

APPENDIX L
TOPOGRAPHIC SURVEY REPORT

TOPOGRAPHIC SURVEY

for

PHASE II REMEDIAL INVESTIGATION

at

**RAVENNA ARMY AMMUNITION PLANT
LOAD LINE 1
RAVENNA, OHIO**

Prepared For:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

September, 1999

Prepared By:

ADAMS CRAFT HERZ WALKER, INC.

ARCHITECTS-ENGINEERS-PLANNERS-SURVEYORS

OAK RIDGE, TENNESSEE

ACHW PROJECT NO. 98742

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NARRATIVE

POINT LIST (NAD 83 STATE PLANE COORDINATE SYSTEM, OHIO
NORTH ZONE)

GPS CONTROL DATA

NARRATIVE

Adams Craft Herz Walker, Inc. began the survey on September 8, 1999 in support of **Science Applications International Corporation (SAIC)** in a Phase II Remedial Investigation of Load Line 1 at Ravenna Army Ammunition Plant, Ravenna, Ohio. Work on the project was completed September 14, 1999. Temperatures during the survey were in the low seventies and sunny throughout most of the week.

The survey efforts conducted to locate 8 monitoring wells at Load Line 1 were located primarily with Global Positioning Systems (GPS) technology. All 8 riser pipe elevations for the monitoring wells were located by GPS. The concrete elevations (ground elevations) were done with traditional survey methods.

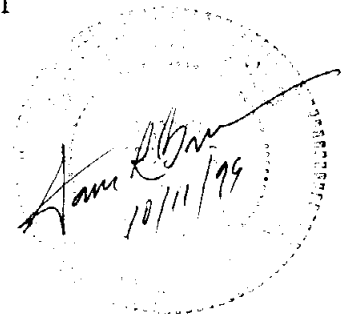
Horizontal and vertical control is based on the existing monuments RAV 10 and RAV 13. The coordinates and elevation of RAV 10 and RAV 13 were provided by the US Army Corps of Engineers. Horizontal data is based on the North American Datum of 1983 (NAD83) State Plane Coordinate System, Ohio North Zone. Vertical datum for the survey is relative to National American Vertical Datum of 1988 (NAVD88).

The field location of data was obtained using 3 Trimble 4600LS GPS receivers.

A copy of the GPS data and drawing TS-1 are attached.



