9	91°	+23.0	+31.9	1412.6		BS	+7	-1320	
	1320				+14.3	90° 46'	+17.7	+32.0			BS			
1852	990		82° 01'	+8.3°	5.2	92°	-34.5	-39.7		1377.9		-5	+990	471,443 2,236,846
1853	660		"	"	14.0	92°	-23.0	-37.0		1375.6		-4	+660	471,444 2,236,516
1854	330		"	"	13.9	91°	-5.8	-19.7		1392.9		-2	+330	471,446 2,236,186
7F	77		83° 47'	+8.3°	6.6	-		-6.6		1406.0		-3	+77	471,445 2,235,933 4-way Inter. 1405.
1855	0				5.4	-		-5.4		1407.2	TP	0	0	471,448 2,235,856
1856	330		261° 25'	+8.3°	8.8	-		-8.8		1403.8		-2	-330	471,446 2,235,526
1857	660		"	"	9.0	-		-9.0		1403.6		-3	-660	471,445 2,235,196
1858	490		"	"	10.7	8H	-5.0	-15.7		1396.9		-5	-990	471,443 2,234,866
1859	1320		261° 25'	+8.3°	6.4	-		-6.4		1406.2	TP	-7	-1320 +3	471,441 2,234,539
1859	1320				13.0	TH	+6.6	-6.4			TP			
	1320		81° 09' 30" +180°	+8.3°	+11.8	-		+11.8	1418.0		BS	-12	-1320 +3	
	1320				+5.2	8H	+6.6	+11.8			BS			
1860	990		81° 10'	+8.3°	13.6	90° 36'	-10.4	-24.0		1394.0		+9	+990	471,438 2,234,212
1861	660		"	"	8.4	-		-8.4		1409.6		+6	+660	471,435 2,233,882
1862	330		"	"	6.8	-		-6.8		1411.2		+3	+330	471,432 2,233,552
1863	0				5.4	-		-5.4		1412.6	TP	0	0	471,429 2,233,222

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-9-81		G. Cotcamp		M. Knapp		6834		MPK Tm		1		88			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Linn Sw		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1418.0						
1864	330		261°16'	+8.3°	12.2	-		-12.2		1405.8		-3	-330	471,426	2,232,892
1865	660		261°16'	+8.3°	5.5	92°-	-23.0	-28.5			TP	-5 +3	-660 +3	471,427	2,232,565
1865	660				13.2	91°26'	-15.4	-28.6		1389.4	TP				
	1320		81°8'40" +180°	+8.3°	+6.6	87°40'	-53.7	-47.1			BS	-9 +3	-1319 +3		
	1320				+2.7	87°50'	-49.9	-47.2	1342.2		BS				
1866	990		81°19'	+8.3°	11.1	88°-	+34.5	+23.4		1365.6		+7	+990	471,428	2,232,239
1867	660		"	"	2.5	89°-	+11.5	+9.0		1351.2		+4	+660	471,425	2,231,909
1868	330		"	"	4.2	89°-	+5.8	+1.6		1343.8		+2	+330	471,423	2,231,579
1869	0				5.4	-		-5.4		1336.8	X	0	0	471,421	2,231,249
1870	330		261°07'	+8.3°	4.2	-		-4.2		1338.0		-3	-330	471,418	2,230,919
TP	565		260°06'	+8.3°	10.9	88°-	+19.7	+8.8		1351.0		-16	-564	471,405	2,230,685
1871	660		261°07'	+8.3°	7.2	88°-	+23.0	+15.8		1358.0		-7	-660	471,414	2,230,587
1872	990		"	"	2.8	88°-	+34.5	+31.7		1373.9		-10	-990	471,411	2,230,259
1873	1320		261°07'	+8.3°	2.4	88°-	+46.0	+43.6		1385.8	TP	-13 +2	-1319 +3	471,410	2,229,933
1873	1320				10.9	87°38'	+54.5	+43.6			TP				
	330		81°24' +180°	+8.3°	+11.4	93°-	+17.2	+28.6	1414.4		BS	-2 +2	-330 +3		
	330				+13.5	92°34'	+15.1	+28.6			BS				
1874	0				5.4	-		-5.4		1409.0	X	0	0	471,410	2,229,606
1875	330		261°41'	+8.3°	10.9	-		-10.9		1403.5		-0	-330	471,410	2,229,276
1876	660		"	"	7.7	-		-7.7		1406.7		-0	-660	471,410	2,228,946

horiz. Corred. Y = +15
X = +26
471,405 + 7,230,685
T-rd (sect 4) del. 1351'

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	11-10-81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	M. Knapp	PARTY NUMBER	6834	NOTES CHECKED BY	MPK <i>dm</i>	LINE NO.	1	PAGE	89
AREA	Kansas	TOPO MAP	Linn SW	STATE	Kansas	COUNTY	Washington	TWP		RANGE	PPM	PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1414.4					
1877	990		261° 41'	+8.3°	12.0	ØH	-5.0	-17.0		1397.4		-0	-990	471,410 2,228,616
1878	1320		261° 40' 34"	+8.3°	12.9	-		-12.9		1401.5	TP	-1 +1	-1320	471,410 2,228,289
1878	1320				6.3	ØH	6.6	-12.9			TP			
	2970		81° 09' 04" +180°	+8.3°	+2.9	-		+2.9	1404.4		BS	-28	-2970	
	2970				+1.2	90° 2'	+1.7	+2.9			BS			
1879	2640		81° 09'	+8.3°	3.1	-		-3.1		1401.3		+25	+2640	471,407 2,227,962
1880	2310		"	"	8.7	-		-8.7		1395.7		+22	+2310	471,404 2,227,632
1881	1980		"	"	11.4	ØH	-9.9	-21.3		1383.1		+19	+1980	471,401 2,227,302
1882	1650		"	"	10.7	90° 40'	-19.2	-29.9		1374.5		+16	+1650	471,398 2,226,972
1883	1320		"	"	13.4	91° -	-23.0	-36.4		1368.0		+13	+1320	471,395 2,226,642
1884	990		"	"	10.3	91° 30'	-25.9	-36.2		1368.2		+10	+990	471,392 2,226,312
1885	660		"	"	11.5	91° 30'	-17.3	-28.8		1375.6		+6	+660	471,388 2,225,982
1886	330		"	"	10.4	91° -	-5.8	-16.2		1388.2		+3	+330	471,385 2,225,652
1887	60		83° 33'	+8.3°	6.3	-		-6.3		1398.1		-2	+60	471,380 2,225,382
1887	0				5.4	-		-5.4		1399.0	π	0	0	471,382 2,225,322
1888	330		261° 29'	+8.3°	2.9	-		-2.9		1401.5		-1	-330	471,381 2,224,992
1889	660		"	"	12.2	-		-12.2		1392.2		-3	-660	471,379 2,224,662
1890	990		"	"	12.7	-		-12.7		1391.7		-4	-990	471,378 2,224,332
1891	1320		"	"	16.6	-		-16.6		1387.8		-5	-1320	471,377 2,224,002
1892	1650		"	"	20.9	-		-20.9		1383.5		-6	-1650	471,376 2,223,672

471,380 + 2,225,380
4-way Intersect 1397

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
11-10-81		G. Cotcamp		M. Knapp		6834		MPK <i>zn</i>		1	90			
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER		
Kansas		Linn SW		Kansas		Washington						L. Davis		
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1404.4					
1893	1980		261°29'	+8.3°	17.2	90°04'	-7.3	-19.5		1384.9		-7	-1980	471,375 2,223,342
1894	2310		261°28'36"	+8.3°	12.8	-	-	-12.8		1391.6	TP	-9	-2310+3	471,373 2,223,015
1894	2310				14.1	89°58'	+1.3	-12.8			TP			
	2310		81°47'56" +180°	+8.3°	+2.3	89°40'	-13.4	-11.1			BS	+4	-2310	
	2310				+5.1	89°36'	-16.1	-11.0	1380.6		BS			
1895	1980		81°48'	+8.3°	7.9	TH	+9.9	+2.0		1382.6		-3	+1980	471,374 2,222,685
1896	1650		"	"	13.6	TH	+8.3	-5.3		1375.3		-3	+1650	471,374 2,222,355
1897	1320		"	"	11.3	TH	+6.6	-4.7		1375.9		-2	+1320	471,375 2,222,025
1898	990		"	"	8.6	TH	+5.0	-3.6		1377.0		-2	+990	471,375 2,221,695
1899	660		"	"	5.8	-	-	-5.8		1374.8		-1	+660	471,376 2,221,365
1900	330		"	"	10.4	-	-	-10.4		1370.2		-1	+330	471,376 2,221,035
1901	0		"	"	5.4	-	-	-5.4		1375.2	π	0	0	471,377 2,220,705
1902	330		261°49'	+8.3°	11.7	91°-	-5.8	-17.5		1363.1		+1	-330	471,378 2,220,375
1903	660		"	"	7.3	91°-	-11.5	-18.8		1361.8		+1	-660	471,378 2,220,045
1903	680		261°33'	+8.3°	7.0	91°-	-11.9	-18.9		1361.7		-2	-680	471,375 2,220,025
1904	990		261°49'	+8.3°	5.3	91°-	-17.3	-22.6		1358.0		+2	-990	471,379 2,219,715
1905	1320		"	"	2.2	91°-	-23.0	-25.2		1355.4		+3	-1320	471,380 2,219,385
1906	1650		"	"	10.2	90°30'	-14.4	-24.6		1356.0		+3	-1650	471,380 2,219,055
1907	1980		"	"	7.1	BH	-9.9	-17.0		1363.6		+4	-1980	471,381 2,218,725

471,350 + 2,220,010
4-Way Intersected 1361

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE			
11-10-81		G. Cotcamp		M. Knapp		6834		MPK Jm		1	92			
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER		
Kansas		Linn SW		Kansas		Washington						L. Davis		
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1380.6					
1908	2310		261° 49' 18"	+8.0°	10.4	-		-10.4		1370.2	TP	-7	-2310 _{±3}	471,370 2,218,398
1908	2310				6.4	90° 6'	-4.0	-10.4			TP			
	2310		81° 02' +180°	+8.0°	+14.1	-		+14.1	1384.3		BS	-39	-2310 _{±3}	
	2310				+2.5	0H	+11.6	+14.1			BS			
1909	1980		81° 02'	+8.0°	11.0	0H	-9.9	-20.9		1363.4		+33	+1980	471,364 2,218,071
1910	1650		"	"	12.8	90° 44'	-21.1	-33.9		1350.4		+28	+1650	471,359 2,217,791
1911	1320		"	"	17.2	90° 44'	-16.9	-34.1		1350.2		+22	+1320	471,353 2,217,411
1912	990		"	"	10.1	90° 44'	-12.7	-22.8		1361.5		+17	+990	471,348 2,217,081
1913	660		"	"	10.0	-		-10.0		1374.3		+11	+660	471,342 2,216,751
1914	330		"	"	9.0	-		-9.0		1375.3		+6	+330	471,337 2,216,421
1915	0		"	"	5.4	-		-5.4		1378.9	π	0	0	471,331 2,216,091
1916	330		261° 16'	+8.0°	10.1	91° -	-5.8	-15.9		1368.4		-4	-330	471,327 2,215,761
1917	660		"	"	11.8	91° 20'	-15.4	-27.2		1357.1		-8	-660	471,323 2,215,431
1918	990		"	"	11.0	91° 20'	-23.0	-34.0		1350.3		-13	-990	471,318 2,215,101
1919	1320		"	"	5.8	91° 20'	-30.7	-36.5		1347.8		-17	-1320	471,314 2,214,771
1920	1650		261° 13'	+8.0°	12.5	91° -	-24.1	-36.6		1347.7		-19	-1380	471,312 2,214,711
1920	1650		261° 16'	+8.0°	5.8	91° -	-28.8	-34.6		1349.7		-21	-1650	471,310 2,214,441
1921	1980		"	"	3.0	91° -	-34.6	-37.6		1346.7		-25	-1980	471,306 2,214,111
1922	2310		"	"	3.0	91° -	-40.3	-43.3		1341.0		-30	-2310	471,301 2,213,781

