

DATE: 8/24/78
 INSTRUMENT MAN: G. CoCamp
 ROD MAN: R. Hulsey
 PARTY NUMBER: 6834
 NOTES CHECKED BY: R. F. H.
 LINE NO.: 2
 PAGE: 1 of 35
 AREA: Michigan
 TOPO MAP: Rathbone 7 1/2'
 STATE: Michigan
 COUNTY: Gratiot
 TWP: 10 N
 RANGE: 1 W
 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.	
7										669.0				642,525, 1,979,880 (calculated)
	1370		93°25.7'+180°	-34°	+12.6	-		+12.6	681.6		BS	+1	-1370	T-intersect. el. 669 R.
	1370				+5.7	BH	+6.9	+12.6		BS				(Woodbridge)
1	1320		93°17'	-34°	13.0	-		-13.0		668.6		+9	+1320	642,535, 1,979,830
2	1100		" "	-34°	13.1	-		-13.1		668.5		+7	+1100	642,533, 1,979,610
3	880		" "	-34°	13.3	-		-13.3		668.3		+6	+880	642,532, 1,979,390
4	660		" "	-34°	13.4	-		-13.4		668.2		+4	+660	642,530, 1,979,170
5	440		" "	-34°	13.2	-		-13.2		668.4		+3	+440	642,529, 1,978,950
6	220		" "	-34°	10.4	-		-10.4		671.2		+1	+220	642,527, 1,978,730
7	0				5.4	-		-5.4		676.2	X	0	0	642,526, 1,978,510
8	220		273°18.2°	-34°	3.6	-		-3.6		678.0		0	-220	642,526, 1,978,290
9	440		" "	-34°	1.7	-		-1.7		679.9		-1	-440	642,525, 1,978,070
10	660		" "	-34°	0.2	-		-0.2		681.4		-1	-660	642,525, 1,977,850
11	880		" "	-34°	1.1	-		-1.1		680.5		-1	-880	642,525, 1,977,630
12	1100		" "	-34°	2.8	-		-2.8		678.8		-2	-1100	642,524, 1,977,410
13	1320		273°18.2'	-34°	2.6	-		-2.6		679.0	TP	-2	-1320	642,524, 1,977,190
13	1320				9.1	TH	+6.6	-2.5			TP			
	2640		93°34.6'+180°	-34°	+12.6	-		+12.6	691.6		BS	+8	-2640	
	2640				+14.2	8938'	-1.5	+12.7		BS				
14	2420		93°34.6'	-34°	12.5	-		-12.5		679.1		-7	+2420	642,525, 1,976,970
15	2200		" "	-34°	12.8	-		-12.8		678.8		-7	+2200	642,525, 1,976,750

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/24/78		G. Cotcamp		R. Hulsey		6834		R. F. H.		2	2				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Michigan		Rathbone		Michigan		Gratiot		10 N	1 W		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
									691.6						
16	1980		93°34.5'	-3.4°	12.6	-		-12.6		679.0		-6	+1980	642,526	1,976,530
17	1760		"	-3.4°	11.0	-		-11.0		680.6		-5	+1760	642,527	1,976,310
18	1540		"	-3.4°	10.0	-		-10.0		681.6		-5	+1540	642,527	1,976,090
19	1320		"	-3.4°	8.1	-		-8.1		683.5		-4	+1320	642,528	1,975,870
20	1100		"	-3.4°	7.0	-		-7.0		684.6		-3	+1100	642,529	1,975,650
21	880		"	-3.4°	6.5	-		-6.5		685.1		-3	+880	642,529	1,975,430
22	660		"	-3.4°	6.6	-		-6.6		685.0		-2	+660	642,530	1,975,210
23	440		"	-3.4°	6.7	-		-6.7		684.9		-1	+440	642,531	1,974,990
24	220		"	-3.4°	6.6	-		-6.6		685.0		-1	+220	642,531	1,974,770
FF	36		100.58'	-3.4°	5.3	-		-5.3		686.3		-5	+36	642,527	1,974,586
25	0		"		5.4	-		-5.4		686.2	T	0	0	642,532	1,974,550 (Barry)
26	220		273°37'	-3.2°	5.8	-		-5.8		685.8		+2	-220	642,534	1,974,330
27	440		"	-3.2°	5.8	-		-5.8		685.8		+3	-440	642,535	1,974,110
28	660		"	-3.2°	4.3	-		-4.3		687.3		+5	-660	642,537	1,973,890
29	880		"	-3.2°	3.2	-		-3.2		688.4		+6	-880	642,538	1,973,670
30	1100		"	-3.2°	2.4	-		-2.4		689.2		+8	-1100	642,540	1,973,450
31	1320		"	-3.2°	2.1	-		-2.1		689.5		+10	-1320	642,542	1,973,230
32	1540		"	-3.2°	1.3	-		-1.3		690.3		+11	-1540	642,543	1,973,010
33	1760		273°37'	-3.2°	2.1	-		-2.1		689.5	TF	+13	-1760	642,545	1,972,790
33	1760		"		10.9	TH	+8.8	-2.1			TF				

y+2' x=-4'
642,525+1,974,570
4-Way Intersect. elev. 684.

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/25/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		1		3			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Rathbone		Michigan		Gratiot		10 N		1 W				J. J. [unclear]	
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
												LAT.	DEP.		
33										689.5					
	2640		93° 3.6' +180°	-32°	+9.2	-		+9.2	698.7		BS	-6	-2640		
	2640				+13.9	89° 34'	-4.6	+9.3			FS				
34	2420		93° 3.6'	-3.2°	8.9	-		-8.9		689.8		+6	+2420	642,545	1,972,570
35	2200		" "	-3.2°	7.8	-		-7.8		690.9		+5	+2200	642,544	1,972,350
36	1980		" "	-3.2°	7.0	-		-7.0		691.7		+5	+1980	642,544	1,972,130
37	1760		" "	-3.2°	7.3	-		-7.3		691.4		+4	+1760	642,543	1,971,910
38	1540		" "	-3.2°	8.4	-		-8.4		690.3		+4	+1540	642,543	1,971,690
39	1320		" "	-3.2°	8.0	-		-8.0		690.7		+3	+1320	642,542	1,971,470
40	1100		" "	-3.2°	7.5	-		-7.5		691.2		+3	+1100	642,542	1,971,250
41	880		" "	-3.2°	7.0	-		-7.0		691.7		+2	+880	642,541	1,971,030
42	660		" "	-3.2°	6.0	-		-6.0		692.7		+2	+660	642,541	1,970,810
43	440		" "	-3.2°	4.8	-		-4.8		693.9		+1	+440	642,540	1,970,590
44	220		" "	-3.2°	4.6	-		-4.6		694.1		+1	+220	642,540	1,970,370
45	0				5.3	-		-5.3		693.4	π	0	0	642,539	1,970,150
46	220		273° 137'	-3.2°	5.1	-		-5.1		693.6		0	-220	642,539	1,969,930
47	440		" "	-3.2°	5.0	-		-5.0		693.7		0	-440	642,539	1,969,710
48	660		" "	-3.2°	4.9	-		-4.9		693.8		0	-660	642,539	1,969,490
48	866		272° 213'	-3.2°	2.1	-		-2.1		696.6		+13	-866	642,526	1,969,284
49	880		273° 137'	-3.2°	2.1	-		-2.1		696.6		0	+880	642,539	1,969,270 (Ransom)
50	1100		" "	-3.2°	3.3	-		-3.3		695.4		+1	-1100	642,540	1,969,050

y=6' x=74'
 642,520 = 1,969,280 (scab)
 4-Way Intersect. El. 697

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE					
8/25/78		G. Cotcamp			R. Hulsey			6837		R. V. H.			2	4					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER								
Michigan		Rathbone		Michigan		Gratiot		10 N	1 W		L. J. 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				
									698.7										
51	1320		273°13.7'	-3.2°	4.0	-		-4.0		694.7		+1	-1320	642,540	1,968,830				
52	1540		" "	-3.2°	5.2	-		-5.2		693.5		+1	-1540	642,540	1,968,610				
53	1760		" "	-3.2°	5.1	-		-5.1		693.6		+1	-1760	642,540	1,968,390				
54	1980		" "	-3.2°	4.4	-		-4.4		694.3		+1	-1980	642,540	1,968,170				
55	2200		" "	-3.2°	4.1	-		-4.1		694.6		+1	-2200	642,540	1,967,950				
56	2420		" "	-3.2°	5.0	-		-5.0		693.7		+1	-2420	642,540	1,967,730				
57	2640		273°13.7'	-3.0°	4.9	-		-4.9		693.8	TP	+11	-2640	642,550	1,967,510				
57	2640				14.2	89°48'	+9.2	-5.0			TP								
	2640		93°31' +180°	-3.0°	+11.7	-		+11.7	705.5		BS	+24	-2640						
	2640				+14.9	89°56'	-3.1	+11.8			BS								
58	2420		93°31'	-3.0°	11.0	-		-11.0		694.5		-22	+2420	642,552	1,967,290				
59	2200		" "	-3.0°	11.0	-		-11.0		694.5		-20	+2200	642,554	1,967,070				
60	1980		" "	-3.0°	10.6	-		-10.6		694.9		-18	+1980	642,556	1,966,850				
61	1760		" "	-3.0°	10.7	-		-10.7		694.8		-16	+1760	642,558	1,966,630				
62	1540		" "	-3.0°	10.7	-		-10.7		694.8		-14	+1540	642,560	1,966,410				
63	1320		" "	-3.0°	10.8	-		-10.8		694.7		-12	+1320	642,562	1,966,190				
64	1100		" "	-3.0°	10.0	-		-10.0		695.5		-10	+1100	642,564	1,965,970				
65	880		" "	-3.0°	7.4	-		-7.4		698.1		-8	+880	642,566	1,965,750				
66	660		" "	-3.0°	8.3	-		-8.3		697.2		-8	+660	642,568	1,965,530				
67	440		" "	-3.0°	8.3	-		-8.3		697.2		-4	+440	642,570	1,935,310				