Sam Bruner, RLS
Ohio Reg. No. 7781



ACHW PROJECT # 98742.0

JOB: 7420TS1.CR5

TIME: 16:20 DATE: 09-22-1999

Load Line 1 @ RAAP

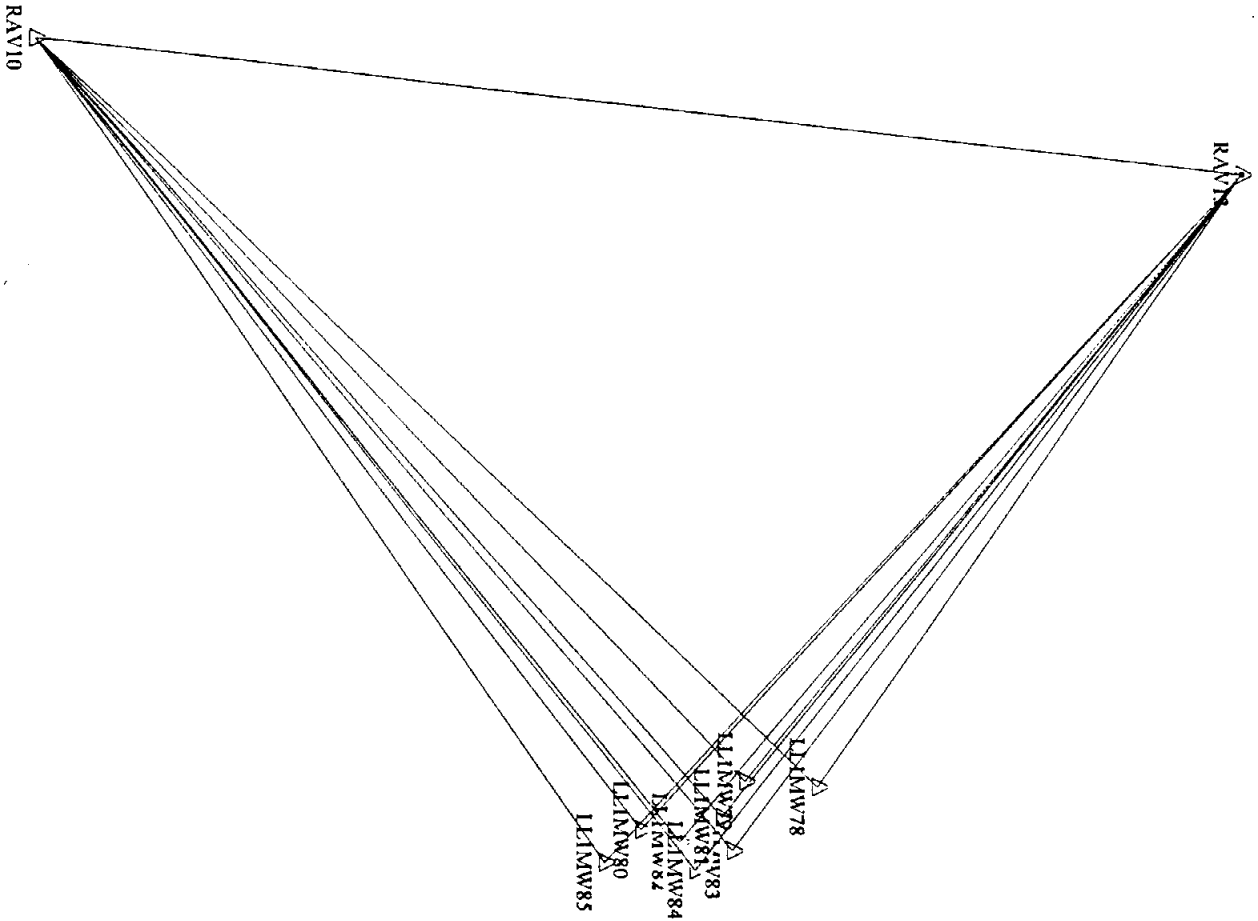
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=====
Point      Northing      Easting      Elevation      Note
=====
1      564623.871000  2376275.854000  995.840  LL1MW78
2      563739.630000  2376228.312000  997.870  LL1MW79
3      562479.728000  2376845.072000  996.270  LL1MW80
4      563462.725000  2376672.655000  998.920  LL1MW81
5      562956.860000  2376977.379000  1006.450  LL1MW82
6      563612.754000  2377074.800000  995.200  LL1MW83
7      563160.442000  2377316.020000  998.730  LL1MW84
8      562046.245000  2377246.938000  996.840  LL1MW85
9      555004.363000  2367417.833000  983.840  RAV10
10     569575.016000  2368754.577000  965.600  RAV13
=====

```

MONITORING WELL		
NO.	RISER PIPE EL.	CONCRETE EL.
LL1-MW78	995.84	993.4
LL1-MW79	997.87	995.3
LL1-MW80	996.27	993.7
LL1-MW81	998.92	996.4
LL1-MW82	1006.45	1003.7
LL1-MW83	995.20	992.8
LL1-MW84	998.73	996.4
LL1-MW85	996.84	994.3

Network Map: gps7420



1000m

Load Line 1 at Ravenna Army Ammunitions Plant

**** Reference Coordinates ****

Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
LL1MW81	LL1MW81	41°12'13.60152" N	081°00'59.56774" W	281.52074	Point Positioning
LL1MW79	LL1MW79	41°12'16.41197" N	081°01'05.31899" W	281.21033	Point Positioning
LL1MW78	LL1MW78	41°12'25.14001" N	081°01'04.50000" W	280.58173	Point Positioning
LL1MW83	LL1MW83	41°12'14.88442" N	081°00'54.32549" W	255.43978	Point Positioning
LL1MW84	LL1MW84	41°12'10.37523" N	081°00'51.27081" W	256.51348	Point Positioning
RAV13	RAV13	41°13'15.30639" N	081°02'41.81202" W	271.37058	Point Positioning
RAV10	RAV10	41°10'51.57490" N	081°03'02.47240" W	276.90800	Point Positioning
LL1MW82	LL1MW82	41°12'08.52365" N	081°00'55.70661" W	267.66469	Point Positioning
LL1MW85	LL1MW85	41°11'59.48184" N	081°00'52.38356" W	264.74261	Point Positioning
LL1MW80	LL1MW80	41°12'03.83227" N	081°00'57.54357" W	264.58857	Point Positioning

**** Adjusted Coordinates ****

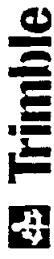
Projection Group: NAD-83 SP Lambert
 Zone Name: Ohio North
 Linear Units: meter
 Angular Units: degrees
 Datum Name: NAD-83

Station Short Name	Station ID	North	East	Ortho. Height	Ellip. Height
LL1MW78	LL1MW78	172097.70009	724290.32942	303.53180	269.73529
LL1MW79	LL1MW79	171828.18326	724275.83759	304.15208	270.35681
LL1MW80	LL1MW80	171444.16376	724463.82671	303.66547	269.86998
LL1MW81	LL1MW81	171743.78245	724411.27357	304.47204	270.67577
LL1MW82	LL1MW82	171589.59392	724504.15412	306.76696	272.97057
LL1MW83	LL1MW83	171789.51117	724533.84828	303.33882	269.54140
LL1MW84	LL1MW84	171651.64635	724607.37176	304.41267	270.61521
LL1MW85	LL1MW85	171312.03753	724586.31618	303.83831	270.04236
RAV10	RAV10	169165.66820	721590.39870	299.87500	266.11547
RAV13	RAV13	173606.81210	721997.83910	294.31600	260.52712

Load Line 1 at Ravenna Army Ammunitions Plant

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
RAV10	LL1MW78	L1 fixed	3986.209	1.4	34.183	1.534	0.848
RAV10	LL1MW79	L1 fixed	3782.026	2.4	17.280	1.534	0.794
RAV10	LL1MW80	L1 fixed	3667.555	3.9	11.305	1.488	0.929
RAV10	LL1MW81	L1 fixed	3821.938	3.2	12.125	1.534	0.746
RAV10	LL1MW82	L1 fixed	3790.580	4.2	7.738	1.488	0.773
RAV10	LL1MW83	L1 fixed	3943.587	3.5	6.911	1.534	0.767
RAV10	LL1MW84	L1 fixed	3909.677	1.6	5.820	1.534	0.831
RAV10	LL1MW85	L1 fixed	3685.827	3.6	8.021	1.488	0.927
RAV10	RAV13	L1 fixed	4460.282	52.2	4.788	1.534	1.607
RAV13	LL1MW78	L1 fixed	2744.931	1.2	44.391	1.607	0.848
RAV13	LL1MW79	L1 fixed	2890.446	1.7	19.762	1.607	0.794
RAV13	LL1MW80	L1 fixed	3280.322	4.0	11.883	1.533	0.929
RAV13	LL1MW81	L1 fixed	3049.210	2.3	13.929	1.607	0.746
RAV13	LL1MW82	L1 fixed	3217.634	5.3	8.152	1.533	0.773
RAV13	LL1MW83	L1 fixed	3120.270	3.5	5.625	1.607	0.767
RAV13	LL1MW84	L1 fixed	3261.091	2.1	5.844	1.607	0.831
RAV13	LL1MW85	L1 fixed	3459.604	4.3	7.256	1.533	0.927

GPS Fast Static Survey Field Log



Date	Julian Day	Filename	Epoch Rate	Operator(s)	Project Name	
9-8-99	251 + 252	1377	15 sec	Chet, Sam, & James	Ravenna Army Ammo Plant 987420	
Occ #	Receiver Type; Mark ID	Start Time	Stop Time	Antenna Height Measurements	Antenna Type;	Point Description & Notes
3	LL1-MW 80	15:20	15:50	(m) / 1.929	(ft)	Riser Pipe Top of Casing -2.53 Conc. EL.