471,295 + 2,214,730
4-Way Intersect. 1347

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE		
11-10-81		G. Catcamp		M. Knapp		6834		MPK <i>gr</i>		1		92		
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER		
Kansas		Linn Sw/Clifton		Kansas		Washington						L. Davis		
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
1923	2640		260° 54' 10"	+8.0°	2.6	91° -	-46.1	-48.7	1384.3					
1923	2640				13.4	90° 46'	-36.3	-48.7		1335.6	TP	-51	-2639.3	471,280 2,213,456
	7980		81° 46' 12" +180°	+8.0°	+4.4	89° 30'	+17.3	-12.9	1322.7		TP			
	1980				+10.1	89° 20'	-23.0	-12.9			BS	-8	-1980.3	
1924	1650		81° 46'	+8.0°	6.6	89° 30'	+14.4	+7.8		1330.5		+7	+1650	471,279 2,213,128
1925	1320		"	"	3.9	89° 30'	+11.5	+7.6		1330.3		+5	+1320	471,277 2,212,798
1926	990		"	"	2.2	89° 30'	+8.6	+6.4		1329.1		+4	+990	471,276 2,212,468
1927	660		"	"	5.1	89° 30'	+5.8	+0.7		1323.4		+3	+660	471,275 2,212,138
1928	330		"	"	10.8	91° -	-5.8	-16.6		1306.1		+1	+330	471,273 2,211,808
1929	0				5.4	-	-	-5.4		1317.3	TP	0	0	471,272 2,211,478
1930	330		259° 52'	+8.0°	9.3	92° -	-11.5	-20.8		1301.9		-12	-330	471,260 2,211,148 (bridge out)
1931	660		"	"	4.3	92° -	-23.0	-27.3		1295.4		-25	-660	471,247 2,210,818 Clifton Quad.
1932	990		"	"	11.6	91° -	-17.3	-28.9		1293.8		-37	-989	471,235 2,210,489
1933	1320		"	"	6.1	91° -	-23.0	-29.1		1293.6		-49	-1319	471,223 2,210,159
1934	1650		259° 52'	+8.0°	14.7	90° 18'	-8.6	-23.3		1299.4	TP	-61	-1649.3	471,211 2,209,832
1934	1650				9.9	90° 28'	-13.4	-23.3			TP			
	330		82° 10' +180°	+8.0°	+0.9	-	-	+0.9	1300.3		BS	+1	-330.3	
	330				+2.6	TH	-1.7	+0.9			BS			
BM	153		74° 32'	+8.0°	5.3	88° -	+5.3	0.0		1300.3		+20	+152	471,232 2,209,657
TP	150		84° 34'	+8.0°	2.8	-	-	-2.3		1298.0		-7	+150	471,205 2,209,155

el. 1299.7
approximate location
471,205 + 2,209,655
(road 1.0 mi. N)

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-10-81		G. Cotcamp		M. Knapp		6834		MPK		1		93			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Clifton		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1300.3						
1935	0				5.4	-		-5.4		1294.9	π	0	0	471,212	2,209,505
1936	328		257° 29'	+8.0°	6.2	-		-6.2		1294.1		-26	-327	471,186	2,209,178
1937	644		266° 52'	+8.0°	6.3	TH	+3.2	-3.1		1297.2	TP	+55	-642	471,267	2,208,863
1937	644				8.7	89° 30'	+5.6	-3.1			TP				
	660		77° 47' +180°	+8.0°	+13.4	-		+13.4	1310.6		BS	-49	-658		
	660				+10.1	BH	+3.3	+13.4			BS				
1938	330		80° 06'	+8.0°	11.1	-		-11.1		1299.5		+11	+330	471,229	2,208,535
1939	0				5.4	-		-5.4		1305.2	π	0	0	471,218	2,208,205
1940	330		262° 59'	+8.0°	5.0	-		-5.0		1305.6		+6	-330	471,224	2,207,875
1941	660		"	"	3.9	89° -	+11.5	+7.6		1318.2		+11	-660	471,229	2,207,545
1942	990		"	"	16.7	89° 14'	+13.2	-3.5		1307.1		+17	-990	471,235	2,207,215
1943	1320		262° 59' 18"	+8.0°	14.5	89° 14'	+17.7	+3.2			TP	+23	-1320	471,241	2,206,885
1943	1320				13.8	89° 16'	+16.9	+3.1		1313.7	TP				
	2640		82° 14' 20" +180°	+8.0°	+10.7	91° -	+46.1	+56.8	1370.5		BS	+11	-2640		
	2640				+13.9	90° 56'	+43.0	+56.9			BS				
1944	2310		82° 14'	+8.0°	5.1	91° 30'	-60.5	-65.6		1304.9		-9	+2310	471,243	2,206,555
1945	1980		"	"	15.6	91° 40'	-57.6	-73.2		1297.3		-8	+1980	471,244	2,206,225
1946	1650		"	"	22.5	91° 40'	-48.0	-70.5		1300.0		-7	+1650	471,245	2,205,895
1947	1320		"	"	23.9	91° 40'	-38.4	-62.3		1308.2		-5	+1320	471,247	2,205,565
1948	990		"	"	21.2	91° 40'	-28.8	-50.0		1320.5		-4	+990	471,248	2,205,235

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-11-81		G. Cotcamp		M. Drapp		6834		MPK Jm		1	94					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Clifton	Kansas	Washington				L. Davis								
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1370.5							
1949	660		82° 14'	+8.0°	12.4	91° 40'	-19.2	-31.6		1338.9		-3	+660	471,249	2,204,905	
1950	330		" "	"	12.0	-		-12.0		1358.5		-1	+330	471,251	2,204,575	
1951	40		92° 35'	+8.0°	5.2	-		-5.2		1365.3		-7	+39	471,245	2,204,284	471,230 + 2,209,300 4-way Intersect. el. 1365
1951	0				5.4	-		-5.4		1365.1	TP	0	0	471,252	2,204,245	
1952	330		261° 49'	+8.0°	11.2	-		-11.2		1359.3		-1	-330	471,251	2,203,915	
1953	660		" "	"	14.7	-		-14.7		1355.8		-2	-660	471,250	2,203,585	
1954	990		" "	"	11.9	8H	-5.0	-16.9		1353.6		-3	-990	471,249	2,203,255	
1955	1320		" "	"	12.0	8H	-6.6	-18.6		1351.9		-4	-1320	471,248	2,202,925	
1956	1650		" "	"	8.0	90° 30'	-14.4	-22.4		1348.1		-5	-1650	471,247	2,202,595	
1957	1980		" "	"	9.1	90° 30'	-17.3	-26.4		1344.1		-6	-1980	471,246	2,202,265	
1958	2310		" "	"	13.6	90° 40'	-26.9	-40.5		1330.0		-7	-2310	471,245	2,201,935	
1959	2640		261° 49'	+8.0°	14.0	90° 40'	-30.7	-44.7			TP	-8	-2640	471,244	2,201,607	
1959	2640				12.5	90° 42'	-32.3	-44.8		1325.7	TP					
	1650		81° 59' 06" + 180°	+8.0°	+10.0	91° -	+28.8	+38.8			BS	-0	-1650			
	1650				+13.8	90° 52'	+24.9	+38.7	1364.4		BS					
1960	1320		81° 59'	+8.0°	10.7	91° 0'	-26.9	-37.6		1326.8		0	+1320	471,244	2,201,279	
1961	990		" "	"	7.9	91° -	-17.3	-25.2		1339.2		0	+990	471,244	2,200,949	
1962	660		" "	"	5.1	91° -	-11.5	-16.6		1347.8		0	+660	471,244	2,200,619	
1963	330		" "	"	8.1	-		-8.1		1356.3		0	+330	471,244	2,200,289	
1964	0				5.4	-		-5.4		1359.0	TP	0	0	471,244	2,199,959	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11-11-81	INSTRUMENT MAN G. Cotcamp	ROD MAN M. Knapp	PARTY NUMBER 6834	NOTES CHECKED BY MPK	LINE NO. 1	PAGE 95
AREA Kansas	TOPO MAP Clifton	STATE Kansas	COUNTY Washington	TWP	RANGE	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1364.4					
1965	330		262°19'	+8.0°	7.3	-		-7.3		1357.1		+2	-330	471,246 2,199,629
1966	660		"	"	14.5	-		-14.5		1349.9		+4	-660	471,248 2,199,299
1967	990													
1967	948		261°33'	+8.0°	11.3	-		-11.3		1353.1		-7	-948	471,237 2,199,011 471,210 + 2,199,010 4-Way Intersect. of 1353
1967	990		262°19'	+8.0°	11.1	-		-11.1		1353.3		+5	-990	471,249 2,198,969
1968	1320		"	"	5.2	-		-5.2		1359.2		+7	-1320	471,251 2,198,639
1969	1650		"	"	5.3	TH	+8.3	+3.0		1367.4		+9	-1650	471,253 2,198,309
1970	1980		"	"	2.2	89°30'	+17.3	+15.1		1379.5		+11	-1980	471,255 2,197,979
1971	2310		262°19'18"	+8.0°	6.0	89°20'	+26.9	+20.9			TP	+13	-2310	471,257 2,197,651
1971	2310		"	"	3.4	89°24'	+24.2	+20.8		1385.2	TP			
	2640		82°02'52" +180°	+8.0°	+13.6	89°12'	-36.9	-23.3	1361.9		BS	+2	-2640	
	2640		"	"	+10.5	89°16'	-33.8	-23.3			BS			
1972	2310		82°03'	+8.0°	3.0	89°20'	+26.9	+23.9		1385.8		-2	+2310	471,257 2,197,323
1973	1980		"	"	5.4	89°20'	+23.0	+17.6		1379.5		-2	+1980	471,257 2,196,993
1974	1650		"	"	4.2	89°40'	+9.6	+5.4		1367.3		-1	+1650	471,258 2,196,663
1975	1320		"	"	3.3	-		-3.3		1358.6		-1	+1320	471,258 2,196,333
1976	990		"	"	11.7	-		-11.7		1350.2		-1	+990	471,258 2,196,003
1977	660		"	"	11.9	8H	-3.3	-15.2		1346.7		-1	+660	471,258 2,195,673
1978	330		"	"	9.2	-		-9.2		1352.7		0	+330	471,259 2,195,343
1979	0		"	"	5.4	-		-5.4		1356.5	π	0	0	471,259 2,195,013