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/25/78		G. Cotcamp		R. Hulsey		6834		R.F.H.		2	5				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Rathbone		Michigan		Gratiot		10 N		1 W				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 -	EAST + WEST -		Y
									705.5						
68	220		73° 31'	-30°	7.1	-		-7.1		698.4		-2	+220	642,572	1,965,090
69	0				5.4	-		-5.4		700.1	TP	0	0	642,574	1,964,870
70	220		273° 40'	-30°	5.3	-		-5.3		700.2		+3	-220	642,577	1,964,650
71	440		" "	-30°	4.8	-		-4.8		700.7		+5	-440	642,579	1,964,430
72	660		" "	-30°	4.3	-		-4.3		701.2		+8	-660	642,582	1,964,210
73	880		" "	-30°	4.4	-		-4.4		701.1		+10	-880	642,584	1,963,990
74	1022		273° 17'	-30°	4.6	-		-4.6		700.9		+5	-1022	642,579	1,963,898
74	1120		273° 40'	-30°	5.5	-		-5.5		700.0		+13	-1100	642,587	1,963,770 (McClelland)
75	1320		272° 56.2'	-30°	5.8	-		-5.8		699.7		-1	-1320	642,573	1,963,550
76	1540		" "	-30°	7.3	-		-7.3		698.2		-2	-1540	642,572	1,963,330
77	1760		" "	-30°	7.3	-		-7.3		698.2		-2	-1760	642,572	1,963,110
78	1980		" "	-30°	8.8	-		-8.8		696.7		-2	-1980	642,572	1,962,890
79	2200		" "	-30°	10.5	-		-10.5		695.0		-2	-2200	642,572	1,962,670
80	2420		" "	-30°	10.0	-		-10.0		695.5		-3	-2420	642,571	1,962,450
81	2640		272° 56.2'	-29°	11.9	-		-11.9			TP	+2	-2640	642,576	1,962,230
81	2640				13.5	89° 58'	+1.5	-12.0		693.5	TP				
	2200		91° 34' + 180°	-29°	+5.9	-		+5.9			BS	-51	-2199		
	2200				+9.9	89° 34'	-3.9	+6.0	699.5		BS				
82	1980		91° 34'	-29°	7.1	-		-7.1		692.4		+46	+1980	642,571	1,962,011
82	1900		91° 43'	-29°	6.8	-		-6.8		692.7		+39	+1900	642,564	1,961,931

y = +4' x = +3'
642,575 + 1,963,845
4-way Intersect. El. 705

clt
bridge (7 Ton)

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

GEO-445

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY			LINE NO.		PAGE	
8/25/78		G. Cotcamp			R. Hulsey			6834		R. P. H.			2		6	
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER		
Michigan		Rathbone		Michigan		Gratiot		T 10 N		2 W				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 -	EAST + WEST -		Y	X
									699.5							
83	1760		91° 34'	-29°	8.1	-		-8.1		691.4		+41	+1760	642,566	1,961,791	
84	1540		" "	-29°	7.8	-		-7.8		691.7		+36	+1540	642,561	1,961,571	
85	1320		" "	-29°	5.8	-		-5.8		693.7		+31	+1320	642,556	1,961,351	
86	1100		" "	-29°	5.8	-		-5.8		693.7		+26	+1100	642,551	1,961,131	
87	880		" "	-29°	5.3	-		-5.3		694.2		+20	+880	642,545	1,960,911	
88	660		" "	-29°	5.4	-		-5.4		694.1		+15	+660	642,540	1,960,691	
89	440		" "	-29°	5.1	-		-5.1		694.4		+10	+440	642,535	1,960,471	
90	220		" "	-29°	5.0	-		-5.0		694.5		+5	+220	642,530	1,960,251	
91	0				5.4	-		-5.4		694.1	X	0	0	642,525	1,960,031	
92	139		258° 26'	-29°	4.5	-		-4.5		695.0		-35	-135	642,490	1,959,896	
92	180		237° 32'	-29°	5.1	-		-5.1		694.4		-104	-147	642,421	1,959,884	
93	190		227° 45'	-29°	5.2	-		-5.2		694.3		-136	-132	642,389	1,959,899	
93	380		253° 1.5'	-25°	5.1	-		-5.1		694.4	TP	-127	-358	642,398	1,959,673	
93	380				7.0	TH	+1.9	-5.1			TP					
	2640		92° 4.3' + 180°	-25°	9.8	-		+9.8	704.2		BS	-20	-2640			
	2640				14.5	89° 54'	-4.6	+9.9			BS					
94	2420		92° 4.3'	-25°	8.8	-		-8.8		695.4		+18	+2420	642,396	1,959,453	
95	2200		" "	-25°	7.8	-		-7.8		696.4		+16	+2200	642,394	1,959,233	
96	1980		" "	-25°	8.0	-		-8.0		696.2		+15	+1980	642,393	1,959,013	
97	1760		" "	-25°	8.0	-		-8.0		696.2		+13	+1760	642,391	1,958,793	

offset 4-way
y=-1' x=-1'
642,390 + 1,959,900
offset 4-way E1. 696'
shooting across offset
4-way

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/25/78		G. Cotcamp		R. Hulsey		6837		R. J. H.		2	7				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		Rathbone		Michigan	Saginaw		10 N	2 W		L. J. P.					
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
									704.2						
98	1540		92° 43'	-25°	8.7	-		-8.7		695.5		+12	+1540	642,390	1,958,573
99	1320		" "	-25°	8.2	-		-8.2		696.0		+10	+1320	642,388	1,958,353
100	1100		" "	-25°	8.0	-		-8.0		696.2		+8"	+1100	642,386	1,958,133
101	880		" "	-25°	6.9	-		-6.9		697.3		+6	+880	642,384	1,957,913
102	660		" "	-25°	7.0	-		-7.0		697.2		+5	+660	642,383	1,957,693
103	440		" "	-25°	6.0	-		-6.0		698.2		+3	+440	642,381	1,957,473
104	220		" "	-25°	5.2	-		-5.2		699.0		+2	+220	642,380	1,957,253
105	0				5.3	-		-5.3		698.9	X	0	0	642,378	1,957,033
106	220		272° 53.4'	-25°	5.0	-		-5.0		699.2		+1	-220	642,379	1,956,813
107	440		" "	-25°	5.2	-		-5.2		699.0		+3	-440	642,381	1,956,593
108	660		" "	-25°	5.1	-		-5.1		699.1		+4	-660	642,382	1,956,373
109	880		" "	-25°	5.2	-		-5.2		699.0		+6	-880	642,384	1,956,153
110	1100		" "	-25°	5.3	-		-5.3		698.9		+7	-1100	642,385	1,955,933
111	1320		" "	-25°	4.3	-		-4.3		699.9		+9	-1320	642,387	1,955,713
112	1540		" "	-25°	4.3	-		-4.3		699.9		+10	-1540	642,388	1,955,493
113	1760		" "	-25°	4.3	-		-4.3		699.9		+12	-1760	642,390	1,955,273
114	1980		" "	-25°	4.1	-		-4.1		700.1		+13	-1980	642,391	1,955,053
115	2200		" "	-25°	3.2	-		-3.2		701.0		+15	-2200	642,393	1,954,833
116	2420		272° 53.4'	-25°	3.8	-		-3.8	-3.9	700.3	TP	+16	-2420	642,394	1,954,613
116	2420				13.8	89° 46'	+9.8	-4.0			TP				

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/25/78		G. Gotschamp		R. W. Wey		6834		R. J. H.		2	8					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan				Michigan		Gratiot		10 N	2 W		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	X
116									700.3							
	2640		92° 57.2' + 180	-25°	+9.2	-		+9.2	709.5		BS	+21.1	-2640			
	2640			-25°	+13.8	89° 54'	-4.6	+9.2		BS						y = -2' x = -7'
$\frac{11}{11}$	2620		93° 7.3'	-25°	8.7	-		-8.7	700.8			-28	+2620	642,388	1,954,533	4-way E. 70'
117	2420		92° 57.2'	-25°	9.2	-		-9.2	700.3			-19	+2420	642,397	1,954,393	
118	2200		" "	-25°	8.7	-		-8.7	700.8			-17	+2200	642,399	1,954,173	
119	1980		" "	-25°	7.9	-		-7.9	701.6			-16	+1980	642,400	1,953,953	
120	1760		" "	-25°	6.9	-		-6.9	702.6			-14	+1760	642,402	1,953,733	
121	1540		" "	-25°	6.9	-		-6.9	702.6			-12	+1540	642,404	1,953,513	
122	1320		" "	-25°	6.8	-		-6.8	702.7			-10	+1320	642,406	1,953,293	
123	1100		" "	-25°	6.3	-		-6.3	703.2			-9	+1100	642,407	1,953,073	
124	880		" "	-25°	6.0	-		-6.0	703.5			-7	+880	642,409	1,952,853	
125	660		" "	-25°	5.2	-		-5.2	704.3			-5	+660	642,411	1,952,633	
126	440		" "	-25°	5.3	-		-5.3	704.2			-3	+440	642,413	1,952,413	
127	220		" "	-25°	5.3	-		-5.3	704.2			-2	+220	642,414	1,952,193	
128	0		" "		5.4	-		-5.4	704.1		X	0	0	642,416	1,951,973	
129	220		273° 13.7'	-25°	5.5	-		-5.5	704.0			+3	-220	642,419	1,951,753	
130	440		" "	-25°	4.6	-		-4.6	704.9			+6	-440	642,422	1,951,533	
131	660		" "	-25°	4.0	-		-4.0	705.5			+8	-660	642,424	1,951,313	
132	880		" "	-25°	3.8	-		-3.8	705.7			+11	-880	642,427	1,951,093	
133	1100		" "	-25°	2.9	-		-2.9	706.6			+14	-1100	642,430	1,950,873	

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
8/25/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		2		9			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM			
Michigan				Michigan		Gratiot		10 N		2 W		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 -	EAST + WEST -		Y
									709.5						
134	1320		273° 13.7'	-2.5°	1.9	-		-1.9		707.6		+17	-1320	642,433	1,950,653
135	1540		"	-2.5°	1.3	-		-1.3		708.2		+20	-1540	642,436	1,950,433
136	1760		"	-2.5°	1.1	-		-1.1		708.4		+22	-1760	642,438	1,950,213
137	1980		"	-2.5°	0.5	-		-0.5		709.0		+25	-1980	642,441	1,949,993
138	2200		"	-2.5°	0.4	-		-0.4		709.1		+28	-2200	642,444	1,949,773
139	2420		"	-2.5°	0.3	-		-0.3		709.2		+31	-2420	642,447	1,949,553
140	2605		273° 24'	-2.5°	11.4	TH	+13.0	+1.6		711.1		+25	-2605	642,441	1,949,368
140	2640		273° 13.7'	-2.4°	12.2	TH	+13.2	+1.0		710.5	TP	+38+1	-2640	642,455	1,949,336
	2200				14.5	89° 40'	+15.4	+0.9			TP				
	2200		92° 4.3' +180° -24°		+8.8	-		+8.8			BS	-13+1	-2200+3		
	2200				10.2	89° 38'	-1.3	+8.9	719.4		BS				
141	1980		92° 4.3'	-2.4°	8.1	-		-8.1		711.3		+11	+1980	642,454	1,949,119
142	1760		"	-2.4°	7.9	-		-7.9		711.5		+10	+1760	642,453	1,948,899
143	1540		"	-2.4°	7.8	-		-7.8		711.6		+9	+1540	642,452	1,948,679
144	1320		"	-2.4°	7.6	-		-7.6		711.8		+8	+1320	642,451	1,948,459
145	1100		"	-2.4°	7.3	-		-7.3		712.1		+6	+1100	642,449	1,948,239
146	880		"	-2.4°	6.7	-		-6.7		712.7		+5	+880	642,448	1,948,019
147	660		"	-2.4°	6.4	-		-6.4		713.0		+4	+660	642,447	1,947,799
148	440		"	-2.4°	8.4	-		-8.4		711.0		+3	+440	642,446	1,947,579
149	220		"	-2.4°	7.7	-		-7.7		711.7		+1	+220	642,444	1,947,359

y = +2' x = +8'
642,439 + 1,949,360 (line #)
4-Way Intersect 711.8 (page 38)
Crapo + Pierce (line # 1)