4	LL1-MW 85	16:06	16:36	(m) / 1.927	(ft)	Riser Pipe Top of Casing -2.52 Conc. EL. SU 8 PDOP 2.7
5	LL1-MW 82	16:49	15:19	(m) / 1.773	(ft)	Riser Pipe Top of Casing -2.75 Conc. EL. SU 9 PDOP 2.9
8	LL1-MW 84	8:45	9:15	(m) / 1.831	(ft)	Riser Pipe Top of Casing -2.33 Conc. EL. SU 6 PDOP 3.1
9	LL1-MW 83	9:25	9:55	(m) / 1.767	(ft)	Riser Pipe Top of Casing -2.43 Conc. EL. SU 5 PDOP 3.8
12	LL1-MW 81	15:07	15:42	(m) / 1.848	(ft)	Riser Pipe Top of Casing -2.44 Conc. EL. SU 5 PDOP 4.3
13	LL1-MW 81	15:49	16:20	(m) / 1.794	(ft)	Riser Pipe Top of Casing -2.53 Conc. EL. SU 7 PDOP 2.0
14	LL1-MW 81	16:26	17:00	(m) / 1.746	(ft)	Riser Pipe Top of Casing -2.49 Conc. EL. SU 7 PDOP 2.9

New Closure

From: RAV13

To: LL1MW78 L1 fixed
9/9/99 19:08:00 00002832.SSF
41°12'25.14001" N 38712523.DAT Slope (m): 2744.931
081°01' 4.50000" W 13772523.DAT Total (m): 2744.931
280.5817 m

To: RAV10 L1 fixed
9/9/99 19:08:00 00002816.SSF
41°10'51.57514" N 38742523.DAT Slope (m): 3986.209
081°03' 2.47205" W 13772523.DAT Total (m): 6731.140
276.9697 m

To: RAV13 L1 fixed
9/9/99 12:17:15 00002484.SSF
41°13'15.30673" N 38742521.DAT Slope (m): 4460.282
081°02'41.81144" W 38712521.DAT Total (m): 11191.422
271.3752 m

Closed

Precision (ppm): 1.5715
Errors (m) N: 0.0104 E: 0.0134 U: 0.0046

New Closure

From: RAV13

To: LL1MW83 L1 fixed
9/9/99 13:26:30 00002488.SSF
41°12'15.01617" N 38712521.DAT Slope (m): 3120.270
081°00'54.27405" W 13772522.DAT Total (m): 3120.270
280.3874 m

To: RAV10 L1 fixed
9/9/99 13:26:30 00002476.SSF
41°10'51.57477" N 38742521.DAT Slope (m): 3943.587
081°03' 2.47289" W 13772522.DAT Total (m): 7063.857

276.9685 m

To: RAV13		L1 fixed
9/9/99 12:17:15	00002484.SSF	
		Slope (m): 4460.282
41°13'15.30636" N	38742521.DAT	
		Total (m): 11524.139
081°02'41.81228" W	38712521.DAT	

271.3740 m

Closed

Precision (ppm):	0.6121			
Errors (m) N:	-0.0009	E:	-0.0061	U: 0.0034

New Closure

From: RAV13

To: LL1MW79		L1 fixed
9/9/99 19:52:30	00002828.SSF	
		Slope (m): 2890.446
41°12'16.41197" N	38712523.DAT	
		Total (m): 2890.446
081°01' 5.31899" W	13772524.DAT	

281.2103 m

To: RAV10		L1 fixed
9/9/99 19:52:30	00002812.SSF	
		Slope (m): 3782.026
41°10'51.57481" N	38742523.DAT	
		Total (m): 6672.472
081°03' 2.47275" W	13772524.DAT	

276.9820 m

To: RAV13		L1 fixed
9/9/99 12:17:15	00002484.SSF	
		Slope (m): 4460.282
41°13'15.30641" N	38742521.DAT	
		Total (m): 11132.754
081°02'41.81214" W	38712521.DAT	

271.3875 m

Closed

Precision (ppm):	1.5452			
Errors (m) N:	0.0005	E:	-0.0029	U: 0.0170

New Closure

From: RAV13

To: L1MW84 L1 fixed
 9/9/99 12:46:30 00002492.SSF
 Slope (m): 3261.091
 41°12'10.50699" N 38712521.DAT
 Total (m): 3261.091
 081°00'51.21939" W 13772520.DAT
 281.4610 m

To: RAV10 L1 fixed
 9/9/99 12:46:30 00002480.SSF
 Slope (m): 3909.677
 41°10'51.57486" N 38742521.DAT
 Total (m): 7170.768
 081°03' 2.47273" W 13772520.DAT
 276.9668 m

To: RAV13 L1 fixed
 9/9/99 12:17:15 00002484.SSF
 Slope (m): 4460.282
 41°13'15.30645" N 38742521.DAT
 Total (m): 11631.050
 081°02'41.81212" W 38712521.DAT
 271.3723 m

Closed

Precision (ppm): 0.2902
 Errors (m) N: 0.0017 E: -0.0023 U: 0.0017

New Closure

From: RAV13

To: L1MW81 L1 fixed
 9/9/99 20:30:30 00002824.SSF
 Slope (m): 3049.210
 41°12'13.60152" N 38712523.DAT
 Total (m): 3049.210
 081°00'59.56774" W 13772525.DAT
 281.5207 m

To: RAV10 L1 fixed
 9/9/99 20:30:30 00002808.SSF
 Slope (m): 3821.938
 41°10'51.57463" N 38742523.DAT
 Total (m): 6871.148
 081°03' 2.47225" W 13772525.DAT
 276.9659 m

To: RAV13 L1 fixed
 9/9/99 12:17:15 00002484.SSF
 Slope (m): 4460.282

41°13'15.30622" N 38742521.DAT
Total (m): 11331.430
081°02'41.81164" W 38712521.DAT

271.3714 m

Closed

Precision (ppm): 0.8934
Errors (m) N: -0.0051 E: 0.0087 U: 0.0008

New Closure

From: RAV13

To: LL1MW82 L1 fixed
9/8/99 20:48:30 00002224.SSF

41°12' 8.55302" N 38742512.DAT Slope (m): 3217.634

081°00'55.69405" W 13772512.DAT Total (m): 3217.634

283.7981 m

To: RAV10 L1 fixed
9/8/99 20:48:30 00002208.SSF

41°10'51.57543" N 38712510.DAT Slope (m): 3790.580

081°03' 2.47193" W 13772512.DAT Total (m): 7008.214

276.9360 m

To: RAV13 L1 fixed
9/9/99 12:17:15 00002484.SSF

41°13'15.30702" N 38742521.DAT Slope (m): 4460.282

081°02'41.81133" W 38712521.DAT Total (m): 11468.496

271.3415 m

Closed

Precision (ppm): 3.3539