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11-11-81		G. Cotcamp		M. Knapp		6834		MPK gm		1	96						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Kansas		Clifton	Kansas	Washington				L. Davis									
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
									1361.9								
1980	330		262°09'	+8.0°	3.7	-		-3.7		1358.2		+1	-330	471,260	2,194,683		
1981	660		" "	"	9.6	-		-9.6		1352.3		+2	-660	471,261	2,194,353		
1982	990		" "	"	12.9	-		-12.9		1349.0		+3	-990	471,262	2,194,023		
1982	1319		262°07'	+8.0°	9.8	0H	-6.6	-16.4		1345.5		+3	-1319	471,262	2,193,694	471,290 + 2,193,705 4-Way Intersect.	
1983	1320		262°09'	+8.0°	9.8	0H	-6.6	-16.4		1345.5		+3	-1320	471,262	2,193,693		
1984	1650		" "	"	10.0	0H	-8.3	-18.3		1343.6		+4	-1650	471,263	2,193,363		
1985	1980		" "	"	11.4	-		-11.4		1350.5		+5	-1980	471,264	2,193,033		
1986	2310		" "	"	9.0	-		-9.0		1352.9		+6	-2310	471,265	2,192,703		
1987	2640		262°09'12"	+8.0°	8.4	-		-8.4			TP	+7	-2640+2	471,266	2,192,375		
1987	2640				5.4	90°4'	-3.1	-8.5		1353.4	TP						
	1650		80°15'59"+180°	+8.0°	+13.6	89°-	-28.8	-15.2	1338.2		BS	-1	-1650+2				
	1650		81°57'10"		+4.1	89°20'	-19.2	-15.1			BS						
1988	1320		80°+16'81°57'	+8.0°	3.6	TH	+6.6	+3.0		1341.2		+1	+1320	471,266	2,192,047		
1989	990		" "	"	13.4	-		-13.4		1324.8		+1	+990	471,266	2,193,717		
1990	660		" "	"	12.8	91°-	-11.5	-24.3		1313.9		+1	+660	471,266	2,191,387		
1991	330		" "	"	9.2	93°-	-17.2	-26.4		1311.8		0	+330	471,265	2,191,057	4-T bridge	
1992	0				5.4	-		-5.4		1332.8	π	0	0	471,265	2,190,727		
1993	330		261°44'	+8.0°	10.9	-		-10.9		1327.3		-2	-330	471,263	2,190,397		
1994	660		" "	"	11.1	91°-	-11.5	-22.6		1315.6		-3	-660	471,262	2,190,067		
1995	990		" "	"	13.1	0H	-5.0	-18.1		1320.1		-5	-990	471,260	2,189,737		

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-11-81		G. Cotcamp		M. Knapp		6834		MPK sm		1		97			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Clifton		Kansas		Washington								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1338.2						
1996	1320		261°44'	+8.0°	3.0	91°-	-23.0	-26.0		1312.2		-6	-1320	471,259	2,189,407
1997	1650		"	"	11.3	BH	-8.3	-19.6		1318.6		-8	-1650	471,257	2,189,077
1998	1980		"	"	3.6	-		-3.6		1334.6		-9	-1980	471,256	2,188,747
1999	2310		"	"	8.9	TH	+11.6	+2.7		1340.9		-11	-2310	471,254	2,188,417
$\frac{+L}{-F}$	2375		261°38'	+8.0°	7.9	TH	+11.9	+4.0		1342.2		-15	-2375	471,250	2,188,352
2000	2640		261°44'30"	+8.0°	10.0	TH	+13.2	+3.2			TP	-12	-2640+2	471,253	2,188,089
2000	2640				6.1	89°48'	+9.2	+3.1		1341.3	TP				
	1320		81°18'34"-180°	+8.0°	+7.2 +5.5	TH	-6.6	+0.6	1341.9		OS	-16	-1320+2		
	1320				+5.2	89°48'	-4.6	+0.6			BS				
2001	990		81°19'	+8.0°	0.6	-		-0.6		1341.3		+12	+990	471,249	2,187,761
2002	660		"	"	3.6	-		-3.6		1338.3		+8	+660	471,245	2,187,431
2003	330		"	"	2.4	-		-2.4		1339.5		+4	+330	471,241	2,187,101
2004	0				5.4	-		-5.4		1336.5	X	0	0	471,237	2,186,771
2005	330		260°57'	+8.0°	9.8	-		-9.8		1332.1		-6	-330	471,231	2,186,441
2006	660		"	"	10.6	-		-10.6		1331.3		-12	-660	471,225	2,186,111
2007	990		"	"	12.0	BH	-5.0	-17.0		1324.9		-18	-990	471,219	2,185,781
2008	1320		"	"	11.2	BH	-6.6	-17.8		1324.1		-24	-1320	471,213	2,185,451
2009	1650		260°57'12"	+8.0°	10.6	BH	-8.3	-18.9		1323.0	TP	-30	-1650+2	471,207	2,185,123
2009	1650				14.1	90°10'	-4.8	-18.9			TP				

4-71,270 +2,188,365
4-Way Intersect. cl. 134

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-12-81		G. Cotcamp		M. Knapp		6834		MPK dm		1	98					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Kansas		Clifton		Kansas		Washington					L. Davis					
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
2009										1323.0						
	1320		82°21'24"+180°	+8.0°	+14.4	BH	+6.6	+21.0	1344.0		BS	+8	-1320+2			
	1320				+14.0	90°18'	+6.9	+20.9			BS					
2010	990		82°21'	+8.0°	14.2	BH	-5.0	-19.2		1324.8		-6	+990	471,209	2,184,795	
2011	660		"	"	11.9	-		-11.9		1332.1		-4	+660	471,211	2,184,465	
2012	330		"	"	5.6	-		-5.6		1338.4		-2	+330	471,213	2,184,135	
2013	0				5.4	-		-5.4		1338.6	π	0	0	471,215	2,183,805	
2014	330		261°32'	+8.0°	6.7	-		-6.7		1337.3		-3	-330	471,212	2,183,475	
2015	990	660	"	"	2.2	-		-2.2		1341.8		-5	-660	471,210	2,183,145	
IF	754		261°11'	+8.0°	2.8	-		-2.8		1341.2		-11	-754	471,204	2,183,051	471,215 + 2,183,060 4-way Intersect.
2016	990		261°32'	+8.0°	2.8	-		-2.8		1341.2		-8	-990	471,207	2,182,815	
2017	1320		"	"	4.5	TH	+6.6	+2.1		1346.1		-11	-1320	471,204	2,182,485	
2018	1650		261°31'24"	+8.0°	0.4	TH	+8.3	+7.9		1351.9	TP	-14	-1650+2	471,201	2,182,157	
2018	1650				5.6	89°32'	+13.4	+7.8			TP					
	990		80°34'+180°	+8.0°	+10.0	91°-	+17.3	+27.3	1379.2		BS	-25	-990+2			
	990				+14.7	90°44'	+12.7	+27.4			BS					
2019	660		80°34'	+8.0°	11.3	91°-	-11.5	-22.8		1356.4		+17	+660	471,193	2,181,829	
2020	330		"	"	10.0	91°-	-5.8	-15.8		1363.4		+8	+330	471,184	2,181,499	
2021	0				5.4	-		-5.4		1373.8	π	0	0	471,176	2,181,169	
2022	330		260°01'	+8.0°	7.8	89°-	+5.8	-2.0		1377.2		-11	-330	471,165	2,180,839	
2023	660		"	"	19.2	89°20'	+7.7	-11.5		1367.7		-23	-660	471,153	2,180,509	

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
11-11-81		G. Cotcamp		M. Knapp		6834		MPK <i>Ben</i>		1	99				
AREA		TOPO MAP		STATE		COUNTY		RANGE		PPM		PARTY MANAGER			
Kansas		Clifton		Kansas		Washington/Cloud						L. Davis			
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1379.2						
2024	660 990		260° 01'	+8.0°	13.9	89° 20'	+11.5	-2.4		1376.8		-34	-989	471,142	2,180,180
2025	1320		" "	"	10.7	89° 20'	+15.4	+4.7		1383.9		-46	-1319	471,130	2,179,850
2026	1650		260° 00' 42"	+8.0°	9.3	89° 20'	+19.2	+9.9		1389.1	TP	-57	-1649.2	471,119	2,179,522
2026	1650				13.1	89° 12'	+23.0	+9.9			TP				
	2310		80° 06' 10" +180°	+8.0°	+9.4	-		+9.4	1398.5		BS	-76	-2309.2		
	2310				+13.4	81° 54'	-4.0	+9.4			BS				
2027	1980		80° 06'	+8.0°	5.2	OH	-9.9	-15.1		1383.4		+66	+1979	471,109	2,179,194
2028	1650		" "	"	0.7	91° -	-28.8	-29.5		1369.0		+55	+1649	471,098	2,178,864
2029	1320		" "	"	7.8	91° -	-23.0	-30.8		1367.7		+44	+1319	471,087	2,178,534
2030	990		" "	"	7.9	91° 30'	-26.9	-33.8		1364.7		+33	+989	471,076	2,178,204
	$\frac{1}{2}$ 711		80° 54'	+8.0°	11.8	91° 30'	-18.6	-30.4		1368.1		+14	+711	471,057	2,177,926
2031	660		80° 06'	+8.0°	12.6	91° 30'	-17.3	-29.9		1368.6		+22	+660	471,065	2,177,875
2032	330		" "		9.0	91° 30'	-8.6	-17.6		1380.9		+11	+330	471,054	2,177,545
2033	0				5.4	-		-5.4		1393.1	π	0	0	471,043	2,177,215
2034	330		261° 10'	+8.0°	5.1	-		-5.1		1398.4		-5	-330	471,038	2,176,885
2035	660		261° 10'	+8.0°	2.7	TH	+3.3	+0.6		1399.1	TP	-10	-660.2	471,033	2,176,557
2035	660				5.2	89° 30'	+5.8	+1.6			TP				
	1320		80° 54' +180°	+8.0°	+5.3	89° -	-23.0	-17.7	1381.4		BS	-25	-1320.2		
	1320				+2.2	89° 08'	-20.0	-17.8			BS				
2036	990		80° 54'	+8.0°	5.1	89° 16'	+12.7	+7.6		1389.0		+19	+990	471,027	2,176,229

↑
Washington Co.
471,100 + 2,177,915
4-way Intersect.

Cloud. Co.