DATE 8/25/78	INSTRUMENT MAN R. Hulsey	ROD MAN G. Cotcamp	PARTY NUMBER 6834	NOTES CHECKED BY R. J. H.	LINE NO. 2	PAGE 10
AREA Michigan	TOPO MAP Ithaca	STATE Michigan	COUNTY Grafton	TWP 10N	RANGE 2W	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				
149									719.4										
150	0				5.4	-		-5.4		714.0	A	0	0	642,443	1,947,139				
151	220		272° 11.8'	-2.4°	4.9	-		-4.9		714.5		-1	-220	642,442	1,946,919				
152	440		" "	-2.4°	4.9	-		-4.9		714.5		-2	-440	642,441	1,946,699				
153	660		" "	-2.4°	4.0	-		-4.0		715.4		-2	-660	642,441	1,946,479				
154	880		" "	-2.4°	3.4	-		-3.4		716.0		-3	-880	642,440	1,946,259				
155	1100		" "	-2.4°	2.7	-		-2.7		716.7		-4	-1100	642,439	1,946,039				
156	1320		" "	-2.4°	4.0	-		-4.0		715.4		-5	-1320	642,438	1,945,819				
157	1540		" "	-2.4°	4.5	-		-4.5		714.9		-5	-1540	642,438	1,945,599				
158	1760		" "	-2.4°	4.0	-		-4.0		715.4		-6	-1760	642,437	1,945,379				
159	1980		" "	-2.4°	2.6	-		-2.6		716.8		-7	-1980	642,436	1,945,159				
160	2200		272° 11.8'	-2.4°	2.7	-		-2.7		716.7	TP	-8	-2200	642,435	1,944,942				
	160				13.6	TH	+11.0	-2.6			TP								
	1540		92° 18.3'	+180° 2.4'	+12.6	-		+12.6	729.3		BS	-3	-1540						
	1540				+4.9	BH	+7.7	+12.6			BS								
161	1320		92° 18.3'	-2.4°	11.0	-		-11.0		718.3		+2	+1320	642,434	1,944,725				
162	1100		" "	-2.4°	9.6	-		-9.6		719.7		+2	+1100	642,434	1,944,505				
163	880		" "	-2.4°	9.3	-		-9.3		720.0		+1	+880	642,433	1,944,285				
164	660		" "	-2.4°	7.8	-		-7.8		721.5		+1	+660	642,433	1,944,065				
165	630		93° 4.1'	-2.4°	7.3	-		-7.3		722.0		-7	+630	642,425	1,944,035				
165	440		92° 18.3'	-2.4°	7.7	-		-7.7		721.6		+1	+440	642,433	1,943,845				(Baldwin)

horiz. correct. y = +3'
x = +12'
642,425 + 1,944,035
4-way int. El. 722

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/25/78		R. Hulsey		G. Cotcamp		6834		R. G. H.		2	11				
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER			
Michigan		Ithaca		Michigan		Grafton		10 N		2 W		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
165									729.3						
166	220		92° 18.3'	-2.4°	6.0	-		-6.0		723.3		0	+220	642,432	1,943,625
167	0				5.4	-		-5.4		723.9	π	0	0	642,432	1,943,405
168	220		272° 35.6'	-2.7°	5.8	-		-5.8		723.5		0	-220	642,432	1,943,185
169	440		" "	-2.7°	4.9	-		-4.9		724.4		-1	-440	642,431	1,942,965
170	660		" "	-2.7°	4.2	-		-4.2		725.1		-1	-660	642,431	1,942,745
171	880		" "	-2.7°	3.4	-		-3.4		725.9		-2	-880	642,430	1,942,525
172	1100		" "	-2.7°	3.1	-		-3.1		726.2		-2	-1100	642,430	1,942,305
173	1320		" "	-2.7°	2.1	-		-2.1		727.2		-2	-1320	642,430	1,942,085
174	1540		" "	-2.7°	0.8	-		-0.8		728.5		-3	-1540	642,429	1,941,865
175	1760		272° 35.6'	-2.7°	1.0	-		-1.0			TP	+3-4	-1760	642,425	1,941,644
175	1760				9.7	TH	+8.8	-0.9		728.4	TP				
	2640		92° 46.3' + 180°	-2.7°	+9.8	-		+9.8			BS	+3-3	-2640		
	2640				+145	89° 54'	-4.6	+9.9	738.3		BS				
176	2420		92° 46.3'	-2.7°	10.0	-		-10.0		728.3		-3	+2420	642,422	1,941,423
177	2200		" "	-2.7°	10.1	-		-10.1		728.2		-3	+2200	642,422	1,941,203
178	1980		" "	-2.7°	9.8	-		-9.8		728.5		-2	+1980	642,423	1,940,983
179	1760		" "	-2.7°	9.3	-		-9.3		729.0		-2	+1760	642,423	1,940,763
#	1660		93° 5'	-2.7°	6.4	-		-6.4		731.9		-11	+1660	642,414	1,940,663 railroad
180	1540		82° 46.3'	-2.7°	8.8	-		-8.8		729.5		-2	+1540	642,423	1,940,543
181	1320		" "	-2.7°	8.6	-		-8.6		729.7		-2	+1320	642,423	1,940,323

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
8/28/78		G. Cotcamp		R. Hulse		6834		R. Y. H.		2	12				
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER				
Michigan		Tthaca		Michigan		Gratiot		10 N	2 W		J. 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
									738.3						
182	1100		92°46.3'	-2.7°	8.3	-		-8.3		730.0		-1	+1100	642,424	1,940,103
183	880		" "	-2.7°	8.0	-		-8.0		730.3		-1	+880	642,424	1,939,883
184	660		" "	-2.7°	7.7	-		-7.7		730.6		-1	+660	642,424	1,939,663
185	440		" "	-2.7°	6.8	-		-6.8		731.5		-1	+440	642,424	1,939,443
186	220		" "	-2.7°	5.6	-		-5.6		732.7		0	+220	642,425	1,939,223
187	0		" "		5.3	-		-5.3		733.0	π	0	0	642,425	1,939,003
□	134		255°51'	-2.7°	6.8	-		-6.8		731.5		-39	-128	642,386	1,938,876
≡≡	185		270°28'	-2.7°	3.4	-		-3.4		734.9		-7	-185	642,418	1,938,818
188	220		273°58'	-2.7°	3.0	-		-3.0		735.3		+5	-220	642,430	1,938,183
≡≡	250		270°49'	-2.7°	2.0	-		-2.0		736.3		-8	-250	642,417	1,938,818
189	440		272°39.3'	-2.7°	5.9	-		-5.9		732.4		0	-440	642,425	1,938,563
190	660		" "	-2.7°	6.8	-		-6.8		731.5		-1	-660	642,424	1,938,343
191	880		" "	-2.7°	6.5	-		-6.5		731.8		-1	-880	642,424	1,938,123
192	1100		" "	-2.7°	5.2	-		-5.2		733.1		-1	-1100	642,424	1,937,903
193	1320		" "	-2.7°	4.7	-		-4.7		733.6		-1	-1320	642,424	1,937,683
194	1540		" "	-2.7°	8.0	-		-8.0		730.3		-1	-1540	642,424	1,937,463
195	1760		" "	-2.7°	5.9	-		-5.9		732.4		-1	-1760	642,424	1,937,243
196	1980		" "	-2.7°	4.6	-		-4.6		733.7		-1	-1980	642,424	1,937,023
197	2200		" "	-2.7°	3.1	-		-3.1		735.2		-2	-2200	642,423	1,936,803
198	2420		" "	-2.7°	1.6	-		-1.6		736.7		-2	-2420	642,423	1,936,583

chiseled square -
X El. 731.8
north bound lane Rt. #27
Y-642,430 Horiz. Corr.
X-1,938,790 Y-7', X-2'
(scaled)
south bound lane Rt. #27

DATE 8/28/78	INSTRUMENT MAN G. Cotcamp	ROD MAN R. Wiley	PARTY NUMBER 6834	NOTES CHECKED BY R.F.H.	LINE NO. 2	PAGE 13
AREA Michigan	TOPO MAP Ithaca	STATE Michigan	COUNTY Grafton	TWP 10 N	RANGE 2 W	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			
199	2640		272° 39.3'	-2.7°	1.7	-		-1.7		736.6	TP	- 2+3	-2640	642426	1936,362			
199	2640				14.9	TH	+13.2	-1.7			TP							
	2640		93° 0.7' +180°	-2.7°	+11.8	-		+11.8			BS	+1 4+2	-2640					
	2640				15.0	89° 56'	-3.1	+11.9	748.5		BS							
200	2420		93° 0.7'	-2.7°	10.8	-		-10.8		737.7		-13	+2420	642429	1936,141			
201	2200		" "	-2.7°	10.8	-		-10.8		737.7		-12	+2200	642430	1935,921			
202	1980		" "	-2.7°	10.2	-		-10.2		738.3		-11	+1980	642431	1935,701			
203	1760		" "	-2.7°	10.9	-		-10.9		737.6		-10	+1760	642432	1935,481			
204	1540		" "	-2.7°	9.9	-		-9.9		738.6		-8	+1540	642434	1935,261			
205	1320		" "	-2.7°	7.5	-		-7.5		741.0		-7	+1320	642435	1935,041			
206	1100		" "	-2.7°	4.6	-		-4.6		743.9		-6	+1100	642436	1934,821			
207	880		" "	-2.7°	4.2	-		-4.2		744.3		-5	+880	642437	1934,601			
208	660		" "	-2.7°	8.8	-		-8.8		739.7		-4	+660	642438	1934,381			
209	440		" "	-2.7°	9.8	-		-9.8		738.7		-2	+440	642440	1934,161			
210	220		" "	-2.7°	8.5	-		-8.5		740.0		-1	+220	642441	1933,941			Horiz. Corr. y-5', x-2'
211	0		" "		5.4	-		-5.4		743.1	π	0	0	642,442	1,933,721			y-642,440 x-1,933,510 (scaled)
212	199		271° 59'	-2.7°	4.1	-		-4.1		744.4		-2	-199	642440	1,933,522			4-Way Intersect. El. 745
212	220		" "	-2.7°	4.3	-		-4.3		744.2		+2	-220	642,444	1,933,501			(Croswell)
213	440		" "	-2.7°	9.9	-		-9.9		738.6		+3	-440	642,445	1,933,281			
214	660		" "	-2.7°	9.4	-		-9.4		739.1		+5	-660	642447	1,933,061			