Errors (m) N: 0.0194 E: 0.0161 U: -0.0290

New Closure

From: RAV13

To: LL1MW85 L1 fixed
9/8/99 20:06:15 00002228.SSF

41°11'59.51122" N 38742512.DAT Slope (m): 3459.604

Total (m): 3459.604

L-16

Closed

Precision (ppm):	3.4566				
Errors (m) N:	0.0318	E:	0.0191	U:	0.0134

Closed

Precision (ppm):	3.4566				
Errors (m) N:	0.0318	E:	0.0191	U:	0.0134

TOPOGRAPHIC SURVEYING SERVICES

for

A PHASE II REMEDIAL INVESTIGATION (LOAD LINE 1)

and

A PHASE II REMEDIAL INVESTIGATION (LOAD LINE 2)

at

**RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO**

Prepared For:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

January, 2000

Prepared By:

ADAMS CRAFT HERZ WALKER, INC.

ARCHITECTS-ENGINEERS-PLANNERS-SURVEYORS

OAK RIDGE, TENNESSEE

ACHW PROJECT NO. 99726

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NARRATIVE

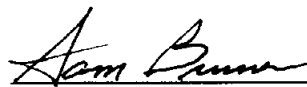
Adams Craft Herz Walker, Inc. mobilized to Ravenna, Ohio on Tuesday, January 4, 2000 to complete the survey begun on November 4, 1999 in support of **Science Applications International Corporation (SAIC)** in a Phase II Remedial Investigation of Load Line 2 at Ravenna Army Ammunition Plant. Work under this mobilization was completed and ACHW demobilized on Thursday, January 6, 2000.

During the initial mobilization, 16 surface soil samples at Load Line 1 were located using traditional survey methods. Under this mobilization, 5 surface soil samples at Load Line 2 were located directly using Global Positioning Systems (GPS) technology. The five surface soil samples were tied to control point RAV 10. There were 21 total surface soil samples located at Load Line 1 & Load Line 2.

Horizontal and vertical control for Load Line 1 is based on the existing monuments RAV 10 and RAV 13. Horizontal and vertical control for Load Line 2 is based on the existing monuments RAV 10. The coordinates and elevation of RAV 10 and RAV 13 were provided by the US Army Corps of Engineers. Horizontal data is based on the North American Datum of 1983 (NAD83) State Plane Coordinate System, Ohio North Zone. Vertical datum for the survey is relative to National American Vertical Datum of 1988 (NAVD88).

The field location of data was obtained using two Trimble 4600LS GPS receivers and a Topcon 303DPG total station.

A copy of the GPS data, points list, raw data, and drawing TS-5 and TS-6 are attached.



L-21

Sam Bruner, RLS
Ohio Reg. No. 7781



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POINT LIST

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ACHW PROJECT #99726

JOB: 7260ALL4.CR5

TIME: 10:32 DATE: 01-10-2000

Load Line 1, Ravenna, Ohio

Point	Northing	Easting	Elevation	Note
801	563936.595000	2375485.856000	1005.520	START
802	563244.991000	2375884.596000	1011.360	PK.2
803	563375.028000	2376026.721000	1008.380	NCH.3
804	562882.999000	2376102.391000	1011.260	PK.4
805	562075.921000	2376522.605000	1017.200	ACHW00.3
851	564153.200000	2375838.765000	991.710	CB.12.4
852	564001.332000	2375584.600000	994.500	CB.12.1
853	563969.375000	2375513.472000	995.010	CB.12.3
854	564052.388000	2375531.435000	995.290	CB.12.2
855	563290.850000	2375987.638000	995.130	CB-23-3
856	563288.891000	2375956.356000	994.230	CB-23-1
857	563166.050000	2375991.930000	994.520	CB-23-5
858	563243.699000	2376012.764000	994.880	CB.23.2
859	563353.847000	2376328.791000	992.170	CB.23.4
860	562934.711000	2376223.905000	994.380	CB.8.1
861	562910.017000	2376171.343000	995.390	CB.8.2
862	563101.664000	2376474.517000	993.040	CB.8.3
863	562270.853000	2376860.179000	991.700	CB.22.4
864	562131.221000	2376635.092000	995.110	CB.22.2
865	562145.738000	2376634.619000	994.600	CB.22.3
866	562051.380000	2376614.908000	995.550	CB.22.1

ACHW PROJECT #99726

JOB: 7263FT.CR5

TIME: 07:24 DATE: 01-10-2000

Load Line 2, Ravenna, Ohio

Point	Northing	Easting	Elevation	Note
900	560134.234060	2373862.332320	1009.522	DB22 1
901	560112.505100	2373811.863260	1010.447	DB22 2
902	560305.240940	2374054.375900	1008.564	DB22 3
903	561901.786300	2372784.555600	1011.192	DB8 1
904	561930.172070	2372837.714940	1010.618	DB8 2
905	555004.362430	2367417.834050	983.840	RAV 10

RAW-DATA FILE

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ACHW PROJECT #99726

JOB: 7260TS4

TIME: 10:33 DATE: 01-10-2000

Load Line 1, Ravenna, Ohio

JOB: Name 7260TS4, Date 11-4-1999, Time 12:41:02.47