↑
Clifton Quad.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11-11-81		G. Cotcamp		M. Knapp		6834		MPK <i>Ln</i>		1	100						
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Clyde	Kansas						L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1331.4								
2037	660		80° 54'	+8.0°	14.9	89° 16'	+8.4	-6.5		1374.9		+13	+660	471,021	2,175,899	Clyde	
2038	330		" "	"	5.2	89° -	+5.8	+0.6		1382.0		+6	+330	471,014	2,175,569		
2039	0				5.4	-		-5.4		1376.0	π	0	0	471,008	2,175,239		
2040	330		261° 06'	+8.0°	12.9	91° -	-5.8	-18.7		1362.7		-5	-330	471,003	2,174,909		
2041	660		" "	"	11.8	91° 30'	-17.3	-29.1		1352.3		-10	-660	470,998	2,174,579		
2042	1390		" "	"	12.8	91° 30'	-25.9	-38.7		1342.7		-16	-990	470,992	2,174,249		
2043	1320		261° 06'	+8.0°	10.5	91° 30'	-34.5	-45.0		1336.4	TP	-21 -2	-1319 +2	470,985	2,173,922		
2043	1320				14.3	91° 20'	-30.7	-45.0			TP						
	1320		80° 59' 12" +180°	+8.0°	+6.2	-		+6.2	1342.6		BS	-23 -3	-1320 +2				
	1320				+12.8	TH	-6.6	+6.2			BS						
2044	990		80° 59'	+8.0°	8.0	-		-8.0		1334.6		+18	+990	470,977	2,173,594		
2045	660		" "	"	1.7	-		-1.7		1340.9		+12	+660	470,971	2,173,264		
2046	330		" "	"	4.2	-		-4.2		1338.4		+6	+330	470,965	2,172,934		
2047	68		86° 29'	+8.0°	3.3	-		-3.3		1339.3		-5	+68	470,954	2,172,672	470,980 + 2,172,665 4-way Intersect. ELEV. 1339	
2047	0				5.4	-		-5.4		1337.2	π	0	0	470,959	2,172,604		
2048	330		261° 34'	+8.0°	11.3	91° 30'	-8.6	-19.9		1322.7		-3	-330	470,956	2,172,274		
2049	660		" "	"	11.2	91° 30'	-17.3	-28.5		1314.1		-5	-660	470,954	2,171,944		
2050	990		" "	"	9.2	91° -	-17.3	-26.5		1316.1		-7	-990	470,952	2,171,614		
2051	1320		261° 33' 50"	+8.0°	3.7	91° -	-23.0	-26.7		1315.9	TP	-10 -3	-1320 +2	470,946	2,171,286		
2051	1320				13.7	90° 34'	-13.1	-26.8			TP						

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-13-81		G. Cotcamp		M. Knapp		6834		MPK Tom		1	101					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Clyde	Kansas	Cloud				L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS
												SOUTH -	WEST -	Y	X	
												LAT.	DEP.			
2051										1315.9						
	2310		81° 51' 20" +180°	+8.0°	+14.7	90° 22'	+14.8	+29.5	1345.4		BS	-6 -3	-2310.4			
	2310				+13.4	90° 24'	+16.1	+29.5			BS					
2052	1980		81° 51'	+8.0°	11.2	90° 30'	-17.3	-28.5		1316.9		+5	+1980	470,942	2,170,957	
2053	1650		"	"	14.0	90° 30'	-14.4	-28.4		1317.0		+4	+1650	470,941	2,170,627	
2054	1320		"	"	10.1	84	-6.6	-16.7		1328.7		+3	+1320	470,940	2,170,297	
2055	990		"	"	13.1	84	-5.0	-18.1		1327.3		+3	+990	470,940	2,169,967	
2056	660		"	"	13.7	84	-3.3	-17.0		1328.4		+2	+660	470,939	2,169,637	
2057	330		"	"	8.2	-	-	-8.2		1337.2		+1	+330	470,938	2,169,307	
2058	0		"	"	5.4	-	-	-5.4		1340.0	π	0	0	470,937	2,168,977	
2059	330		262° 31'	+8.0°	2.8	-	-	-2.8		1342.6		+3	-330	470,940	2,168,647	
2060	660		"	"	3.1	-	-	-3.1		1342.3		+6	-660	470,943	2,168,317	
2061	990		"	"	3.5	-	-	-3.5		1341.9		+9	-990	470,946	2,167,987	
2062	1320		"	"	7.2	-	-	-7.2		1338.2		+12	-1320	470,949	2,167,657	
2063	1630		262° 06'	+8.0°	5.6	-	-	-5.6		1339.8		+3	-1630	470,940	2,167,347	470,930 + 2,167,355 4-Way Intersect.
2063	1650		262° 31'	+8.0°	6.1	-	-	-6.1		1339.3		+15	-1650	470,952	2,167,327	
2064	1980		262° 31' 06"	+8.0°	12.6	-	-	-12.6		1332.8	TP	+18 -3	-1980 -1	470,952	2,166,996	
2064	1980				9.1	90° 6'	-3.5	-12.6			TP					
	2310		82° 29' 18" +180°	+8.0°	+4.8	89° 34'	-17.5	-12.7	1320.1		BS	+20 -3	-2310			
	2310				+14.2	89° 20'	-26.9	-12.7			BS					
2065	1980		82° 29'	+8.0°	0.8	-	-	-0.8		1319.3		-17	+1980	470,952	2,166,666	

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-13-81		G. Cotcamp		M. Knapp		6834		MPK Jm		1	102					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Clyde	Kansas	Cloud				L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH + SOUTH -	EAST + WEST -		Y	X
									1320.1							
2066	1650		82°29'	+8.0°	9.5	-		-9.5		1310.6		-14	+1650	470,955	2,166,334	
2067	1320		" "	"	7.4	-		-7.4		1312.7		-11	+1320	470,958	2,166,006	
2068	990		" "	"	8.0	-		-8.0		1312.1		-8	+990	470,961	2,165,676	
2069	660		" "	"	9.7	-		-9.7		1310.4		-6	+660	470,963	2,165,346	
2070	330		" "	"	9.0	-		-9.0		1311.1		-3	+330	470,966	2,165,016	
2071	0				5.4	-		-5.4		1314.7	π	0	0	470,969	2,164,686	sta. 271 is 43' west of R.R.
2072	330		261°42'	+8.0°	6.7	-		-6.7		1313.4		-2	-330	470,967	2,164,356	3-Ton bridge
2073	660		" "	"	9.2	-		-9.2		1310.9		-3	-660	470,966	2,164,026	
2074	990		" "	"	4.5	-		-4.5		1315.6		-5	-990	470,964	2,163,696	
2075	1320		" "	"	0.2	-		-0.2		1319.9		-7	-1320	470,962	2,163,366	
2076	1650		" "	"	4.8	89°36'	+14.4	+9.6		1329.7		-9	-1650	470,960	2,163,036	
2077	1980		" "	"	6.3	89°30'	+17.3	+11.0		1331.1		-10	-1980	470,959	2,162,706	
2078	2310		261°41'48"	+8.0°	3.5	89°30'	+20.2	+16.7		1336.8	TP	-12 -3	-2310	470,954	2,162,376	
2078	2310				14.2	89°4'	+30.9	+16.7			TP					
	1320		80°17'30" +180°	+8.0°	+10.5	BH	+6.6	+17.1	1353.9		BS	-39 -3	-1319			
	1320				+14.0	90°8'	+3.1	+17.1			BS					
	930		79°40'	+8.0°	12.5	-		-12.5		1341.4		+38	+929	470,950	2,161,986	470,990 + 2,161,970 4-way Intersect.
2079	990		79°05'	+8.0°	13.8	-		-13.8		1340.1		+50	+989	470,962	2,162,046	
2080	660		" "	"	9.7	-		-9.7		1344.2		+34	+659	470,946	2,161,716	
2081	330		" "	"	7.2	-		-7.2		1346.7		+17	+330	470,929	2,161,387	

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11-13-81		G. Cotcamp		M. Knapp		6834		MPK Jan		1	103						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Clyde		Kansas	Cloud					L. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH +	EAST +	COORDINATES		REMARKS	
												SOUTH -	WEST -	Y	X		
									1353.9								
2082	0				5.4	-		-5.4		1348.5	π	0	0	470,912	2,161,057		
2083	330		259°09'	+8.0°	14.1	04	-1.7	-15.8		1338.1		-16	-330	470,896	2,160,727		
2084	660		"	"	13.2	-		-13.2		1340.7		-33	-659	470,879	2,160,398		
2085	990		"	"	13.0	-		-13.0		1340.9		-49	-989	470,863	2,160,068		
2086	1320		"	"	3.9	-		-3.9		1350.0		-66	-1318	470,846	2,159,739		
2087	1650		259°09'16"	+8.0°	4.3	89°30'	+14.4	+10.1		1364.0	TP	-82-3	-1648	470,827	2,159,409		
2087	1650		"	"	9.1	89°20'	+19.2	+10.1			TP						
	1320		78°46' +180°	+8.0°	+11.8	-		+11.8	1375.8		BS	-74-3	-1318				
	1320		"	"	+5.2	04	+6.6	+11.8			BS						
2088	990		78°46'	+8.0°	10.0	-		-10.0		1365.8		+56	+988	470,806	2,159,079		
2089	660		"	"	8.1	-		-8.1		1367.7		+37	+659	470,787	2,158,750		
2090	330		"	"	6.4	-		-6.4		1369.4		+19	+329	470,769	2,158,420		
2091	0				5.4	-		-5.4		1370.4	π	0	0	470,750	2,158,091		
2092	330		259°12'	+8.0°	7.9	-		-7.9		1367.9		-16	-330	470,734	2,157,761		
2093	660		"	"	4.2	-		-4.2		1371.6		-32	-659	470,718	2,157,432		
2094	990		"	"	4.1	-		-4.1		1371.7		-48	-989	470,702	2,157,102	horiz. correct. y = -29'	
2095	1320		"	"	4.0	-		-4.0		1371.8		-64	-1318	470,686	2,156,773	x = +39'	
JL TP	1388		258°53'	+8.0°	2.8	-		-2.8		1373.0		-75	-1386	470,675	2,156,705	470,675 + 2,156,705 4-way Intersect.	
2096	1650		259°50'12"	+7.5°	2.0	-		-2.0		1373.8	TP	-77-2	-1648+2	470,671	2,156,445		
2096	1650		"	"	10.3	TH	+8.3	-20			TP						