SURVEY NOTES-HIGH RESOLUTION DATA

GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
8/28/78		G. Cotcam		R. Hulsey		883		R. V. H		2	14						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Ithaca		Michigan	Gratiot		10 N	2 W		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		
									748.5								
215	880		273° 8.3'	-2.7°	10.0	-		-10.0		738.5		+7	-880	642,449	1,932,841		
216	1100		" "	-2.7°	10.8	-		-10.8		737.7		+8	-1100	642,450	1,932,621		
217	1320		" "	-2.7°	10.3	-		-10.3		738.2		+10	-1320	642,452	1,932,401		
218	1540		" "	-2.7°	8.4	-		-8.4		740.1		+12	-1540	642,454	1,932,181		
219	1760		" "	-2.7°	1.8	-		-1.8		746.7		+13	-1760	642,455	1,931,961		
220	1980		" "	-2.7°	10.3	TH	+9.9	-0.4		748.1		+15	-1980	642,457	1,931,741		
221	2200		" "	-2.7°	8.2	TH	+11.0	+2.8		751.3		+17	-2200	642,459	1,931,521		
222	2420		" "	-2.7°	8.4	TH	+12.1	+3.7		752.2		+19	-2420	642,461	1,931,301		
223	2640		273° 8.3'	-2.7°	9.5	TH	+13.2	+3.7		752.2	TP	+20	-2640	642,462	1,931,081		
223	2640				14.8	89°36'	+18.4	+3.6			TP						
	2640		93° 11' + 180°	-2.7°	+9.3	-		+9.3	761.6	+9.4	BS	+22	-2640				
	2640				14.1	89°54'	-4.6	+9.5			BS						
224	2420		93° 11'	-2.7°	6.0	-		-6.0		755.6		-20	+2420	642,464	1,930,861		
225	2200		" "	-2.7°	6.6	-		-6.6		755.0		-19	+2200	642,465	1,930,641		
226	1980		" "	-2.7°	8.4	-		-8.4		753.2		-17	+1980	642,467	1,930,421		
227	1760		" "	-2.7°	9.2	-		-9.2		752.4		-15	+1760	642,469	1,930,201		
228	1540		" "	-2.7°	7.0	-		-7.0		754.6		-13	+1540	642,471	1,929,981		
229	1320		" "	-2.7°	6.3	-		-6.3		755.3		-11	+1320	642,473	1,929,761		
230	1100		" "	-2.7°	7.9	-		-7.9		753.7		-9	+1100	642,475	1,929,541		
231	880		" "	-2.7°	10.1	-		-10.1		751.5		-7	+880	642,477	1,929,321		

SURVEY NOTES-HIGH RESOLUTION DATA
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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
8/28/78		G. Cotcamp		R. Hulsey		5834		R. V. H.		2	15					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		Ithaca		Michigan		Gratiot		10 N	3 W		L. J. 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
									761.6							
232	660		93°11'	-2.7°	7.3	-		-7.3		754.3		-6	+660	642,478	1,929,101	Horiz. Corr. y=0', x=0'
233	440		" "	-2.7°	6.0	-		-6.0		755.6		-4	+440	642,480	1,928,881	y=642,480, x=1,928,775 (scaled)
TF	334		93°33'	-2.7°	3.6	-		-3.6		758.0		-5	+334	642,499	1,928,775	4-way Intersect. El. 758
234	220		93°11'	-2.7°	5.6	-		-5.6		756.0		-2	+220	642,482	1,928,661	(STATE)
235	0				5.4	-		-5.4		756.2	X	0	0	642,484	1,928,441	
236	220		272°34.3'	-2.7°	6.3	-		-6.3		755.3		0	-220	642,484	1,928,221	
237	440		" "	-2.7°	7.2	-		-7.2		754.4		-1	-440	642,483	1,928,001	
238	660		" "	-2.7°	6.3	-		-6.3		755.3		-1	-660	642,483	1,927,781	
239	880		" "	-2.7°	3.6	-		-3.6		758.0		-2	-880	642,482	1,927,561	
240	1100		" "	-2.7°	0.3	-		-0.3		761.3		-2	-1100	642,482	1,927,341	
241	1320		" "	-2.7°	5.8	TH	+6.6	+0.8		762.4		-3	-1320	642,481	1,927,121	
242	1540		" "	-2.7°	6.3	TH	+7.7	+1.4		763.0		-3	-1540	642,481	1,926,901	
243	1760		" "	-2.7°	7.5	TH	+8.8	+1.3		762.9		-4	-1760	642,480	1,926,681	
244	1980		" "	-2.7°	8.5	TH	+9.9	+1.4		763.0		-4	-1980	642,480	1,926,461	
245	2200		" "	-2.7°	10.6	89°30'	+6.4	-4.2		757.4		-5	-2200	642,479	1,926,241	
246	2420		" "	-2.7°	13.8	89°30'	+7.0	-6.8		754.8		-5	-2420	642,479	1,926,021	
247	2640		272°34.3'	-2.7°	14.5	89°50'	+7.7	-6.8		754.8	TF	-6	-2640-2	642,478	1,925,799	
247	2640		" "		11.5	89°51'	+4.6	-6.9			TF					
	1760		93° 6.2' +180°	-2.7°	+14.6	-		+14.6	769.4		BS	+12	-1760-2		1,925,579	
	1760		" "		+5.8	BH	+8.8	+14.6			BS					

SURVEY NOTES-HIGH RESOLUTION DATA

Geosource Inc.

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DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
9/8/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		2		16			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Ithaca		Michigan		Gratiot		10 N		3 W				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
									769.4						
248	1540		93°6.2'	-2.7°	7.0	BH	-7.7	-14.7		754.7		-11	+1540	642,479	1,925,577
249	1320		" "	-2.7°	8.0	BH	-6.6	-14.6		754.8		-9	+1320	642,481	1,925,357
250	1100		" "	-2.7°	14.1	-		-14.1		755.3		-8	+1100	642,482	1,925,137
251	880		" "	-2.7°	12.9	-		-12.9		756.5		-6	+880	642,484	1,924,917
252	660		" "	-2.7°	9.2	-		-9.2		760.2		-5	+660	642,485	1,924,697
253	440		" "	-2.7°	8.7	-		-8.7		760.7		-3	+440	642,487	1,924,477
254	220		" "	-2.7°	10.1	-		-10.1		759.3		-2	+220	642,488	1,924,257
255	0		" "	-	54	-		-5.4		764.0	T	0	0	642,490	1,924,037
256	220		272°51.2'	-2.7°	9.2	-		-9.2		760.2		+1	-220	642,491	1,923,817
257	440		" "	-2.7°	9.0	91°-	-7.7	-16.7		752.7		+1	-440	642,491	1,923,597
257	557		271°51'	-2.7°	8.0	91°-	-9.7	-17.7		751.7		-8	-557	642,482	1,923,480
258	660		272°51.2'	-2.7°	8.0	91°-	-11.5	-19.5		749.9		+2	-660	642,492	1,923,377
259	880		" "	-2.7°	11.1	90°30'	-7.7	-18.8		750.6		+2	-880	642,492	1,923,157
260	1000		" "	-2.7°	13.6	BH	-5.5	-19.1		750.3		+3	-1100	642,493	1,922,937
261	1320		" "	-2.7°	11.0	BH	-6.6	-17.6		751.8		+4	-1320	642,494	1,922,717
262	1540		" "	-2.7°	7.9	BH	-7.7	-15.6		753.8		+4	-1540	642,494	1,922,497
263	1760		272°51.2'	-2.7°	7.1	BH	-8.8	-15.9		753.5	TP	+5	-1760-2	642,495	1,922,275
263	1760		" "	-	13.9	90°04'	-2.0	-15.9			TP				
	1980		93°3' +180°	-2.7°	+6.4	90°40'	+23.0	+29.4	782.9		BS	+12	-1980-2		
	1980		" "		+9.8	90°34'	+19.6	+29.4			BS				

642,480 + 1,923,475 (scaled)
+ way to road. El. 752

James + Lisa

SURVEY NOTES-HIGH RESOLUTION DATA

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Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE				
9/8/78		G. Cotcamp		R. Hulsey		6834		R. Y. H.		2	17				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		Alma South		Michigan	Gratiot		10 N	3 W		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 -	EAST + WEST -		Y
									782.9						
264	1760		93°3'	-2.7°	12.2	90°30'	-15.4	-27.6		755.3		-11	+1760	642,496	1,922,053
265	1540		" "	-2.7°	12.4	90°30'	-13.4	-25.8		757.1		-9	+1540	642,498	1,921,833
266	1320		" "	-2.7°	12.8	90°30'	-11.5	-24.3		758.6		-8	+1320	642,499	1,921,613
267	1100		" "	-2.7°	13.2	90°30'	-9.6	-22.8		760.1		-7	+1100	642,500	1,921,393
268	880		" "	-2.7°	13.7	90°30'	-7.7	-21.4		761.5		-5	+880	642,502	1,921,173
269	660		" "	-2.7°	12.5	90°40'	-7.7	-20.2		762.7		-4	+660	642,503	1,920,953
270	440		" "	-2.7°	11.1	90°40'	-5.1	-16.2		766.7		-3	+440	642,504	1,920,733
271	220		" "	-2.7°	10.9	-		-10.9		772.0		-1	+220	642,506	1,920,513
272	0		" "		5.4	-		-5.4		777.5	T	0	0	642,507	1,920,293
273	220		273°22.7'	-2.7°	8.5	-		-8.5		774.4		+3	-220	642,510	1,920,073
274	440		" "	-2.7°	12.3	8H	-2.2	-14.5		768.4		+5	-440	642,512	1,919,853
275	660		" "	-2.7°	12.9	90°30'	-5.8	-18.7		764.2		+8	-660	642,515	1,919,633
276	880		" "	-2.7°	13.2	90°30'	-7.7	-20.9		762.0		+10	-880	642,517	1,919,413
277	1100		" "	-2.7°	7.8	90°30'	-9.6	-17.4		765.5		+13	-1100	642,520	1,919,193
278	1320		" "	-2.7°	12.1	-		-12.1		770.8		+16	-1320	642,523	1,918,973
279	1540		" "	-2.7°	12.0	-		-12.0		770.9		+18	-1540	642,525	1,918,753
280	1760		" "	-2.7°	13.0	-		-13.0		769.9		+21	-1760	642,528	1,918,533
281	1980		273°22.7'	-2.6°	6.0	8H	-9.9	-15.9			TP	+27+2	-1980-2	642,536	1,918,311
281	1980		" "		14.7	90°02'	-1.1	-15.8		767.1	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		
9/8/78		G. Cotcamp		R. Hulsey		6834		R. V. H.		2		18		
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		
Michigan				Michigan		Gratiot		10 N		3 W		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 -	EAST + WEST -	
281										767.1				
	2640		92°40.6' +180°	-26°	+3.0	89°30'	-23.0	-20.0	747.1		BS	+4	+2	-2640-2
	2640				+13.8	89°16'	-33.8	-20.0			BS			
282	2580		92°45'	-26°	11.4	89°20'	+30.0	+18.6		765.7		-7	+2580	642,535 1,918,249 4-Way Intersect El. 765
283	2420		92°40.6'	-26°	7.0	89°30'	+21.1	+14.1		761.2		-3	+2420	642,539 1,918,089 (Begole)
284	2200		" "	-26°	3.0	TH	+11.0	+8.0		755.1		-3	+2200	642,539 1,917,869
285	1980		" "	-26°	3.7	TH	+9.9	+6.2		753.3		-3	+1980	642,539 1,917,649
286	1760		" "	-26°	3.1	TH	+8.8	+5.7		752.8		-2	+1760	642,540 1,917,429
287	1540		" "	-26°	1.0	TH	+7.7	+6.7		753.8		-2	+1540	642,540 1,917,209
288	1320		" "	-26°	2.4	TH	+6.6	+4.2		751.3		-2	+1320	642,540 1,916,989
289	1100		" "	-26°	3.1	TH	+5.5	+2.4		749.5		-1	+1100	642,541 1,916,769
290	880		" "	-26°	2.0	TH	+4.4	+2.4		749.5		-1	+880	642,541 1,916,549
291	660		" "	-26°	3.2	TH	+3.3	+0.1		747.2		-1	+660	642,541 1,916,329
292	440		" "	-26°	2.8	-		-2.8		744.3		-1	+440	642,541 1,916,109
293	220		" "	-26°	3.4	-		-3.4		743.7		0	+220	642,542 1,915,889
294	0				5.4	-		-5.4		741.7	X	0	0	642,542 1,915,669
295	220		272°47.6'	-26°	5.7	-		-5.7		741.4		+1	-220	642,543 1,915,449
296	440		" "	-26°	5.5	-		-5.5		741.6		+1	-440	642,543 1,915,229
297	660		" "	-26°	5.5	-		-5.5		741.6		+2	-660	642,544 1,915,009
298	880		" "	-26°	5.8	-		-5.8		741.3		+3	-880	642,545 1,914,789
299	1100		" "	-26°	6.6	-		-6.6		740.5		+4	-1100	642,546 1,914,569