Mode Setup: North Azimuth, Dist feet, Scale 1.0000, Earth crv OFF

Store: Pt 1, N 5000.0000, E 5000.0000, Elv 100.0000, START

Occupy: Occ 1, N 5000.0000, E 5000.0000, Elv 100.0000, START

Backsight: Occ 1, BS Pt 1, BS azm 0.0000, Back circle 0.0000

HI / HR : Inst H 5.2900, Rod H 5.4500

Side Shot: 1-2, Ang-Rt 0.0000, Zenith 89.3410, Slp Dst 798.3400, PK 2

HI / HR : Inst H 5.2900, Rod H 15.0500

Side Shot: 1-51, Ang-Rt 268.2530, Zenith 90.3340, Slp Dst 414.1000, CB 12 4

HI / HR : Inst H 5.2900, Rod H 6.5000

Side Shot: 1-52, Ang-Rt 266.4300, Zenith 94.4500, Slp Dst 118.4800, CB 12 1

Side Shot: 1-53, Ang-Rt 250.0445, Zenith 102.1445, Slp Dst 43.8600, CB 12 3

HI / HR : Inst H 5.2900, Rod H 28.1500

Side Shot: 1-54, Ang-Rt 231.2705, Zenith 84.1210, Slp Dst 125.0800, CB 12 2

Occupy: Occ 2, N 5798.3175, E 5000.0000, Elv 105.8390, PK 2

Backsight: Occ 2, BS Pt 1, BS azm 180.0000, Back circle 0.0000

HI / HR : Inst H 5.4000, Rod H 5.4500

Side Shot: 2-55, Ang-Rt 95.5825, Zenith 98.0945, Slp Dst 113.9400, CB-23-3

Side Shot: 2-56, Ang-Rt 88.3030, Zenith 99.1210, Slp Dst 85.2200, CB-23-1

HI / HR : Inst H 5.4000, Rod H 8.9000

Side Shot: 2-56, Ang-Rt 88.3030, Zenith 99.1210, Slp Dst 85.2200, CB-23-1

HI / HR : Inst H 5.4000, Rod H 12.4000

Side Shot: 2-57, Ang-Rt 156.1755, Zenith 94.1330, Slp Dst 133.6000, CB-23-5

HI / HR : Inst H 5.4000, Rod H 5.4500

Side Shot: 2-3, Ang-Rt 77.3030, Zenith 90.5220, Slp Dst 192.6600, NCH 3

Traverse: 2-4, Ang-Rt 178.5555, Zenith 90.0025, Slp Dst 422.4600, PK 4

Occupy: Occ 3, N 5756.6504, E 4811.9225, Elv 102.8560, NCH 3

Backsight: Occ 3, BS Pt 2, BS azm 77.3030, Back circle 0.0000

HI / HR : Inst H 5.2900, Rod H 5.2200

Note: BS point check:3-2

HI / HR : Inst H 5.2900, Rod H 5.4500

Side Shot: 3-58, Ang-Rt 318.3125, Zenith 95.4555, Slp Dst 132.7400, CB 23 2

HI / HR : Inst H 5.2900, Rod H 15.0500

Side Shot: 3-59, Ang-Rt 226.2805, Zenith 91.1310, Slp Dst 302.8800, CB 23 4

Occupy: Occ 4, N 6220.7041, E 4992.1253, Elv 105.7380, PK 4

Backsight: Occ 4, BS Pt 2, BS azm 178.5555, Back circle 0.0000

HI / HR : Inst H 5.3500, Rod H 5.2000

Note: BS point check:4-2

HI / HR : Inst H 5.3500, Rod H 5.1500

Side Shot: 4-60, Ang-Rt 97.5850, Zenith 97.2210, Slp Dst 133.1600, CB 8 1

HI / HR : Inst H 5.3500, Rod H 12.4000

Side Shot: 4-61, Ang-Rt 99.3810, Zenith 96.4715, Slp Dst 74.5800, CB 8 2

HI / HR : Inst H 5.3500, Rod H 15.0500

Side Shot: 4-62, Ang-Rt 90.3540, Zenith 91.0750, Slp Dst 431.7000, CB 8 3

HI / HR : Inst H 5.3500, Rod H 5.4500

Side Shot: 4-5, Ang-Rt 183.3145, Zenith 89.3710, Slp Dst 909.9400, ACHW00 3

Occupy: Occ 5, N 7129.7847, E 5031.1985, Elv 111.6820, ACHW00 3

Backsight: Occ 5, BS Pt 4, BS azm 182.2740, Back circle 0.0000

HI / HR : Inst H 5.4800, Rod H 15.0500

Side Shot: 5-63, Ang-Rt 87.3000, Zenith 92.2025, Slp Dst 390.1400, CB 22 4

HI / HR : Inst H 5.4800, Rod H 12.4000

Side Shot: 5-64, Ang-Rt 91.1930, Zenith 96.5405, Slp Dst 126.2600, CB 22 2

ACHW PROJECT #99726

JOB: 7260TS4

TIME: 10:33 DATE: 01-10-2000

Load Line 1, Ravenna, Ohio

Side Shot: 5-65, Ang-Rt 85.3410, Zenith 96.4640, Slp Dst 132.9200, CB 22 3

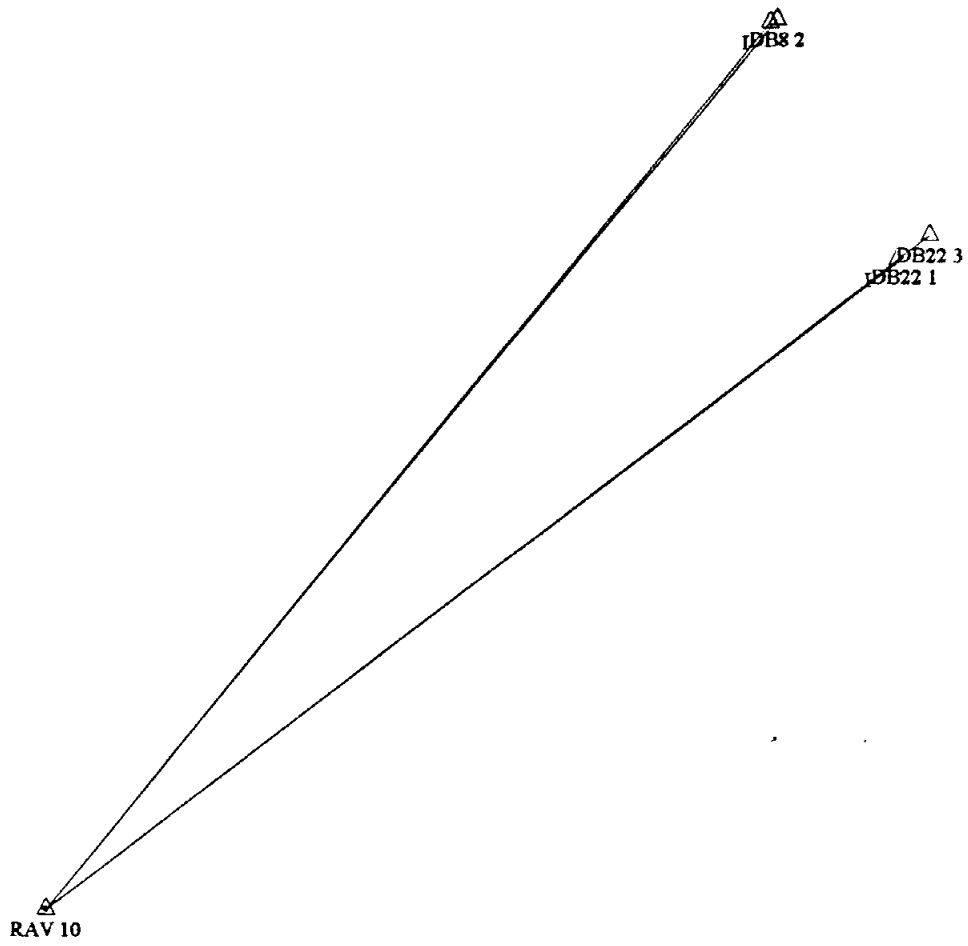
HI / HR : Inst H 5.4800, Rod H 18.0500

Side Shot: 5-66, Ang-Rt 132.2335, Zenith 95.2545, Slp Dst 95.9400, CB 22 1

GPS CONTROL DATA

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Network Map: gps7263



L-33

500m

Load Line 1 & 2 @ Ravenna Army Ammunitions Plant

Project: gps7263
Supervisor:
Date Created: 1/7/2000 7:52
Date Last Accessed: 1/7/2000 7:52
Project Directory: g:\997260\gps7263
Antenna Type: 4600LS Internal
Antenna Measurement Method: Reading from hook using 4600LS tape
Antenna Group: GPSurvey
Receiver Type: 4600LS
Coordinate System: Geographic
Zone: WGS84
Linear Unit: Meter
Timezone: Eastern Std USA : -5:00
Number of Stations: 6
Number of Baselines: 5
No. of Continuous Kinematic Solns: 0

Load Line 1 & 2 @ Ravenna Army Ammunitions Plant

**** Reference Coordinates ****

Station Short Name	Station ID	Latitude	Longitude	Height	Station Quality
RAV 10	RAV 10	41°10'51.66250" N	081°03'02.38722" W	276.83359	Point Positioning
DB22 3	DB22 3	41°11'42.93368" N	081°01'34.43208" W	284.34699	Point Positioning
DB22 1	DB22 1	41°11'41.27627" N	081°01'36.98171" W	284.63901	Point Positioning