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-13-81		G. Cotcamp		M. Knapp		6834		MPK Lm		1	104					
AREA		TOPO MAP	STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Clyde	Kansas	Cloud					L. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
2096										1373.8						
	2970		83°20' + 180°	+7.5'	+4.2	TH	-14.9	-10.7	1363.1		BS	+43-2	-2970.2			
	2970				+13.6	89°32'	-24.2	-10.6			BS					
2097	2640		83°20'	+7.5°	4.2	TH	+13.2	+9.0		1370.1		-38	+2640	470,674	2,156,117	
2098	2310		"	"	5.7	TH	+11.6	+5.9		1369.0		-34	+2310	470,678	2,155,787	
2099	1980		"	"	4.9	-		-4.9		1358.2		-29	+1980	470,683	2,155,457	
2100	1650		"	"	6.8	-		-6.8		1356.3		-24	+1650	470,688	2,155,127	
2101	1320		"	"	1.0	-		-1.0		1362.1		-19	+1320	470,693	2,154,797	
2102	990		"	"	3.8	-		-3.8		1359.3		-14	+990	470,698	2,154,467	
2103	660		"	"	5.0	-		-5.0		1358.1		-10	+660	470,702	2,154,137	
2104	330		"	"	5.4	-		-5.4		1357.7		-5	+330	470,707	2,153,807	
2105	0		"	"	5.4	-		-5.4		1357.7	π	0	0	470,712	2,153,477	
2106	330		263°15'	+7.5'	5.9	-		-5.9		1357.2		+4	-330	470,716	2,153,147	
2107	660		"	"	8.0	91°-	-11.5	-19.5		1343.6		+9	-660	470,721	2,152,817	
2108	990		"	"	13.3	90°56'	-16.1	-29.4		1333.7		+13	-990	470,725	2,152,487	
2109	1320		"	"	10.3	90°56'	-21.5	-31.8		1331.3		+17	-1320	470,729	2,152,157	
2110	1650		"	"	12.7	90°40'	-19.2	-31.9		1331.2		+22	-1650	470,734	2,151,827	
2111	1980		"	"	5.1	90°26'	-15.0	-20.1		1343.0		+26	-1980	470,738	2,151,497	
IL IF	2080		263°03'30"	+7.5°	14.1	-		-14.1		1349.0		+20	-2080	470,732	2,151,397	470,705 + 2,151,410 4-Way Intersect.
X	2105		262°23'	+7.5°	5.4	0H	-10.5	-15.9		1347.2		-4	-2105	470,708	2,151,372	chiseled square ELEV 1347
2112	2310		263°15'	+7.5°	10.0	-		-10.0		1353.1		+30	-2310	470,742	2,151,167	

SURVEY NOTES-HIGH RESOLUTION DATA
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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
11-14-81		G. Cotcamp		M. Knapp		6834		MPK Bm		1	105						
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Kansas		Clyde		Kansas		Cloud					L. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES		REMARKS	
														Y	X		
									1363.1								
2113	2640		263°15'26"	+7.5°	12.4	TH	+13.2	+0.8		1363.9	TP	+35-2	-2640.2	470,745	2,150,839		
2113	2640				11.5	89°44'	+12.3	+0.8			TP						
	2640		82°14'50"+180°	+7.5°	+12.0	90°40'	+30.7	+42.7	1406.6		BS	-12-2	-2640.2				
	2640				+13.6	90°38'	+29.2	+42.8			BS						
2114	2310		82°15'	+7.5°	7.1	91°-	-40.3	-47.4		1359.2		+10	+2310	470,741	2,150,511		
2115	1980		"	"	8.1	91°-	-34.6	-42.7		1363.9		+9	+1980	470,740	2,150,181		
2116	1650		"	"	9.8	91°10'	-33.6	-43.4		1363.2		+7	+1650	470,738	2,149,851		
2117	1320		"	"	7.8	91°-	-23.0	-30.8		1375.8		+6	+1320	470,737	2,149,521		
2118	990		"	"	9.1	91°-	-17.3	-26.4		1380.2		+4	+990	470,735	2,149,191		
2119	660		"	"	11.9	91°30'	-17.3	-29.2		1377.4		+3	+660	470,734	2,148,861		
2120	330		"	"	13.6	BH	-1.7	-15.3		1391.3		+1	+330	470,732	2,148,531		
2121	0				5.4	-		-5.4		1401.2	π	0	0	470,731	2,148,201		
2122	330		262°23'	+7.5°	3.5	-		-3.5		1403.1		-1	-330	470,730	2,147,871		
2123	660		"	"	13.1	BH	-3.3	-16.4		1390.2		-1	-660	470,730	2,147,541		
2124	990		"	"	5.8	-		-5.8		1400.8		-2	-990	470,729	2,147,211		
2125	1320		"	"	5.8	-		-5.8		1400.8		-3	-1320	470,728	2,146,881		
2126	1650		"	"	8.0	-		-8.0		1398.6		-3	-1650	470,728	2,146,551		
2127	1843		262°16'12"	+7.5°	11.2	-		-11.2		1395.4		-7	-1843	470,724	2,146,358	470,710 + 2,146,385 4-way Intersect.	
2127	1980		262°23'20"	+7.5°	14.1	90°08'	-4.6	-18.7			TP	-4-2	-1980	470,725	2,146,221		
2127	1980				13.0	90°10'	-5.8	-18.8		1387.8	TP						

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
11-14-81		G. Cotcamp		M. Knapp		6834		MPK Ym		1	106				
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER							
Kansas		Clyde	Kansas	Cloud				L. Davis							
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
2127	1650		82° 09' 18" +180°	+7.5°	+9.7	88° 38'	-39.3	-29.62	1358.2	1387.8	BS	-10.2	-1650.2		
	1650				+14.5	88° 28'	-44.1	-29.60			BS				
2128	1320		82° 09'	+7.5°	5.8	89° -	+23.0	+17.2		1375.4		+8	+1320	470,721	2,145,891
2129	990		"	"	8.9	89° -	+17.3	+8.4		1366.6		+6	+990	470,719	2,145,561
2130	660		"	"	10.8	89° -	+11.5	+0.7		1358.9		+4	+660	470,717	2,145,231
2131	330		"	"	11.3	-	-	-11.3		1346.9		+2	+330	470,715	2,144,901
2132	0		"	"	5.4	-	-	-5.4		1352.8	π	0	0	470,713	2,144,571
2133	330		261° 54'	+7.5°	11.5	-	-	-11.5		1346.7		-3	-330	470,710	2,144,241
2134	660		"	"	13.1	91° -	-11.5	-24.6		1333.6		-7	-660	470,706	2,143,911
2135	990		"	"	12.1	91° -	-17.3	-29.4		1328.8		-10	-990	470,703	2,143,581
2136	1320		"	"	12.1	-	-	-12.1		1346.1		-14	-1320	470,699	2,143,251
2137	1650		261° 53' 42"	+7.5°	7.2	-	-	-7.22		1351.0	TP	-17.2	-1650.2	470,694	2,142,921
2137	1650		"	"	5.2	90° 4'	-1.9	-7.1			TP				
	1650		82° 07' 34" +180°	+7.5°	+10.2	-	-	+10.22	1361.2		BS	-11	-1650.2		
	1650				+1.9	BH	+8.3	+10.2			BS				
2138	1320		82° 08'	+7.5°	6.9	91° -	-23.0	-29.9		1331.3		+8	+1320	470,691	2,142,591 bridge
2139	990		"	"	10.7	91° 20'	-23.0	-33.7		1327.5		+6	+990	470,689	2,142,261
2140	660		"	"	12.8	91° 20'	-15.4	-28.2		1333.0		+4	+660	470,687	2,141,931
2141	330		"	"	13.0	-	-	-13.0		1348.2		+2	+330	470,685	2,141,601
2142	0		"	"	5.4	-	-	-5.4		1355.8	π	0	0	470,683	2,141,271

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE				
11-14-81		G. Cotcamp		M. Knapp		6834		MPK Jm		1		107				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Kansas		Clyde/Rice		Kansas		Cloud								L. Davis		
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH+ SOUTH - LAT.	EAST+ WEST - DEP.		Y	X
BM									1361.2							
TL	215		254°35'	+7.5°	3.3	-		-3.3		1357.9		-30	-213	470,653	2,141,058	ELEV. 1987
TL	244		260°31'	+7.5°	2.4	-		-2.4		1358.8		-8	-244	470,675	2,141,027	D.S.G.S. 91 KEF 1961 470,690+2,141,035 4-Way Intersect
2143	330		261°22'	+7.5°	3.8	-		-3.8		1357.4		-7	-330	470,676	2,140,941	Clyde Quad.
2144	660		"	"	1.2	TH	+3.3	+2.1		1363.3		-13	-660	470,670	2,140,611	Rice Quad.
2145	990		"	"	11.2	89°-	+17.3	+6.1		1367.3		-20	-990	470,663	2,140,281	↓
2146	1320		"	"	7.2	89°20'	+15.4	+8.2		1369.4		-26	-1320	470,657	2,139,951	
2147	1650		"	"	13.1	89°-	+28.8	+15.7		1376.9		-33	-1650	470,650	2,139,621	
2148	1980		261°21'50"	+7.2°	9.1	89°-	+34.6	+25.5		1386.7	TP	-50	-1979	470,633	2,139,292	
2148	1980		"	"	4.4	89°08'	+29.9	+25.5			TP					
	1980		80°59'30"+180°	+7.2°	+4.8	89°24'	-20.7	-15.9	1370.8		BS	-62	-1979			
	1980		"	"	14.0	89°08'	-29.9	-15.9			BS					
2149	1650		80°59'	+7.2°	4.3	TH	+8.3	+4.0		1374.8		+52	+1649	470,623	2,138,962	
2150	1320		"	"	4.6	-		-4.6		1366.2		+42	+1319	470,613	2,138,632	
2151	990		"	"	1.3	-		-1.3		1369.5		+31	+990	470,602	2,138,303	
2152	660		"	"	5.7	-		-5.7		1365.1		+21	+660	470,592	2,137,973	
2153	330		"	"	10.1	-		-10.1		1360.7		+10	+330	470,581	2,137,643	
2154	0		"	"	5.4	-		-5.4		1365.4	π	0	0	470,571	2,137,313	
2155	330		261°24'	+7.2°	5.6	-		-5.6		1365.2		-8	-330	470,563	2,136,983	
2156	660		"	"	7.4	-		-7.4		1363.4		-16	-660	470,555	2,136,653	
2157	990		"	"	9.9	-		-9.9		1360.9		-24	-990	470,547	2,136,323	