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
9/8/78		G. Cotcamp		R. Hulsey		6834		R. J. A.		2	19					
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE	PPM	PARTY MANAGER				
Michigan		Alma South		Michigan		Gratiot		10 N		3 W		G.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 -	EAST + WEST -		Y	X
									747.1							
299	1320		272° 47.6'	-26°	5.3	-		-5.3		741.8		+4	-1320	642,546	1,914,349	c/l bridge
300	1540		" "	-26°	7.3	-		-7.3		739.8		+5	-1540	642,547	1,914,129	
301	1760		" "	-26°	7.2	-		-7.2		739.9		+6	-1760	642,548	1,913,909	
302	1980		" "	-26°	6.9	-		-6.9		740.2		+7	-1980	642,549	1,913,689	
303	2200		" "	-26°	5.4	-		-5.4		741.7		+7	-2200	642,549	1,913,469	
304	2420		" "	-26°	4.3	-		-4.3		742.8		+8	-2420	642,550	1,913,249	
305	2640		272° 47.6'	-25°	3.7	-		-3.7		743.4	TP	+14	-2640.2	642,556	1,913,027	
305	2640				14.6	89° 46'	+10.7	-3.9			TP					
	2640		93° 11' +180°	-25°	+5.7	-		+5.7			BS	+31	-2640			
	2640				+15.0	89° 48'	-9.2	+5.8	749.2		BS					horizontal correct. y=+6' x=76'
TL	2570		93° 21'	-25°	4.3	-		-4.3		744.9		-38	+2570	642,549	1,912,957	642,550 + 1,912,955 (scaled) 4-Way Intersect. EL. 748
306	2420		93° 11'	-25°	4.3	-		-4.3		744.9		-29	+2420	642,558	1,912,807	(Alger)
307	2200		" "	-25°	6.8	-		-6.8		742.4		-26	+2200	642,561	1,912,587	
308	1980		" "	-25°	7.1	-		-7.1		742.1		-24	+1980	642,563	1,912,367	
309	1760		" "	-25°	6.1	-		-6.1		743.1		-21	+1760	642,566	1,912,147	
310	1540		" "	-25°	5.9	-		-5.9		743.3		-18	+1540	642,569	1,911,927	
311	1320		" "	-25°	5.8	-		-5.8		743.4		-16	+1320	642,571	1,911,707	
312	1100		" "	-25°	5.1	-		-5.1		744.1		-13	+1100	642,574	1,911,487	
313	880		" "	-25°	4.4	-		-4.4		744.8		-10	+880	642,577	1,911,267	
314	660		" "	-25°	4.5	-		-4.5		744.7		-8	+660	642,579	1,911,047	

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN			ROD MAN		PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE				
9/8/78		G. Colcamp			R. Hulsey		3834		R.S.H.			2	20				
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Alma South		Michigan	Gratiot		10N	3W		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		
									749.2								
315	440		93° 11'	-25°	5.4	-		-5.4		743.8		-5	+440	642,582	1,910,827		
316	220		" "	-25°	4.9	-		-4.9		744.3		-3	+220	642,584	1,910,607		
317	0			-	5.4	-		-5.4		743.8	π	0	0	642,587	1,910,387		
318	59		271° 46'	-23°	5.1	-		-5.1		744.1		-1	-59	642,586	1,910,328	1-rod (south) E1. 744	
318	220		273° 22.7'	-23°	4.2	-		-4.2		745.0		+4	-220	642,591	1,910,167	Smith + Pierce	
319	440		" "	-23°	3.2	-		-3.2		746.0		+8	-440	642,595	1,909,947		
320	660		" "	-23°	2.9	-		-2.9		746.3		+12	-660	642,599	1,909,727		
321	880		" "	-23°	2.2	-		-2.2		747.0		+17	-880	642,604	1,909,507		
322	1100		" "	-23°	2.3	-		-2.3		746.9		+21	-1100	642,608	1,909,287		
323	1320		" "	-23°	1.1	-		-1.1		748.1		+25	-1320	642,612	1,909,067		
324	1540		" "	-23°	0.3	-		-0.3		748.9		+29	-1540	642,616	1,908,847		
325	1760		" "	-23°	6.7	TH	+8.8	+2.1		751.3		+33	-1760	642,620	1,908,627		
326	1980		" "	-23°	7.1	TH	+9.9	+2.8		752.0		+37	-1980	642,624	1,908,407		
327	2200		" "	-23°	7.8	TH	+11.0	+3.2		752.4		+42	-2200	642,629	1,908,187		
328	2420		" "	-23°	7.1	TH	+12.1	+5.0		754.2		+46	-2420	642,633	1,907,967		
329	2640		273° 22.7'	-2.0°	5.5	TH	+13.2	+7.7			TP	+64	-2639	642,651	1,907,748		
329	2640				13.7	89° 32'	+21.5	+7.8		757.0	TP						
	2200		92° 31.7' +180°	-2.0°	+12.7	TH	-11.0	+1.7			BS	+20	-2200				
	2200				+14.6	89° 40'	-12.8	+1.8	758.8		BS						
330	1980		92° 31.7'	-2.0°	8.2	TH	+9.9	+1.7		760.5		-18	+1980	642,653	1,907,528		

DATE: 9/8/78
 INSTRUMENT MAN: G. Cotcamp
 ROD MAN: R. Hulsey
 PARTY NUMBER: 6834
 NOTES CHECKED BY: R. V. H.
 LINE NO.: 2
 PAGE: 21
 AREA: Michigan
 TOPO MAP: Alma South 7.5'
 STATE: Michigan
 COUNTY: Gratiot
 TWP: 10 N
 RANGE: 3 W
 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
									758.8						
331	1760		92°31.7'	-2.0°	6.4	TH	+8.8	+2.4		761.2		-16	+1760	642,655	1,907,308
332	1540		" "	-2.0°	6.2	TH	+7.7	+1.5		760.3		-14	+1540	642,657	1,907,088
333	1320		" "	-2.0°	0.4	-	-	-0.4		758.4		-12	+1320	642,659	1,906,868
334	1100		" "	-2.0°	2.1	-	-	-2.1		756.7		-10	+1100	642,661	1,906,648
335	880		" "	-2.0°	3.6	-	-	-3.6		755.2		-8	+880	642,663	1,906,428
336	660		" "	-2.0°	5.1	-	-	-5.1		753.7		-6	+660	642,665	1,906,208
337	440		" "	-2.0°	6.3	-	-	-6.3		752.5		-4	+440	642,667	1,905,988
338	220		" "	-2.0°	6.1	-	-	-6.1		752.7		-2	+220	642,669	1,905,768
339	0				5.4	-	-	-5.4		753.4	X	0	0	642,671	1,905,548
340	220		272°22.3'	-2.0°	5.2	-	-	-5.2		753.6		+1	-220	642,672	1,905,328
341	440		" "	-2.0°	4.2	-	-	-4.2		754.6		+3	-440	642,674	1,905,108
342	472		271°26'	-2.0°	4.2	-	-	-4.2		754.6		-5	-472	642,666	1,905,076
342	660		272°22.3'	-2.0°	5.0	-	-	-5.0		753.8		+4	-660	642,675	1,904,888
343	880		" "	-2.0°	5.2	-	-	-5.2		753.6		+6	-880	642,677	1,904,668
344	1100		" "	-2.0°	5.5	-	-	-5.5		753.3		+7	-1100	642,678	1,904,448
345	1320		" "	-2.0°	4.5	-	-	-4.5		754.3		+9	-1320	642,680	1,904,228
346	1540		" "	-2.0°	3.2	-	-	-3.2		755.6		+10	-1540	642,681	1,904,008
347	1760		" "	-2.0°	1.1	-	-	-1.1		757.7		+11	-1760	642,682	1,903,788
348	1980		" "	-2.0°	1.0	-	-	-1.0		757.8		+13	-1980	642,684	1,903,568
349	2200		" "	-2.0°	2.7	-	-	-2.7		756.1		+14	-2200	642,685	1,903,348