DB22 2	DB22 2	41°11'41.07003" N	081°01'37.64662" W	284.92182	Point Positioning
DB8 2	DB8 2	41°11'59.18993" N	081°01'49.98729" W	284.97354	Point Positioning
DB8 1	DB8 1	41°11'58.91836" N	081°01'50.68888" W	285.14903	Point Positioning

**** Adjusted Coordinates ****

Projection Group: NAD-83 SP Lambert

Zone Name: Ohio North

Linear Units: meter

Angular Units: degrees

Datum Name: NAD-83

Station Short Name	Station ID	North	East	Ortho. Height	Ellip. Height
DB22 1	DB22 1	170729.25594	723554.68590	307.70254	273.91771
DB22 2	DB22 2	170722.63320	723539.30272	307.98520	274.20053
DB22 3	DB22 3	170781.37939	723613.22144	307.41123	273.62570
DB8 1	DB8 1	171268.00729	723226.17898	308.21217	274.42774
DB8 2	DB8 2	171276.65886	723242.38179	308.03685	274.25225
RAV 10	RAV 10	169165.66820	721590.39870	299.87500	266.11230

Load Line 1 & 2 @ Ravenna Army Ammunitions Plant

From Station Short Name	To Station Short Name	Solution Type	Slope	Ratio	Reference Variance	Entered Ant. Ht. (From)	Entered Ant. Ht. (To)
RAV 10	DB22 1	L1 fixed	2510.894	3.5	8.943	1.594	1.875
RAV 10	DB22 2	L1 fixed	2494.737	10.8	1.827	1.594	1.713
RAV 10	DB22 3	L1 fixed	2589.163	5.5	2.755	1.594	1.614
RAV 10	DB8 1	L1 fixed	2664.044	4.2	4.259	1.594	1.716
RAV 10	DB8 2	L1 fixed	2680.834	8.1	2.044	1.594	1.703



GPS Fast Static Survey Field Log

Date		Julian Day	Filename	Epoch Rate	Operator(s)	Project Name
	-5-00	605	3871	15 sec	James J. Herchel	Lead Line 2, Recovery, OK 1472 # 99726.0
Receiver Type/Type		Receiver	Antenna Type:			
		Receiver 2	46065 INT			
Occ #	MarkID	Start Time	Stop Time	Antenna Height Measurements		
				(m) /	(ft)	
1	DB88-1	9:55	10:25	1.716 (m) /	5.63 (ft)	Soil Borings SW#7
2	DB88-2	10:30	11:00	1.703 (m) /	5.59 (ft)	Soil Boring SW#6
3	DB22-2	11:10	11:40	1.713 (m) /	5.62 (ft)	Soil Boring
4	DB22-1	11:45	12:15	1.875 (m) /	6.15 (ft)	Soil Boring
5	DB22-3	12:20	12:50	1.614 (m) /	5.295 (ft)	Soil Boring
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	
				(m) /	(ft)	

DRAWING

L-39

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**LOAD LINE 1 PHASE II RI
GPS COORDINATE DATA**

(Survey coordinates for the enclosed stations were determined in the field by a GPS system and were not surveyed by a subcontracted surveyor)

Station	Northing	Easting
CORP OF ENG MONUMENT 3008	563167.312	2380523.285
LL1-001	563404.2076	2376611.317
LL1-002	563397.6741	2376587.191
LL1-003	563333.0726	2376655.54
LL1-004	563311.5532	2376601.306
LL1-005	563243.0056	2376478.959
LL1-006	563357.874	2376522.997
LL1-007	563385.0301	2376558.887
LL1-008	563409.2188	2376469.134
LL1-009	562958.8712	2376836.787
LL1-010	562933.9608	2376796.812
LL1-110	564491.9733	2375913.262
LL1-014	562851.2214	2376807.509
LL1-015	562874.55	2376845.203
LL1-016	562763.3742	2376826.162
LL1-023	563591.3513	2376984.329
LL1-024	563700.641	2376843.22
LL1-027	561915.6751	2377148.271
LL1-034	563762.4444	2376179.721
LL1-035	563826.729	2376150.782
LL1-037	563902.6258	2376109.788
LL1-038	564640.7877	2376221.565
LL1-068	564466.7534	2375873.306
LL1-086	565279.0639	2375857.293
LL1-087	565313.6485	2375847.46
LL1-088	565319.37	2375818.892
LL1-089	565306.2629	2375796.068
LL1-091	565266.4984	2375793.625
LL1-092	565232.3513	2375812.467
LL1-093	565200.7119	2375839.292
LL1-094	565191.878	2375864.083
LL1-095	565244	2375902
LL1-096	564660.6714	2376215.193
LL1-097	564711.6063	2376187.829
LL1-098	564752.4864	2376166.627
LL1-099	564827.307	2376125.515
LL1-100	564847.537	2376092.236
LL1-101	564835.6497	2376060.874
LL1-102	564777.4533	2376085.797
LL1-103	564703.9089	2376126.317
LL1-104	564630.1793	2376165.739
LL1-105	564339.0652	2375794.167
LL1-106	564357.5713	2375848.304
LL1-107	564417.2486	2375844.029
LL1-108	564456.7032	2375851.479
LL1-109	564414.0156	2375857.346
LL1-011	562886.9167	2376863.126
LL1-111	564529.4756	2375895.362
LL1-112	564652.4721	2375828.438
LL1-113	564776.2154	2375759.993
LL1-114	564813.6092	2375727.35

LL1-115	564822.8563	2375629.25
LL1-116	564851.3753	2375640.657
LL1-117	564928.8023	2375564.928
LL1-118	564736.4111	2375684.747
LL1-119	564711.4916	2375696.908
LL1-120	563697.5226	2376222.285
LL1-121	563683.321	2376218.147
LL1-122	563670.5791	2376193.062
LL1-123	563663.6661	2376177.991
LL1-124	563656.9945	2376163.46
LL1-125	563756.7854	2376276.119
LL1-126	563744.6294	2376198.893
LL1-127	563767.8322	2376181.803
LL1-128	563844.4669	2376140.686
LL1-129	563873.3473	2376125.901