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO	PAGE						
11-14-81		G. Cotcamp		M. Knapp		6834		MPK Jm		1	108						
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER									
Kansas		Cloud Rice	Kansas	Cloud				L. Davis									
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									1370.8								
2158	1320		261°24'	+7.2°	10.0	0H	-6.6	-16.6		1354.2		-32	-1320	470,539	2,135,993	horiz. corrad. yz = -14, x = +8	
$\frac{1}{2}$	1594		260°57'18"	+7.2°	11.7	-		-11.7		1359.1		-51	-1593	470,520	2,135,720	470,520 + 2,135,720 T-rd (north)	
2159	1650		261°24'	+7.2°	11.7	-		-11.7		1359.1		-40	-1650	470,531	2,135,463		
2160	1980		" "	+7.2°	11.4	-		-11.4		1359.4		-48	-1979	470,523	2,135,334		
2161	2310		261°23'34"		14.9	-		-14.9		1355.9	TP	-45 +2	-2310	470,528	2,135,003		
2161	2310				9.5	90°08'	-5.4	-14.9			TP						
	1980		81°55'20" +180°	+7.5°	5.1 +4.4	90°30'	+17.3	+22.4	1378.3		BS	-20 +2	-1980				
	1980				+14.3	90°14'	+8.1	+22.4			BS						
2162	1650		81°55'	+7.5°	7.3	91° -	-28.8	-36.1		1342.2		+17	+1650	470,527	2,134,673		
2163	1320		" "	" "	11.3	91°20'	-30.7	-42.0		1336.3		+13	+1320	470,523	2,134,343		
2164	990		" "	+7.5°	16.2	91°20'	-23.0	-39.2		1339.1		+10	+990	470,520	2,134,013		
2165	660		" "	+7.5°	9.8	91°20'	-15.4	-25.2		1353.1		+7	+660	470,517	2,133,683		
2166	330		" "	+7.5°	8.1	-		-8.1		1370.2		+3	+330	470,513	2,133,353		
2167	0		" "	" "	5.4	-		-5.4		1372.9	π	0	0	470,510	2,133,023		
2168	330		262°10'	+7.5°	3.5	-		-3.5		1374.8		-2	-330	470,508	2,132,693		
2169	660		" "	+7.5°	3.9	-		-3.9		1374.4		-4	-660	470,506	2,132,363		
2170	990		" "	" "	5.6	-		-5.6		1372.7		-6	-990	470,504	2,132,033		
2171	1320		" "	" "	8.5	-		-8.5		1369.8		-8	-1320	470,502	2,131,703		
$\frac{1}{2}$	1281		261°37'	+7.5°	8.0	-		-8.0		1370.3		-20	-1281	470,470	2,131,742	470,470 + 2,131,770 T-rd (south) 1369	
2172	1650		262°10'	+7.5°	9.8	-		-9.8		1368.5		-10	-1650	470,500	2,131,373		

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-22-81		G. Cotcamp		M. Knapp		6874		Jm B.G.		1	109					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Rice	Kansas	Cloud				L. Davis								
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS
												LAT.	DEP.	Y	X	
									1378.3							
2173	1980		262°09'48"	+7.5°	11.3	-	-11.3				TP	-12+2	-1980.2	470,500	2,131,045	
2173	1980				6.8	90°8'	-4.6	-11.4		1366.9	TP					
	1650		82°36'24"+180°	+7.5°	+4.0	TH	-8.3	-4.3		1362.6	OS	+3+2	-1650+2			
	1650				+5.4	89°40'	-9.6	-4.2			OS					
2174	1320		82°36'	+7.5°	4.7	TH	+6.6	-1.9		1360.7		-2	+1320	470,503	2,130,717	
2175	990		" "	" "	0.2	-	-0.2			1362.4		-2	+990	470,503	2,130,387	
2176	660		" "	+7.5°	5.6	-	-5.6			1357.0		-1	+660	470,504	2,130,057	
2177	330		" "	" "	2.3	-	-2.3			1360.3		-1	+330	470,504	2,129,727	
2178	0				5.4	-	-5.4			1357.2	X	0	0	470,505	2,129,397	
2179	330		263°19'	+7.5°	9.0	92°-	-11.5	-20.5		1342.1		+5	-330	470,510	2,129,067	
2180	660		" "	+7.5°	8.4	92°-	-23.0	-31.4		1331.2		+9	-660	470,514	2,128,737	
2181	990		" "	" "	2.1	92°-	-34.5	-36.6		1326.0		+14	-990	470,519	2,128,407	
2182	1320		" "	+7.5°	14.4	91°-	-23.0	-37.4		1325.2		+19	-1320	470,524	2,128,077	
2183	1650		" "	+7.5°	7.8	91°-	-28.8	-36.6		1326.0		+24	-1650	470,529	2,127,747	
2184	1980		263°19'	" "	14.0	90°40'	-23.0	-37.0			TP	+28+2	-1980.2	470,535	2,127,419	
2184	1980				10.6	90°46'	-26.5	-37.1		1325.5	TP					
	1192		84°34'+180°	+7.5°	+6.0	-	+6.0			1381.5	OS	+43+2	-1191+2			
	1192				+12.0	TH	-6.0	+6.0			OS					
2185	862		85°34'	+7.5°	5.1	-	-5.1			1326.4		-46	+861	470,534	2,127,091	
2186	530		87°09'	+7.5°	5.3	-	-5.3			1326.2		-43	+528	470,537	2,126,758	last sta. on road

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-22-81		G. Cotcamp		B.E. M. Knapp		6834		Lm B.C.		1	110					
AREA		TOPO MAP	STATE	COUNTY	TWP	RANGE	PPM	PARTY MANAGER								
Kansas		Rice	Kansas	Cloud				L. Davis								
STATION NO.	SLOPE DISTANCE	PLOT DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS TP	COORDINATES		REMARKS		
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y	X
									1331.5							
2187	201		85°35'	+7.5°	4.5	-		-4.5		1327.0		-11	+201	470,569	2,126,431	in field
π	0				5.4	-		-5.4		1326.1	π	0	0	470,580	2,126,230	↓
2188	130		250°04'	+7.5°	9.0	-		-9.0		1322.5		-28	-127	470,552	2,126,103	
2189	459		246°49'	+7.5°	4.0	9030'	-4.0	-8.0		1323.5		-124	-442	470,456	2,125,788	
TP	665		249°33'	" "	10.1	-		-10.1		1321.4	TP	-149 ₊₂	-648 ₊₂	470,433	2,125,584	
TP	665				6.8	84	-3.3	-10.1			TP					
	129		93°57'+180°	+7.5°	+2.4	91°	+2.3	+4.7	1326.1		OS	+26 ₊₂	-126 ₊₂			
	129				+2.1	91°10'	+2.6	+4.7			OS					
2190	0				5.4	-		-5.4		1320.7	π	0	0	470,461	2,125,460	east side of creek
2191	306		283°59'	+7.5°	12.2	88°	+10.7	-15.2			TP	+112 ₊₂	-285 ₊₂	470,575	2,125,177	in field
2191	306				11.7	88°6'	+10.1	-1.6		1324.5	TP					
	1320		81°17'46'+180°	+7.5°	+14.4	91°32'	+35.3	+49.7	1374.2		OS	-28 ₊₂	-1319 ₊₂			
	1320				+12.1	91°38'	+37.6	+49.7			OS					
71	1270		81°40'	+7.5°	9.1	91°40'	-36.9	-46.0		1328.2		+18	+1269	470,567	2,125,129	470,580 + 2,125,105 T-intersect.
2192	990		81°18'	" "	10.3	92°	-34.5	-44.8		1329.4		+21	+990	470,570	2,124,850	
2193	660		" "	+7.5°	14.4	92°	-23.0	-37.4		1336.8		+14	+660	470,563	2,124,520	
2194	330		" "	+7.5°	13.0	91°	-5.8	-18.8		1355.4		+7	+330	470,556	2,124,190	
2195	0			+7.5°	5.4	-		-5.4		1368.8	π	0	0	470,549	2,123,860	
2196	330		261°25'	+7.5°	10.3	91°	-5.8	-16.1		1358.1		-6	-330	470,543	2,123,530	
2197	660		" "		11.2	91°30'	-17.3	-28.5		1345.7		-12	-660	470,537	2,123,200	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
11-22-81		G. Cotcamp		M. Knapp		6834		B.C.		1	111					
AREA		TOPO MAP		STATE		COUNTY		RANGE	PPM	PARTY MANAGER						
Kansas		Rite		Kansas		Cloud				L. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH - LAT.	EAST + WEST - DEP.	COORDINATES Y X		REMARKS
2198	990		261° 25'	+7.5	12.5	91° -	-17.3	-29.8	1374.2							
2199	1320		" "	+7.8	10.2	90° 30'	-11.5	-21.7		1344.4		-19	-990	470,530	2,122,870	
2200	1650		" "	" "	7.1	-		-7.1		1352.5		-25	-1320	470,524	2,122,540	
2201	1980		261° 24' 34"	" "	4.9	77	+9.9	+5.0		1367.1		-31	-1650	470,518	2,122,210	
2201	1980				6.4	89° 40'	+11.5	+5.1		1379.2	TP	-38 ₊₂	-1980 ₊₂	470,513	2,121,882	
	2640		81° 39' 54" +180°	+7.5	+14.6	91° 06'	+50.7	+65.3			TP					
	2640				+13.0	91° 08'	+52.2	+65.2	1444.4		BS	-38	-2639 ₊₂			
2202	2310		81° 40'	+7.5	22.6	91° 22'	-55.1	-77.7		1366.7		+34	+2310	470,509	2,121,555	
2203	1980		" "	" "	23.7	91° 22'	-47.2	-70.9		1373.5		+29	+1980	470,504	2,121,225	
2204	1650		" "	+7.5	9.1	91° 22'	-39.3	-48.4		1396.0		+24	+1650	470,499	2,120,895	
2205	1320		" "	" "	11.8	91° 10'	-26.9	-38.7		1405.7		+19	+1320	470,494	2,120,565	
2206	990		" "	" "	8.7	91° -	-17.3	-26.0		1418.4		+14	+990	470,489	2,120,235	
2207	660		" "	+7.5	6.9	91° -	-11.5	-18.4		1426.0		+16	+660	470,485	2,119,905	
2207	600		82° 20'	+7.5	8.0	90° 57' 20"	-10.0	-18.0		1426.4		+2	+600	470,477	2,119,845	470,480 + 2,119,840 4-Way Intersect.
2208	330		81° 40'	+7.5	13.4	-		-13.4		1431.0		+5	+330	470,483	2,119,525	
2209	0		" "	" "	5.4	-		-5.4		1439.0	π	0	0	470,475	2,119,245	
2210	330		262° 54'	" "	13.0	91° -	-5.8	-18.8		1425.6		+2	-330	470,477	2,118,915	
2211	660		" "	+7.5	14.0	91° -	-11.5	-25.5		1418.9		+5.	-660	470,480	2,118,585	
2212	990		" "	" "	10.9	90° 30'	-8.6	-19.5		1424.9		+7	-990	470,482	2,118,255	
2213	1320		" "	+7.5	12.2	90° 30'	-11.5	-23.7		1420.7		+9	-1320	470,484	2,117,925	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
11-22-81		G. Cotcamp		M. Knapp		6834		MPK Jm		1		112			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Kansas		Rice		Kansas		Cloud								L. Davis	
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1444.4						
2214	1650		262°54'	+7.5°	11.7	90°42'	-20.2	-31.9		1412.5		+12	-1650	470,487	2,117,595
2215	1980		"	"	12.0	90°42'	-24.2	-36.2		1408.2		+14	-1980	470,489	2,117,265
2216	2310		"	"	11.4	90°40'	-26.9	-38.3		1406.1		+16	-2310	470,491	2,116,935
2217	2640		"	"	10.1	90°40'	-30.7	-40.8		1403.6		+18	-2640	470,493	2,116,605
2218	2970		"	"	13.2	90°30'	-25.9	-39.1		1405.3		+21	-2970	470,496	2,116,275
2219	3300		"	"	8.1	90°30'	-28.8	-36.9		1407.5		+23	-3300	470,498	2,115,945
2220	3630		"	"	3.8	BH	-18.2	-22.0		1422.4		+25	-3630	470,500	2,115,615
2221	3960		262°53'46"	+7.5°	8.0	90°45'	-8.0	-16.0	1457	1428.7	TP	+27	-3960	470,502	2,115,287
2221	3960		"	"	8.0	269°53'32"	-7.4	-15.4			TP				
	1320		81°49' +180°	+7.5°	+8.0	88°38'14"	-31.4	-23.4	1405.3		BS	-16 +1	-1320 +2		
	1320		"	"	+8.0						BS				
2222	990		81°49'	+7.5°	8.3	88°30'	+25.9	+17.6		1422.9		+12	+990	470,499	2,114,959
2223	660		"	"	9.9	88°30'	+17.3	+7.4		1412.7		+8	+660	470,495	2,114,629
$\frac{1}{2}$	361		81°57'	+7.5°	8.0	89°16'30"	+4.6	-3.4		1401.9		+3	+361	470,490	2,114,330
2224	330		81°49'	+7.5°	4.2	-	-	-4.2		1401.1		+4	+330	470,491	2,114,299
2225	0		"	"	5.4	-	-	-5.4		1399.9	X	0	0	470,487	2,113,969
2226	330		261°42'	+7.5°	14.5	91°-	-5.8	-20.3		1385.0	TP	-5	-330	470,482	2,113,639
2226	330		"	"	8.7	92°-	-11.5	-20.2			TP				
	1980		80°45' 06" +180°	+7.5°	+13.2	90°46'	+26.5	+39.7	1424.7		BS	-60	-1979		
	1980		"	"	+10.9	90°50'	+28.8	+39.7			BS				