642,670 + 1,905,080 (scale)
 4-Way Intersect. (El. 755)
 Ennis + Perce.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
9/8/78		G. Co'camp		R. Hulsey		6834		R. J. H.		2	22						
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Alma South		Michigan		Gratiot		10 N	3 W		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.				
									758.8								
350	2420		272° 22.3'	-20°	3.8	-		-3.8		755.0	TP	+16	-2420	642,687	1,903,128		
350	2420				13.7	89° 46'	+9.8	-3.9			TP						
	2640		92° 29.2' + 180°	-20°	+13.0	-		+13.0			BS	+22	-2640				
	2640				+14.6	89° 58'	-1.5	+13.1	768.1		BS						
351	2420		92° 29.2'	-20°	13.0	-		-13.0		755.1		-21	+2420	642,688	1,902,908		
352	2200		" "	-20°	12.1	-		-12.1		756.0		-19	+2200	642,690	1,902,688		
353	1980		" "	-20°	11.2	-		-11.2		756.9		-17	+1980	642,692	1,902,468		
354	1760		" "	-20°	9.7	-		-9.7		758.4		-15	+1760	642,694	1,902,248		
355	1540		" "	-20°	8.4	-		-8.4		759.7		-13	+1540	642,696	1,902,028		
356	1320		" "	-20°	7.9	-		-7.9		760.2		-11	+1320	642,698	1,901,808		
357	1100		" "	-20°	7.3	-		-7.3		760.8		-9	+1100	642,700	1,901,588		
358	880		" "	-20°	5.3	-		-5.3		762.8		-7	+880	642,702	1,901,368		
359	660		" "	-20°	5.2	-		-5.2		762.9		-6	+660	642,703	1,901,148		
360	440		" "	-20°	5.9	-		-5.9		762.2		-4	+440	642,705	1,900,928		
361	220		" "	-20°	6.0	-		-6.0		762.1		-2	+220	642,707	1,900,708		
362	0		" "		5.4	-		-5.4		762.7	TP	0	0	642,709	1,900,488		
363	220		272° 31.8'	-20°	5.5	-		-5.5		762.6		+2	-220	642,711	1,900,268		
364	440		" "	-20°	6.4	-		-6.4		761.7		+4	-440	642,713	1,900,048		
365	660		" "	-20°	5.8	-		-5.8		762.3		+6	-660	642,715	1,899,828		
365	700		271° 56'	-20°	5.2	-		-5.2		762.9		-1	-700	642,708	1,899,788	642,710 + 1879, 800 (scale) 4-Way Intersect El. 763 Ely Highway + Pierce	

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
9/9/78		G. CoTeamp		R. Hulsey		6837		R. S. H.		2	23						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Alma South		Michigan	Gratiot		10 N	3W/4W		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		
									768.1								
366	880		272° 31.8'	-20°	7.2	-		-7.2		760.9		+8	-880	642,717	1,899,608		
367	1100		" "	-20°	6.9	-		-6.9		761.2		+10	-1100	642,719	1,899,388		
368	1320		" "	-20°	6.1	-		-6.1		762.0		+12	-1320	642,721	1,899,168		
369	1540		" "	-20°	5.5	-		-5.5		762.6		+14	-1540	642,723	1,898,948		
370	1760		" "	-20°	5.0	-		-5.0		763.1		+16	-1760	642,725	1,898,728		
371	1980		" "	-20°	4.1	-		-4.1		764.0		+18	-1980	642,727	1,898,508		
372	2200		" "	-20°	4.1	-		-4.1		764.0		+20	-2200	642,729	1,898,288		
373	2420		" "	-20°	4.3	-		-4.3		763.8		+22	-2420	642,731	1,898,068		
374	2640		272° 31.8'		2.7	-		-2.7		765.4	TP	+24	-2640	642,733	1,897,848	↑	
374	2640			-20°	136	89° 46'	+10.7	-2.9			TP					R 3W	
	435		80° 36' + 180°	-19°	+4.4	-		+4.4	769.8		BS	-85	-427			shooting thru S-curve	
	435				+6.6	TH	-2.2	+4.4			BS					RAW	
375	220		73° 4'	-19°	5.1	-		-5.1		764.7		+71	+208	642,719	1,897,629	↓	
376	0				5.4	-		-5.4		764.4	X	0	0	642,648	1,897,421		
377	220		272° 35.1'	-19°	4.9	-		-4.9		764.9		+1	-220	642,649	1,897,201		
378	440		" "	-19°	3.3	-		-3.3		766.5		+1	-440	642,649	1,896,981		
379	660		" "	-19°	2.8	-		-2.8		767.0		+2	-660	642,650	1,896,761		
380	880		" "	-19°	2.1	-		-2.1		767.7		+2	-880	642,650	1,896,541		
381	1100		272° 35.1'	-19°	0.9	-		-0.9		768.9	TF	+3	-1100	642,651	1,896,321		
381	1100				6.4	TH	+5.5	-0.9			TF						

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE		
9/19/78		G. Cozcamp		R. Hickey		2831		R. J. H.		2		24		
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		
Michigan		Alma South		Michigan		Washtenaw		10N		4W		20 PPM		
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.	
381										768.9				
	2640		92° 43.3' +180°	-1.9°	+4.2	-		+4.2	773.1		BS	+38	-2640	
	2640				+15.0	89° 46'	-10.7	+4.3			BS			
382	2420		92° 43.3'	-1.9°	4.8	-		-4.8		768.3		-35	+2420	642,654 1,896,101
383	2200		" "	-1.9°	6.1	-		-6.1		767.0		-32	+2200	642,657 1,895,881
384	1980		" "	-1.9°	7.0	-		-7.0		766.1		-28	+1980	642,661 1,895,661
385	1760		" "	-1.9°	7.4	-		-7.4		765.7		-25	+1760	642,664 1,895,441
386	1540		" "	-1.9°	7.3	-		-7.3		765.8		-22	+1540	642,667 1,895,221
387	1320		" "	-1.9°	5.4	-		-5.4		767.7		-19	+1320	642,670 1,895,001
7/7	1225		92° 51'	-1.9°	4.2	-		-4.2		768.9		-20	+1225	642,669 1,894,906 4-Way Intersect. El. 768
388	1100		92° 43.3'	-1.9°	4.5	-		-4.5		768.6		-16	+1100	642,673 1,894,781 (Pendell)
389	880		" "	-1.9°	3.9	-		-3.9		769.2		-13	+880	642,676 1,894,561
390	660		" "	-1.9°	3.5	-		-3.5		769.6		-9	+660	642,680 1,894,341
391	440		" "	-1.9°	4.1	-		-4.1		769.0		-6	+440	642,683 1,894,121
392	220		" "	-1.9°	4.8	-		-4.8		768.3		-3	+220	642,686 1,893,901
393	0		" "	-1.9°	5.4	-		-5.4		767.7	X	0	0	642,689 1,893,681
394	220		272° 55'	-1.9°	5.4	-		-5.4		767.7		+4	-220	642,693 1,893,461
395	440		" "	-1.9°	5.4	-		-5.4		767.7		+8	-440	642,697 1,893,241
396	660		" "	-1.9°	5.4	-		-5.4		767.7		+12	-660	642,701 1,893,021
397	880		" "	-1.9°	6.2	-		-6.2		766.9		+16	-880	642,705 1,892,801
398	1100		" "	-1.9°	6.2	-		-6.2		766.9		+20	-1100	642,709 1,892,581

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE					
9/9/78		G. Cotcamp		R. Hulsey		288-1		R. S. H.		2	25					
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER					
Michigan		Alma South		Michigan		Gratiot		10 N	4 W		L. O. P.					
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
									773.1							
399	1320		272°55'	-1.9°	5.8	-		-5.8		767.3		+23	-1320	642,712	1,892,361	
400	1412		272°42'	-1.9°	4.8	-		-4.8		768.3		+20	-1412	642,709	1,892,369	642,695 + 1,892,265 4-Way Intersect.
400	1540		272°55'	-1.9°	5.6	-		-5.6		767.5		+27	-1540	642,716	1,892,141	(Pingree)
401	1760		"	-1.9°	4.5	-		-4.5		768.6		+31	-1760	642,720	1,891,921	
402	1980		"	-1.9°	3.5	-		-3.5		769.6		+35	-1980	642,724	1,891,701	
403	2200		"	-1.9°	1.9	-		-1.9		771.2		+39	-2200	642,728	1,891,481	
404	2420		"	-1.9°	12.8	TH	+12.1	+1.3		774.4		+43	-2420	642,732	1,891,261	
405	2640		272°55'	-1.9°	7.8	TH	+13.2	+5.4			TP	+47	-2640	642,736	1,891,037	
405	2640				5.4	89°46'	+10.7	+5.3		778.4	TP					
	440		92°58' + 180°	-1.9°	+10.8	91°	+7.7	+18.5			BS	+8	-440			
	440				3.1	92°	+15.3	+18.4	796.8		BS					
406	220		92°58'	-1.9°	11.7	-		-11.7		785.1		-4	+220	642,740	1,890,813	
407	0				5.4	-		-5.4		791.4	X	0	0	642,744	1,890,593	
408	220		272°51.7'	-1.9°	11.2	91°	-3.8	-15.0		781.8		+4	-220	642,748	1,890,373	
409	440		"	-1.9°	13.6	91°	-7.7	-21.3		775.5		+7	-440	642,751	1,890,153	
410	660		"	-1.9°	11.9	91°	-11.5	-23.4		773.4		+11	-660	642,755	1,889,933	
411	880		"	-1.9°	10.0	91°	-15.4	-25.4		771.4		+15	-880	642,759	1,889,713	
412	1100		"	-1.9°	8.4	91°	-19.2	-27.6		769.2		+18	-1100	642,762	1,889,493	
413	1320		272°51.7'	-1.9°	5.3	91°	-23.0	-28.3			TP	+22	-1320	642,766	1,889,267	
418	1320				6.9	90°56'	-21.5	-28.4		768.4	TP					

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
9/11/78		G. Co. comp		R. Hulsey		5834		R. S. H.		C		26			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Summer		Michigan		Gratiot		10 N		4 W				L. J. ...	
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
413										768.4					
	1980		92° 44' +180°	-1.9°	+14.3	90° 06'	+3.5	+17.8	786.2		BS	+29	-1980-4		
	1980				+5.1	90° 22'	+12.7	+17.8			BS				
414	1760		92° 44'	-1.9°	8.1	8H	-8.8	-16.9		769.3		-26	+1760	642,769	1,889,045
415	1540		" "	-1.9°	7.0	8H	-7.7	-14.7		771.5		-22	+1540	642,773	1,888,825
416	1320		" "	-1.9°	8.3	8H	-6.6	-14.9		771.3		-19	+1320	642,776	1,888,605
417	1100		" "	-1.9°	11.8	8H	-5.5	-17.3		768.9		-16	+1100	642,779	1,888,385
418	880		" "	-1.9°	12.8	8H	-4.4	-17.2		769.0		-13	+880	642,782	1,888,165
419	660		" "	-1.9°	13.0	8H	-3.3	-16.3		769.9		-10	+660	642,785	1,887,945
420	440		" "	-1.9°	13.4	-	-	-13.4		772.8		-6	+440	642,789	1,887,725
421	220		" "	-1.9°	7.1	-	-	-7.1		779.1		-3	+220	642,792	1,887,505
422	0				5.4	-	-	-5.4		780.8	π	0	0	642,795	1,887,285
423	220		273° 14.5'	-1.9°	6.8	-	-	-6.8		779.4		+5	-220	642,800	1,887,065
<u>IL</u>	310		273° 55'	-1.9°	7.4	-	-	-7.4		778.8		+11	-310	642,806	1,886,975
424	440		273° 14.5'	-1.9°	8.3	-	-	-8.3		777.9		+10	-440	642,805	1,886,845 (Bliss)
425	660		" "	-1.9°	10.4	-	-	-10.4		775.8		+15	-660	642,810	1,886,625
426	880		" "	-1.9°	9.9	8H	-4.4	-14.3		771.9		+21	-880	642,816	1,886,405
427	1100		" "	-1.9°	10.1	8H	-5.5	-15.6		770.6		+26	-1100	642,821	1,886,185
428	1320		" "	-1.9°	8.9	8H	-6.6	-15.5		770.7		+31	-1320	642,826	1,885,965
429	1540		" "	-1.9°	6.9	8H	-7.7	-14.6		771.6		+36	-1540	642,831	1,885,745
430	1760		" "	-1.9°	5.3	8H	-8.8	-14.1		772.1		+41	-1759	642,836	1,885,526