LL1-130	563944.9003	2376087.818
LL1-131	563974.4983	2376060.367
LL1-132	563989.0796	2376059.818
LL1-133	563974.66	2376034.251
LL1-134	563963.8884	2376011.79
LL1-135	563540.5255	2376946.967
LL1-137	563598.1042	2376988.657
LL1-138	563553.5812	2376995.164
LL1-139	563546.8061	2377011.018
LL1-140	563563.1368	2377033.61
LL1-141	563609.2232	2377008.985
LL1-142	563604.2956	2376999.578
LL1-143	563554.9705	2377040.592
LL1-144	563350.7635	2376671.975
LL1-145	563408.0763	2376690.734
LL1-146	563410.7524	2376631.458
LL1-147	563371.6579	2376548.392
LL1-148	563327.2109	2376466.862
LL1-149	563305.6649	2376434.821
LL1-150	563296.2901	2376575.608
LL1-151	563274.7009	2376536.357
LL1-152	563265.3094	2376519.143
LL1-153	563254.6391	2376499.322
LL1-154	562926.9196	2376905.539
LL1-155	562922.4059	2376912.911
LL1-156	562912.6771	2376910.658
LL1-157	562973.7397	2376875.308
LL1-158	562966.6542	2376851.802
LL1-159	562930	2376761
LL1-160	562898.9847	2376748.184
LL1-161	562887.6356	2376709.392
LL1-162	562867.2793	2376674.557
LL1-163	562801.2397	2376714.721
LL1-164	562816.5678	2376742.359
LL1-165	562819.5299	2376773.244
LL1-166	562787.1882	2376792.283
LL1-167	562763.6363	2376797.579

LL1-168	562786.1399	2376827.202
LL1-169	562489.5413	2376842.305
LL1-170	562497.7359	2376830.878
LL1-171	562491.6605	2376847.371
LL1-172	562487.5894	2376852.223
LL1-173	562481.8959	2376838.467
LL1-174	562461.0107	2376887.264
LL1-175	562481.8618	2376857.834
LL1-176	562490.4507	2376842.818
LL1-177	562490.8221	2376877.227
LL1-178	562431.7779	2376938.441
LL1-179	562019.4016	2377182.934
LL1-180	561929.8682	2377139.888
LL1-181	561937.0079	2377136.491
LL1-182	561922.7466	2377143.597
LL1-183	561932.642	2377129.161
LL1-184	561907	2377106
LL1-185	561869	2377128
LL1-186	561903.5341	2377144.563
LL1-187	561908.2623	2377152.291
LL1-188	565458.4571	2375149.628
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LL1-191	562171.6258	2376233.349
LL1-192	561574.2726	2376480.756
LL1-193	560902.3353	2377372.13
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LL1-197	561589.2875	2377004.824
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LL1-200	564346.1516	2375940.863
LL1-201	563530.4018	2376489.424
LL1-202	563273.8121	2376631.619
LL1-203	563041.1057	2376581.144
LL1-204	562828.0472	2376816.863
LL1-205	562026.2644	2377272.525
LL1-206	565392.0859	2376147.86
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LL1-208	564205.1309	2376928.777
LL1-209	563530.5734	2377199.835
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LL1-211	563580.4754	2377952.223
LL1-212	563580.4754	2378687.332
LL1-213	562675.9186	2378464.254
LL1-214	561486.4504	2377899.609
LL1-215	561317.4946	2378502.004
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LL1-217	562249.3414	2379522.477
LL1-218	561955	2377584
LL1-219	561902.9722	2377556.596

LL1-220	561960	2377527
LL1-221	564603.1207	2375679.006
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LL1-232	562927.8839	2376846.215
LL1-233	563583.1059	2377018.651
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LL1-239	563510.7618	2376259.182
LL1-240	563262.9591	2376410.61
LL1-241	563036.8576	2376540.764
LL1-242	562827.0081	2376668.06
LL1-243	562455.5439	2376810.808
LL1-244	562303.9822	2376864.083
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LL1-246	561502.0356	2377312.697
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LL1-248	563020	2376092
LL1-249	561920	2376682
LL1-250	563732.576	2377012.459
LL1-251	563727	2377083
LL1-254	563538.6725	2376751.124
LL1-255	563561.7975	2376767.881
LL1-256	563585.5456	2376779.786
LL1-257	563604.4671	2376794.521
LL1-258	563601.2207	2376801.05
LL1-259	563599.366	2376810.604
LL1-260	563599.1838	2376824.534
LL1-261	563602.9459	2376835.724
LL1-262	563613.1907	2376845.504
LL1-263	563629.5203	2376841.822
LL1-264	563636.8795	2376836.64
LL1-265	563622.0523	2376794.187
LL1-266	563650.7046	2376805.881
LL1-267	563636.1017	2376819.123
LL1-268	563734.9497	2376839.023
LL1-269	563626.2546	2376829.596
LL1-270	563622.7488	2376811.55
LL1-271	563629.2492	2376809.424
LL1-272	563624.7212	2376818.904
LL1-273	563615.3807	2376820.056

LL1-274	562992.9772	2376995.962
LL1-275	563007.9177	2377025.005
LL1-276	563019.5385	2377045.834
LL1-277	563029.2051	2377061.266
LL1-278	563043.5633	2377090.677
LL1-279	563050.6416	2377105.237