Note- stadia distance checked with an E.D.M. (Liota RED)

horiz. Correc. X=+22, X=+24
470,490 + 2,114,330
4-way Intersect. of 1400.
4-way Inter.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE 11-23-81	INSTRUMENT MAN G. Catcamp	ROD MAN M. Knapp	PARTY NUMBER 6834	NOTES CHECKED BY MPK Jr	LINE NO. 1	PAGE 113
AREA Kansas	TOPO MAP Rice	STATE Kansas	COUNTY Cloud	TWP	RANGE	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTting DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH+ SOUTH - LAT.	EAST+ WEST - DEP.	
									1424.7					
2227	1650		80° 45'		9.3	91° 20'	-38.4	-47.7		1377.0		+50	+1649	470,472 2,113,309
2228	1320		" "		12.6	91° 30'	-34.5	-47.1		1377.6		+40	+1319	470,462 2,112,979
2229	990		" "		12.2	91° 40'	-28.8	-41.0		1383.7		+30	+990	470,452 2,112,650
2230	660		" "		9.2	91° 40'	-19.2	-28.4		1396.3		+20	+660	470,442 2,112,320
2231	330		" "		11.1	-		-11.1		1413.6		+10	+330	470,432 2,111,990
2232	0		" "		5.4	-		-5.4		1419.3	X	0	0	470,422 2,111,660
2233	330		260° 50'		3.6	-		-3.6		1421.1		-10	-330	470,412 2,111,330
2234	660		" "		1.4	TH	+3.3	+1.9		1426.6		-19	-660	470,403 2,111,000
2235	990		" "		9.6	89° -	+17.3	+7.7		1432.4		-29	-990	470,393 2,110,670
2236	1320		" "		11.3	89° -	+23.0	+11.7		1436.4		-38	-1319	470,384 2,110,341
2237	1650		" "		11.7	89° 20'	+19.2	+7.5		1432.2		-48	-1649	470,374 2,110,011
2238	1980		260° 49' 38"		12.9	89° 26'	+19.6	+6.7		1431.4	TP	-58	-1979	470,364 2,109,681
2238	1980		" "		14.0	89° 24'	+20.7	+6.7			TP			
	1980		81° 06' 30" +180°		+11.4	BH	+9.9	+21.3	1452.7		BS	-48	-1979	
	1980		" "		+14.4	90° 12'	+6.9	+21.3			BS			
2239	1650		81° 06'		8.9	90° 40'	-19.2	-28.1		1424.6		+40	+1650	470,356 2,109,352
2240	1320		" "		11.9	90° 40'	-15.4	-27.3		1425.4		+32	+1320	470,348 2,109,022
2240	1310		81° 26'		11.2	90° 40'	-15.2	-26.4		1426.3		+24	+1310	470,340 2,109,012
2241	990		81° 06'		13.6	BH	-5.0	-18.6		1434.1		+24	+990	470,340 2,108,692
2242	660		" "		11.7	-		-11.7		1441.0		+16	+660	470,332 2,108,362

470,320 + 2,109,025
4-way Intersect

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
11-23-81		G. Cotcamp		M. Knapp		6834		MPK <i>Ln</i>		1	114				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Kansas		Rice / Concordia		Kansas		Cloud					L. Davis				
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1452.7						
2243	330		81°06'	+7.5	7.4	-		-7.4		1445.3		+8	+330	470,324	2,108,032
2244	0				5.4	-		-5.4		1447.3	π	0	0	470,316	2,107,702
BM	26		157°15'	+7.5	5.1	-		-5.1		1447.6		-25	+7	470,291	2,107,709
2245	330		261°12'	+7.5	8.5	-		-8.5		1444.2		-7	-330	470,309	2,107,372
2246	660		" "	" "	12.2	BH	-3.3	-15.5		1437.2		-15	-660	470,301	2,107,042
2247	990		" "	" "	13.0	90°30'	-8.6	-21.6		1431.1		-22	-990	470,294	2,106,712
2248	1320		" "	+7.5	11.9	BH	-6.6	-18.5		1434.2		-30	-1320	470,286	2,106,382
2249	1650		" "	+7.5	9.9	90°30'	-14.4	-24.3		1428.4		-37	-1650	470,279	2,106,052
2250	1980		" "	" "	11.0	90°42'	-24.2	-35.2		1417.5		-45	-1979	470,271	2,105,723
2251	2310		261°11'36"	" "	9.3	90°30'	-20.2	-29.5			TP	-53	-2309	470,263	2,105,398
2251	2310				14.6	90°22'	-14.8	-29.4		1423.3	TP				
	1320		81°03'12" +180°	+7.5	+6.9	89°30'	-8.4	-1.52			BS	-33	-1320		
	1320				+10.1	89°30'	-11.5	-1.4	1421.9		BS				
2252	990		81°03'	" "	1.0	TH	+5.0	+4.0		1425.9		+25	+990	470,255	2,105,073
2253	660		" "	+7.5	4.0	-		-4.0		1417.9		+17	+660	470,247	2,104,743
2254	330		" "	" "	1.3	-		-1.3		1420.6		+8	+330	470,238	2,104,413
2255	0		" "	" "	5.4	-		-5.4		1416.5	π	0	0	470,230	2,104,083
2256	330		263°35'	+7.5	11.2	-		-11.2		1410.7		+6	-330	470,236	2,103,753
IF	282		261°05'	+7.5	10.6	-		-10.6		1411.3		-7	-282	470,223	2,103,801
2257	660		263°35'	+7.5	13.4	-		-13.4		1408.5		+12	-660	470,242	2,103,423

ELEV 1448 approximate location

↑
Rice Quad.
Concordia Quad.
↓

470,240 + 2,103,805
4-way Intersect.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE	11-23-81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	M. Knapp	PARTY NUMBER	6834	NOTES CHECKED BY	MPK	LINE NO.	1	PAGE	115
AREA	Kansas	TOPO MAP	Concordia	STATE	Kansas	COUNTY	Cloud	RANGE		PPM		PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -		EAST + WEST -		COORDINATES		REMARKS	
												LAT.	DEP.	Y	X				
									1421.9										
II	264		257°14'	+7.5	11.6	-		-11.6		1410.3		-24	-263	470,206	2,103,820			ELEV 1411 chiseled square	
2258	990		264°48'	+7.5	5.5	91°-	-17.3	-22.8		1399.1		+40	-989	470,270	2,103,094				
2259	1320		" "	" "	10.5	90°30'	-11.5	-22.0		1399.9		+53	-1319	470,283	2,102,764				
2260	1650		" "	" "	3.6	90°30'	-14.4	-18.0		1403.9		+66	-1649	470,296	2,102,434				
2261	1980		" "	+7.5	8.1	-		-8.1		1413.8		+79	-1978	470,309	2,102,105				
2262	2310		" "	" "	7.6	TH	+11.6	+4.0		1425.9		+93	-2308	470,323	2,101,725				
2263	2640		" "	" "	7.5	89°26'	+26.1	+18.6		1410.5		+106	-2638	470,336	2,101,445				
2264	2970		264°48'08"	+7.5	5.1	89°20'	+34.5	+29.4		1451.3	TP	+119	-2967	470,349	2,101,121				
2264	2970		" "	" "	8.6	89°16'	+38.0	+29.4			TP								
	2640		84°56'10" +180°	+7.5	+14.3	89°08'	-39.9	-25.6			OS	+112	-2637						
	2640		" "	" "	+12.9	89°10'	-38.4	-25.5	1425.8		OS								
2265	2310		84°56'	+7.5	8.1	89°24'	+24.2	+16.1		1441.9		-98	+2308	470,363	2,100,797				
2266	1980		" "	" "	4.5	TH	+9.9	+5.4		1431.2		-84	+1978	470,377	2,100,467				
2267	1650		" "	" "	6.2	-		-6.2		1419.6		-70	+1649	470,391	2,100,138				
2268	1320		" "	" "	2.9	-		-2.9		1422.9		-56	+1319	470,405	2,099,808				
2269	990		" "	+7.5	2.8	-		-2.8		1423.0		-42	+989	470,419	2,099,478				
2270	660		" "	+7.5	9.0	-		-9.0		1416.8		-28	+659	470,433	2,099,148				
2271	330		" "	" "	7.0	-		-7.0		1418.8		-14	+330	470,447	2,098,819				
2272	0		" "	" "	5.4	-		-5.4		1420.4	π	0	0	470,461	2,098,489				
II	9		218°51'	+7.5	5.2	-		-5.2		1420.6		-6	-7	470,455	2,098,482			470,475 + 2,098,480 4-Way Intersect	