642,800 + 1,886,960
7-roll (north) El. 778

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.	PAGE						
9/11/78		G. Cotcamp		R. Hulsey		6834		R. J. H.		2	27						
AREA		TOPO MAP		STATE	COUNTY		TWP	RANGE	PPM	PARTY MANAGER							
Michigan		Summer		Michigan	Gratiot		10 N	4 W		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		
									786.2								
431	1980		273° 14.5'	-1.9°	2.9	84	-9.9	-12.8		773.4		+46	-1979	642,841	1,885,306		
432	2200		" "	-1.9°	0.4	84	-11.0	-11.4		774.8		+52	-2199	642,847	1,885,086		
433	2420		273° 14.5'	-1.9°	7.5	-	-7.5			778.7	TP	+57	-2419.4	642,852	1,884,882		
433	2420				1.9	90° 08'	-5.6	-7.5			TP						
	1760		92° 53' +180°	-1.9°	+12.2	-	+12.2		790.9		BS	+30	-1760.4				
	1760				+10.2	96° 04'	+2.0	+12.2			BS						
434	1540		92° 53'	-1.9°	6.8	-	-6.8			784.1		-26	+1540	642,856	1,884,638		
435	1320		" "	-1.9°	9.3	-	-9.3			781.6		-23	+1320	642,859	1,884,418		
$\frac{1}{2}$	1235		93° -	-1.9°	10.0	-	-10.0			780.9		-24	+1235	642,858	1,884,333	642,855 + 1,884,315 4-Way Intersect. El. 780	
436	1500		92° 53'	-1.9°	11.0	-	-11.0			779.9		-19	+1100	642,863	1,884,198	(Haven)	
437	880		" "	-1.9°	11.2	-	-11.2			779.7		-15	+880	642,867	1,883,978		
438	660		" "	-1.9°	10.4	-	-10.4			780.5		-11	+660	642,871	1,883,758		
439	440		" "	-1.9°	5.9	-	-5.9			785.0		-8	+440	642,874	1,883,538		
440	220		" "	-1.9°	5.6	-	-5.6			785.3		-4	+220	642,878	1,883,318		
441	0				5.4	-	-5.4			785.5	π	0	0	642,882	1,883,098		
442	220		273° 14.4'	-1.9°	4.9	-	-4.9			786.0		+5	-220	642,887	1,882,878		
443	440		" "	-1.9°	3.9	-	-3.9			787.0		+10	-440	642,892	1,882,658		
444	660		" "	-1.9°	6.3	-	-6.3			784.6		+15	-660	642,897	1,882,438		
445	880		" "	-1.9°	9.0	-	-9.0			781.9		+21	-880	642,903	1,882,218		
446	1100		" "	-1.9°	10.8	-	-10.8			780.1		+26	-1100	642,908	1,881,998		

DATE		INSTRUMENT MAN			ROD MAN			PARTY NUMBER		NOTES CHECKED BY			LINE NO.	PAGE			
9/11/78		G. Cotcamp			R. Hulsey			6834		R. J. H.			2	28			
AREA		TOPO MAP		STATE		COUNTY		TWP	RANGE	PPM	PARTY MANAGER						
Michigan		Summer		Michigan		Gratiot		10N	4W		L. O. Davis						
STATION NO.	SLOPE DISTANCE	PLOTTING DISTANCE	AZIMUTH FROM MAGNETIC NORTH	DEC	ROD READING	VERTICAL ANGLE	VERTICAL CHANGE	DIFFER-ENCE IN ELEVATION	ELEVATION OF INSTRUMENT	ELEVATION OF STATION	BS X TP	NORTH + SOUTH -	EAST + WEST -	COORDINATES		REMARKS	
												LAT.	DEP.	Y	X		
									790.9								
447	1320		273°14.4'	-1.9°	10.0	-		-10.0		780.9		+31	-1320	642,913	1,881,778		
447	1398		273° -	-1.9°	8.5	-		-8.5		782.4		+27	-1398	642,909	1,881,700	642,905 + 1,881,700 4-Way Intersect. El. 782	
448	1540		273°14.4'	-1.9°	8.0	-		-8.0		782.9		+36	-1540	642,918	1,881,558	(Warner)	
449	1760		" "	-1.9°	4.2	-		-4.2		786.7		+41	-1760	642,923	1,881,338		
450	1980		" "	-1.9°	9.4	TH	+9.9	+0.5		791.4		+46	-1979	642,928	1,881,119		
451	2200		273°14.4'	-1.9°	4.4	TH	+11.0	+6.6		797.5	TP	+51	-2199.4	642,933	1,880,895		
451	2200			-1.9°	6.2	89°40'	+12.8	+6.6			TP						
	1980		92°52' + 180°		+4.7	90°30'	+28.8	+33.5	831.0		BS	+33	-1980-5				
	1980			-1.9°	+15.0	90°32'	+18.4	+33.4			BS						
452	1760		92°52'	-1.9°	1.8	91°-	-30.7	-32.5		798.5		-30	+1760	642,936	1,880,670		
453	1540		" "	-1.9°	9.0	91°-	-26.9	-35.9		795.1		-26	+1540	642,940	1,880,450	horizont. correct. y=0 x=33'	
453	1480		93°13'	-1.9°	10.0	91°-	-25.8	-35.8		795.2		-34	+1480	642,932	1,880,390	642,935 + 1,880,390 (scaled) T-rd (south)	
454	1320		92°52'	-1.9°	10.4	91°-	-23.0	-33.4		797.6		-22	+1320	642,944	1,880,230	(Duffield)	
455	1100		" "	-1.9°	12.6	91°-	-19.2	-31.8		799.2		-19	+1100	642,947	1,880,010		
456	880		" "	-1.9°	13.0	91°-	-15.4	-28.4		802.6		-15	+880	642,951	1,879,790		
457	660		" "	-1.9°	9.9	91°30'	-17.3	-27.2		803.8		-11	+660	642,955	1,879,570		
458	440		" "	-1.9°	13.3	91°40'	-12.8	-26.1		804.9		-7	+440	642,959	1,879,350		
459	220		" "	-1.9°	12.2	91°40'	-6.4	-18.6		812.4		-4	+220	642,962	1,879,130		
460	0				5.4	-		-5.4		825.6	π	0	0	642,966	1,878,910		
461	220		273°88'	-1.9°	6.9	-		-6.9		824.1		+5	-220	642,971	1,878,690		

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
9/11/78		G. Catcamp		R. Hulsey		6834		R. S. H.		2		29			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Sumner		Michigan		Gratiot		10 N		4 W				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
									831.0						
462	440		273° 88'	-1.9°	11.6	91° -	-7.7	-19.3		811.7		+10	-440	642,976	1,878,470
463	660		"	-1.9°	12.2	91° 20'	-15.4	-27.6		803.4		+14	-660	642,980	1,878,250
464	880		"	-1.9°	13.2	91° -	-15.4	-28.6		802.4		+19	-880	642,985	1,878,030
465	1100		"	-1.9°	9.2	91° -	-19.2	-28.4		802.6		+24	-1100	642,990	1,877,810
466	1320		"	-1.9°	10.3	91° -	-23.0	-33.3		797.7		+29	-1320	642,995	1,877,590
467	1540		"	-1.9°	11.7	91° 20'	-35.8	-47.5		783.5		+34	-1540	643,000	1,877,370
468	1760		"	-1.9°	13.5	91° 20'	-40.9	-54.4		776.6		+38	-1760	643,004	1,877,150
469	1980		"	-1.9°	10.7	91° 20'	-46.1	-56.8		774.2		+43	-1980	643,009	1,876,930
470	2200		"	-1.9°	6.1	91° 20'	-51.2	-57.3		773.7		+48	-2199	643,014	1,876,711
471	2420		273° 88'	-1.9°	4.8	91° 0'	-49.3	-54.1		776.9	TP	+53	-2419.4	643,019	1,876,495
471	2420				11.8	91° -	-42.2	-54.0			TP				
	1320		91° 54.2' +180°	-1.9°	+3.1	-		+3.1	780.0		BS	-0	-1320.4		
	1320				4.7	89° 36'	-1.5	+3.2			BS				
+	1250		92° 06'	-1.9°	3.3	-		-3.3		776.7		-4	+1250	643,015	1,876,429
472	1100		91° 54.2'	-1.9°	8.5	BH	-5.5	-14.0		766.0		0	+1100	643,019	1,876,279 (Osborn)
473	880		"	-1.9°	11.3	BH	-4.4	-15.7		764.3		0	+880	643,019	1,876,059
474	660		"	-1.9°	10.9	BH	-3.3	-14.2		765.8		0	+660	643,019	1,875,839
475	440		"	-1.9°	13.2	BH	-2.2	-15.4		764.6		0	+440	643,019	1,875,619
476	220		"	-1.9°	13.2	-		-13.2		766.8		0	+220	643,019	1,875,399
477	0		"	-1.9°	5.4	-		-5.4		774.6	TP	0	0	643,019	1,875,179

643,025 + 1,876,435
4-Way Intersect. El. 776

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NO. BS CHECKED BY		LINE NO.		PAGE			
9/12/78		G. Cotcamp		R. Huisoy		6834		R. J. A.		2		30			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Summer		Michigan		Gratiot		10N		4W				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 -	EAST + WEST -		Y
									780.0						
478	220		271°45'	-1.9°	6.6	-		-6.6		773.4		-1	-220	643,018	1,874,959
479	440		"	-1.9°	8.6	-		-8.6		771.4		-1	-440	643,018	1,874,739
(480)	660		"	-1.9°	10.0	-		-10.0		770.0		-2	-660	643,017	1,874,519
481	880		"	-1.9°	12.1	-		-12.1		767.9		-2	-880	643,017	1,874,299
482	1100		"	-1.9°	13.1	-		-13.1		766.9		-3	-1100	643,016	1,874,079
483	1320		271°45'	-2.3°	13.8	-		-13.8		766.2	TP	-13	-1320 ₊₃	643,006	1,873,862
483	1320		"		7.2	84	-6.6	-13.8			TP				
	2420		92°53.8' +180°	-2.3°	+4.4	-		+4.4	770.6		BS	+25	-2420 ₊₃		
	2420		"		+14.3	89°46'	-9.8	+4.5			BS				
484	2200		92°53.8'	-2.3°	5.4	-		-5.4		765.2		-23	+2200	643,008	1,873,645
(485)	1980		"	-2.3°	4.5	-		-4.5		766.1		-21	+1980	643,010	1,873,425
486	1760		"	-2.3°	4.5	-		-4.5		766.1		-18	+1760	643,013	1,873,205
487	1540		"	-2.3°	5.1	-		-5.1		765.5		-16	+1540	643,015	1,872,985
488	1320		"	-2.3°	6.4	-		-6.4		764.2		-14	+1320	643,017	1,872,765
489	1100		"	-2.3°	7.8	-		-7.8		762.8		-11	+1100	643,020	1,872,545
(490)	880		"	-2.3°	7.7	-		-7.7		762.9		-9	+880	643,022	1,872,325
491	660		"	-2.3°	6.6	-		-6.6		764.0		-7	+660	643,024	1,872,105
492	440		"	-2.3°	6.5	-		-6.5		764.1		-5	+440	643,026	1,871,885
493	220		"	-2.3°	5.4	-		-5.4		765.2		-2	+220	643,029	1,871,665
494	0		"		5.4	-		-5.4		765.2	TP	0	0	643,031	1,871,445