LL1-280	563060.7624	2377124.514
LL1-281	563079.3273	2377161.126
LL1-289	563099	2377918
LL1-301	563463.0032	2375449.189
LL1-304	564624	2376219
LL1-308	563088.8145	2377092.483
LL1-309	563670.3234	2376960.134
LL1-318	568700	2379100
LL1-321	567000	2384100
LL1-323	566325	2386625
LL1-324	563136	2377200
LL1-325	563150.0342	2377225.189
LL1-326	563159.7273	2377226.73
LL1-327	563171.2745	2377249.207
LL1-328	563205.2403	2377226.782
LL1-329	563172	2377255
LL1-330	563109.9459	2377279.198
LL1-331	563096.6129	2377290.721
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LL1-334	563101.4895	2377243.022
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LL1-337	563373.6579	2376514.579
LL1-338	563422.704	2376584.819
LL1-339	563299.626	2376435.539
LL1-340	563352.7687	2376526.601
LL1-341	563393.1185	2376638.15
LL1-342	563250.0834	2376465.647
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LL1-344	563352.0882	2376655.446
LL1-345	563231.3199	2376502.488
LL1-346	563287.1308	2376594.78
LL1-347	563317.6909	2376657.839
LL1-348	563420.7039	2376664.829
LL1-349	563367.4804	2376699.963
LL1-350	562911.3252	2376702.976
LL1-351	562943.1057	2376776.646
LL1-352	562960.6401	2376806.352
LL1-353	562853.8135	2376674.133
LL1-354	562916.7591	2376751.954
LL1-355	562949.0484	2376845.998
LL1-356	562807.7249	2376702.297
LL1-357	562890.5577	2376865.654
LL1-358	562782.3932	2376746.33
LL1-359	562803.6553	2376773.051

LL1-360	562857.0564	2376871.172
LL1-361	562993.8315	2376929.298
LL1-362	562945.1772	2376985.037
LL1-363	562494.0362	2376882.066
LL1-364	562515.9091	2376900.983
LL1-365	562512.1894	2376824.655
LL1-366	562454.0891	2376857.876
LL1-367	564006.0339	2376138.544
LL1-368	563866.4395	2376219.195
LL1-369	563721.5671	2376257.004
LL1-370	563969.2117	2376048.655
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LL1-372	563698.2485	2376214.05
LL1-373	565082	2376322
LL1-374	565094	2376381
LL1-375	563586.3082	2377059.602
LL1-376	563613.7385	2376953.214
LL1-377	563520.8173	2377003.64
LL1-378	563546.9093	2376922.345
LL1-379	563167.0126	2377291.635
LL1-380	563208.9186	2377180.61
LL1-381	563072.2307	2377259.936
LL1-382	563105.3786	2377219.386
LL1-384	561861.3168	2377184.666
LL1-385	562091.638	2377264.108
LL1-386	562143.8304	2377066.826
LL1-387	562228.9826	2377021.899
LL1-388	561785.5044	2377327.102
LL1-389	561681.0917	2377363.953
LL1-390	561495.6149	2377476.378
LL1-391	566775.4926	2385459.418
LL1-392	566829.9132	2385375.516
LL1-393	566967.8909	2385122.301
LL1-394	564420	2375927
LL1-395	563036	2377524
LL1-396	564384	2376989
LL1-397	561124	2377755
LL1-398	563704	2377028
LL1-399	561242	2377649
LL1-400	561106	2377791
LL1-401	565228.3935	2375733.683
LL1-402	565172.9817	2375854.953
LL1-403	565167	2375904
LL1-404	565324	2375886
LL1-405	564553	2376217
LL1-406	562756.7209	2376850.867
LL1-407	562732.3342	2376819.039
LL1-408	561822.838	2377417.153
LL1-409	561951.497	2377393.259
LL1-410	561885.1849	2377272.932
LL1-411	561957.7935	2377513.323
LL1-412	561859.2745	2377550.175

LL1-413	564550	2375973
LL1-414	564019	2376010
LL1-415	563878.3977	2376251.181
LL1-416	563618	2378026
LL1-417	563579	2376708
LL1-418	563540	2376779
LL1-419	563199	2376599
LL1sd-046(d)	565204	2374597
LL1sd-047(d)	564927	2376851
LL1sd-050(d)	561141	2377722
LL1sd-055(p)	561817	2380141
LL1sd-070	564554	2376391
LL1-ss013	562857.4711	2376656.201
LL1-ss029	562501	2376830
LL1ss-030	562476	2376835
STA 048 SD DITCH BY LL1MW084	563048.6034	2377496.3
STA 049 SD CULVRT LL1 SIDE 150	561908.1192	2377878.366
STA 051 SD DITCH LRACC 120	560515.8283	2377426.39
STA 059 SW CHARLIES POND	563200.3171	2379674.113
STA 060 SD	563151.7271	2379683.627
STA 061 SD NEAR COESVY PT 3008	563168.7812	2380286.217
STA 077 SD DITCH	563143.4914	2379332.311
STA 252 SD DITCH BLDG CB13A	564765.6092	2375881.237
STA 253 SW GRIGGYS POND	562502.8544	2380352.439
STA 286 SD DTCH LOW ACCURACY55	563103.287	2378544.548
STA 287 SD DITCH	563104.06	2378739.686
STA 288 SD	563094.0398	2379030.975
STA 295 MH208 BY BLDG CB 4	563433.6887	2376655.42
STA 300 SD HEADWALL	564644.4575	2376597.519
STA 306 SD INLET B8	563354.0309	2376676.438
STA 310 SD INLET D7	562402.5742	2376846.393
STA 322 SW SD BAILEY BRIDGE	567065.004	2385016.835
STA319 SWSD RAMSDELL 6IN HIGH	566910.1582	2379041.02
STA320 SWSD UTES 1 OFFSTE CULV	563175.315	2380520.045

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