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
11-23-81		G. Cotcamp		M. Knapp		6834		MPK <i>for</i>		1	116				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Kansas		Concordia		Kansas		Cloud					L. Davis				
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS	
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.		Y
									1405.8						
2273	330		258° 05'	+7.5°	12.6	91° -	-5.8	-18.4		1407.4		-25	-329	470,436	2,098,160
H	434		256° 51'	+7.5	13.4	91° -	-7.6	-21.0		1404.8		-43	-432	470,418	2,098,057
2274	660		258° 05'	" "	13.0	-		-13.0		1412.8		-51	-658	470,410	2,097,831
2275	990		" "	" "	11.0	-		-11.0		1414.8		-76	-987	470,385	2,097,502
2276	1320		" "	+7.5	12.8	-		-12.8		1413.0		-102	-1316	470,359	2,097,173
2277	1650		" "	" "	7.1	-		-7.1		1418.7		-127	-1645	470,334	2,096,844
2278	1980		" "	" "	3.8	-		-3.8		1422.0		-152	-1974	470,309	2,096,515
2279	2310		" "	+7.5	3.3	-		-3.3		1422.5		-178	-2303	470,283	2,096,186
2280	2640		258° 04' 42"	+7.5°	8.6	-		-8.6		1417.2	TP	-204	-2632	470,257	2,095,862
2280	2640				5.5	90° 4'	-3.1	-8.6			TP				
	1980		82° 10' 33" + 180°	+7.5	+3.7	-		+3.7	1420.9		BS	-11	-1980		
	1980				+13.6	TH	-9.9	+3.7			BS				
H	1960		82° 20'	+7.5	3.9	-		-3.9		1417.0		+6	+1960	470,252	2,095,847
2281	1650		82° 10'	+7.5	9.1	0H	-8.3	-17.4		1403.5		+10	+1650	470,256	2,095,537
2282	1320		" "	+7.5	4.8	91° -	-23.0	-27.8		1395.1		+7	+1320	470,253	2,095,207
2283	990		" "	" "	11.3	91° -	-17.3	-28.6		1392.3		+6	+990	470,252	2,094,877
2284	660		" "	" "	13.8	0H	-3.3	-17.1		1403.8		+4	+660	470,250	2,094,547
2285	330		" "	+7.5	9.1	-		-9.1		1411.8		+2	+330	470,248	2,094,217
2286	0		" "	" "	5.4	-		-5.4		1415.5	X	0	0	470,246	2,093,887
2287	330		263° 06'	+7.5	7.1	-		-7.1		1413.8		+3	-330	470,249	2,093,557

ELEV 1406
chiseled square

4-way (at 81) c. 1418

bridge

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE 11-23-81	INSTRUMENT MAN G. Cotcamp	ROD MAN M. Knapp	PARTY NUMBER 6834	NOTES CHECKED BY MPK Jn	LINE NO. 1	PAGE 117
AREA Kansas	TOPO MAP Concordia	STATE Kansas	COUNTY Cloud	TWP	RANGE	PPM
				PARTY MANAGER L. Davis		

STATION NO.	SLOPE DISTANCE	PLOTting DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1400.9					
2288	660		263° 06'	+7.5	13.4	-		-13.4		1407.5		+7	-660	470,253 2,093,227
2289	721		261° 57'	+7.5	9.3	-		-9.3		1411.6		-7	-721	470,239 2,093,166 470,225+2,093,160 4-way Intersect. pt. 1412
2289	990		263° 06'	" "	4.1	-		-4.1		1416.8		+10	-990	470,256 2,092,897
2290	1320		" "	" "	2.2	-		-2.2		1418.7		+14	-1320	470,260 2,092,567
2291	1650		" "	+7.5	7.0	-		-7.0		1413.9		+17	-1650	470,263 2,092,237
2292	1980		263° 05' 48"	+7.4	10.7	-		-10.7		1410.2	TP	+17	-1980	470,263 2,091,912
2292	1980		" "	" "	8.5	90° 04'	-2.3	-10.8			TP			
	2640		83° 42' 52" ±180°	+7.4	+6.0	-		+6.0	1416.2		BS	+51	-2640	
	2640		" "	" "	+4.5	90° 02'	+1.5	+6.0			BS			
2293	2310		83° 43'	+7.4	6.7	-		-6.7		1409.5		-45	+2310	470,269 2,091,587
2294	1980		" "	" "	6.4	-		-6.4		1409.8		-38	+1980	470,276 2,091,257
2295	1650		" "	" "	2.7	-		-2.7		1413.5		-32	+1650	470,282 2,090,927
2296	1320		" "	" "	10.5	8H	-6.6	-17.1		1399.1		-26	+1320	470,288 2,090,597
2297	990		" "	" "	8.8	91° -	-17.3	-26.1		1390.1		-19	+990	470,295 2,090,267
2298	660		" "	" "	12.2	91° -	-11.5	-23.7		1392.5		-13	+660	470,301 2,089,937
2299	330		" "	" "	12.7	8H	-1.7	-14.4		1401.8		-6	+330	470,308 2,089,607
2300	0		" "	" "	5.4	-		-5.4		1410.8	π	0	0	470,314 2,089,277
2301	330		263° 37'	" "	9.9	-		-9.9		1406.3		+6	-330	470,320 2,088,947
2302	660		" "	" "	12.0	8H	-3.3	-15.3		1400.9		+12	-660	470,326 2,088,617
2303	990		" "	" "	12.8	8H	-5.0	-17.8		1398.4		+18	-990	470,332 2,088,287

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

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DATE	11-23-81	INSTRUMENT MAN	G. Cotcamp	ROD MAN	M. Knapp	PARTY NUMBER	6834	NOTES CHECKED BY	B.C.	LINE NO.	1	PAGE	118
AREA	Kansas	TOPO MAP	Concordia	STATE	Kansas	COUNTY	Cloud	RANGE		PPM		PARTY MANAGER	L. Davis

STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS
												NORTH + SOUTH - LAT.	EAST + WEST - DEP.	
									1416.2					
2304	1320		263° 37'	+7.4	12.3	BH	-6.6	-18.9		1397.3		+23	-1320	470,337 2,087,957
7/8	1320		263° 27' 34"	+7.4	12.3	BH	-6.6	-18.9		1397.3		+20	-1320	470,334 2,087,957 470,3154 2,087,945 4-Way Intersect
2305	1650		263° 37'	" "	12.3	BH	-8.3	-20.6		1395.6		+29	-1650	470,343 2,087,627
II	1590		263° 00'	" "	12.7	BH	-8.0	-20.7		1395.5		+11	-1590	470,325 2,087,687 chiseled square el. 1396.
2306	1980		263° 37'	" "	10.1	BH	-9.9	-20.0		1396.2		+35	-1980	470,349 2,087,297
2307	2310		" "	+7.4	7.7	BH	-11.6	-19.3		1396.9		+41	-2310	470,355 2,086,967
2308	2640		263° 37' 06"	+7.4	5.8	BH	-13.2	-19.0			TP	+47	-2640	470,361 2,086,642
2308	2640				14.3	90° 06'	-4.6	-18.9		1397.3	TP			
	3630		83° 39' 32" +180°	+7.4	+14.9	-		+14.9	1412.2		BS	+67.5	-3629	
	3630				+10.7	90° 04'	+4.2	+14.9			BS			
2309	3300		83° 40'	+7.4	9.8	90° 06'	-5.8	-15.6		1396.6		-61	+3299	470,362 2,086,313
2310	2970		" "	" "	11.0	90° 06'	-5.2	-16.2		1396.0		-55	+2969	470,368 2,085,983
2311	2640		" "	" "	12.1	90° 06'	-4.6	-16.7		1395.5		-49	+2640	470,374 2,085,654
2312	2310		" "	+7.4	2.8	BH	-11.6	-14.4		1397.8		-43	+2310	470,380 2,085,324
2313	1980		" "	" "	4.7	BH	-9.9	-14.6		1397.6		-37	+1980	470,386 2,084,994
2314	1650		" "	" "	8.5	BH	-8.3	-16.8		1395.4		-31	+1650	470,392 2,084,664
2315	1320		" "	+7.4	12.0	BH	-6.6	-18.6		1393.6		-25	+1320	470,398 2,084,334
2316	990		" "	" "	10.3	BH	-5.0	-15.3		1396.9		-18	+990	470,405 2,084,004
2317	660		" "	" "	13.0	-		-13.0		1399.2		-12	+660	470,411 2,083,674
2318	330		" "	+7.4	6.7	-		-6.7		1405.5		-6	+330	470,417 2,083,344

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE				
11-23-81		G. Cotcamp		M. Knapp		6834		MPK Jr		1		119				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Kansas		Concordia		Kansas		cloud								L. Davis		
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFERENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	COORDINATES		REMARKS		
												NORTH + SOUTH -	EAST + WEST -		Y	X
									1412.2							
2319	0				5.0	-		-5.0		1407.2	π	0	0	470,423	2,083,014	
4/1	240		262° 12'	+7.4°	5.6	-		-5.6		1406.6		-2	-240	470,421	2,082,774	470,410 + 2,082,780 4-Way Intersect.
2320	330		263° 07'	+7.4°	6.3	-		-6.3		1405.9		+3	-330	470,426	2,082,684	paved road
2321	660		" "	" "	7.9	-		-7.9		1404.3		+6	-660	470,429	2,082,354	↓
2322	990		" "	" "	11.2	-		-11.2		1401.0		+9	-990	470,432	2,082,024	
2323	1320		" "	+7.4°	14.1	-		-14.1		1398.1		+12	-1320	470,435	2,081,694	
2324	1650		" "	" "	7.3	OH	-8.3	-15.6		1396.6		+15	-1650	470,438	2,081,364	
2325	1980		" "	" "	7.1	OH	-9.9	-17.0		1395.2		+18	-1980	470,441	2,081,034	
2326	2310		" "	+7.4°	9.5	OH	-11.6	-21.1		1391.1		+21	-2310	470,444	2,080,704	
2327	2640		" "	" "	11.9	OH	-13.2	-25.1		1387.1		+24	-2640	470,447	2,080,374	
2328	2970		" "	" "	12.0	OH	-14.9	-26.9		1385.3		+27	-2970	470,450	2,080,044	
2329	3300		" "	+7.4°	11.3	OH	-16.5	-27.8		1384.4		+30	-3300	470,453	2,079,714	
2330	3630		" "	" "	10.8	OH	-18.2	-29.0		1383.2		+33	-3630	470,456	2,079,384	
2331	3960		" "	" "	9.7	OH	-19.8	-29.5		1382.7		+36	-3960	470,459	2,079,054	
2332	4290		" "	+7.4°	8.0	OH	-21.5	-29.5		1382.7		+39	-4290	470,462	2,078,724	
2333	4620		263° 06' 36"	" "	6.7	OH	-23.1	-29.8		1382.4		+41	-4620	470,464	2,078,394	
2334	4944		263° 30' 10"	" "	8.0	90° 15' 35"	-22.4	-30.4		1381.8		+78	-4943	470,501	2,078,071	E.O.L. #1
4	4678		83° 52' 20"	+7.4°	8.0	90° 06' 36"	-9.0	-17.0		1395.2		-104	+4677	470,319	2,087,691	ELEV 1596 chiseled square
4/1	2642		177° 21' 46"	+7.4°	8.0	90° 31' 27"	-24.2	-32.2		1380.0		-2633	-219	467,790	2,082,795	467,790 + 2,082,795 T-rd (west) el. 1380, y = -5' horiz. correct, x = +46'