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
9/12/78		G. Coicamp		R. Hulsev		6834		R.S.H.		2		31			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Summer		Michigan		Gratiot		10N		4W				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
									770.6						
495	220		273°39.3'	-23°	5.8	-		-5.8		764.8		+5	-220	643,036	1,871,225
	240		272°	-23°	4.5	-		-4.5		766.1		-1	-240	643,030	1,871,205
496	440		273°39.3'	-23°	3.9	-		-3.9		766.7		+10	-440	643,041	1,871,005
497	660			-23°	2.2	-		-2.2		768.4		+16	-660	643,047	1,870,785
498	880			-23°	3.3	-		-3.3		767.3		+21	-880	643,052	1,870,565
499	1100			-23°	4.1	-		-4.1		766.5		+26	-1100	643,057	1,870,345
500	1320			-23°	4.0	-		-4.0		766.6		+31	-1320	643,062	1,870,125
501	1540			-23°	5.0	-		-5.0		765.6		+36	-1540	643,067	1,869,905
502	1760			-23°	3.2	-		-3.2		767.4		+42	-1760	643,073	1,869,685
503	1980			-23°	3.7	-		-3.7		766.9		+47	-1979	643,078	1,869,466
504	2200			-23°	3.2	-		-3.2		767.4		+52	-2199	643,083	1,869,246
505	2420		273°39.3'	-27°	2.3	-		-2.3		768.3	TP	+40	-2419+2	643,071	1,869,028
505	2420				14.4	TH	+12.1	-2.3			TP				
	2640		74°8.6'+180°	-27°	+5.6	-		+5.6	773.9		BS	+66	-2639+2		
	2640				10.3	89°54'	-4.6	+5.7			BS				
506	2420		94°8.6'	-27°	6.5	-		-6.5		767.4		-61	+2419	643,076	1,868,810
507	2200			-27°	6.6	-		-6.6		767.3		-55	+2199	643,082	1,868,590
508	1980			-27°	6.3	-		-6.3		767.6		-50	+1979	643,087	1,868,370
509	1760			-27°	6.3	-		-6.3		767.6		-44	+1759	643,093	1,868,150
510	1540			-27°	6.6	-		-6.6		767.3		-39	+1540	643,098	1,867,931

SURVEY NOTES-HIGH RESOLUTION DATA
GEO-445

Geosource Inc.

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE							
9/12/78		G. Cotcamp		R. Hulsey		6837		R. Y. H.		2		32							
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER					
Michigan		Summer		Michigan		Grand/Montcalm		10N		4W/5W				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				
									7739										
511	1320		94° 36'	-2.7°	6.8	-		-6.8		767.1		-33	+1320	643,104	1,867,711				
512	1100		" "	-2.7°	6.8	-		-6.8		767.1		-28	+1100	643,109	1,867,491				
513	880		" "	-2.7°	6.6	-		-6.6		767.3		-22	+880	643,115	1,867,271				
514	660		" "	-2.7°	6.3	-		-6.3		767.6		-17	+660	643,120	1,867,051				
515	440		" "	-2.7°	6.7	-		-6.7		767.2		-11	+440	643,126	1,866,831				
516	220		" "	-2.7°	6.5	-		-6.5		767.4		-6	+220	643,131	1,866,611				↑
517	0				5.4	-		-5.4		768.5	π	0	0	643,137	1,866,391				RAW
518	180		273° 36'	-2.7°	4.3	-		-4.3		769.6		+3	-180	643,140	1,866,271				1,866,215 + 643,130 4-Way Intersect. E1.70
519	220		270° 59.4'	-2.7°	4.9	-		-4.9		769.0		+1	-220	643,138	1,866,171				County Line Rd.
519	440		" "	-2.7°	4.4	-		-4.4		769.5		+2	-440	643,139	1,865,951				R5W
520	660		" "	-2.7°	4.9	-		-4.9		769.0		+3	-660	643,140	1,865,731				↓
521	880		" "	-2.7°	4.9	-		-4.9		769.0		+4	-880	643,141	1,865,511				
522	1100		" "	-2.7°	4.6	-		-4.6		769.3		+6	-1100	643,143	1,865,291				
523	1320		" "	-2.7°	4.1	-		-4.1		769.8		+7	-1320	643,144	1,865,071				
524	1540		" "	-2.7°	4.4	-		-4.4		769.5		+8	-1540	643,145	1,864,851				
525	1760		" "	-2.7°	4.4	-		-4.4		769.5		+9	-1760	643,146	1,864,631				
526	1980		" "	-2.7°	3.9	-		-3.9		770.0		+10	-1980	643,147	1,864,411				
527	2200		" "	-2.7°	3.4	-		-3.4		770.5		+11	-2200	643,148	1,864,191				
528	2420		" "	-2.7°	1.8	-		-1.8		772.1		+12	-2420	643,149	1,863,971				

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
9/12/78		G. Cotcamp		R. Hulsey		6834		R.S.H.		2		33			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Summer		Michigan		Alontcalm		10N		5W				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 -	EAST + WEST -		Y
									773.9						
529	2640		272°59.4'	-2.7°	11.9	74	+13.2	+1.3		775.2	TP	+13 +4	-2640	643,154	1,863,751
529	2640				14.0	89°40'	+15.4	+1.4			TP				
	1540		92°57'+180°	-2.7°	+7.3	91°-	+26.9	+34.2	809.4		BS	+7 +3	-1540		
	1540				+14.5	90°44'	+19.7	+34.2			BS				
530	1320		92°57'	-2.7°	12.0	91°-	-23.0	-35.0		774.4		-6	+1320	643,158	1,863,531
531	1100		" "	-2.7°	11.3	91°10'	-22.4	-33.7		775.7		-5	+1100	643,159	1,863,311
532	880		" "	-2.7°	13.1	91°-	-15.4	-28.5		780.9		-4	+880	643,160	1,863,091
533	500		" "	-2.7°	13.7	91°-	-11.5	-25.2		784.2		-3	+660	643,161	1,862,871
534	450		" "	-2.7°	9.4	91°-	-7.7	-17.1		792.3		-2	+440	643,162	1,862,651
535	500		" "	-2.7°	13.4	64	-1.1	-14.5		794.9		-1	+220	643,163	1,862,431
536	0				5.4	-		-5.4		804.0	T	0	0	643,164	1,862,211
537	500		273°15'	-2.7°	6.0	-		-6.0		803.4		+2	-220	643,166	1,861,991
538	490		" "	-2.7°	11.4	-		-11.4		798.0		+4	-440	643,168	1,861,771
539	550		" "	-2.7°	13.8	-		-13.8		795.6		+6	-660	643,170	1,861,551
540	280		" "	-2.7°	12.8	84	-4.4	-17.2		792.2		+8	-880	643,172	1,861,331
541	700		" "	-2.7°	7.1	90°40'	-12.8	-19.9		789.5		+11	-1100	643,175	1,861,111
JL 7F	1268		273°5'	-2.7°	6.5	90°40'	-14.7	-21.2		788.2		+8	-1268	643,172	1,860,943
542	1320		273°15'	-2.7°	10.5	90°30'	-11.5	-22.0		787.4		+13	-1320	643,177	1,860,891 (Mt. Hope)
543	1540		" "	-2.7°	10.0	90°30'	-13.4	-23.4		786.0		+15	-1540	643,179	1,860,671
544	1760		" "	-2.7°	8.3	90°30'	-15.4	-23.7		785.7		+17	-1760	643,181	1,860,451

643,190 + 1,860,940
4 Way Intersect E1.788

DATE		INSTRUMENT MAN		ROD MAN		PARTY NUMBER		NOTES CHECKED BY		LINE NO.		PAGE			
9/12/78		G. Cotcamp		R. Hulsey		6834		R. S. H.		2		34			
AREA		TOPO MAP		STATE		COUNTY		TWP		RANGE		PPM		PARTY MANAGER	
Michigan		Summer		Michigan		Montcalm		10 N		5 W				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 -	EAST + WEST -		Y
									8094						
545	1980		273°15'	-2.7°	61	90°30'	-17.3	-23.4		786.0		+19	-1980	643,183	1,860,231
546	2200		273°15'	-2.7°	3.8	90°30'	-19.2	-23.0		786.4	TP	+21	-2200	643,185	1,860,011
546	2200			-2.7°	5.0	90°28'	-17.9	-22.9			TP				
	2640		93°51.6'±180°	-2.7°	+5.4	-		+5.4	791.9	+5.5	BS	+53	-2639		
	2640				+14.8	89°48'	-9.2	+5.6			BS				
547	2420		93°51.6'	-2.7°	5.7	-		-5.7		786.2		-49	+2420	643,189	1,859,792
548	2200		"	-2.7°	6.5	-		-6.5		785.4		-44	+2200	643,194	1,859,572
549	1980		"	-2.7°	7.8	-		-7.8		784.1		-40	+1980	643,198	1,859,352
550	1760		"	-2.7°	7.8	-		-7.8		784.1		-36	+1760	643,202	1,859,132
551	1540		"	-2.7°	7.6	-		-7.6		784.3		-31	+1540	643,207	1,858,912
552	1320		"	-2.7°	6.5	-		-6.5		785.4		-27	+1320	643,211	1,858,692
553	1100		"	-2.7°	6.8	-		-6.8		785.1		-22	+1100	643,216	1,858,472
554	880		"	-2.7°	7.2	-		-7.2		784.7		-18	+880	643,220	1,858,252
555	660		"	-2.7°	6.9	-		-6.9		785.0		-13	+660	643,225	1,858,032
556	440		"	-2.7°	6.8	-		-6.8		785.1		-9	+440	643,229	1,857,812
557	220		"	-2.7°	5.7	-		-5.7		786.2		-4	+220	643,234	1,857,592
558	0		"		5.4	-		-5.4		786.5	TP	0	0	643,238	1,857,372
559	0		273°34.2'	-2.7°	3.7	-		-3.7		788.2		+3	-220	643,241	1,857,152
560	440		"	-2.7°	3.6	-		-3.6		788.3		+7	-440	643,245	1,856,932
561	660		"	-2.7°	3.2	-		-3.2		788.7		+10	-660	643,248	1,856,712

